Standard Treatment Guidelines and Essential Medicines List for South Africa

Primary Healthcare Level
2020 Edition

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

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The Directorate: Primary Healthcare
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NOTE:
The information presented in these guidelines conforms to the current medical, nursing and pharmaceutical practice. Contributors and editors cannot be held responsible for errors, individual responses to medicines and other consequences.

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FOREWORD

It is my pleasure to bring to you the Seventh Edition of the Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML).

Health for all is vital, and the movement towards universal health coverage is now one of the most prominent global health priorities. To achieve universal health coverage, emphasis is placed on the role of primary healthcare (PHC), integrated into the broader framework for delivering comprehensive care in a patient-centered, efficient and equitable way. Furthermore, there must be a focus on disease prevention and health promotion, supported by the use of appropriate technology and cost-effective use of available resources.

During the unprecedented times that the country is experiencing through the COVID-19 pandemic, access to safe, effective and affordable medicines has become more important than ever. The National Essential Medicines List Committee (NEMLC) together with its Expert Review Committees, and supported by the Essential Drugs Programme, has worked tirelessly to contribute to making sure that the highest standard of quality healthcare based on available resources is provided to all citizens. The seventh edition of the PHC Guidelines brings updates based on the latest scientific evidence and other new and updated practice guidelines, and includes guidance related to the management of COVID-19.

The National STGs and EML, accessed by healthcare professionals in both the public and private health sectors South Africa and across the globe, are important tools to support the rational use of medicines. The evidence-based medicine recommendations included in the STGs and EML are reviewed through the transparent critical appraisal of global evidence, using a systematic evidence-to-decision framework. Transparency is maintained through the publication of all NEMLC decisions on the National Department of Health website.

As the country continues to move towards National Health Insurance, the PHC STGs and EML will continue to provide a strong foundation on which health service benefits will be structured, assisting with the provision of equitable access to safe, effective affordable healthcare for all.

I urge all healthcare professionals to use this important resource in the provision of quality health care to the people we serve.

DR Z MKHIZE, MP
MINISTER OF HEALTH
DATE: 03/02/2021

INTRODUCTION

Welcome to the latest edition of the Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML).

PHC is the first level of care at which most patients access the health system. In addition to these treatment guidelines aimed at healthcare workers at PHC facilities, the Essential Medicines List Clinical Guide mobile application encourages improved access to Standard Treatment Guidelines at all levels of care. Healthcare services can then be accessed at primary level of care dependant on the level of skills and resources available at each individual facility.

The STGs and EML provide clear guidance to support equitable access to essential health care services at the primary level of care to enable the prevention and treatment of a wide range of acute and chronic conditions, with appropriate referral to higher levels of care.

In updating the STGs and EML, evidence-based reviews have been conducted systematically considering benefit-risk assessment, feasibility, affordability, values and preferences, equity, and applicability to primary level of care. In particular, the therapeutic interchange database, developed to address medicine supply challenges and enables competitive pricing, has been updated, and algorithms for management of HIV on the use of dolutegravir for HIV have been included in this edition. Guidance on the management of COVID-19 promotes the rational use of medicines during the ongoing outbreak, as well as, basic information on screening, referral and home-based management.

I would like to thank all stakeholders who provided input into the new PHC STGs and EML 2020 edition, as well as the clinical experts within the National Essential Medicines List Committee, its Expert Review Committees and the Essential Drugs Programme for their incredible efforts in managing the development and implementation of these important guidelines.

DR SSS BUTHELEZI
DIRECTOR-GENERAL: HEALTH
DATE: 2020/11/19

ACKNOWLEDGEMENTS

The expedited publication of this edition of the Primary Healthcare (PHC) Standard Treatment Guidelines and Essential Medicines List is testament of the enthusiasm, dedication, technical expertise and time given by the Essential Drugs Programme, the combined PHC/Adult Hospital Level Expert review Committee and the National Essential Medicines List Committee. Guidance has been aligned with the currently approved NEMLC recommendations described in the Adult Hospital Level (2019 edition) and Paediatric Hospital Level STGs and EML, draft format (currently in progress) and National Department of Health Programmatic Guidelines. Constructive collaboration with various stakeholders further contributed to the quality of this edition.

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Prof H Brits
Dr TE Zulu
Dr NI Tsabedze
Ms SC Oliviera

CONSULTANT

Dr J Wessels (BHPSA)

COMMENTS AND CONTRIBUTIONS

Dr K Balme
Prof C Cohen (NICD)
Dr H Dawood
Dr L Erasmus (NICD)
Prof GS Gebhardt
Ms Y Johnson
Ms J Jones
Ms TD Leong (Secreteriate)
Prof G Maartens
Dr N Mayet (NICD)
Dr JS Nel
Dr J Nuttall
Ms V Raath
Dr LJ Robertson
Prof A von Gottberg (NICD)
Dr K McCarthy (NICD)

EDITORIAL

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Dr J Jugathpal

DIRECTOR: AFFORDABLE MEDICINES

Ms K Jamaloodien

ACTING CLUSTER MANAGER: SECTOR WIDE PROCUREMENT

Ms K Jamaloodien

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THE ESSENTIAL MEDICINES CONCEPT

The WHO describes Essential medicines as those that satisfy the priority health care needs of the population. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate quantities, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.

The concept of essential medicines is forward-looking. It incorporates the need to regularly update medicines selections to:

» reflect new therapeutic options and changing therapeutic needs;
» the need to ensure medicine quality; and
» the need for continued development of better medicines, medicines for emerging diseases, and medicines to meet changing resistance patterns.

Effective health care requires a judicious balance between preventive and curative services. A crucial and often deficient element in curative services is an adequate supply of appropriate medicines. In the health objectives of the National Drug Policy, the government of South Africa clearly outlines its commitment to ensuring availability and accessibility of medicines for all people. These are as follows:

» To ensure the availability and accessibility of essential medicines to all citizens.
» To ensure the safety, efficacy and quality of medicines.
» To ensure good prescribing and dispensing practices.
» To promote the rational use of medicines by prescribers, dispensers and patients through provision of the necessary training, education and information.
» To promote the concept of individual responsibility for health, preventive care and informed decision-making.

Achieving these objectives requires a comprehensive strategy that not only includes improved supply and distribution, but also appropriate and extensive human resource development. The implementation of an Essential Drugs Programme (EDP) forms an integral part of this strategy, with continued rationalisation of the variety of medicines available in the public sector as a first priority. The private sector is encouraged to use these guidelines and medicine list wherever appropriate.

The criteria for the selection of essential medicines for Primary Health Care in South Africa were based on the WHO guidelines for drawing up a national EML. Essential medicines are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost.

The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations. It remains a national responsibility to determine which medicines are regarded as essential.

HOW TO USE THESE GUIDELINES

Principles

The National Drug Policy[1] provides for an Essential Drugs Programme (EDP) - a key component of promoting rational medicines use. Medicines are included or removed from the Essential Medicines List (EML) based on an evidence-based review of safety and effectiveness, followed by consideration of cost and other relevant practice factors. All reasonable steps are taken to align the Standard Treatment Guidelines (STGs) with Department of Health guidelines that are available at the time of review. Some recommendations might not be aligned with the SAHPRA registered label/package insert; but are guided by health needs assessment and the best available scientific evidence.

The perspective adopted in the Primary Healthcare (PHC) STGs is that of a competent prescriber practicing in a public sector facility. The STGs serve as a standard for practice, but do not replace sound clinical judgment. It is important to remember that the treatments recommended are guidelines only based on the assumption that prescribers can manage patients with the relevant conditions. This includes rational prescribing in the elderly and palliative care, as the use of some medicines, especially as people get older or more ill, can cause more harm than good. Optimizing medication through targeted de-prescribing is a vital part of managing chronic conditions, avoiding adverse effects, improving outcomes, reducing pill burden and maintaining or improving quality of life.

The Primary Healthcare (PHC) EML and STGs allow for the management of patients with relatively common conditions at primary level of care. They also guide referral of patients with more complex or uncommon conditions to facilities with the skills and resources to provide further investigation and management. As such, they serve as a progression to Adult and Paediatric hospital level EMLs and STGs.

The PHC STGs and EML should be used by healthcare workers providing care at clinics, community health centres, and gateway clinics at hospitals.

Pharmaceutical and Therapeutics Committees (PTCs) are responsible for ensuring the availability of medicines listed in the PHC EML at those facilities, as well as at higher levels of care.

Provincial PTCs are authorised to reasonably adapt the STGs/EML according to local circumstances and available expertise, and to facilitate and control access to medicines listed on the Adult and Paediatric hospital level EMLs at specific PHC facilities.

Provincial PTCs are also responsible for facilitating access to medicines at PHC level for specific patients through down-referral from higher levels of care. This flexible approach aims to promote better utilisation of resources while providing access to healthcare that is more convenient for patients.

[1] National Drugs Policy, 1996. https://www.gov.za/documents/national-drugs-policy

Given that the STGs and EMLs for the various levels of care are reviewed at different times, there may be periods when they are not perfectly aligned. Likewise, updated STGs and EMLs will not always be synchronised with public sector pharmaceutical tenders, and PTCs should facilitate the phase in/out of the relevant essential medicines.

Local formularies

The EML has been developed down to generic or International Non-Propriety Name (INN) level. Each Province is expected to review the EML and prevailing tenders and compile a formulary which:

» lists formulations and pack sizes that will facilitate care in alignment with the STGs and EML;
» selects the preferred member of the therapeutic class based on cost;
» implements formulary restrictions consistent with the local environment; and
» provides information on medicine prices.

Therapeutic classes are designated in the "Medicine treatment" sections of the STGs which provide classes of medicines followed by an example of each class, such as 'HMGCoA reductase inhibitors (statins) e.g. simvastatin'. Therapeutic classes are designated where none of the members of the class offer any significant benefit over the other registered members of the class. It is anticipated that by listing a class rather than a specific medicine there is increased competition and hence an improved chance of obtaining the lowest possible price in the tender process.

Where therapeutic classes are listed in the STGs always consult your local formulary to identify the specific medicine that has been approved for use in your facility. A therapeutic interchange database has been developed that lists evidence-based reviewed medicines that have been grouped into each therapeutic class for a specific condition, as outlined in the policy for classifying medicines into therapeutic classes for purposes of therapeutic interchange. The database and policy are available on the National Department of Health website: http://www.health.gov.za/edp.php

Navigating the guidelines

Each chapter covers a broad organ system, with cross-referral to other chapters where necessary. Within each chapter, conditions are usually listed alphabetically. Conditions and medicines are cross referenced in two separate indexes of these guidelines.

ICD10 codes

Diagnosis codes from the International Statistical Classification of Diseases and Related Health Problems (ICD-10) are included for each condition to facilitate accurate recording of diagnoses. The primary ICD-10 code may be accompanied by a secondary code that is bracketed to differentiate a secondary manifestation from the primary aetiology. (For example, uncomplicated broncho-pneumonia with severe penicillin allergy would be coded as: J18.0+(Z88.0)). All the rules and guidelines for the use of ICD-10 must be applied as per the World Health Organisation (WHO), the agreed South African Morbidity Coding Standards and Guidelines document, and the South African Master Industry Table (MIT).

Available at: http://www.health.gov.za/index.php/shortcodes/2015-03-29-10-42-47/2015-06-10-09-23-36/2015-06-10-09-26-11

Diagnosis

A brief description and diagnostic criteria for each condition are included to assist healthcare workers to make a diagnosis.

Medicine treatment

Medicines may be listed according to a preferential order (e.g. first medicine as first-line option, second medicine as second-line option, etc). The dosing regimens provide the recommended doses for usual circumstances. The final dose should take into consideration capacity to eliminate the medicine, interactions and co-morbid states.

Paediatric dose calculation

Paediatric doses are usually provided in the form of weight-band dosing tables according to age. Doses should be calculated by weight, described as mg/kg. If this is not possible, choose a dose from the weight-band tables. Only use the dose according to age as a last resort. In particular, do not use age bands if the child appears small for his/her age or is malnourished.

Different conditions may require different doses of medicine. 'Standard' paediatric weight-band dosing tables for medicines are contained in an appendix. Where a specific condition is not listed in the appendix, refer to the STG in the main text of the guidelines for the dose specific to that condition.

EML Clinical Guide tools

The mobile application also provides tools to assist healthcare workers. These include calculators for BMI, Cardiovascular Event Risk (cholesterol- and BMI-based), eGFR, and Paediatric dose.

Prescription writing

All prescriptions must:

» be written legibly in ink by the prescriber with the full name, identification number and address of the patient, and signed with the date on the prescription form;
» specify the age and, in the case of children, weight of the patient;
» have prescriber details including contact details i.e. name, qualification, registration number, address and contact telephone number;
» indicate the diagnosis on the prescription, where there patient has provided consent.

In all prescriptions:

» State the treatment regimen in full:
  - medicine name, strength and formulation,
  - dose or dosage,
  - dose frequency,
  - dose route
  - duration of treatment,
  - e.g. amoxicillin 250 mg capsules, 8 hourly orally for 5 days.
» Write the name of the medicine/preparation in full using the generic name.
» Avoid abbreviations to reduce the risk of misinterpretation. Avoid the Greek mu (ų): write mcg as an abbreviation for micrograms.
» Avoid unnecessary use of decimal points. If necessary, write a zero in front of the decimal point only, e.g. 2 mg not 2.0 mg; or 0.5 mL not .5 mL.

» Avoid Greek and Roman frequency abbreviations that cause considerable confusion (qid, qod, tds, tid, etc). Instead either state the frequency in terms of hours (e.g. '8 hourly') or times per day in numerals (e.g. '3x/d').
» In the case of "as required", a minimum dose interval should be specified, e.g. 'every 4 hours as required'.
» Most monthly outpatient scripts for chronic medication are for 28 days; check that the patient will be able to access a repeat before the 28 days are completed.
» Prescriptions for schedules 6 medicines are not repeatable, requiring to be issued monthly; and the quantity to be issued should be expressed in words.

After writing a prescription, check that the dose, dose units, route, frequency, and duration for each item is stated. Consider whether the number of items is too great to be practical for the patient, and check that there are no redundant items or potentially important drug interactions. Check that the script is dated, that the patient's name, identification number and diagnosis/diagnostic code are on the prescription form. Only then should you sign the prescription and provide some other way for the pharmacy staff to identify the signature if there are problems (print your name, use a stamp, or use a prescriber number from your institution's pharmacy).

Nurses granted authorisation provided in terms of Section 56(6) of the Nursing Act 33, 2005 may prescribe medicines in accordance with the PHC STGs and EML and their scope of practice. The STGs generally provides for nurse prescribers except where designated as "doctor prescribed" only or "doctor initiated". The latter refers to an initial prescription prescribed by a doctor and which may be repeated by a nurse prescriber.

NEMLC reports

To promote transparency of medicine selection decisions, NEMLC reports, summary slide decks, medicine reviews and costing reports are available on the National Department of Health website: http://www.health.gov.za/edp.php

Other initiatives

The PHC STGs and EML supports the Ideal Clinic Framework (https://www.idealclinic.org.za/) and the Central Chronic Medicines Dispensing and Distribution (CCMDD) programme (See page xxiii).

Medicines Safety

Provincial and local PTCs should develop medicines safety systems to obtain information regarding medication errors, prevalence and severity of adverse medicine events, interactions, and medication quality. These systems should not only support the regulatory pharmacovigilance plan but should also provide pharmacoepidemiology data to inform future essential medicines decisions as well as local interventions to improve safety.

In accordance with the SAHPRA's guidance on reporting adverse drug reactions in South Africa, healthcare workers (with the support of PTCs) should report all relevant adverse reactions to the National Adverse Drug Event Monitoring Centre (NADEMC). To facilitate reporting, a copy of the Adverse Drug Reaction form and guidance on its use has been provided at the back of the guidelines.

Feedback

Comments that aim to improve these treatment guidelines are appreciated. The submission form and guidelines for completing the form are included. Motivations will only be accepted via Provincial PTCs.

These guidelines are also reviewed on a regular basis. During the review process, comments are requested during a comment period and should be forwarded directly to the EML Secretariat.

Achieving health goals for chronic conditions such as asthma, diabetes, HIV and AIDS, epilepsy, hypertension, mental health disorders and TB requires attention to:

» Adherence to long term pharmacotherapy – incomplete or non-adherence can lead to failure of an otherwise sound pharmacotherapeutic regimen.
» Organisation of health care services, which includes consideration of access to medicines and continuity of care.

Patient Adherence

Adherence is the extent to which a person's behaviour – taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.

Poor adherence results in less than optimal management and control of the illness and is often the primary reason for suboptimal clinical benefit. It can result in medical and psychosocial complications of disease, reduced quality of life of patients, and wasted health care resources.

Poor adherence can fall into one of the following patterns where the patient:

» takes the medication very rarely (once a week or once a month);
» alternates between long periods of taking and not taking their medication e.g. after a seizure or BP reading;
» skips entire days of medication;
» skips doses of the medication;
» skips one type of medication;
» takes the medication several hours late;
» does not stick to the eating or drinking requirements of the medication;
» adheres to a purposely modified regimen; and
» adheres to an unknowingly incorrect regimen.

Adherence should be assessed on a regular basis. Although there is no gold standard, the current consensus is that a multi method approach that includes self-report be adopted such as that below.

Barriers that contribute toward poor adherence:

BARRIER	RECOMMENDED SUPPORT
Life style	
» It is often difficult to take multiple medications.	» Create a treatment plan with information on how and when to take the medications.
» A busy schedule makes it difficult to remember to take the medication.	» Use reminders such as cues that form part of the daily routine.
Attitudes and beliefs	
» The condition is misunderstood or denied.	» Remind patients that they have a long term illness that requires their involvement.
» Treatment may not seem to be necessary.	» Use change techniques such as motivational interviewing.
» May have low expectations about treatment.	» Identify goals to demonstrate improvement/stabilisation.
Social and economic	
» May lack support at home or in the community	» Encourage participation in treatment support programs.
» May not have the economic resources to attend appointments.	» Consider down referral or reschedule appointment to fit in with other commitments.
Healthcare team related	
» Little or no time during the visit to provide information.	» Encourage patient to ask questions.
» Information may be provided in a way that is not understood.	» Use patient literacy materials in the patient's language of choice.
» Relationship with the patient may not promote understanding and self-management.	» Engage active listening.
Treatment related	
» Complex medication regimens (multiple medications and doses) can be hard to follow.	» If possible reduce treatment complexity
» May be discouraged if they don't feel better right away.	» Help the patient understand the condition and the role of their medication
» May be concerned about adverse effects.	» Discuss treatment goals in relation to potential adverse effects.

Although many of these recommendations require longer consultation time, this investment is rewarded many times over during the subsequent years of management.

For a patient to consistently adhere to long term pharmacotherapy requires integration of the regimen into his or her daily life style. The successful integration of the regimen is informed by the extent to which the regimen differs from his or her established daily routine. Where the pharmacological proprieties of the medication permits it, the pharmacotherapy dosing regimen should be adapted to the patient's daily routine. For example, a shift worker may need to take a sedating medicine in the morning when working night shifts, and at night, when working day shifts. If the intrusion into life style is too great alternative agents should be considered if they are available. This would include situations such as a lunchtime dose in a school-going child who remains at school for extramural activity and is unlikely to adhere to a three times a regimen but may very well succeed with a twice daily regimen.

Towards concordance when prescribing

Establish the patient's:

» occupation,
» daily routine,
» recreational activities,
» past experiences with other medicines, and
» expectations of therapeutic outcome.

Balance these against the therapeutic alternatives identified based on clinical findings. Any clashes between the established routine and life style with the chosen therapy should be discussed with the patient in such a manner that the patient will be motivated to change their lifestyle.

Note: Education that focuses on these identified problems is more likely to be successful than a generic approach toward the condition/medicine.

Education points to consider

» Focus on the positive aspects of therapy, but be supportive regarding negative aspects and offer guidance on how to manage this, if present.
» Provide realistic expectations regarding:
  - normal progression of the illness - especially important in those diseases where therapy merely controls the progression and those that are asymptomatic;
  - the improvement that therapy and non-medicinal treatment can add to the quality of life.
» Establish therapeutic goals and discuss them openly with the patient.
» Any action to be taken with loss of control or when side effects develop.
» In conditions that are asymptomatic or where symptoms have been controlled, reassure the patient that this reflects therapeutic success, and not that the condition has resolved.
» Where a patient raises concern regarding anticipated side effects, attempt to place this in context with respect to incidence, the risks vs. the benefits, and whether or not the side effects will disappear after continued use.

Note: Some patient's lifestyles make certain adverse responses acceptable which others may find intolerable. Sedation is unlikely to be acceptable to a student, but an older patient with insomnia may welcome this side effect. This is where concordance plays a vital role.

Notes on prescribing in chronic conditions.

» Do not change doses without good reason.
» Never blame anyone or anything for non-adherence before fully investigating the cause.
» If the clinical outcome is unsatisfactory - investigate adherence (note that side effects may be an issue).
» Always think about side effects and screen for them from time to time.
» When prescribing a new medicine for an additional health related problem ask yourself whether or not this medicine is being used to manage a side effect.
» Adherence with a once daily dose is best. Twice daily regimens show agreeable adherence. However, adherence decreases as the number of administration interval increases.

» Keep the total number of tablets to an absolute minimum as too many may lead to medication dosing errors and may influence adherence.

Improving Continuity of Therapy

» Make clear and concise records.
» Involvement the patient in the care plan.
» Every patient on chronic therapy should know:
  - his/her diagnosis
  - the name of every medicine
  - the dose and interval of the regimen
  - his/her BP or other readings

  Note: The prescriber should reinforce this only once management of the condition has been established.
» When the patient seeks medical attention for any other complaints such as a cold or headache he/she must inform that person about any other condition/disease and its management.
» If a patient indicates that he/she is unable to comply with a prescribed regimen, consider an alternative - not to treat might be one option, but be aware of the consequences e.g. ethical.

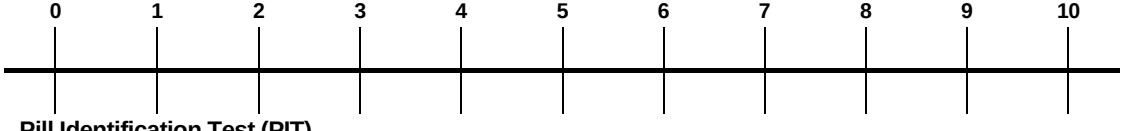
Patient Adherence Record

Folder No.	Date (dd/mm/yyyy) / /

Self-Reporting

Question	**Yes**	**No**
Do you sometimes find it difficult to remember to take your medicine?		
When you feel better, do you sometimes stop taking your medication?		
Thinking back over the past four days, have you missed any of your doses?		
Sometimes if you feel worse when you take the medicine, do you stop taking it?		

Visual Analogue Scale (VAS)



Score ____%

Pill Identification Test (PIT)

Medication	Knows the name (Y/N)	Knows the number of pills per dose (Y/N)	Time the medication is taken			Knows any additional instruction
			Morning (hour)	Evening (hour)	Considered Acceptable (Y/N)	

Pill Count

Did the client return the medication containers? Yes* No

***If yes**, check that the client only used medication from this container since the date of their last visit. If leftover medication had been used or an emergency prescription obtained, then the calculation will be invalid – skip to adherence assessment.

$$\text{\% Adherence} = \frac{\text{Dispensed} - \text{Returned}}{\text{Expected to be taken}} \times 100 = \frac{\square - \square}{\square} \times 100 = \square\ \%$$

Adherence Assessment

Self-reporting	Answered 'No' to all questions	Answered 'Yes' to 1 question	Answered 'Yes' to 2 or more questions
VAS	≥ 95%	75–94%	Less than 75%
PIT—*Client knows the…*	Dose, Time, and Instructions	Dose and Time	Dose only or confused
Pill count	≥ 95%	75–94%	Less than 75%
Overall Adherence	High	Moderate	Low

CENTRAL CHRONIC MEDICINE DISPENSING AND DISTRIBUTION (CCMDD)

The Central Chronic Medicines Dispensing and Distribution programme (CCMDD) has been implemented to improve access to medicines for stable patients with chronic conditions. It enables patients to collect their repeat medicines for one or two month`s supply at a pick-up point nearer to home or place of work and it is thus no longer necessary to wait in long queues at health facilities just to collect repeat medicines.

Each province provides a list of medicines aligned to the EML and STGs including prescriber levels that can be utilised for recruitment of patients on the programme. Prescriptions for patients enrolled on CCMDD not meeting legal requirements and compliance to EML and STGs are rejected. The ultimate goal of the CCMDD programme is to improve adherence and better health outcomes.

CCMDD Benefits:

Improved **access** to chronic medicines;

Reduced **workload** for public health facilities and health workers;

Reduced patient **waiting times** and better time management;

Improved **quality** of care and service delivery;

Improved **patient experience** in collection of chronic medication;

Decongestion of health facilities through the use of alternative Pick up Points;

Improved **patient satisfaction** and knowledge of care.

Improved treatment **adherence**;

Decreased **stigma** for HIV patients;

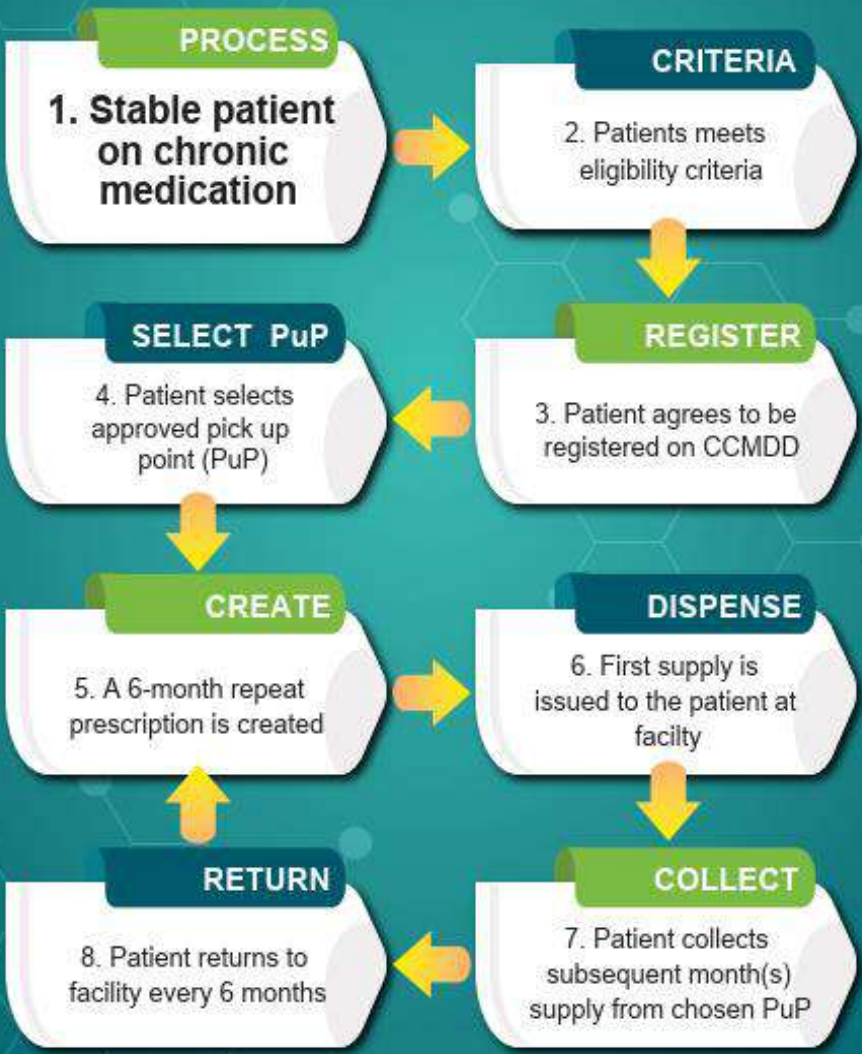
Improved availability of reliable **data** to inform decision-making at Facilities, SPs, PuPs;

Improved **supply chain** processes.

CCMDD is a proven, successful, patient centric approach to service patients in a manner that is beneficial to patients, Departments of Health, communities and creates lasting partnerships with the private sector.

Detailed information regarding the CCMDD process can be accessed at: www.health.gov.za/

Central Chronic Medicine Dispensing and Distribution (CCMDD)



PHC Chapter 1: Dental and oral conditions

1.1 ABSCESS AND CARIES, DENTAL

1.1.1 DENTAL ABSCESS

K04.7

DESCRIPTION

Acute or chronic suppuration related to teeth, due to infection. It is characterised by:

» acute, severe, throbbing pain
» swelling adjacent to the tooth, or on the face
» pain worsened by tapping on affected teeth
» restricted mouth opening or difficulty chewing
» pus collection located around the tooth or at the apex of the root

MEDICINE TREATMENT

Initiate treatment before referral:

Children

- Amoxicillin, oral, 10–20 mg/kg 8 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Susp		**Capsule**		
		125mg/ 5mL	250mg/ 5mL	250 mg	500 mg	
>11–25 kg	250 mg	10 mL	5 mL	1 cap	–	>18 months–7 years
>25 kg	500 mg	–	–	2 caps	1 cap	>7 years

AND

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 23.7.

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

AND

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

Severe penicillin allergy:

Z88.0

Children < 18 kg

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose, daily for 3 days. See dosing table, pg 23.2.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

All cases.

1.1.2 DENTAL CARIES

K02.0-5/K02.8-9

To be managed by a dentist or dental therapist.

For local anaesthesia for dental procedures:

- Lidocaine (Dentist and dental therapist).
- Lidocaine with adrenaline (epinephrine) (Dentist and dental therapist). *LoE: III*[1]

1.2 CANDIDIASIS, ORAL (THRUSH)

B37.0

DESCRIPTION

A candida infection of the mouth and sometimes of the pharynx.

Commonly presents as painful creamy white patches that can be scraped off the tongue and buccal mucosa.

Often occurs in healthy babies up to one month of age.

Risk factors for candidiasis include:

» poor oral hygiene
» immunosuppression (may be responsible for severe cases of oral thrush)
» prolonged use of broad spectrum antibiotics or corticosteroids (including inhaled)
» certain chronic diseases, e.g. diabetes mellitus
» trauma e.g. from poorly fitting dentures or dentures worn whilst sleeping

GENERAL MEASURES

» Identify underlying causes, based on risk factors.
» Improve oral hygiene.
» Feed infants using cup instead of a bottle.
» Ensure proper fitting dentures.

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 1 mL 6 hourly after each meal/feed for 7 days.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
  - In older children, ask the child to swirl in the mouth, prior to swallowing.
  - In infants, advise mothers to apply to front of the mouth and spread over the oral mucosa with a clean finger.
  - Continue for 48 hours after cure.

Note: In HIV-infected patients, candidiasis may involve the oesophagus as well as the mouth. Pain and difficulty in swallowing in an HIV-infected patient with oral candidiasis suggest oesophageal involvement, which requires systemic treatment with fluconazole. See Section 11.3.3: Candidiasis, oesophageal.

REFERRAL
No improvement.

1.3 GINGIVITIS AND PERIODONTITIS

1.3.1 UNCOMPLICATED GINGIVITIS
K05.0/K05.1

DESCRIPTION
An inflammation of the gum margin causing the gums to separate from the teeth.

Pockets (recesses) form between the gums and the teeth.

Pus and bacteria can collect in these pockets, eventually causing periodontitis. See section 1.3.2: Periodontitis.

Characteristics of uncomplicated gingivitis:

» may be painful
» bleeding
» gum recession may occur
» redness
» swollen gums

PROPHYLAXIS AND GENERAL MEASURES
Oral hygiene is usually adequate to prevent superficial mouth and gum infection:
» Oral hygiene after each meal to remove plaque and food debris.
» Brush teeth twice daily.
» Floss teeth at least once daily.
» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).

MEDICINE TREATMENT
Brush, floss, rinse mouth with water and then rinse with:
- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, after brushing teeth, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.

- Maximum dose: 4 g in 24 hours.

1.3.2 PERIODONTITIS

K05.2/K05.3

DESCRIPTION

Progressive gingivitis to the point where the underlying bone is eroded. It is characterised by loose teeth and is a cause of tooth loss in adults.

GENERAL MEASURES

» Provide advice on improving and maintaining oral hygiene.
» Brush teeth frequently, at least twice daily.

MEDICINE TREATMENT

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

All cases for dental treatment.

1.3.3 NECROTISING PERIODONTITIS

K05.2

DESCRIPTION

An acute, very painful infection of the gingival margin. It is characterised by:
» foul smelling breath
» necrosis and sloughing of the gum margin, especially of the interdental papillae
» loss of gingiva and supporting bone around teeth
May be associated with underlying disease, e.g. HIV.
May lead to disease of surrounding lips and cheeks if not adequately treated.

GENERAL MEASURES

» Relieve pain.
» Improve oral hygiene.
» Exclude underlying disease e.g. HIV.

MEDICINE TREATMENT

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 23.7.

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- • Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

All cases for dental treatment.

1.4 HERPES SIMPLEX INFECTIONS OF THE MOUTH AND LIPS

B00.1-2

DESCRIPTION

Acute, painful vesicular eruptions of the lips or ulcerations of the lips and mouth caused by Herpes simplex virus and characterised by:

» shallow, painful ulcers on the lips, gingiva, tongue and pharynx
» pain exacerbated by eating

It is a self-limiting infection with symptoms subsiding within 10 days.

GENERAL MEASURES

» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).
» Ensure adequate hydration.
» Fluid diet for children.
» Avoid acidic drinks, e.g. orange juice or soft drinks as they may cause pain.

MEDICINE TREATMENT

- Cover lesions on the lips with petroleum jelly.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Extensive oral herpes:

For children > 6 years and adults
- Tetracaine 0.5 %, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only (may be used inside mouth).

  Note: Safety in children < 6 years of age has not been established.

The following patients should be treated with aciclovir:

» Children with extensive oral herpes **provided treatment can be started within 72 hours of onset of symptoms.**
» HIV-infected patients with herpes infections of the lips or mouth.

Children < 15 years of age
- Aciclovir, oral, 250 mg/m2/dose, 8 hourly for 7 days. See dosing table, pg 23.1

Children ≥ 15 years of age and adults
- Antiviral, (active against herpes simplex) e.g.:
- Aciclovir, oral, 400 mg, 8 hourly for 7 days.

LoE: II[2]

REFERRAL
» Severe condition.
» Dehydrated patients.
» No improvement after 1 week of treatment.

1.5 APHTHOUS ULCERS
K12.0

DESCRIPTION
Painful ulcers in the mouth, except the gums, hard palate and dorsum of the tongue. Minor ulcers (< 1 cm diameter) usually heal within 10 days. Major ulcers (> 1 cm diameter) are very painful, often very deep and persist. Major ulcers usually indicate advanced HIV infection.

MEDICINE TREATMENT

Minor aphthous ulcers:

Children < 6 years of age
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Children > 6 years of age and adults
- Tetracaine 0.5 %, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only (may be used inside mouth).

  Note: Safety in children < 6 years of age has not been established.

REFERRAL

» Major ulcers for further diagnostic evaluation.
» Ulcers that are not healing within 10 days.

1.6 TEETHING, INFANT

K00.7

DESCRIPTION

Teething is the appearance of teeth through the gums in the mouth of infants and young children.

Symptoms often associated with teething include:

» fretfulness
» biting or chewing on hard objects
» drooling, which may often begin before teething starts
» gum swelling and tenderness
» refusing food
» sleeping problems

Teething is not a cause of severe or systemic symptoms, such as high fever or diarrhoea. Exclude conditions other than teething in infants who are systemically unwell or in distress.

Advise caregivers to seek medical advice if the infant becomes systemically unwell.

GENERAL MEASURES

Teething is a normal physiological process; simple self-care measures are recommended.

» Gentle massage to the gum or biting on objects (such as teething rings) may produce relief by producing counter-pressure against the gums (beware of choking risks).
» Cold objects may help to ease symptoms.

Do not use local oral anaesthetic preparations in infants, as these have been associated with severe adverse events.

REFERRAL

All children with systemic symptoms (e.g. high fever or diarrhoea) that cannot be managed at primary healthcare level.

PHC Chapter 2: Gastro-intestinal conditions

2.1 ABDOMINAL PAIN

R10.0-4

DESCRIPTION

Abdominal pain is a common symptom, which may be non-specific. It is frequently benign, but may indicate a serious acute pathology. A thorough evaluation is necessary to exclude a surgical abdomen or other serious conditions.

The history should include:

» duration, location, type, radiation and severity of pain
» relieving or aggravating factors e.g. food, antacids, exertion
» associated symptoms e.g. fever or chills, weight loss or gain, nausea, vomiting, diarrhoea, cramps, fresh blood per rectum, melaena stools, jaundice, change in stool or urine colour, vaginal discharge
» past medical and surgical history
» medication history
» alcohol intake or intake of other recreational substances
» family history of bowel disorders
» menstrual and contraceptive history in women
» associated vaginal discharge in women with lower abdominal pain

Examination should emphasise detection of:

» tachycardia
» fever
» jaundice or pallor
» abdominal masses, distension, tenderness
» signs of peritonitis (rebound tenderness and guarding)
» features of possible associated diseases (e.g. HIV)

MEDICINE TREATMENT

Urinary tract infection:
See Chapter 8: Kidney and urological disorders.

Dyspepsia:
See Section 2.2: Dyspepsia, heartburn and indigestion, in adults.

Cancer pain e.g. pancreatic, gastric cancer
See Section 20.4: Chronic cancer pain.

Renal and biliary colic or acute surgical abdomen:

- Morphine, IM/IV, 10 mg as a single dose and refer (Doctor prescribed).
  - For IV morphine: dilute in 10 mL Sodium chloride 0.9%
  - Administer slowly over 5 minutes.

Symptomatic treatment if no specific cause or indication for referral is found:

Pain relief (adults):
Analgesia as appropriate. See Section 20.1: Pain control.

Abdominal cramp-like pains (adults):

- Hyoscine butylbromide, oral, 10 mg 6 hourly for a maximum of 3 days.

REFERRAL

» Severe pain that cannot be managed at primary level of care.
» Signs of acute abdomen.
» Associated bloody non-diarrhoeal stools. (Red currant jelly stools in children).
» Associated abdominal mass.

2.2 DYSPEPSIA, HEARTBURN AND INDIGESTION, IN ADULTS

K30/R12

DESCRIPTION

Dyspepsia, heartburn and indigestion are common conditions and may be caused by gastro-oesophageal reflux.
These conditions often present with epigastric discomfort and minimal change in bowel habits.
Intermittent indigestion, heartburn or dyspepsia may be associated with:
» use of NSAIDs e.g. aspirin, ibuprofen, pain powders
» spicy food, alcohol, carbonated drinks
» smoking
Note: Dyspeptic symptoms may possibly be due to acute coronary syndrome.

GENERAL MEASURES

» Stop smoking.
» Limit alcohol intake.
» Eat small frequent meals.
» Avoid late night meals.
» Check haemoglobin.
» Stop the use of potential ulcerogenic medicines e.g. NSAIDs.

MEDICINE TREATMENT

Initiate medicine therapy with:

- Proton-pump inhibitor e.g.:
- Lansoprazole, oral, 30 mg daily for a maximum of 14 days.
  - Also indicated for short-term use in pregnancy.
  - Refer if symptoms recur after 14-day course of therapy.

REFERRAL

» Presence of warning signs:
  - weight loss
  - persistent vomiting
  - dysphagia
  - anaemia
  - haematemesis
  - palpable abdominal mass
» No response within 7 days of starting proton-pump inhibitor therapy treatment.
» Recurrence of symptoms, especially:
  - > 50 years of age
  - family history of gastric carcinoma
  - previous gastric surgery

2.3 GASTRO-OESOPHAGEAL REFLUX/DISEASE IN INFANTS

P78.8-9

DESCRIPTION

Gastro-oesophageal reflux (GOR) is the passive regurgitation of gastric content into the oesophagus. It may be a normal physiological phenomenon in infants, children and adults. Gastro-oesophageal reflux disease (GORD) is when GOR results in abnormal or pathological complications.

Symptoms

Frequent positing/regurgitation of small amounts of milk/food.

GENERAL MEASURES

In the absence of referral criteria (features of GORD), no medicine treatment is required. Counselling and non-medicinal measures are suggested:

» Explain that GOR is common and resolves in the majority of children by the age of 12–18 months.
» Upright positioning after feeds.

REFERRAL

» Failure to thrive (growth faltering).
» Abnormal posturing with opisthotonus or torticollis (Sandifer's syndrome).
» Respiratory symptoms, i.e. recurrent wheeze or cough, chronic obstructive airway disease, recurrent aspiration/pneumonia, stridor, apnoea and apparent life-threatening events.

2.4 NAUSEA AND VOMITING, NON-SPECIFIC

R11

DESCRIPTION

There are many possible causes of nausea and vomiting.

Some important causes to **exclude** are:

» gastro-intestinal disease
» liver disease
» renal failure
» alcohol abuse
» early pregnancy
» medicines

Establish if the vomiting is associated with:

» abdominal pain
» diarrhoea
» headache
» constipation

GENERAL MEASURES

» Maintain adequate hydration with clear fluids. See Section 2.9: Diarrhoea.
» In children, do not stop feeds for more than 1 hour. Restart feeds in smaller and more frequent amounts.
» Exclude pregnancy in women of child bearing age.

MEDICINE TREATMENT

Children

Do not use anti-emetics. Give small volumes of fluids more frequently.

Adults

- Metoclopramide, IM/IV, 10 mg 8 hourly, or

OR

- Metoclopramide, oral, 10 mg 8 hourly

REFERRAL

Urgent

» Severe dehydration.
» Shock.
» Diabetes.
» Severe pain.
» Wasting.
» Jaundice.
» Clinical features of sepsis.
» Associated abdominal tenderness with guarding and rebound tenderness.
» Signs of intestinal obstruction i.e. no stool or flatus passed.
» Infants with projectile vomiting or vomiting everything.
» Vomiting with digested or fresh blood present.

2.5 ANAL CONDITIONS

2.5.1 ANAL FISSURES

K60.0-2

DESCRIPTION

Painful small cracks just inside the anal margin, sometimes a linear ulcer.
It is often seen together with a sentinel pile or external haemorrhoids.
May cause spasm of the anal sphincter.
May cause bleeding on defaecation.

GENERAL MEASURES

Dietary advice to promote soft stools.

MEDICINE TREATMENT

Children

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 23.6.
  - If poor response, increase frequency to 12 hourly.

Adult

- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.
- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.

OR

- Lidocaine 2%, cream, topical, applied before and after each bowel action.

REFERRAL

» Severe pain.

» Recurrent episodes.
» Poor response to symptomatic treatment.
» Persistent anal bleeding.

2.5.2 HAEMORRHOIDS

I84.0-9

DESCRIPTION

Varicose veins of the ano-rectal area.
Is usually accompanied by a history of constipation.
In older patients consider a diagnosis of underlying carcinoma.

GENERAL MEASURES

» High-fibre diet.
» Counsel against chronic use of laxatives.
» Avoid straining at stool.

MEDICINE TREATMENT

Symptomatic treatment for painful haemorrhoids:

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily

OR

- Bismuth subgallate compound suppositories, insert one into the rectum 3 times daily.

OR

- Lidocaine 2%, cream, topical, applied before and after each bowel action.

Constipation

See Section 2.8: Constipation.

REFERRAL

» For surgical intervention if necessary:
  - if the haemorrhoid cannot be reduced
  - if the haemorrhoid is thrombosed
  - poor response to conservative treatment
» Children.
» Persistent anal bleeding.

2.5.3 PERIANAL ABSCESSES

K61.0-4

An abscess adjacent to the anus.
Caused by organisms spreading through the wall of the anus into peri-anal soft tissues.
Treatment is by surgical drainage.
Presents as an indurated or tender area adjacent to the anus.

2.6 APPENDICITIS

K35.0-3/K35.8-9/K37

DESCRIPTION

This is characterised by inflammation of the appendix, and usually requires urgent surgical intervention.

Clinical features

» Sudden peri-umbilical pain often migrating to the right iliac fossa.
» Nausea and vomiting.
» Loss of appetite.
» Fever.
» Constipation or occasionally diarrhoea.
» Bloated abdomen.
» Rebound tenderness, guarding and rigidity.
» Right iliac fossa tenderness.
» Right iliac fossa rebound pain.
» Severe persistent abdominal pain.

GENERAL MEASURES

Keep nil per mouth.

MEDICINE TREATMENT

Hydrate if required:

- Sodium chloride 0.9%, IV.

REFERRAL

All patients.

2.7 CHOLERA

A00.0-1/A00.9

Note: notifiable condition.

DESCRIPTION

Very acute severe watery diarrhoea due to infection with Vibrio cholerae.

Clinical features include:

» rice water appearance of stools:
  - no blood in stools
  - no pus in stools
  - no faecal odour
» possible vomiting
» rapid severe dehydration

GENERAL MEASURES

Rehydrate aggressively with oral rehydration solution (ORS).

MEDICINE TREATMENT

Treat dehydration

Children
Treat dehydration. See Section 2.9.1: Diarrhoea, acute in children.

Adults
Oral treatment:

- Oral rehydration solution.

OR

- Homemade sugar and salt solution. See Section 2.9: Diarrhoea.
  The volume of fluid required for oral rehydration depends on the severity of the dehydration.

Oral rehydration is preferred. In stuporose patients administer IV fluids or ORS by nasogastric tube.
IV treatment:

- Sodium chloride 0.9%, IV.

AND

Antibiotic treatment

Children

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days. See dosing tables, pg 23.4. (Ciprofloxacin is specifically used for this indication in children). *LoE:III*[3]

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days.
  - Adjust antibiotic choice, according to the sensitivity of the isolate responsible for the local epidemic. *LoE:III*[4]

AND

Nutritional supplementation

In all children who are able to take oral medication

- Zinc (elemental), oral for 14 days.
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

REFERRAL

» Severely ill patients.
» According to provincial and local policy.

2.8 CONSTIPATION

K59.0

DESCRIPTION

A condition characterised by a change in usual bowel habits and dry, hard stools.
There is a decreased frequency of bowel action. Patients should be assessed individually.
Constipation may have many causes, including:

» incorrect diet (insufficient fibre and fluid)
» lack of exercise

» pregnancy
» medicines, e.g. opiates and anticholinergics
» hypothyroidism
» lower bowel abnormalities
» chronic use of enemas and laxatives
» behavioural problems in children
» old age
» ignoring the urge
» neurogenic
» psychogenic disorders
» cancer of the bowel

CAUTION
In adults be especially suspicious of a change in bowel habits, as this may indicate cancer of the large bowel.

GENERAL MEASURES
» Encourage exercise.
» Increase intake of fibre-rich food, e.g. vegetables, coarse maize meal, bran and cooked dried prunes.
» Ensure adequate hydration.
» Encourage regular bowel habits.
» Discourage continuous use of laxatives.

MEDICINE TREATMENT
Children >12 months of age
- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 23.6.
  - If poor response, increase frequency to 12 hourly.

Adults and children >15 years of age
- Sennosides A and B, oral, 13.5 mg, 1 tablet at night.
  - In resistant cases increase to 4 tablets.

OR
- Lactulose, oral 10–20 mL once or twice daily.

CAUTION
Prolonged severe constipation may present with overflow "diarrhoea".
Rectal examination should be done in all adults.

REFERRAL
» Recent change in bowel habits.
» Faecal impaction.
» Poor response to treatment.
» Uncertain cause of constipation.

2.9 DIARRHOEA

CAUTION
There is no place for antidiarrhoeal preparations in the treatment of acute diarrhoea in children or in dysentery.

2.9.1 DIARRHOEA, ACUTE IN CHILDREN
A09.0/A09.9

DESCRIPTION

A sudden onset of increased frequency of stools that are looser than normal, with or without vomiting. Commonly caused by a virus, but may be caused by bacteria or parasites. The cause of acute diarrhoea cannot be diagnosed without laboratory investigation. It may be an epidemic if many patients are infected at the same time.

Assess and manage dehydration according to the table below.

Children with severe dehydration require referral. Begin management for dehydration immediately whilst awaiting referral (see below).

All children should be assessed and treated for associated conditions e.g. hypothermia, convulsions, altered level of consciousness, respiratory distress, surgical abdomen.

Special types of diarrhoea

» Bloody diarrhoea: consider dysentery. See Section 2.10: Dysentery.
» Diarrhoea with high fever or very ill: consider typhoid. See Section 2.13: Typhoid fever.
» Persistent diarrhoea: See section 2.9.2: Diarrhoea, persistent in children.
» Diarrhoea in children in the context of an adult epidemic: consider cholera. See Section 2.7: Cholera

.

Treatment according to hydration classification			
Assess hydration and begin hydration (Plan A, B and C) based on this assessment →			
	Plan C **Severe dehydration**	**Plan B** **Some dehydration**	**Plan A** **No visible dehydration**
Classification	2 of the signs below: » lethargic or unconscious » eyes sunken » drinks poorly or not able to drink » severe decrease in skin turgor (skin pinch returning ≥ 2 seconds)	2 of the signs below, but not severe dehydration: » restless or irritable » eyes sunken » thirsty, drinks eagerly » moderate decrease in skin turgor - by slow skin pinch, returning in < 2 seconds	Only one or none of the signs of dehydration.
	Plan C **Severe dehydration**	**Plan B** **Some dehydration**	**Plan A** **No visible dehydration**
Treatment	Give rapidly: • Sodium chloride 0.9%, IV, 20 mL/kg. o If signs of acute severe malnutrition decrease the bolus to 10 mL/kg over 10 minutes. o Repeat up to twice if radial pulse is weak or undetectable. o Continue with 20 mL/kg every hour for the next 5 hours. **Then:** o Refer urgently for further management, continuing with 20 mL/kg every hour for the next 5 hours unless the child is reclassified as B: Some dehydration.	Give: • Oral rehydration solution, oral, 80 mL/kg over 4 hours, e.g. 5 mL/kg every 15 minutes. » Give more if the child wants more. » Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » If child vomits wait 10 minutes and then continue more slowly.	» Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » Encourage caregiver to give: • ORS, oral, 10 mL/kg after each diarrhoeal stool until diarrhoea stops. o Child ≤ 2 years of age: 50–100 mL. o Child >2 years of age: 100–200 mL. » Continue at home.

	○ Reassess every 2 hours while awaiting transfer. ○ If hydration status does not improve, give IV fluids more rapidly. » As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give: • Oral rehydration solution, oral, 5 mL/kg/hour. ○ If IV administration is not possible, insert a nasogastric tube. » While awaiting, and during urgent transfer, give: • Oral rehydration solution, NG, 20 mL/kg/hour over the next 6 hours. » If only oral administration is possible, or the condition is not improving, transfer the child urgently. While awaiting, and during urgent transfer, give: • Oral rehydration solution, oral, 20 mL/kg/hour. » Reassess and reclassify the child every **4 hours**. If improves reclassify as B: Some dehydration and treat accordingly.	» Encourage the caregiver to continue feeding the child, especially breastfeeding. If after 4 hours there are: » No signs of dehydration – treat as **A: No visible dehydration** » Still some dehydration signs – continue as above. (Refer if dehydration still present after 8 hours of treatment). » Signs of severe dehydration – treat as C: Severe dehydration.	» Encourage the caregiver to continue feeding the child, especially breastfeeding. » Instruct the caregiver how to make ORS/SSS at home and to continue treatment.

Child should return immediately if:

» condition does not improve
» condition deteriorates
» poor drinking or feeding
» blood in stool
» fever develops
» eyes sunken
» slow skin pinch

MEDICINE TREATMENT

The following children should receive ceftriaxone prior to referral:

- Neonates with severe dehydration.
- Children with Severe Acute Malnutrition (SAM) AND severe dehydration or shock.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with Sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

In all children who are able to take oral medication

- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

Homemade sugar and salt solution is recommended for home use and to prevent dehydration.

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

REFERRAL

» Severe dehydration. Failure to maintain hydration on oral fluids/feeds (failed Plan B).
» Children with general danger signs, e.g.:
  - convulsions
  - altered level of consciousness
  - intractable vomiting
  - inability to feed or drink
» Children with dysentery if:
  - < 12 months of age

- signs of dehydration

» Malnourished children.
» Suspected acute abdomen or other surgical problem.

2.9.2 DIARRHOEA, PERSISTENT IN CHILDREN

A09.0/A09.9/ K52.2/K52.8/K52.9

DESCRIPTION

Diarrhoea for 7–14 days.

GENERAL MEASURES

» Assess for possible HIV infection, and manage appropriately.
» Prevent dehydration using homemade sugar and salt solution.
» Counsel mother regarding feeding.
- If breastfeeding, give more frequent, longer feeds.
- If replacement feeding, replace milk with breast milk or with fermented milk products such as amasi (maas) or yoghurt, if available.
- Continue with solids: give small, frequent meals at least 6 times a day.

» Follow-up 5 days later. If diarrhoea persists, refer to doctor.

MEDICINE TREATMENT

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	**Dose** IU	**Capsule** 100 000 IU	**Capsule** 200 000 IU
Infants 6–11 months old	100 000	1 capsule	–
Children 12 months to 5 years	200 000	2 capsules	1 capsule

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.
- Do **NOT** give the capsule to the mother or the caregiver to take home.

- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If ≥ 10 kg give 20 mg/day.

REFERRAL

» Child < 2 months of age.
» Signs of dehydration. See Section 2.9.1: Diarrhoea, acute in children.
» Malnutrition or weight loss.
» Diarrhoea still present at 5-day follow-up

2.9.3 DIARRHOEA, ACUTE, WITHOUT BLOOD, IN ADULTS

A09.0/A09.9/ K52.2/K52.8/K52.9

DESCRIPTION

Acute diarrhoea is usually self-limiting and is managed by fluid replacement.

MEDICINE TREATMENT

Treat dehydration vigorously.

- Oral rehydration solution (ORS).

OR

- Homemade sugar and salt solution (SSS)

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool up to 6 hourly.
  - Not more than 12 mg daily.

REFERRAL

» Suspected acute surgical abdomen.
» Dehydration not corrected with rehydration.

2.9.4 DIARRHOEA, CHRONIC, IN ADULTS

A07.1/A09.0/A09.9/ K52.2/K52.8/K52.9

DESCRIPTION

Diarrhoea lasting > 2 weeks.
The majority of cases may be HIV related. Encourage HIV testing.
Send a stool sample for microscopy for ova, cysts and parasites.
Note: Do not request culture and sensitivity of the stool sample. Giardiasis is a common cause of chronic diarrhoea in adults, and may be difficult to diagnose on stools. Therefore, empiric treatment for giardiasis is recommended before referring such patients.

MEDICINE TREATMENT

Giardiasis

- Metronidazole, oral, 2 g daily for 3 days.
  - Avoid alcohol.

Chronic diarrhoea in HIV/AIDS

See Section 11.3.5: Diarrhoea, HIV-associated.

REFERRAL

All HIV negative cases with no pathogen identified and significant diarrhoea.

2.10 DYSENTERY

A06.0

Dysentery, or diarrhoeal stool with blood or mucus, is usually due to bacteria and should be treated as bacillary dysentery. If there is no clinical response within three days manage as amoebic dysentery or refer for formal assessment. Exclude surgical conditions, e.g. intussusception in children.
Commonly encountered infectious conditions include *Shigella, Salmonella*, *E. Coli*, *Entamoeba histolytica* and *Campylobacter*.

REFERRAL

» No response to treatment.
» Abdominal distension.
» Intussusception.

2.10.1 DYSENTERY, BACILLARY

A02.0/A03.0/A04.5

DESCRIPTION

Acute infection of the bowel usually caused by Shigella, Salmonella or Campylobacter.
There is sudden onset diarrhoea with:
» blood (not due to haemorrhoids or anal fissure) or mucous in the stools
» convulsions (in children)
» fever
» tenesmus

GENERAL MEASURES

» Prevent spread of micro-organism by:
  - good sanitation to prevent contamination of food and water
  - washing hands thoroughly before handling food
  - washing soiled garments and bed clothes

MEDICINE TREATMENT

Treat dehydration vigorously.

Children
Treat dehydration according to Section 2.9.1: Diarrhoea, acute in children.

Adults
Oral treatment:

- Oral rehydration solution (ORS).

OR

- Homemade sugar and salt solution.

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

Oral rehydration volume will depend on the severity of the dehydration.

IV treatment:

- Sodium chloride 0.9%, IV.

AND

Antibiotic therapy

Indicated for:

» Children > 1 year of age and adults with blood in the stools.
» HIV-infected patients.
» Children < 12 months of age.

Children

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days. See dosing tables, pg 23.4.

Children < 12 months of age

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose and refer. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with Sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days.

Note:

» Check for complications such as intestinal perforation or peritonitis.
» Ensure adequate urine output to exclude haemolytic uraemic syndrome.

REFERRAL

» Severe illness.
» Persistent blood in urine on dipstix or macroscopically.
» Acute abdominal signs (severe pain, acute tenderness, persistent or bilious vomiting).
» Bloody mucous passed in absence of diarrhoea.
» Failure to respond within 3 days.
» Malnutrition in children.
» Dehydration in children.
» Children < 12 months of age.

2.11 HELMINTHIC INFESTATION

2.11.1 HELMINTHIC INFESTATION, TAPEWORM

B68.0-1/B68.9

DESCRIPTION

Infestation with tapeworm occurs after eating infected, undercooked or raw meat like beef or pork.

Infestation may be caused by:

» beef tapeworm – Taenia saginata
» pork tapeworm – Taenia solium

Signs and symptoms include:

» vague abdominal pain
» diarrhoea
» flat white worm segments seen in the stool (blunt ended)
» weight loss
» anal (nocturnal) itch

GENERAL MEASURES

Health education about adequate preparation and cooking of meat.

MEDICINE TREATMENT

If the patient has diarrhoea, wait for it to settle.

- Albendazole, oral, daily for 3 days.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose.

REFERRAL

» Abdominal tenderness or pain.
» Abdominal masses.
» Vomiting.

2.11.2 HELMINTHIC INFESTATION, EXCLUDING TAPEWORM

B76.1/B76.9/B77.0/B77.8/B77.9/B79/B80/B81.4/B82.0

Note: Soil-transmitted helminth infections are notifiable conditions.

DESCRIPTION

Types of worm infestation and the characteristics are shown in the table below. Check for anaemia and failure to thrive (growth faltering). Infestations are often asymptomatic.

Type of worm	Description	Signs and symptoms
Common Roundworm ***Ascaris lumbricoides***	» Long pink/white worms with sharp ends. » Up to 25–30cm long. » Often seen in the stools and vomitus.	» Cough. » If there is vomiting consider intestinal obstruction.
Pinworm ***Enterobius vermicularis***	» White and thread-like. » Up to 10 mm long. » Often seen in the stools. » Self-infection common.	» Anal itching; worse at night. » Sleeplessness.
Hookworm ***Necator americanus***	» Up to 8 mm long.	» No symptoms or pain. » Anaemia.
Whipworm ***Trichuris trichiura***	» Up to 5 cm long. » Anterior half thinner than posterior half.	» No symptoms. » Abdominal pain. » Diarrhoea. » Possible anaemia and rectal prolapse. » Abdominal discomfort. » Weight loss.

GENERAL MEASURES

» Patient counselling and education.
» Wash hands with soap and water, especially:
  - after passing stool(s)
  - before working with food or eating
» Keep fingernails short.
» Wash fruit and vegetables well before eating or cooking.
» Keep toilet seats clean.
» Teach children how to use toilets and wash hands.
» Do not pollute the soil with sewage or sludge.
» Dispose of faeces properly.

MEDICINE TREATMENT

- Mebendazole, oral, 12 hourly for three days.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children ≥ 2 years and adults:500 mg as a single dose.

OR *LoE:II*[5]

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose.

Many children with worms who have pica may have iron deficiency (See Section 3.1.1: Anaemia, iron deficiency).

REFERRAL
» Signs of intestinal obstruction.
» Abdominal tenderness.
» Pain.
» Persistent vomiting.

2.12 IRRITABLE BOWEL SYNDROME (IBS)
K58.0/K58.9
(Synonyms: spastic colon, irritable colon)

DESCRIPTION
» Irritable bowel syndrome consists of a triad of:
  - abdominal pain and discomfort,
  - variations in bowel habits from constipation to diarrhoea, and
  - the passage of small stools at the time abdominal pain is at its worst.
» The diagnosis is suggested by a protracted and intermittent history of these symptoms which are frequently more pronounced when there is also stress.
» It is a functional disorder, most often seen in women 15–45 years old.

GENERAL MEASURES
For patients with an established diagnosis:
» Reassure patient that there is no serious organic disorder.
» High fibre/bran diets may be tried for patients with constipation.
  - warn about temporary increased flatus and abdominal distension.
  - High fibre/bran diets are not effective for Global IBS (i.e. all symptoms).
» Dietary advice by dietician.

MEDICINE TREATMENT
» Not specifically indicated.
» Based on patients' predominant symptoms.
» Short-term symptomatic treatment for diarrhoea and/or constipation.
- Laxatives only for constipation-specific IBS. See Section 2.8: Constipation.
- Anti-diarrhoeals only for diarrhoea-specific IBS. See Section 2.9: Diarrhoea.

REFERRAL
» Blood or mucous in the stool.
» Weight loss.
» Age > 50 years of age.

2.13 TYPHOID FEVER

A01.0

Note: notifiable condition.

DESCRIPTION

A septicaemic illness with fever caused by the micro-organism Salmonella typhi.
The cause of the fever is difficult to diagnose except in an epidemic.
It may present with:

» acute abdomen. See Section 2.1: Abdominal pain
» prolonged or high fever in a previously healthy individual
» fever with a slower pulse rate than expected
» headache and convulsions
» constipation during the first week
» diarrhoea may occur later in the illness and may be accompanied by frank bleeding
» diagnosis is confirmed only by stool culture or blood tests

MEDICINE TREATMENT

Treat dehydration if present and refer.

REFERRAL

Urgent

All cases or suspected cases.

PHC Chapter 3: Nutrition and Anaemia

3.1 ANAEMIA

DESCRIPTION

A condition characterised by low haemoglobin (Hb), clinically recognised by pallor, tiredness, shortness of breath.

It is commonly caused by:

» Nutritional deficiency of iron or folate or vitamin B12.
» Chronic systemic diseases such as HIV, TB, malignancy.
» Blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, abnormal menstruation.

Other causes include:

» Infiltration or replacement of the bone marrow.
» Abnormal Hb or red cells.
» Haemolysis.

DIAGNOSIS

	Hb less than:
» women	12 g/dL;11 g/dL in pregnancy
» men	13 g/dL
» children 1–5 years of age	10 g/dL
» children >5 years of age	11 g/dL

Children < 5 years of age

Anaemia is most often due to iron deficiency. See Section 3.1.1: Anaemia, iron deficiency.

Children > 5 years of age and adults

Request a full blood count.

» If MCV is normal (normocytic):
  - then systemic disease or haemolysis are likely causes.
» If MCV is low (microcytic):
  - then iron deficiency is the most likely cause.
» If MCV is high (macrocytic):
  - then folate and/or vitamin B12 deficiency is the most likely cause.

Pregnant women

See Section 6.4.3: Anaemia in pregnancy.

REFERRAL

» Unknown cause.
» Symptomatic anaemia e.g. palpitations and shortness of breath.
» Evidence of cardiac failure.
» Signs of chronic disease (investigate for HIV and TB before referral).
» Anaemia associated with enlargement of the liver, spleen or lymph nodes.
» Evidence of acute blood loss or bleeding disorder.
» Menorrhagia or dysfunctional uterine bleeding.
» Blood in stool, or melaena.
» Pregnant women > 34 weeks of gestation and Hb < 7 g/dL.
» Children with Hb ≤ 7 g/dL (If Hb cannot be done, look for severe palmar pallor).
» Anaemia associated with other abnormalities on FBC or smear.

» No improvement despite correct treatment.

3.1.1 ANAEMIA, IRON DEFICIENCY

D50.0/D50.8/D50.9

DESCRIPTION

A common cause of anaemia in young children and women of childbearing age.
A full blood count showing a low MCV suggests the diagnosis of iron deficiency anaemia.
A full blood count is not required for children, unless referral criteria above are present.
Note: Iron deficiency anaemia in children > 5 years of age, adult males and non-menstruating women, is generally due to occult or overt blood loss. Refer all cases for investigation and treatment of the underlying cause.

GENERAL MEASURES

» Identify and treat the cause.
» Exclude other causes. See referral criteria in Section 3.1: Anaemia.
» Dietary advice:
  - Avoid drinking tea/coffee with meals.
  - Increase vitamin C intake (e.g. citrus fruit, orange juice, broccoli, cauliflower, guavas, strawberries) with meals to increase iron absorption from the diet.
» Increase dietary intake of iron. Foods rich in iron include: liver, kidney, beef, dried beans and peas, green leafy vegetables, fortified wholegrain breads, cereals.

MEDICINE TREATMENT

Treatment
Treat underlying cause.

Children < 5 years of age

- Iron, oral, 1–2 mg/kg/dose of elemental iron 8 hourly with meals.
  - Follow up Hb after 14 days.
  - Hb lower than before: refer.
  - Hb the same/higher: continue treatment and repeat after another 28 days.
  - Continue treatment for 3 months after Hb normalises.

Empiric treatment for worms (this will not treat tapeworm)

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:II*[6]

Adults

- Ferrous sulphate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals. *LoE:III*[7]

OR

- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.

- Do not ingest with tea, antacids or calcium supplements/milk.
- Doses should be taken on an empty stomach, but if gastrointestinal side effects occur doses should be taken with meals
- Continue with treatment for 3–6 months once Hb has normalised to replace iron stores.

Follow the patient after one month of treatment and Hb should rise by at least 2 g/dl in 4 weeks in the adherent patient without ongoing blood loss.

If daily iron is poorly tolerated (e.g. epigastric pain, nausea, vomiting and constipation), intermittent iron supplementation may be administered:

- Ferrous sulphate compound BPC (dried), oral, 340 mg per week, (± 110 mg elemental iron), with meals.

OR

- Ferrous fumarate, oral, 400 mg per week (± 130 mg elemental iron). *LoE:I*[8]

Pregnant women

See Section 6.4.3: Anaemia in pregnancy.

Consider the following if there is failure to respond to iron therapy:

» non-adherence,
» continued blood loss,
» wrong diagnosis,
» malabsorption, or
» mixed deficiency; concurrent folate or vitamin B12 deficiency. *LoE: III*[9]

Prophylaxis

Infants from 6 weeks (Z29.2)

If < 2.5 kg at birth:

- Ferrous lactate, oral, 0.6 mL daily (provides ± 15 mg elemental iron) until 6 months of age.

OR

- Ferrous gluconate syrup, oral, 2.5 mL daily (provides ± 15 mg elemental iron) until 6 months of age. *LoE: III*[10]

Pregnant women

See Section 6.4.1: Antenatal supplements.

Elemental iron per preparation

Ferrous gluconate elixir	350 mg/5 mL	40 mg elemental iron per 5 mL	8 mg elemental iron per mL
Ferrous gluconate syrup	250 mg/5 mL	30 mg elemental iron per 5 mL	6 mg elemental iron per mL
Ferrous lactate drops	25 mg/mL	25 mg elemental iron per mL	1 mg elemental iron per 0.04 mL
Ferrous sulphate compound BPC (dried) tablets	170 mg	± 55 mg elemental iron per tablet	
Ferrous fumarate	200 mg	± 65 mg elemental iron per tablet	

LoE:III[11]

CAUTION
Iron is extremely toxic in overdose, particularly in children.
Store all medication out of reach of children.

REFERRAL
» As in Section 3.1: Anaemia.
» Children > 5 years of age, men and non-menstruating women.
» No or inadequate response to treatment.

3.1.2 ANAEMIA, MACROCYTIC OR MEGALOBLASTIC
D52.0/D52.1/D52.8/D52.9/D53.1

DESCRIPTION
Anaemia with large red blood cells is commonly due to folate or vitamin B_{12} deficiency.
Folate deficiency is common in pregnant women and in the postpartum period, and in alcoholics. Macrocytic anaemia in these patients can be assumed to be due to folate deficiency and does not require further investigation. See Section 6.4.3: Anaemia in pregnancy.
Vitamin B_{12} deficiency occurs mainly in middle-aged or older adults, and can cause neurological damage if not treated.
Macrocytic anaemia outside of pregnancy or the postpartum period requires further investigations to establish the cause.

INVESTIGATIONS
FBC will confirm macrocytic anaemia.
» MCV will be elevated.
» White cell count and/or platelet count may also be reduced.
If there is a poor response to folate, measure serum vitamin B_{12}.
Note: Zidovudine and stavudine cause elevated MCV. Zidovudine often causes anaemia and/or decreased white cell count. It is not necessary to measure folate and B_{12} if the patient is not anaemic.

GENERAL MEASURES
» Dietary advice: Increase intake of folic acid rich foods such as:
  - Liver, eggs, fortified breakfast cereals, citrus fruit, spinach and other green vegetables, lentils, dry beans, peanuts.
  - Reduce alcohol intake.
» Vitamin B_{12} deficiency anaemia:
  - High protein diet is recommended (1.5g/kg/day).
  - Increase intake of dietary vitamin B_{12} sources, including meat (especially liver), eggs and dairy products.

MEDICINE TREATMENT
<u>Folic acid deficiency:</u>
- Folic acid, oral, 5 mg daily until Hb is normal.
  - Check Hb monthly.

Folic acid given to patients with vitamin B12 deficiency can mask vitamin B12 deficiency and lead to neurological damage, unless vitamin B12 is also given.

REFERRAL

» Patients with suspected B12 deficiency.
» Chronic diarrhoea.
» Poor response within a month of treatment.
» Macrocytic anaemia of unknown cause.

3.2 CHILDHOOD MALNUTRITION, INCLUDING NOT GROWING WELL/ GROWTH FALTERING

E40/E41/E42/E43/E44.0/E44.1/E45/E46

In all children, check for malnutrition and anaemia:

» Plot the weight on the Road to Health chart/booklet.
» Look at the shape of the weight curve:
  - Is the weight curve rising parallel to the reference lines?

  OR
  - is it flattening?

  OR
  - is there weight loss?
» Look for visible wasting.
» Look and feel for oedema of both feet.
» Look for palmar pallor.
» Check Hb if anaemia is suspected.

3.2.1 SEVERE ACUTE MALNUTRITION (SAM)

E40/E41/E42/E43

DESCRIPTION

Diagnostic criteria for SAM in children aged 6–60 months (any one of the following):

Indicator	Measure	Cut-off
Severe wasting	Weight-for-Height z-score (WHZ)	< -3
	Mid Upper Arm Circumference (MUAC)	< 11.5 cm
Bilateral nutritional oedema	Clinical signs of nutritional oedema*	

Where a suitable measuring device is not available the following less sensitive findings would also indicate the need to manage as severe acute malnutrition:

» **Severe underweight**
  - WHZ < -3 (usually clinically reflective of marasmus) where no other explanation is present, and/or
  - clinically severe wasting (usually clinically reflective of marasmus – thin arms, thin legs, “old man” appearance, baggy pants folds around buttocks, wasted buttocks).
» **Nutritional oedema*** supported by findings of skin changes, fine pale sparse hair, enlarged smooth soft liver, moon face.

Exception
Babies who were premature and are growing parallel to or better than the z-score lines, should not be classified as failure to thrive or not growing well.

3.2.1.1 COMPLICATED SAM

E40/E41/E42/E43

DESCRIPTION

Any child with SAM who has any **ONE** of the following features:
» < 6 months of age or weighs < 4 kg.
» Pitting oedema.
» Refusing feeds or is not eating well.
» Any of the danger signs listed below.

Danger Signs

- dehydration
- vomiting
- respiratory distress (including fast breathing)
- not able to feed
- lethargy (not alert)
- weeping skin lesions
- hypoglycaemia
- hypothermia
- convulsions
- shock
- jaundice
- bleeding

All children with complicated SAM are at risk of complications or death.
Refer urgently!
Stabilise before referral.

Initiate treatment while waiting for transport to hospital.

GENERAL MEASURES

» Keep the child warm.
» Test for and prevent hypoglycaemia in all children.

If the child is able to swallow:
- If breastfed: ask the mother to breastfeed the child, or give expressed breastmilk.
- If not breastfed: give a 30–50 mL of a stabilising feed (F-75) or a breastmilk substitute before the child is referred.
- If no F-75 or breastmilk substitute is available, give 30–50 mL of sugar water. To make sugar water: Dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of clean water.
- Repeat 2 hourly until the child reaches hospital.

If the child is not able to swallow:
- Insert a nasogastric tube and check the position of the tube.
- Give 50 mL of breastmilk, F-75, breastmilk substitute or sugar water by nasogastric tube (as above).
- Repeat 2 hourly until the child reaches hospital.

If blood sugar < 3 mmol/L treat with:
- 10% Glucose:

- Nasogastric tube: 10 mL/kg.
- Intravenous line: 2 mL/kg.

CAUTION

In malnutrition, if IV fluids are required for severe dehydration/shock, give sodium chloride 0.9%, 10 mL/kg/hour and monitor for volume overload. Once stable continue with ORS orally or by nasogastric tube

MEDICINE TREATMENT

Note: Signs of infection such as fever are usually absent. Treat infection while awaiting transfer.

If there are no danger signs, give1st dose while arranging referral to hospital:

- Amoxicillin, oral, 45 mg/kg as a single dose. See dosing table, pg 23.1.

If the child has any danger signs:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose and refer. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

3.2.1.2 UNCOMPLICATED SAM

E43

DESCRIPTION

Children with SAM who meet the following criteria:

» The child is > 6 months of age and weight > 4 kg, and

» There is no pitting oedema, and

» The child is alert (not lethargic), and

» The child has a good appetite and is feeding well, and

» The child does not have any danger signs or severe classification (and does not require referral for another reason).

All cases require careful assessment for possible TB or HIV.

GENERAL MEASURES

» Provide RTUF and/or other nutritional supplements according to supplementation guidelines.
» Counsel according to IMCI guidelines.
» Regular follow-up to ensure that the child gains weight and remains well.
» Discharge with supplementation, once the following criteria are met:
  - WHZ (weight-for-height z-score): > -2 WHZ for two consecutive visits at least one month apart and/or
  - MUAC: > 11.5cm (preferably at 12 cm, if MUAC used alone).
» Follow patients for at least 6 months to ensure sustained growth.

MEDICINE TREATMENT

Do not repeat if child has received these during inpatient stay:

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

- Multivitamin, oral, daily.

Empiric treatment for worms:

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:II*[12]

REFERRAL

» When regular nutritional supplements (e.g. RTUF) cannot be provided and follow-up on an ambulatory (outpatient) basis is not possible.
» The child develops pitting oedema or any of the danger signs (see above).
» Failure to gain weight despite provision of nutritional supplements.

3.2.2 MODERATE ACUTE MALNUTRITION (MAM)

E44.0

DESCRIPTION

Children and infants older than 6 months who have either:
» A WHZ-score between -2 and -3.
» MUAC between 11.5 cm and 12.5 cm.
» No pitting oedema or SAM danger signs (see above).
» Good appetite.
All cases require careful assessment for possible TB or HIV.

GENERAL MEASURES

» Provide ready to use therapeutic food (RTUF) and/or other nutritional supplements according to supplementation guidelines.
» Counsel according to IMCI guidelines.
» Follow-up frequently to ensure that the child gains weight and remains well.
» Discharge with supplementation, once the following criteria are met:
  - WHZ (weight-for-height z-score): > -2 WHZ for two consecutive visits at least one month apart and/or
  - MUAC: > 11.5 cm (preferably at 12 cm, if MUAC used alone).
» Follow patients for at least 6 months to ensure sustained growth.

MEDICINE TREATMENT

Do not repeat if child has received these during inpatient stay:

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

LoE: III[13]

- Multivitamin, oral, daily.

Empiric treatment for worms: *LoE:III*[14]

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose. *LoE:III*[15]

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:II*[16]

REFERRAL

» No response to treatment.
» All children other than those with insufficient food intake (If there is inadequate food intake, refer to a social worker, if available).
» Severe malnutrition.

3.2.3 NOT GROWING WELL (INCLUDING FAILURE TO THRIVE/ GROWTH FALTERING)

R62.0/R62.8/R62.9

DESCRIPTION

Children and infants who have either:

» Unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health chart/ booklet.

OR

» Low weight for age (but WHZ > -2)

Note: Babies who were premature and are growing parallel to or better than the z-score line, should not be classified as having failure to thrive or not growing well.
Not growing well may be due to:
» Insufficient food intake due to anorexia and illness or poor availability of food.
» Insufficient uptake of nutrients, e.g. malabsorption.
» Insufficient use of nutrients for growth due to chronic disease.
» Increased demand for nutrients due to illness such as TB and HIV/ AIDS.
Conduct a feeding and clinical assessment to determine the cause. Exclude anaemia.

GENERAL MEASURES

» Counselling on nutrition (see below).
» Nutritional supplementation should be supplied unless there is a correctable cause.
» Assess the general condition of the child.
» Assess the child for possible HIV and TB, and manage appropriately.
» Assess for other long-term health conditions, and manage appropriately.
» Assess the child's feeding and recommend actions as outlined below.
» Provide supplements according to child's age to meet specific nutritional needs.
» Provide adequate micronutrients.
» Ensure that immunisations are up to date. Record the dose given on the Road to Health chart/booklet.
» Follow up monthly. If responding, review the child every two months.
» Refer for social assistance if needed.

Feeding recommendations for all children:

0–6 months of age
Breastfeed exclusively- feed at least 8 times in 24 hours.
If formula is medically indicated (refer below) or if the mother has chosen to formula-feed the child, discuss safe preparation and use with the mother.

6–12 months of age
Continue breastfeeding (breastfeed before giving foods).
Introduce complementary foods at six months of age. Start by giving 2–3 teaspoons of iron-rich food such as mashed vegetables or cooked dried beans.
Children 6–8 months should be given two meals daily, gradually increasing the number of meals so that at 12 months the child is receiving 5 small meals.
For children who are not growing well, mix margarine, fat, or oil with their porridge.

12 months to 2 years of age
Continue breastfeeding. If the child is not breastfed, give 2 cups of full cream cow's milk every day. Make starchy foods the basis of the child's meal. Give locally available protein at least once a day, and fresh fruit or vegetables twice every day.

2–5 years of age
Give the child his/her own serving of family foods 3 times a day. In addition, give 2 nutritious snacks e.g. bread with peanut butter, full cream milk or fresh fruit between meals.

CONDITIONS WHICH JUSTIFY RECOMMENDING THAT MOTHERS DO NOT BREASTFEED

Infants with a small number of metabolic diseases qualify to receive specialised infant formula. These infants should be managed in tertiary centres.

Maternal medical condition that may justify temporary or permanent avoidance of breastfeeding:

» Severe illness that prevents a mother from caring for her infant, e.g.: sepsis, renal failure.
» Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved.
» Maternal medications: sedating psychotherapeutic medicines, anti-epileptic medicines and opioids (may cause drowsiness and respiratory depression in the infant), radioactive iodine-131, excessive use of topical iodine or iodophors (especially on open wounds or mucous membranes), cytotoxic chemotherapy.

Infants who qualify to receive infant formula as part of the supplementation scheme:

» The mother has died or infant has been abandoned.
» Other individual circumstances deemed necessary by a multidisciplinary team.
» Infants of mothers who are failing second or third line ARV treatment (VL >1000 copies/ml) should be advised not to breastfeed. *LoE:III*[17]

MEDICINE TREATMENT

- Multivitamin, oral, daily.

Empiric treatment for worms (this will not treat tapeworm):

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:II*[18]
- Vitamin A (retinol), oral, 6 monthly.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Anaemia:

See Section 3.1: Anaemia.

REFERRAL

» No response to treatment.
» All children other than those with insufficient food intake (If there is inadequate food intake, refer to a social worker, if available).
» Severe malnutrition.

3.3 OVERWEIGHT AND OBESITY

E66.0/E66.8/E66.9

DESCRIPTION

Overweight and obesity are abnormal or excessive fat accumulation that may impair health.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults (> 19 years). It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m2).

For adults:

» overweight is a BMI ≥25; and
» obesity is a BMI ≥30.

Children aged between 5–19 years:

» overweight is BMI-for-age > 1 standard deviation above the WHO Growth Reference median; and
» obesity is > 2 standard deviations above the WHO Growth Reference median.

For children < 5 years of age:

» overweight is weight-for-height > 2 standard deviations above WHO Child Growth Standards median; and
» obesity is weight-for-height > 3 standard deviations above the WHO Child Growth Standards median.

GENERAL MEASURES

» maintain ideal weight, i.e. BMI ≤ 25 kg/m2
» weight reduction, i.e. if BMI > 25 kg/m2
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with fresh fruit and vegetables
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week (150 minutes/week)
» screen for hypertension, diabetes and hyperlipidaemia, and manage appropriately (See Sections: 4.7: Hypertension, 9.2: Type 2 Diabetes mellitus, 4.1: Prevention of ischaemic heart disease and atherosclerosis).
» calculate risk of developing cardiovascular events and manage appropriately (See Section: 4.1: Prevention of ischaemic heart disease and atherosclerosis).

REFERRAL

Dietician and support group, where available.

3.4 VITAMIN A DEFICIENCY

E50.0-9

DESCRIPTION

A condition predominantly affecting the skin, mucous membranes and the eyes.

It is most common in children of 1–5 years of age.

If associated with measles and diarrhoea there is an increased risk of illness and death.

If not identified and treated early, it can cause blindness.

Clinical features include:

» night blindness or inability to see in the dark
» white foamy patches on the eye (Bitot's spot) or conjunctival and corneal dryness
» keratomalacia or wrinkling and cloudiness of cornea
» corneal ulceration or the cornea becomes soft and bulges

GENERAL MEASURES

Increase dietary intake of vitamin A rich food including: fortified maize meal and/or bread; carrots, sweet potato, mangoes and pawpaw, broccoli, sprouts; dark green leafy vegetables e.g. morogo/imifino and spinach; apricots, melon, pumpkin, and liver, eggs, full cream milk and fish.

MEDICINE TREATMENT

Prophylaxis

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Children with the following conditions should be given an additional dose:

» Severe Acute Malnutrition
» persistent diarrhoea
» measles

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infant < 6 months	50 000	½ capsule	–
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsule	1 capsule

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.
- Do **NOT** give the capsule to the mother or the caretaker to take home.

Treatment

If any clinical eye signs of vitamin A deficiency are present (see clinical features above), give a pre-referral dose:

- Vitamin A (retinol), oral, as a pre-referral dose.

Age range	Dose Units (IU)	Capsule 100 000 IU	Capsule 200 000 IU
Infant < 6 months	50 000	½ capsule	–
Infants 6–11 months	100 000	1 capsule	–
Children > 12 months and adults	200 000	2 capsule	1 capsule

Note:
» Children (6 months to 5 years of age) who received a routine prophylactic dose within the previous month should not receive any additional doses of vitamin A.
» If a child is scheduled to receive a routine prophylactic dose of vitamin A and has received a treatment dose within the past month, postpone the routine dose for approximately one month.
» Wait at least one month between doses.
» Children receiving routine multivitamin syrup can still receive vitamin A supplements.

REFERRAL
All cases with clinical signs.

3.5 VITAMIN B DEFICIENCIES

3.5.1 VITAMIN B_3/NICOTINIC ACID DEFICIENCY (PELLAGRA)
E52

DESCRIPTION
Pellagra is a condition associated with nicotinic acid deficiency. It is usually accompanied by other vitamin deficiencies.
Clinical features include:
» diarrhoea
» dementia
» dermatitis with darkening of sun-exposed skin

GENERAL MEASURES
» Lifestyle adjustment including discouraging of alcohol abuse.
» Dietary advice. Increase intake of liver, kidneys, other meats, poultry and fish, milk, marmite and Brewer's yeast, peanuts, pulses, whole meal wheat and bran.

MEDICINE TREATMENT

For severe deficiency

Children
- Nicotinamide, oral, 50 mg 8 hourly until resolution of major signs and symptoms.

Adults
- Nicotinamide, oral, 100 mg 8 hourly until skin lesions heal *LoE:III*[19]

For mild deficiency

Children
- Nicotinamide, oral, 50 mg daily for one week.

Adults
- Nicotinamide, oral, 100 mg daily for one week.

REFERRAL
Failure to respond.

3.5.2 VITAMIN B_6/PYRIDOXINE DEFICIENCY

E53.1

DESCRIPTION

Commonly presents as signs of peripheral neuropathy including:
» tingling sensation
» burning pain or numbness of the feet
Pyridoxine deficiency is related to:
» malnutrition
» alcoholism
» isoniazid or combination TB therapy

GENERAL MEASURES

Dietary advice: Increase intake of pyridoxine rich foods such as:
» Liver, meat, fish and offal,
» Wholegrain cereals, fortified breakfast cereals,
» Peanuts, bananas, raw vegetables,
» Walnuts and seeds, avocados, dried fruits,
» Potatoes and baked beans.

MEDICINE TREATMENT

For deficiency

Children

- Pyridoxine, oral, 12.5 mg daily for 3 weeks.

Adults

- Pyridoxine, oral, 25 mg daily for 3 weeks.

For medicine-induced neuropathy

Children

- Pyridoxine, oral, daily for 6 months.
  - < 5 years of age: 12.5 mg daily.
  - ≥ 5 years of age: 25 mg.

Adults

LoE:III[20]

- Pyridoxine, oral, 200 mg daily for 3 weeks.

Then follow with:

- Pyridoxine, oral, 25 mg daily as maintenance dose (for patients on TB therapy/isoniazid).

REFERRAL

Failure to respond.
Children.

3.5.3 Vitamin B_1/thiamine deficiency (Wernicke encephalopathy and beriberi)

E51.1-2/E51.8-9

DESCRIPTION

Clinical features include:

» confusion
» short-term memory loss
» paralysis of one or more of the ocular muscles or ophthalmoplegia
» nystagmus
» ataxia
» peripheral neuropathy
» cardiac failure

Alcoholics may present with Wernicke encephalopathy, neuropathies or cardiac failure associated with multiple vitamin deficiencies.

GENERAL MEASURES

» Lifestyle adjustment including discouraging alcohol abuse.
» Dietary advice to increase intake of thiamine rich foods such as: wholewheat breads, oatmeal, pulses, nuts, yeast, fortified cereals, pork, bacon, marmite and potatoes and peas

MEDICINE TREATMENT

Peripheral neuropathy and cardiac failure

- Thiamine, oral, 100 mg daily.

In susceptible patients, administration of intravenous glucose precipitates Wernicke encephalopathy if administered before thiamine supplementation. Thiamine should be given first in all patients treated with intravenous glucose who are at risk of thiamine deficiency, e.g. alcoholics.

REFERRAL

All patients with encephalopathy, eye muscle paralysis or cardiac failure.

PHC Chapter 4: Cardiovascular conditions

4.1 PREVENTION OF ISCHAEMIC HEART DISEASE AND ATHEROSCLEROSIS

I20.0-1/I20.8-9/I21.0-4/I21.9/I22.0-1/I22.8-9/I24.0-1/I24.8-9/I25.0-6/I25.8-9/I63.0-6/I63.8-9/I64/I65.0-3/I65.8-9/I73.8-9/G45.0-2/G45.8-9

Patients at risk for cardiovascular diseases (such as stroke or myocardial infarction) may benefit from lifestyle modification and lipid-lowering medicine therapy. Patients should be managed according to their level of risk, and lipid lowering medicines should be given to those with a high risk of CVD even if cholesterol is within the desirable range.

Indications for lipid lowering medicine therapy

Patients with any of the following factors are at a relatively high risk for a cardiovascular event and should receive lipid lowering therapy:

» Established atherosclerotic disease:
  - ischaemic heart disease
  - peripheral vascular disease
  - atherothrombotic stroke
» Type 2 diabetes with age > 40 years.
» Diabetes for > 10 years.
» Diabetes with chronic kidney disease (eGFR < 60 mL/min).

Patients with any of the following factors are also potentially at risk for cardiovascular disease (other than the categories above)

» diabetes mellitus
» hypertension
» central obesity: waist circumference ≥ 94 cm (men) and ≥ 80 cm (women)
» smoking
» age: men > 55 years of age, women > 65 years of age

These patients should be managed according to their 10-year risk of a cardiovascular event as calculated using either:

A. BMI - based risk assessment, or
B. Framingham risk score (cholesterol-based assessment).

Management is based on the patient's 10-year risk of a cardiovascular event as follows:

» < 10% risk: lifestyle modification and risk assess patient every 5 years
» 10–20% risk: lifestyle modification and risk assess patient annually
» ≥ 20% risk: lifestyle modification and start statin treatment

Cardiovascular disease risk assessment

A: BMI-based risk assessment:

1. Measure body mass index (BMI): BMI=weight (kg)/[height (m) x height (m)]
2. Measure blood pressure. *LoE:III*[21]
3. Calculate 10-year risk of a cardiovascular event using the BMI-based CVD risk tool.
   *(BMI and BMI-based CVD risk tools are available on the EML Clinical Guide mobile application **or** at: https://www.framinghamheartstudy.org/fhs-risk-functions/cardiovascular-disease-10-year-risk/#).*

B: Framingham risk score (cholesterol-based):

Calculation of risk of developing cardiovascular events over 10 years

(in the absence of cardiovascular disease or genetic disorders such as familial hypercholesterolaemia)

To derive the absolute risk as a percentage of patients who will have a cardiovascular event (i.e. death, myocardial infarction or stroke) over 10 years, add the points for each risk category (Section A). The risk associated with the total points is then derived from Section B.

SECTION A

Age (years)	**MEN**	**WOMEN**
30–34	0	0
35–39	2	2
40–44	5	4
45–49	6	5
50–54	8	7
55–59	10	8
60–64	11	9
65–69	12	10
70–74	14	11
75–79	15	12

Total cholesterol (mmol/L)	**MEN**	**WOMEN**
<4.1	0	0
4.1–5.19	1	1
5.2 – 6.19	2	3
6.2–7.2	3	4
>7.2	4	5

HDL cholesterol (mmol/L)	**MEN**	**WOMEN**
>1.5	–2	–2
1.3–1.49	–1	–1
1.2–1.29	0	0
0.9–1.119	1	1
<0.9	2	2

	MEN	**WOMEN**
Smoker	4	3
Diabetic*	3	4

*Type 2 diabetics > 40 years of age qualify for statin therapy irrespective of risk score.

	MEN		**WOMEN**	
Systolic BP (mmHg)	Untreated	Treated	Untreated	Treated
<120	–2	0	–3	–1
120–129	0	2	0	2
130–139	1	3	1	3
140–149	2	4	2	5
150–159	2	4	4	6
≥160	3	5	5	7

SECTION B

Total points

MEN	**10-year risk %**	**WOMEN**	**10-year risk %**
≤–3	<1	≤–2	<1

–2	1.1	–1	1.0
–1	1.4	0	1.2
0	1.6	1	1.5
1	1.9	2	1.7
2	2.3	3	2.0
3	2.8	4	2.4
4	3.3	5	2.8
5	3.9	6	3.3
6	4.7	7	3.9
7	5.6	8	4.5
8	6.7	9	5.3
9	7.9	10	6.3
10	9.4	11	7.3
11	11.2	12	8.6
12	13.2	13	10.0
13	15.6	14	11.7
14	18.4	15	13.7
15	21.6	16	15.9
16	25.3	17	18.5
17	29.4	18	21.5
≥18	>30	19	24.8

Calculation of CVS risk using the table:

A risk of MI > 20% in 10 years equates to ≥ 15 points for men, and ≥ 18 points for women. It is important to score each patient individually, as there are many combinations of risk factors that can add up to those total points.

For example:

» A male patient > 60 years old with systolic BP > 140 mmHg on treatment would score:
- 11 points for his sex and age
- 4 points for his on-treatment BP
- Total: 15 points

» A male patient > 50 years old with systolic BP > 130 mmHg on treatment who is a smoker would score:
- 8 points for his sex and age
- 3 points for his on-treatment BP
- 4 points for his smoking status
- Total: 15 points

» A female patient > 70 years old with systolic BP > 160 mmHg on treatment would score:
- 11 points for her sex and age
- 7 points for her on-treatment BP
- Total: 18 points

Screening for familial hypercholestareamia:

In addition to the above cardiovascular risk assessment, measure random total cholesterol in patients with the following features (suggestive of familial hypercholesterolaemia or other heritable dyslipidaemias), regardless of their cardiovascular risk:

» cardiovascular event < 55 years in men or < 65 years in women

» family history of early onset cardiovascular disease in male relatives < 55 years of age and in female relatives < 65 years of age
» skin or tendon xanthomata in patient or first degree relative
» family history of familial hyperlipidaemia

Refer patients with random total cholesterol > 7.5 mmol/L for further investigation.

GENERAL MEASURES

All people with any risk factors for cardiovascular disease should be encouraged to make the following lifestyle changes as appropriate.

» maintain ideal weight, i.e. BMI < 25 kg/m2
» weight reduction in the overweight patient, i.e. BMI > 25 kg/m2
» reduce alcohol intake to ≤ 2 standard drinks/day for men and ≤ 1 for women on no more than 5 out of 7 days per week (1 standard drink is equivalent to 25 mL of spirits, 125 mL of wine, 340 mL of beer or sorghum beer, or 60 mL of sherry)
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with fresh fruit and vegetables
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week (150 minutes/week)
» stop smoking

MEDICINE TREATMENT

Note:

» Lipid lowering medicines should be given to those with a high risk of CVD even if cholesterol is within the desirable range.
» When lipid-lowering medicines are used, this is ALWAYS in conjunction with ongoing lifestyle modification.

▪ HMGCoA reductase inhibitors (statins), according to table below:

INDICATION	HMGCOA REDUCTASE INHIBITOR (STATIN) DOSE
A: Primary prevention - no existing CVD	
» Type 2 diabetes with age >40 years. » Diabetes for >10 years. » Diabetes with chronic kidney disease. » ≥ 20% 10-year risk of cardiovascular event.	▪ HMGCoA reductase inhibitors (statins), e.g.: • Simvastatin, oral, 10 mg at night.
» Patients on protease inhibitors. (Risks as above, after switching to atazanavir – see section below).	• Atorvastatin, oral, 10 mg at night.
B: Secondary prevention – existing CVD	
» Ischaemic heart disease. » Atherothrombotic stroke. » Peripheral vascular disease.	▪ HMGCoA reductase inhibitors (statins), e.g.: • Simvastatin, oral, 40 mg at night ***LoE:I***[22]
» Patients on protease inhibitors.	• Atorvastatin, oral, 10 mg at night. ***LoE:I***[23]
» Patients on amlodipine (and not on protease inhibitor).	• Simvastatin, oral, 10–20 mg at night. ***LoE:III***[24]
» If patient complains of muscle pain.	Reduce dose: ▪ HMGCoA reductase inhibitors (statins), e.g.: • Simvastatin, oral, 20 mg at night.

	○ If 20 mg not tolerated, reduce to 10 mg. **OR** Consult specialist for further management. ***LoE:III[25]***

Note: Lipid-lowering medicines must always be used in conjunction with ongoing lifestyle modification.

Protease inhibitor-induced dyslipidaemia:

» Certain antiretroviral medication, particularly protease inhibitors, can cause dyslipidaemia. Fasting lipid levels should be done 3 months after starting lopinavir/ritonavir. Lopinavir/ritonavir is associated with a higher risk of dyslipidaemia (specifically hypertriglyceraemia) than atazanavir/ritonavir.
» Patients at high risk (> 20% risk of developing a CVS event in 10 years) should switch to atazanavir/ritonavir and repeat the fasting lipid profile in 3 months.
» Patients with persistent dyslipidaemia despite switching, qualify for lipid lowering therapy. Criteria for initiating lipid lowering therapy are the same as for HIV-uninfected patients. Many statins (including simvastatin) cannot be used with protease inhibitors, as protease inhibitors inhibit the metabolism of the statin resulting in extremely high blood levels.
» Patients who fail to respond to lifestyle modification and have dyslipidaemia treat with:

- Atorvastatin, oral, 10 mg at night.

REFERRAL

» Random cholesterol > 7.5 mmol/L (to be evaluated for genetic disorders), after excluding secondary causes such as uncontrolled diabetes, hypothyroidism, or protease inhibitor use.
» Tendon or skin xanthomata (except xanthelasma around the eyes).
» Statins not tolerated by patients, despite lower dose (for consideration of alternative treatment).

4.2 ANGINA PECTORIS, STABLE

I20.9

DESCRIPTION

Characteristic chest pain (burning or heavy discomfort behind the sternum), of duration < 15 minutes, due to myocardial ischaemia, usually occurring on exercise and relieved by rest.

GENERAL MEASURES

Life style modification. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

MEDICINE TREATMENT (doctor initiated)

Long-term prophylaxis for thrombosis:

- Aspirin, oral, 150 mg daily. ***LoE:I[26]***

AND

Relief of angina:

- Nitrates, short acting e.g.:
- Isosorbide dinitrate, sublingual, 5 mg.
  - May be repeated if required at 5-minute intervals for 3 or 4 doses.
  - Instruct patients to keep the tablets in the airtight and lightproof container in which they are supplied.
  - Instruct patients that nitrates are not addictive.
  - Instruct patients to use prophylactically, before activities which may provoke angina.

LoE:III[27]

AND

Step 1

- Beta-blocker
- Atenolol, oral, 50–100 mg daily.
  - Titrate to resting heart rate of approximately 60 beats/minute.

If ß-blocker cannot be tolerated or is contraindicated, consider long-acting calcium channel blocker.

Step 2

ADD

- Long-acting calcium channel blocker e.g.:
- Amlodipine, oral, 5 mg daily.

Step 3

ADD

- Isosorbide mononitrate, oral, 10–20 mg twice daily.

LoE:III[28]

OR

- Isosorbide dinitrate, oral, 20–30 mg twice daily.
  - Taken at 8:00 and 14:00 hours for both medicines in order to provide a nitrate free period to prevent tolerance.
  - Modify for night shift workers.

LoE:III[29]

Angina is a high-risk condition for cardiovascular disease and an indication for a statin.

- HMGCoA reductase inhibitors (statins), e.g.:
- Simvastatin, oral, 40 mg at night.

LoE:I[30]

Patients on protease inhibitor:

- Atorvastatin, oral, 10 mg at night.

LoE:I[31]

Patients on amlodipine (and not on a protease inhibitor):

- Simvastatin, oral, 10–20 mg at night.

LoE:III[32]

If patient complains of muscle pain:

Reduce dose to:

- Simvastatin, oral, 20 mg at night.
  - If 20 mg not tolerated, reduce to 10 mg.

OR

Refer for further management.

LoE:III[33]

REFERRAL

» When diagnosis is in doubt.

» Failed medical therapy.

4.3 ANGINA PECTORIS, UNSTABLE / NON ST ELEVATION MYOCARDIAL INFARCTION (NSTEMI)

I20.0/I21.0-4/I21.9/I22.0-1/I22.8-9/I24.8-9/I25.6/I25.8-9

DESCRIPTION

Unstable angina is a medical emergency and if untreated can progress to NSTEMI.
Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:

» angina at rest or minimal effort
» angina occurring for the first time, particularly if it occurs at rest
» prolonged angina > 10 minutes, not relieved by sublingual nitrates
» the pattern of angina accelerates and gets worse

DIAGNOSIS

» Made from good history.
» ECG may show ST segment depression or transient ST segment elevation.
» Normal ECG does not exclude the diagnosis. *LoE:I*[34]

MEDICINE TREATMENT

- Oxygen 40% via facemask, if saturation < 94% or if in distress.
- Aspirin, oral, 150 mg as a single dose (chewed or dissolved) as soon as possible. *LoE:I*[35]

ADD

- Nitrates, short acting, e.g.:
- Isosorbide dinitrate, sublingual, 5 mg immediately as a single dose.
  - May be repeated at 5-minute intervals for 3 or 4 doses. *LoE:III*[36]

ADD

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor prescribed).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10 mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

Continuation of aftercare treatment initiated at higher level of care:
Continue therapy with appropriate lifestyle modification and adherence support.

- Aspirin, oral, 150 mg daily (continued indefinitely in absence of contraindications). *LoE:I*[37]

<u>When clinically stable without signs of heart failure, hypotension, bradydysrhythmias or asthma:</u>

- Cardio-selective beta-blocker, e.g.:(Doctor initiated)
- Atenolol, oral, 50 mg daily.

AND

- HMGCoA reductase inhibitors (statins), e.g.:
- Simvastatin, oral, 40 mg at night. *LoE:I*[38]

Patients on protease inhibitor:

- Atorvastatin, oral, 10 mg at night. *LoE:I*[39]

Patients on amlodipine (and not on a protease inhibitor):

- Simvastatin, oral, 10-20 mg at night. *LoE:III*[40]

If patient complains of muscle pain:

Reduce dose to:

- Simvastatin, oral, 20 mg at night.
  - If 20 mg not tolerated, reduce to 10 mg.

OR

Refer for further management. *LoE:III*[41]

AND

If there is cardiac failure or LV dysfunction (Doctor initiated):

- ACE-inhibitor, e.g.:
- Enalapril, oral, target dose 10 mg 12 hourly (usually titrated from 2.5 mg 12 hourly). *LoE:III*[42]

Angioedema is a potentially serious complication of ACE-inhibitor treatment and if it occurs it is a contraindication to continued therapy or to re-challenge.

REFERRAL

Urgent

All suspected or diagnosed cases.

4.4 MYOCARDIAL INFARCTION, ACUTE (AMI)/ ST ELEVATION MYOCARDIAL INFARCTION (STEMI)

I21.0-4/I21.9/I22.0-1/I22.8-9/I24.8-9/I25.6/I25.8-9

DESCRIPTION

AMI/STEMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and intensive care management.

The major clinical feature is severe chest pain with the following characteristics:

» site: retrosternal or epigastric
» quality: crushing, constricting, or burning pain or discomfort
» radiation: to the neck and/or down the inner part of the left arm
» duration: at least 20 minutes and often not responding to sublingual nitrates
» occurrence: at rest

May be associated with:

» pallor
» sweating
» arrhythmias
» pulmonary oedema
» a decrease in blood pressure

Note: Not all features have to be present.

EMERGENCY TREATMENT

Before transfer

Cardio-pulmonary resuscitation if necessary (See Section 21.1: Cardiac arrest – cardiopulmonary resuscitation).

- Oxygen 40% via facemask, if saturation < 94% or if in distress. *LoE:I*[43]

AND

- Aspirin, oral, 150 mg as a single dose (chewed or dissolved) as soon as possible. *LoE:I*[44]

AND

- Nitrates, short acting, e.g.:
- Isosorbide dinitrate, sublingual, 5 mg immediately as a single dose.
  - May be repeated at 5-minute intervals for 3 or 4 doses. *LoE:III*[45]

AND

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor prescribed).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10 mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

AND

- Thrombolytic, e.g.:(see table for time window below): (Doctor initiated) *LoE:I*[46]
- Streptokinase, IV 1.5 million units diluted in 100 mL sodium chloride 0.9%, infused over 30–60 minutes. **Do not use heparin if streptokinase is given.** *LoE:I*[47]
  - Hypotension may occur. If it does, reduce the rate of infusion but strive to complete it in < 60 minutes.
  - Streptokinase is antigenic and should not be re-administered in the period of 5 days to 2 years after 1st administration.
  - Severe allergic reactions are uncommon but antibodies which may render it ineffective may persist for years.

Indications	Contra-indications
» For acute myocardial infarction with ST elevation or left bundle branch block: – maximal chest pain is ≤6 hours – beyond 6 hours and chest pain, consult a specialist – >6 hours and no chest pain, manage with anticoagulants (see section 4.3: NSTEMI) – if on-going ischaemic pain ***LoE:I***[48]	» Absolute: – streptokinase used within the last year, – previous allergy, – CVA within the last 3 months, – history of recent major trauma, – bleeding within the last month, – aneurysms, – brain or spinal surgery or head injury within the preceding month, or recent (<3 weeks) major surgery, – active bleeding or known bleeding disorder, – aortic dissection. » Relative (consult specialist): – refractory hypertension, – warfarin therapy, – recent retinal laser treatment, – subclavian central venous catheter, – pregnancy,

	– TIA in the preceding 6 months, – traumatic resuscitation.

Note: Refer all suspected or diagnosed cases urgently.

Continuation of aftercare treatment initiated at higher level of care:

Continue therapy with appropriate lifestyle modification and adherence support.

- Aspirin, oral, 150 mg daily (continued indefinitely in absence of contraindications). *LoE:I*[49]

<u>When clinically stable without signs of heart failure, hypotension, bradydysrhythmias or asthma:</u>

- Cardio-selective beta-blocker, e.g.:(Doctor prescribed)
- Atenolol, oral, 50 mg daily.
- HMGCoA reductase inhibitors (statins), e.g.:
- Simvastatin, oral, 40 mg at night. *LoE:I*[50]

<u>Patients on protease inhibitor:</u>

- Atorvastatin, oral, 10 mg at night. *LoE:I*[51]

<u>Patients on amlodipine (and not on a protease inhibitor):</u>

- Simvastatin, oral, 10–20 mg at night. *LoE:III*[52]

<u>If patient complains of muscle pain:</u>

Reduce dose to:

- Simvastatin, oral, 20 mg at night.
  - If 20 mg not tolerated, reduce to 10 mg. *LoE:III*[53]

OR

Refer for further management.

AND

<u>If there is cardiac failure or LV dysfunction (Doctor initiated):</u>

- ACE-inhibitor, e.g.:
- Enalapril, oral, target dose 10 mg 12 hourly (usually titrated from 2.5 mg 12 hourly). *LoE:III*[54]

Angioedema is a potentially serious complication of ACE-inhibitor treatment and if it occurs it is a contraindication to continued therapy or to re-challenge.

REFERRAL

Urgent

All suspected or diagnosed cases.

4.5 CARDIAC ARREST, CARDIO-PULMONARY RESUSCITATION

See Chapter 21: Emergencies and injuries.

4.6 CARDIAC FAILURE, CONGESTIVE (CCF)

4.6.1 CARDIAC FAILURE, CONGESTIVE (CCF), ADULTS

I50.0-1/I50.9

DESCRIPTION

CCF is a clinical syndrome and has several causes. The cause and immediate precipitating factor(s) must be identified and treated to prevent further damage to the heart.

Signs and symptoms include:

- » dyspnoea (breathlessness)
- » ankle swelling with pitting oedema
- » fatigue
- » tachycardia
- » orthopnoea
- » raised jugular venous pressure
- » tachypnoea
  - men: breathing rate > 18 breaths/minute
  - women: breathing rate > 20 breaths/minute
- » inspiratory basal crackles or wheezing on auscultation of the lungs
- » enlarged liver, often tender

GENERAL MEASURES

- » Monitor body weight to assess changes in fluid balance.
- » Salt (sodium chloride) restriction to less than 2–3 g/day.
- » Regular exercise within limits of symptoms.

MEDICINE TREATMENT

All patients should be assessed by a doctor for initiation or change of treatment.

- » Many of the medicines used can affect renal function and electrolytes.
- » Monitor sodium, potassium and serum creatinine.

STEP 1: Diuretic plus ACE-inhibitor

Mild volume overload (mild CCF) and normal renal function – thiazide diuretic

- Hydrochlorothiazide, oral, 25–50 mg daily.
  - Caution in patients with gout.
  - Less effective in impaired renal function.
  - Caution in patients with a history or family history of skin cancer; and counsel all patients on sun avoidance and sun protection. *LoE:III*[55]

Significant volume overload or abnormal renal function – loop diuretic

- Furosemide, oral, daily (Doctor initiated).
  - Initial dose: 40 mg.
  - If dose > 80 mg/day is required, change dose interval to 12 hourly.
  - Higher doses may be needed if co-morbid kidney impairment is present.
  - Once CCF has improved, consider switching to hydrochlorothiazide.
  - Monitor electrolytes and creatinine.

Acute pulmonary oedema

- Furosemide, IV. See Section 21.2.8: Pulmonary oedema, acute.

Note:

- » Use a lower diuretic dose when given in combination with an ACE-inhibitor.
- » Routine use of potassium supplements with diuretics is not recommended. They should only be used short-term to correct documented low serum potassium level.

All patients with CCF, unless contraindicated or poorly tolerated

- ACE-inhibitor, e.g.:
- Enalapril, oral, 2.5 mg 12 hourly, up to maximum of 10 mg twice daily.
  - Titrate dosages gradually upwards until an optimal dose is achieved
  - Absolute contraindications include: (refer to package insert)
    - cardiogenic shock
    - bilateral renal artery stenosis, or stenosis of an artery to a dominant/single kidney
    - aortic valve stenosis and hypertrophic obstructive cardiomyopathy
    - pregnancy
    - history of angioedema associated with previous ACE-inhibitor or angiotensin II receptor blocker (ARB) therapy

STEP 2: After titration of ACE-inhibitor add carvedilol (alpha 1 and non-selective beta blocker) unless contra-indicated (Refer to package insert for full prescribing information).

Note: Do not use atenolol for cardiac failure.

- Carvedilol, oral (Doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Should treatment be discontinued for >14 days, reinstate therapy as above.
  - Absolute contraindications include: (Refer to package insert)
    - cardiogenic shock, bradycardia, various forms of heart block
    - severe fluid overload
    - hypotension
    - asthma

OR

- Spironolactone, oral, 25 mg daily (Doctor initiated).

CAUTION

Spironolactone can cause severe hyperkalemia and should only be used when serum potassium and renal function can be monitored.Check potassium levels within one month of starting therapy and thereafter, as per clinical need . Routine monitoring of potassium levels is essential if spironolactone is used with an ACE-inhibitor, other potassium sparing agent or in the elderly.

Do not use together with potassium supplements.

Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

LoE:III[56]

STEP 3: (If carvedilol added in step 2, add spironolactone in step 3; if spironolactone ade step 2, add carvedilol in step 3).

Add spironolactone, if patient remains symptomatic despite optimal therapy AND if serum potassium can be monitored.

- Spironolactone, oral, 25mg daily (Doctor initiated).

CAUTION
Spironolactone can cause severe hyperkalemia and should only be used when serum potassium and renal function can be monitored.Check potassium levels within one month of starting therapy and thereafter, as per clinical need . Routine monitoring of potassium levels is essential if spironolactone is used with an ACE-inhibitor, other potassium sparing agent or in the elderly.
Do not use together with potassium supplements.
Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

LoE:III[57]

OR

- Carvedilol, oral (Doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Should treatment be discontinued for > 14 days, reinstate therapy as above.
  - Absolute contraindications include: (Refer to package insert)
    - cardiogenic shock, bradycardia, various forms of heart block
    - severe fluid overload
    - hypotension
    - asthma

STEP 4:

Symptomatic CCF despite above-mentioned therapy:
Refer to hospital for step up therapy with digoxin.

CAUTION
Patients with CCF on diuretics may become hypokalaemic.
Digoxin therapy should not be initiated if the patient is hypokalaemic.

REFERRAL

Urgent

» Patients with prosthetic heart valve.
» Suspected infective endocarditis.
» Fainting spells.

Non urgent

» Initial assessment and initiation of treatment.
» Poor response to treatment.

4.6.2 CARDIAC FAILURE, CONGESTIVE (CCF), CHILDREN

I50.0/I50.1-9

DESCRIPTION

The congestion of the systemic or pulmonary venous systems due to cardiac dysfunction of various different causes; including congenital heart disease and acquired cardiac and lung conditions (e.g. cor-pulmonale due to bronchiectasis in HIV-infected children). Often mistaken for respiratory infection.

Signs and symptoms

Infants

- » rapid breathing
- » rapid heart rate
- » cardiomegaly
- » enlarged tender liver
- » chest indrawing
- » crackles or wheezing in lungs
- » active cardiac impulse

Often presents primarily with shortness of breath, difficulty in feeding and sweating during feeds. Oedema is usually not an obvious feature.

Children

- » rapid breathing
- » rapid heart rate
- » cardiomegaly
- » enlarged tender liver
- » chest indrawing
- » crackles or wheezing in lungs
- » active and displaced cardiac impulse
- » oedema of the lower limbs or lower back

GENERAL MEASURES

While arranging transfer:

- Oxygen, using nasal cannula at 2–3 L per minute.

OR

- Oxygen 40%, using face mask at 2–3 L per minute.
  - Semi-Fowlers position.

Note: If hypertensive, consider glomerulonephritis in children.

MEDICINE TREATMENT

While arranging transfer:

If CCF is strongly suspected

- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing tables, pg 23.5.
  - Do not put up a drip or run in any IV fluids.

REFERRAL

All children with suspected congestive cardiac failure.

4.7 HYPERTENSION

4.7.1 HYPERTENSION IN ADULTS

I10

DESCRIPTION

A condition characterised by an elevated BP measured on 3 separate occasions, a minimum of 2 days apart.

However, when BP is severely elevated (refer to the table below), a minimum of 3 BP readings must be taken at the 1st visit to confirm hypertension. Ensure that the correct cuff size is used in obese patients.

» Systolic BP ≥ 140 mmHg

and/or

» Diastolic BP ≥ 90 mmHg.

LEVELS OF HYPERTENSION IN ADULTS

Level of hypertension	Systolic mmHg	Diastolic mmHg
mild	140–159	90–99
moderate	160–179	100–109
severe	≥ 180	≥ 110

Achieve and maintain target BP: Systolic < 140 mmHg and diastolic < 90 mmHg.

MONITORING

At every visit:

» Weight

» Blood pressure

Baseline:

» Urine protein by dipstix.
  - If dipstix positive send blood for serum creatinine concentration (and eGFR) (See Section 8.2: Acute kidney injury).

» BMI for cardiovascular risk assessment (See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis).

» Abdominal circumference.

» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min. (See Section 9.2.2: Type 2 Diabetes Mellitus, Adults).

Six monthly:

» Serum potassium concentration in patients on spironolactone or eGFR < 30 mL/min.

Annually:

» Fingerprick blood glucose (see Section 9.2.2: Type 2 Diabetes Mellitus, Adults).

» Urine protein by dipstix (see Section 8.1: Chronic Kidney Disease (CKD)).

» Serum creatinine concentration (and eGFR) in patients who have:
  - proteinuria 1+ or more
  - existing cardiovascular disease

- hypertension present for 10 years or more (annually if uncontrolled)
- chronic kidney disease (eGFR < 60 mL/min)

GENERAL MEASURES

Screen all patients for cardiovascular disease risk factors (see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis) and prescribe a statin if required.
Screen for presence of compelling indications (see table below) and manage patients accordingly.

Lifestyle modification

All persons with hypertension should be encouraged to make the following lifestyle changes as appropriate.

» Smoking cessation.
» Maintain ideal weight, i.e. BMI < 25 kg/m2. Weight reduction in the overweight patient.
» Salt restriction with increased potassium intake from fresh fruits and vegetables (e.g. remove the salt from the table, gradually reduce added salt in food preparation and avoid processed foods). Dietician's advice recommended.
» Reduce alcohol intake to no more than 2 standard drinks per day for males and 1 for females.
» Follow a healthy eating plan i.e. low fat, high fibre and unrefined carbohydrates, with adequate fresh fruit and vegetables. Dietician's advice recommended.
» Regular moderate aerobic exercise, e.g. 40 minutes brisk walking at least 3 times a week. *LoE:III*[58]

MEDICINE TREATMENT

Initial medicine choices are dependent on the presence or absence of compelling indications for specific medicines.

Medicine treatment without compelling indications (see table below: Stepwise treatment without compelling indications, for a list of compelling indications and recommendations for specific medicines).

Advise patient to take medication regularly, including on the day of the clinic visit, but a single missed dose does not account for severe elevations in BP.

Note:

» Check adherence to antihypertensive therapy by doing pill counts and questioning family members.
» The use of fixed dose combination medication for control of hypertension provides greater adherence and such agents should be used when they are available. *LoE:III*[59]
» There is emerging evidence that taking the total daily dose of antihypertensive medication at bedtime rather than on awaking provides both better control of hypertension and a significant reduction in important cardiovascular events. *LoE:III*[60]
» Monitor patients monthly and adjust therapy if necessary until the BP is stable.
» Check adherence to medication before escalating therapy.
» After target BP is achieved, patients may be seen at 3–6 monthly intervals.

Mild hypertension

When there are no cardiovascular risk factors, initiate lifestyle modification measures (Step 1). If there is poor response to lifestyle modification measures after 3 months, initiate medicine therapy (Step 2).

If mild hypertension with the presence of risk factors (see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis), initiate medicine therapy as well as lifestyle modification (Step 2).

Moderate hypertension

Confirm diagnosis within 2 weeks. Initiate treatment after confirmation of diagnosis (medicine and lifestyle modification) at Step 2.

Severe hypertension

Confirm diagnosis within 1 hour.

» In patients who are not symptomatic, initiate treatment (medicine and lifestyle modification) at Step 3.

Patients with symptoms of progressive target organ damage or associated clinical conditions: See hypertensive urgency, below and Section 4.7.2: Hypertensive emergency.

Special cases

Pregnancy-induced hypertension

See Section 6.4.2: Hypertensive disorders of pregnancy.

Asymptomatic severe hypertension

» These patients have severe hypertension, are asymptomatic and have no evidence of progressive target organ damage.
» Observe the patient in the health care setting and repeat BP measurement after the patient has rested for 1 hour.
» If the second measurement is still elevated at the same level, start oral treatment with 2 agents (Step 3), one of which should be low dose hydrochlorothiazide and the second medicine is usually a calcium channel blocker, e.g. amlodipine.
» Patient should be followed up within a week.
» Refer to doctor if BP >160/100 mmHg after 4 weeks.

Hypertensive urgency

» Most have a systolic BP > 180 mmHg and/or diastolic BP > 110 mmHg.
» Patients are symptomatic, usually with severe headache, shortness of breath and oedema, but there are no immediate life threatening neurological or cardiac complications such as are seen in the hypertensive emergencies (see Section 4.7.2: Hypertensive emergency).
» Treatment should be commenced with 2 oral agents (Step 3) with the aim to lower diastolic BP to 100 mmHg slowly, over 48–72 hours.
» Amlodipine and furosemide or hydrochlorothiazide should be used, if there is renal insufficiency or evidence of pulmonary congestion (See Section 4.6.1: Cardiac failure, congestive (CCF), adults).
» All patients with hypertensive urgency should be referred to a hospital.

Stroke

BP is often elevated in acute stroke. Do not treat elevated BP at PHC, but refer patient urgently.

Elderly

In patients without co-existing disease, initiate medicine treatment only when the BP > 160/90 mmHg.

CAUTION

Lower BP over a few days.

A sudden decrease in BP can be dangerous, especially in the elderly.

STEPWISE TREATMENT WITHOUT COMPELLING INDICATIONS

STEP 1: Lifestyle modification.

Entry to Step 1	Treatment	Target
» Diastolic BP 90–99 mmHg and/or systolic BP 140–159 mmHg without any existing disease. **AND** » No major risk factors.	» Lifestyle modification.	» BP control within 3 months to < 140/90 mmHg

STEP 2: Add hydrochlorothiazide.

Entry to Step 2	Treatment	Target
» Diastolic BP 90–99 mmHg and systolic BP 140–159 mmHg without any existing disease. **AND** » No major risk factors. **AND** » Failure of lifestyle modification alone to reduce BP after 3 months. **OR** Mild hypertension with major risk factors or existing disease. **OR** Moderate hypertension at diagnosis.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. ***LoE:I***[61]	» BP control within 1 month to < 140/90 mmHg

STEP3: Add a second antihypertensive medicine.

Entry to Step 3	Treatment	Target
» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy. **OR** Severe hypertension (See table).	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **ADD** ▪ Long-acting calcium channel blocker, e.g.: ▪ Amlodipine, oral, 5 mg at night. **OR** ▪ ACE-inhibitor. e.g.: • Enalapril, oral, 10 mg at night. ***LoE:III***[62] •	» BP control within 1 month to < 140/90 mmHg

STEP 4: Increase the dose of the second antihypertensive medicine.

Entry to Step 4	Treatment	Target
» Failure of step 3 after 1 month of adherence.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **AND** Increase dose of antihypertensive started in Step 3: ▪ Long-acting calcium channel blocker, e.g.: ▪ Amlodipine, oral, increase to 10 mgat night. **OR** ▪ ACE-inhibitor, e.g.: • Enalapril, oral, increase to 20 mg at night.	» BP control within 1month to < 140/90 mmHg, with no adverse reactions.

STEP 5: Add a third antihypertensive medicine

Entry to Step 5	Treatment	Target
» Failure of step 4 after 1 month of adherence.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **AND** ▪ ACE-inhibitor, e.g.: • Enalapril, oral: continue Step 4 dose, or if not started previously start at 10 mg at night. **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral: continue Step 4 dose, or if not started previously start at 5 mg at night.	» BP control within 1 month to < 140/90 mmHg with no adverse medicine reactions.

STEP 6: Increase the dose of the third antihypertensive medicine

Entry to Step 6	Treatment	Target
» Failure of step 5 after 1 month of adherence.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily **AND** ▪ ACE-inhibitor, e.g.: • Enalapril, oral, 20 mg at night **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral, 10 mg at night.	» BP control within 1 month to < 140/90 mmHg with no adverse medicine reactions.

STEP 7: Increase the dose of HCTZ and add a fourth antihypertensive medicine

Entry to Step 7	Treatment	Target
» Failure of step 7 after 1 month of adherence.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 25 mg daily. **AND** ▪ ACE-inhibitor, e.g.: • Enalapril, 20 mg at night. **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral 10 mg at night. *LoE:I*[63] **AND ADD** • Spironolactone, oral, 25 mg daily (Doctor initiated).	» BP control within 1 month to < 140/90 mmHg, with no adverse medicine reactions.

CAUTION

Spironolactone can cause severe hyperkalemia and should only be used when serum potassium and renal function can be monitored.Check potassium levels within one month of starting therapy and thereafter, as per clinical need . Routine monitoring of potassium levels is essential if spironolactone is used with an ACE-inhibitor, other potassium sparing agent or in the elderly.

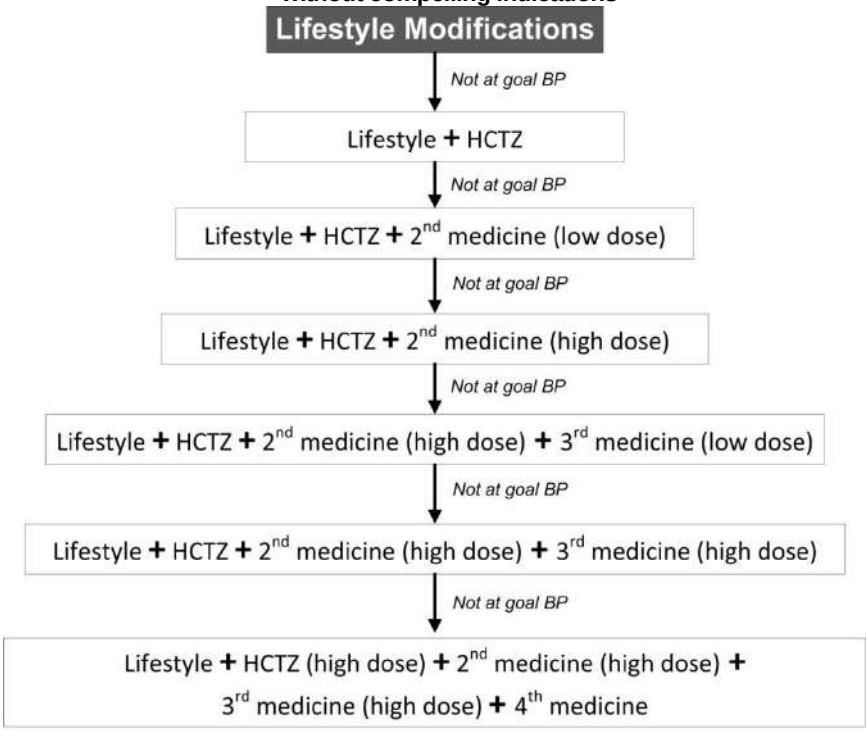
Do not use together with potassium supplements.

Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

LoE:III[64]

If not controlled on step 7– refer.

Hypertension treatment algorithm for stepwise treatment without compelling indications



Medicines include hydrochlorothiazide (HCTZ), ACE-inhibitors, long-acting calcium channel blockers, spironolactone

Note:

» If lifestyle modification failed to achieve BP control: Counsel patient on the risk of major cardiovascular events associated with elevated BP; and initiate monotherapy.

» If BP control is suboptimal: Up titrate treatment (maximise dose of current antihypertensive and/or add additional medicine). Evidence suggests that treatment inertia contributes to suboptimal BP control with patients remaining on monotherapy and/or suboptimal doses. *LoE:III*[65]

» Initiate combination medicine therapy in cases of severe hypertension and hypertension urgency (see Section 4.7.2: Hypertensive emergency).

TREATMENT OF HYPERTENSION WITH COMPELLING INDICATIONS

Compelling indications for specific medicines	Medicine therapeutic class
Angina	• Beta-blocker **OR** • Long-acting calcium channel blocker
Prior myocardial infarction	• Beta-blocker **AND** • ACE-inhibitor
Heart failure	• ACE-inhibitor **AND** • Carvedilol, oral **OR** • Spironolactone, oral For significant volume overload: • Loop diuretic
Left ventricular hypertrophy(confirmed by ECG)	• ACE-inhibitor
Stroke: secondary prevention	• Hydrochlorothiazide, oral **AND** • ACE-inhibitor
Diabetes type 1 and 2 with/without evidence of microalbuminuria/proteinuria	• ACE-inhibitor, usually in combination with diuretic
Chronic kidney disease	• ACE-inhibitor, usually in combination with diuretic
Isolated systolic hypertension	• Hydrochlorothiazide, oral **OR** • Long-acting calcium channel blocker
Pregnancy	• Methyldopa, oral

Contraindications to individual medicines

Hydrochlorothiazide

» gout
» pregnancy
» severe liver impairment
» kidney impairment (eGFR < 30 mL/min)
» use with caution in patients with a history or family history of skin cancer; and counsel all patients on sun avoidance and sun protection. *LoE:III*[66]

Spironolactone

» kidney impairment (eGFR < 30 mL/min) *LoE:III*[67]
» pregnancy

ACE-inhibitors

» pregnancy
» bilateral renal artery stenosis or stenosis of an artery to a dominant/single kidney
» aortic valve stenosis
» history of angioedema
» hyperkalemia

» severe renal impairment (eGFR < 30 mL/min), unless dose-adjusted usage is recommended by a specialist – See Section 8.1:Chronic kidney disease (CKD). *LoE:III*[68]

CAUTION
Advise all patients receiving ACE-inhibitors about the symptoms of ACE-induced angioedema.

Calcium channel blockers
» untreated heart failure

REFERRAL
» Young adults (< 30 years of age).
» BP not controlled by 4 medicines and where there is no doctor available.
» Pregnancy.
» Signs of target organ damage e.g. oedema, dyspnoea, proteinuria, angina etc.
» If severe adverse drug reactions develop.
» Hypertensive urgency and hypertensive emergency.
» Severe renal impairment (eGFR < 30 mL/min).

4.7.2 HYPERTENSIVE EMERGENCY
I10

DESCRIPTION
A markedly elevated BP: systolic BP > 180 mmHg and/or a diastolic BP > 130 mmHg **associated with** ≥ one of the following:
» unstable angina/chest pain
» neurological signs, e.g. severe headache, visual disturbances, confusion, coma or seizures
» pulmonary oedema
» renal failure

MEDICINE TREATMENT
- Amlodipine, oral, 10 mg immediately as a single dose.

If pulmonary oedema:
- Furosemide, IV, 40 mg as a single dose (See Section 21.2.8: Pulmonary oedema, acute).

CAUTION
A hypertensive emergency is life threatening and needs immediate referral to hospital.

REFERRAL
Urgent
All patients.

4.7.3 HYPERTENSION IN CHILDREN

I10

DESCRIPTION

Hypertension is defined as systolic and/or diastolic blood pressure ≥ the 95th percentile for gender, age, and height percentile on at least 3 consecutive occasions. Refer to table below.

The use of appropriate cuff size is important. Too small a cuff for the arm leads to false high BP. The cuff bladder must encircle at least 80% of the upper arm and should cover at least 75% of the distance between the acromion and the olecranon. It is better to use a cuff that is slightly too large than one that is too small. Large cuffs, if covered with linen-like material, can be folded to the appropriate size in smaller infants as long as the bladder encompasses the arm.

Infants and preschool-aged children are almost never diagnosed with essential hypertension and are most likely to have secondary forms of hypertension.

With age, the prevalence of essential hypertension increases, and after 10 years of age, it becomes the leading cause of elevated BP. Obesity currently is emerging as a common comorbidity of essential hypertension in paediatric patients, often manifesting during early childhood.

DIAGNOSIS

Age years	**95th BP percentiles for boys** mmHg	**95th BP percentiles for girls** mmHg
1	103/56	104/58
3	109/65	107/67
5	112/72	110/72
6	114/74	111/74
8	116/78	115/76
9	118/79	117/77
10	119/80	119/78
11	121/80	121/79
12	123/81	123/80

Adapted from U.S Department of Health and Human Services.National Institutes of Health (National Heart, Lung, and Blood Institute): The 4th report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents, May 2005 (using the 50th height percentile).

REFERRAL

All cases with BP above the 95th percentile.

4.8 PULMONARY OEDEMA, ACUTE

See Section 21.2.8: Pulmonary oedema, acute.

4.9 RHEUMATIC FEVER, ACUTE

I00/I01.0-2/I01.8-9
Note: notifiable condition.

DESCRIPTION

A condition in which the body develops antibodies against its own tissues, following a streptococcal throat infection. Effective treatment of streptococcal pharyngitis can markedly reduce the occurrence of this disease.
Commonly occurs in children, 3–15 years of age.
Recurrences are frequent.
Clinical signs and symptoms include:
» arthralgia or arthritis that may shift from one joint to another
» carditis including cardiac failure
» heart murmurs
» subcutaneous nodules
» erythema marginatum
» chorea (involuntary movements of limbs or face)
» other complaints indicating a systemic illness e.g. fever

MEDICINE TREATMENT

Eradication of streptococci in throat:

Children: 18 months–11 years of age

- Phenoxymethylpenicillin, oral, 250 mg 12 hourly for 10 days.

Children > 11 years of age and adults

- Phenoxymethylpenicillin, oral, 500 mg 12 hourly for 10 days.

OR

Children

- Amoxicillin, oral, 50 mg/kg daily for 10 days.

Weight kg	Dose mg	Use one of the following				Age Months/years
		Susp		Capsule		
		125 mg/5mL	250 mg/5mL	250 mg	500 mg	
>2–2.5 kg	100 mg	4 mL	2 mL	–	–	>34–36 weeks
>2.5–3.5 kg	150 mg	6 mL	3 mL	–	–	>36 weeks–1 month
>3.5–5 kg	200 mg	8 mL	4 mL	–	–	>1–3 months
>5–7 kg	275 mg	11 mL	5.5 mL	–	–	>3–6 months
>7–11 kg	400 mg	–	8 mL	–	–	>6–18 months
>11–17.5 kg	575 mg	–	11.5 mL	–	–	>18 months–5 years
>17.5–25 kg	750 mg	–	15 mL	3	–	>5–7 years
>25–35 kg	1000 mg	–	20 mL	4	2	>7–11 years
>35 kg	2000 mg	–	–		4	>11years

LoE:I[69]

Adults

- Amoxicillin, oral, 1 000 mg 12 hourly for 10 days.

OR *LoE:III[70]*

- Benzathine benzylpenicillin, IM, single dose.

- Children < 30 kg: 600 000 IU.
- Children ≥ 30 kg and adults: 1.2 MU.
- Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine) or 3 mL water for injection.

Severe penicillin allergy:
Z88.0

Children
- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table pg 23.2.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Prophylaxis for rheumatic fever: (Z29.2)

All patients with confirmed rheumatic fever and no persistent rheumatic valvular disease
» Treat for 10 years or until the age of 21 years, whichever is longer.

All patients with confirmed rheumatic fever and persistent rheumatic valvular disease
- Phenoxymethylpenicillin, oral, 12 hourly.
  - Children: 125 mg
  - Adults: 250 mg

OR
- Amoxicillin, oral, daily.
  - Children <30 kg: 125 mg
  - Children ≥30 kg and adults: 250 mg

LoE:III

OR
- Benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks).
  - Children < 30 kg: 600 000 IU
  - Children ≥ 30 kg and adults: 1.2 MU
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine).

CAUTION
Avoid IM injections if patients are on warfarin.

Severe penicillin allergy:
Z88.0

Children < 11 years
- Macrolide, e.g.:
- Azithromycin, oral, 10mg/kg/day, 3 times weekly. See dosing table, pg 23.2.

LoE:III[71]

Children ≥ 11 years and adults
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily.

LoE:III[72]

REFERRAL
All patients for diagnosis and management.

4.10 VALVULAR HEART DISEASE AND CONGENITAL STRUCTURAL HEART DISEASE

I05.0-2/I05.8-9/I06.0-2/I06.8-9/I07.0-2/I07.8-9/I08.0-3/I08.8-9/I34.0-2/I34.8-9/I35.0-2/I35.8-9/I36.0-2/I36.8-9/I37.0-2/I37.8-9/Q22.0-6/Q22.8-9/Q23.0-4/Q23.8-9

DESCRIPTION

Damage to heart valves, chamber or vessel wall anomalies caused by rheumatic fever or other causes, e.g. congenital heart defects and ischaemic heart disease.
May be complicated by:

- » heart failure
- » infective endocarditis
- » atrial fibrillation
- » systemic embolism

GENERAL MEASURES

- » Advise all patients with a heart murmur regarding the need for prophylactic treatment prior to undergoing certain medical and dental procedures.
- » Advise patients to inform health care providers of the presence of the heart murmur when reporting for medical or dental treatment.

MEDICINE TREATMENT

Prophylactic antibiotic treatment for infective endocarditis:

- » Should be given prior to certain invasive diagnostic and therapeutic procedures e.g. tooth extraction, to prevent infective endocarditis.
- » Is essential for all children with congenital or rheumatic heart lesions needing dental extraction.

Dental extraction, if no anaesthetic is required:
Z29.2

- Amoxicillin, oral, 50 mg/kg (maximum dose: 2 g), 1 hour before the procedure.
  - Repeat dose 6 hours later.

Age	Dose
< 5 years	750 mg
5–10 years	1 500 mg
≥ 10 years	2 g

Severe penicillin allergy:
Z88.0
Refer.

If anaesthetic is required:
Refer.

Prophylaxis for rheumatic fever:
See Section 4.9: Rheumatic fever, acute.

REFERRAL

- » All patients with pathological heart murmurs for assessment.
- » All patients with heart murmurs not on a chronic management plan.
- » Development of cardiac signs and symptoms.
- » Worsening of clinical signs and symptoms of heart disease.
- » Any newly developing medical condition, e.g. persistent fever.

» All patients with valvular heart disease for advice on prophylactic antibiotic treatment prior to any invasive diagnostic or therapeutic procedure.

PHC Chapter 5: Skin Conditions

5.1 DRY SKIN

L85.3

DESCRIPTION

The skin is dry and rough, together with varying degrees of scaling.
Severe forms are mainly inherited, e.g. ichthyosis.
Milder forms (xeroderma), seen as dryness with only slight scaling are common in the elderly and some chronic conditions, e.g. HIV disease, malignancies and atopic eczema.

MEDICINE TREATMENT

- Avoid soap, use soap substitutes e.g.
- Aqueous cream (UEA)
  - Rub on skin, before rinsing off completely.
  - Aqueous cream should not be used as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE)

5.2 ITCHING (PRURITUS)

L29.0-3/L29.8-9

DESCRIPTION

Itching may be:
» localised or generalised
» accompanied by obvious skin lesions or skin conditions e.g. chicken pox
» accompanied by many systemic diseases, e.g. hepatitis
» caused by scabies and insect bites

GENERAL MEASURES

» Trim fingernails.
» Avoid scratching.

MEDICINE TREATMENT

Diagnose and treat the underlying condition.

- Calamine lotion, apply when needed.

For pruritis associated with dry skin:

- Emollient, e.g.:
- Emulsifying ointment (UE).

Severe pruritus:
For short term use

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

For long term use e.g. for chronic pruritus:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL

» No improvement after 2 weeks.
» Underlying malignancy or systemic disease suspected.

5.3 ACNE VULGARIS

L70.0-5/L70.8-9

DESCRIPTION

Acne is an inflammatory condition of the hair follicle.
It is caused by hormones and sebum gland keratinisation, leading to follicular plugging producing comedomes and proliferation of Propioni bacterium acnes.
Distributed on face, chest and back.
Occurs more commonly in adolescence, but may also occur in adulthood.
May also occur as a result of the inappropriate use of topical steroids or as a side effect of medicine e.g. INH therapy.

Mild acne:
Predominantly consists of non-inflammatory comedones.

Moderate acne:
Consists of a mixture of non-inflammatory comedones and inflammatory papules and pustules.

Severe acne
It is characterised by the presence of widespread nodules and cysts, as well as a preponderance of inflammatory papules and pustules.

GENERAL MEASURES

» Do not squeeze lesions.
» Avoid greasy or oily cosmetics and hair grooming products that block the hair follicle openings.
» Discourage excessive facial washing.

MEDICINE TREATMENT

Mild inflammatory acne:

- Benzoyl peroxide 5%, gel, apply in the morning to affected areas as tolerated.
  - Wash off in the evening.
  - If ineffective and tolerated, increase application to 12 hourly.

- Avoid contact with eyes, mouth, angles of the nose and mucous membranes. LoE:III[73]

For non-inflammatory acne:
Topical retinoids
The main action is to control comedone formation.
Introduce topical retinoids gradually as a night-time application to limit skin irritant effects, as they are not photo-stable and degrade when exposed to sunlight.

CAUTION
Do not use if pregnant or planning pregnancy.
Limit exposure to sunlight. If sunburn occurs, discontinue therapy until the skin has recovered. LoE:I[74]

- Tretinoin, topical, apply at night to affected areas for at least 6 weeks.
  - Review patient after 6 weeks' treatment.
  - Minimise exposure to sunlight. If sunburn occurs, discontinue therapy until the skin has recovered
  - Acne may worsen during the first few weeks.

Moderate inflammatory acne:
- Benzoyl peroxide 5%, gel, apply in the morning to affected areas as tolerated.
  - Wash off in the evening.
  - If ineffective and tolerated, increase application to 12 hourly.
  - Avoid contact with eyes, mouth, angles of the nose and mucous membranes. LoE:III[75]

AND
- Doxycycline, oral, 100 mg daily for 3 months.
  - Review patient after 3 months of treatment.
  - It should be taken with meals.
  - Do not take it together with iron preparations and antacids. LoE:III[76]

REFERRRAL
» All severe cases.
» Poor response to treatment.

5.4 BACTERIAL INFECTIONS OF THE SKIN

5.4.1 BOIL, ABSCESS
L02.0-4/L02.8-9/H00.0/H60.0/N76.4/J34.0 + (B95.6)

DESCRIPTION
Localised bacterial skin infection of hair follicles or dermis, usually with *S. aureus*.
The surrounding skin becomes:
» swollen
» red
» hot
» tender to touch

Note:
» Check blood glucose level if diabetes suspected or if the boils are recurrent. Boils in diabetic or immunocompromised patients require careful management.

» Axillary abscesses and pustules (See Section 5.17: Hidradenitis suppurativa).

GENERAL MEASURES

» Encourage general hygiene e.g.: frequent showering, keeping nails short.
» Drainage of abscess is the treatment of choice.
» Perform surgical incision only when the lesion is fluctuant.

MEDICINE TREATMENT

Systemic antibiotics are seldom necessary, except if there are:

» Swollen tender lymph nodes in the area
» fever
» extensive surrounding cellulitis
» boils on the face

Antibiotics are also indicated in immunocompromised patients, diabetic patients and neonates:

Children ≤ 7 years of age

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days See dosing table, pg 23.3.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.5.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. See dosing table, pg 23.2.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

REFERRAL

» Poor response to treatment.
» Abscesses of the palm of the hand and pulp space abscess of the fingers.
» Features of severe sepsis requiring intravenous antibiotics.
» Deep abscess e.g. ischiorectal and breast abscess.

5.4.2 IMPETIGO

L01.0-1

DESCRIPTION

A common contagious skin infection caused by streptococci or staphylococci.
Predominantly occurs in children.
Often secondary to scabies, insect bite, eczema or tinea capitis.
Clinical features:

» starts as blisters containing pus

» subsequently becomes eroded producing honey-coloured crusts
» commonly starts on the face or buttocks
» spreading to neck, hands, arms and legs

Note:

» Post-streptococcal glomerulonephritis is a potential complication.
» Check urine for blood if the sores have been present for more than a week.

GENERAL MEASURES

» Good personal and household hygiene to avoid spread of the infection and to reduce carriage of organisms.
» Trim finger nails.
» Wash and soak sores in soapy water to soften and remove crusts.
» Continue with general measures until the sores are completely healed.

MEDICINE TREATMENT

- Povidone iodine 5%, cream or 10% ointment apply 8 hourly.

AND

Children ≤ 7 years of age

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.3.

OR

- Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.5.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. See dosing table, pg 23.2.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

If impetigo has improved, but has not completely cured, give a 2nd 5-day course of antibiotics.

REFERRAL

» No improvement after second course of antibiotics.
» Presence of blood on urine test strip for longer than 5-7 days.
» Clinical features of glomerulonephritis. See Section 8.3.1: Nephritic syndrome.

5.4.3 CELLULITIS

L03.0-3/L03.8-9

DESCRIPTION

A diffuse, spreading, acute infection within skin and soft tissues, commonly caused by streptococci and staphylococci.

Characterised by:

- » oedema
- » redness
- » increased local temperature
- » no suppuration

Frequently associated with lymphangitis and regional lymph node involvement.

Commonly occurs on the lower legs, but may occur elsewhere.

May follow minor trauma.

There may be significant systemic manifestations of infection:

- » fever
- » tachycardia
- » hypotension
- » chills
- » delirium/altered mental state

May present as an acute fulminant or chronic condition.

GENERAL MEASURES

Elevate the affected limb to reduce swelling and discomfort.

MEDICINE TREATMENT

Children ≤ 7 years of age

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.3.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.5.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. See dosing table, pg 23.2.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Severe cases:

Refer for parenteral antibiotics.

REFERRAL

Urgent

- » Children who have significant pain, swelling or loss of function (to exclude osteomyelitis).
- » Haemorrhagic bullae, gas in the tissues or gangrene.
- » Extensive cellulitis.

» Recurrent cellulitis associated with underlying conditions, e.g. lymphoedema.
» Cellulitis with systemic manifestations, e.g. confusion, hypotension.
» Poorly controlled diabetic patients.
» Involvement of the hand, face and scalp.

Non-urgent

» Inadequate response to initial antibiotic treatment.

5.4.4 CHRONIC LOWER LEG ULCERS

L97

DESCRIPTION

A chronic relapsing disorder of the lower limbs.
Associated with vascular insufficiency (predominantly venous insufficiency) and patient immobility.
Commonly associated with neuropathy, infections, neoplasia, trauma or other rare conditions.

GENERAL MEASURES

» If the ulcer is oedema- or stasis-related, rest the leg in an elevated position.
» In venous insufficiency, compression (bandages or stockings) are essential to achieve and maintain healing, provided the arterial supply is normal.
» In patients with arterial insufficiency, avoid pressure on bony prominences and the toes.
» In patients with neuropathy, relieve pressure from the area.
» Exclude diabetes with finger prick blood glucose test.
» Avoid topical application of home remedies.
» Stress meticulous foot care and avoidance of minor trauma. Encourage patients with neuropathy not to walk barefoot, check their shoes for foreign objects, examine their feet daily for trauma and to test bath water before bathing to prevent getting burnt.
» Avoid excessive local heat.
» Walking and exercises are recommended.

MEDICINE TREATMENT

Refer for assessment and initiation of treatment.

Local wound care:

Topical cleansing
Use bland, non-toxic products to clean the ulcer and surrounding skin.

For clean uninfected wounds:

- Sodium chloride 0.9% or sterile water.

Dressed frequently with:

- Moistened dressing e.g. gauze with Sodium chloride 0.9%. *LoE:I*[77]

For exudative, infected wounds:

- Povidone-iodine 5% cream, topical apply daily *LoE:III*[78]

For venous ulcers:

- Paraffin gauze dressing.

REFERRAL
» No improvement after 1 month.
» All foot ulcers.
» Ulcers with atypical appearance.
» Venous ulcers that are persistently infected, or have offensive odour.

5.5 FUNGAL INFECTIONS OF THE SKIN

5.5.1 CANDIDIASIS, SKIN
B37.2
Vaginal candidiasis: See Section 12.1: Vaginal discharge syndrome (VDS).

DESCRIPTION
A skin infection caused by *C. albicans*.
Most common sites for infection are skin folds such as:
» under the breasts
» axillae
» nail folds
» natal cleft
» groins
» neck folds, peri-anal, perineum and groins in infants

The skin lesions or sores:
» are red raw-looking patches
» appear moist (weeping)
» have peripheral outlying white pustules, red scaly lesions which become confluent

GENERAL MEASURES
Exclude diabetes.

MEDICINE TREATMENT
- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply 3 times daily for 14 days.

5.5.2 RINGWORM AND OTHER TINEAS
Fungal infections affecting the skin (tinea corporis; tinea versicolor), feet (tinea pedis), scalp (tinea capitis) and nails (tinea unguium). These infections may be contagious.

5.5.2.1 RINGWORM – TINEA CORPORIS
B35.4

DESCRIPTION
Clinical features include:
» itchy ring-like patches
» patches slowly grow bigger
» raised borders

As the patch extends a clear area develops in the center which may become hyper-pigmented in dark skin.
Extensive disease is common in HIV, often with no evidence of the patches developing clear centres.

GENERAL MEASURES
» Prevent spreading the infection to others.
» Do not share:
  - clothes
  - towels
  - toiletries, especially combs and hair brushes
» Wash skin well and dry before applying medicine treatment.

MEDICINE TREATMENT
Treat any secondary skin infection with antibiotics. See Section 5.4.2: Impetigo.
- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply 3 times daily.
  - Continue using cream for at least 2 weeks after lesions have cleared.

REFERRAL
Extensive disease.

5.5.2.2 ATHLETE'S FOOT – TINEA PEDIS
B35.3

DESCRIPTION
A common contagious fungal infection of the foot, characterised by itching, burning and stinging between the toes or the sole.
The skin between the toes is moist and white (maceration) and may become fissured. There is also associated erythema, scaling and peeling.
Secondary eczema of the hands may be an associated condition. See Section 5.8.1: Eczema, atopic.
Vesicles may occur in inflammatory cases.
Pain and tenderness in the web spaces may indicate secondary bacterial infection.
Re-infection is common.

GENERAL MEASURES
» Discourage the use of shared bathing or swimming areas, whilst infected.
» Keep feet dry:
  - wear open sandals
  - do not wear socks of synthetic material
  - dry between toes after washing the feet or walking in water
  - wash and dry feet twice daily before applying medicine treatment

MEDICINE TREATMENT
- Imidazole cream, e.g.:
- Clotrimazole 1%, topical, apply twice daily for 4 weeks.

REFERRAL
No improvement after 4 weeks.

5.5.2.3 SCALP INFECTIONS – TINEA CAPITIS

B35.0

DESCRIPTION

Round or patchy bald areas with scales and stumps of broken off hair.

GENERAL MEASURES

Avoid shaving head in children.
Do not share toiletries such as combs and hair brushes.

MEDICINE TREATMENT

For scalp infections:

Children

- Fluconazole, oral, 6 mg/kg once daily, for 28 days. See dosing table, pg 23.5. *LoE:I*[79]

Adults

- Fluconazole, oral, 200 mg weekly, for 6 weeks. *LoE:I*[80]

Note: Do not give to women of child-bearing age unless they are using an effective contraceptive.

5.5.2.4 PITYRIASIS VERSICOLOR – TINEA VERSICOLOR

B36.0

DESCRIPTION

Mostly found on the upper chest and back and less commonly on the neck, face, abdomen and upper limbs. Round macules which are usually lighter than normal skin (but may be darker). On the chest and back the more central macules join together and the condition spreads with the formation of new macules on the periphery. After treatment, the pigmentation may take months to return to normal.
Recurrences are common, especially in hot weather.

GENERAL MEASURES

Avoid wearing heavy clothing in hot weather to reduce perspiration.

MEDICINE TREATMENT

Oral antifungal therapy is not indicated.

- Selenium sulphide, 2.5% suspension.
  - Lather shampoo on affected parts.
  - Apply daily for 3 successive days and leave on for 30 minutes, then wash off.
  - Alternatively, apply once weekly for 3 weeks and leave on overnight, then wash off. *LoE:III*[81]

5.5.2.5 NAIL INFECTIONS – TINEA UNGUIUM

See Section 5.6.3: Nail infections – *tinea unguium*.

5.6 NAILFOLD AND NAIL INFECTIONS

5.6.1 PARONYCHIA, ACUTE

L03.0

DESCRIPTION

Small subcutaneous collection of pus under the nailfold.
Often associated with cutting nails too short, or nail biting.

GENERAL MEASURES

» Avoid cutting finger nails too short.
» Avoid nail biting.

MEDICINE TREATMENT

Drain abscess by puncture or incision.

Adults

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

5.6.2 PARONYCHIA, CHRONIC

L03.0

DESCRIPTION

» Chronic, red, swollen nailfold, lifted off the nail plate with whitish pus.
» Commonly caused by working in water and contact with household detergents.

GENERAL MEASURES

» Avoid hand contact with household detergents, washing powders and fabric softeners.
» Patients to wear rubber gloves when washing clothes, linen and kitchen utensils in order to keeping hands clean and dry as far as possible, during day.

MEDICINE TREATMENT

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed)
- Betamethasone 0.1%, topical, apply at night until lesions have cleared.
  - After washing hands, massage cream into the nailfold.

If secondary infection is present, indicated by pain and tenderness in the nail fold, treat with antibiotics. See Section 5.4.2: Impetigo. *LoE:III*[82]

REFERRAL

No response to treatment.

5.6.3 NAIL INFECTIONS – TINEA UNGUIUM

B35.1

DESCRIPTION

Nails are lifted, distorted, crumbling and discoloured. One or more nails may be affected.

GENERAL MEASURES

Topical treatment is generally ineffective for fungal nail infections.
Systemic treatment is often unsuccessful and recurrent infections are common if repeat exposure is not prevented.

REFERRAL

Only patients that are distressed by cosmetic appearance.

5.7 PARASITIC INFESTATIONS OF THE SKIN

5.7.1 LICE (PEDICULOSIS)

DESCRIPTION

An infestation of the body with parasitic lice.
Clinical features include:

» itching
» bite marks
» presence of secondary eczema and secondary infection

CAUTION
Do not use commercial insect sprays as they are toxic.
Lotions used for the treatment of lice are toxic when swallowed.

Treat secondary infection with antibiotics. See Section 5.4.2: Impetigo.

5.7.1.1 HEAD LICE

B85.0

DESCRIPTION

Head lice are common in children. The eggs (nits) appear as fixed white specks on the hair.

GENERAL MEASURES

» Use a fine comb to comb out the nits after washing hair.
» Shaving of the head may expedite treatment, where socially acceptable.
» Prevent spread by treating other contacts.
» Remove nits from eyelashes by applications of white soft paraffin.

MEDICINE TREATMENT

- Permethrin 5%, topical

- Apply permethrin 5% lotion to towel-dried or dry hair. Comb into hair repeatedly with a normal comb until scalp is covered completely.
- Remove lice and nymphs with fine lice comb, by dividing scalp into sections and combing away from scalp.
- Rinse lice comb in a white bowl filled with hot water between hair strokes to identify removed lice, or detach on white tissue paper. Paralysed and dead lice will present as dark spots (like ground pepper).
- Take note of the physical size of removed lice and nymphs, as the size should get smaller with consecutive treatments.
- Keep on combing with fine lice comb, rinsing or wiping comb frequently.
- Permethrin 5% lotion is safe and can be left in the hair for up to one hour.
- After combing, rinse hair with lukewarm water and wash permethrin 5% lotion out with normal shampoo (more than one foaming might be needed).
- Repeat this procedure every 5 days for 3 weeks.
- Thereafter, carry out frequent inspections to detect new infestations early.

Note:

- **Do not** apply to broken skin or sores. *LoE:III*[83]
- **Avoid** contact with eyes.

5.7.1.2 BODY LICE

B85.1/B85.4

Body lice live in the seams of clothing and only come to the skin to feed.
Note: Body lice may carry typhus fever.

GENERAL MEASURES

Regularly wash bed linen and underclothes in hot water and expose to sunlight.

MEDICINE TREATMENT

Adults and adolescent children

- Benzyl benzoate 25% lotion, undiluted, applied over the whole body.
  - Leave on overnight and wash off the next day.
  - Repeat once a week for up to 3 weeks.

  Note:
  - **Do not** apply to neck and face.
  - Avoid contact with eyes and broken skin or sores.
  - The lotion is toxic if swallowed.
  - Do not continue if a rash or swelling develops.
  - Itching may continue for 2–3 weeks after treatment. *LoE:II*[84]

5.7.1.3 PUBIC LICE

B85.3/B85.4

DESCRIPTION

Pubic lice are acquired as STIs and nits are found on pubic hair and eyelashes.

GENERAL MEASURES
Prevent spread by treating other contacts.

MEDICINE TREATMENT
- Benzyl benzoate 25%
  - Apply to affected area.
  - Leave on for 24 hours, then wash thoroughly.
  - Repeat in 7 days.

Pediculosis of the eyelashes or eyebrows

- Yellow petroleum jelly (Note: Do not use white petroleum jelly near the eyes).
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes. *LoE:III*

REFERRAL
Lice infestation of eyelashes in children to exclude suspected sexual abuse.

5.7.2 SCABIES
B86

DESCRIPTION
An infestation with the parasite *Sarcoptes scabei.*
Commonly occurs in the skin folds. The infestation spreads easily, usually affecting more than one person in the household.
Clinical features include:
» intense itching, which is more severe at night
» small burrows between fingers, toes, elbow areas and buttocks where the parasite has burrowed under the skin
» secondary infection which may occur due to scratching with dirty nails
» in small babies, there are often vesicles and pustules on the palms and soles and sometimes on the scalp

GENERAL MEASURES
All close contacts must be treated simultaneously even if they are not itchy – see medicinal treatment below.
» Cut finger nails and keep them clean.
» Wash all linen and underclothes in hot water.
» Expose all bedding to direct sunlight.
» Put on clean, washed clothes after medicine treatment.

MEDICINE TREATMENT
Adults and children > 6 years of age
- Benzyl benzoate 25% lotion applied undiluted to the whole body from neck to feet and rub in well.
  - Allow the lotion to remain on the body for 24 hours, then wash off using soap and water.

- For severe infestation treatment may be repeated after 24 hours or once within 5 days.
- All infected persons living in the household, or likely to contract the infection, should be treated at the same time.

If benzyl benzoate is unsuccessful:

- Permethrin 5%, topical, apply lotion undiluted to the whole body from neck to feet.
  - Leave on overnight (8–12 hours) and wash off the following morning. *LoE:I*[85]

Children < 6 years of age

- Permethrin 5%, topical, apply lotion undiluted to the whole body from neck to feet
  - Leave on overnight (8–12 hours) and wash off the following morning. *LoE:III*[86]

Note:

» Benzyl benzoate and permethrin are toxic if swallowed.
» Avoid contact with eyes and broken skin or sores.
» Do not continue if rash or swelling develops.
» Itching may continue for 2–3 weeks after treatment.

Treatment may need to be repeated after one week.
Treat secondary infection with antibiotics. See Section 5.4.2: Impetigo.

5.7.3 SANDWORM

B76.0

DESCRIPTION

Creeping eruption (cutaneous larva migrans) caused by *Ancylostoma braziliense*, a hookworm of dog or cat. Larvae of ova in soil penetrate skin commonly through the feet, legs, buttocks or back and cause a winding thread-like trail of inflammation with itching, scratching dermatitis and bacterial infection.

MEDICINE TREATMENT

- Albendazole, oral, daily for 3 days.
  - Children < 2 years of age: 200 mg
  - Children ≥ 2 years of age and adults: 400 mg

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

CAUTION
Do not give an antihistamine to children < 2 years of age.

5.8 ECZEMA AND DERMATITIS

5.8.1 ECZEMA, ATOPIC

L20.0/L20.8-9

DESCRIPTION

An allergic disorder with an itchy red rash or dry rough skin.
In babies it appears at approximately 3 months.
Family history of asthma, hay fever or atopic dermatitis is common.
Clinical features:

» occurs on the inner (flexural) surfaces of elbows and knees, the face and neck
» can become chronic with thickened scaly skin (lichenification)
» secondary bacterial infection may occur with impetigo or pustules
» can be extensive in infants
» very itchy at night

Eczema is usually a chronic condition and requires long-term care.
Sufferers of atopic eczema are particularly susceptible to herpes simplex and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum). See Section 5.13: Herpes simplex.

GENERAL MEASURES

» Avoid direct skin contact with woollen or rough clothes.
» Avoid overheating by blankets at night.
» Trim fingernails to prevent scratching.
» Good personal hygiene with regular washing to remove crusts and accretions and to avoid secondary infection.
» Diet modification may have no role in atopic eczema treatment.
» Avoid soap on affected areas.

MEDICINE TREATMENT

(For management of severe eczema, start at step 3).

STEP 1

- Avoid soap, use soap substitutes such as aqueous cream (UEA).
  - Rub on skin, before rinsing off completely.
  - Aqueous cream should not be used as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE).

STEP 2

<u>If no response within seven days; or more severe eczema:</u>

- Hydrocortisone 1%, topical, applied twice daily for 7 days.
  - Apply sparingly to the face.
  - **Do not** apply around the eyes.

<u>If there is a response:</u>
Reduce the use of the hydrocortisone cream to once daily for a further few days, then stop and maintain treatment with:

- Aqueous cream (UEA) as a soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

STEP 3

If no response within seven days or more severe eczema:

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed).
- Betamethasone 0.1%, topical, apply ointment once daily for 7 days
  - **Do not** apply to face, neck and flexures.

LoE:I[87]

If there is a response:

Reduce use of corticosteroid ointment to once daily for a further few days, then stop and maintain treatment with:

- Aqueous cream (UEA) as a soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

For itching

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose at night for a maximum of 2 weeks. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, at night for a maximum of 2 weeks.
  - **Note:** Chlorphenamine is sedating.

LoE:III

If itch not controlled or more severe daytime itch, switch to:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

LoE:III

CAUTION

Do not give an antihistamine to children < 2 years of age

REFERRAL

» No improvement in 2 weeks.
» Infants and children requiring more than 1% hydrocortisone cream.
» Extensive involvement.
» Eczema herpeticum.

5.8.2 ECZEMA, ACUTE, MOIST OR WEEPING

L20.0/L20.8-9

DESCRIPTION

A form of eczema with small or large vesicles, associated with oozing and eventual crusting and scaling. Yellow pustules which crust indicate sepsis.

GENERAL MEASURES

» Sodium chloride 0.9% dressings, applied daily or twice daily.
» Avoid use of soap on affected areas.

MEDICINE TREATMENT

- Topical steroids, e.g.:
- Hydrocortisone 1%, topical, applied 12 hourly, until improved.
  - Topical steroids should be applied to both moist and dry inflamed areas.

Antibiotic treatment if secondary infection is present:

Children ≤ 7 years of age

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.3.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.4.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children:

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. See dosing table, pg 23.4.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

For itching:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose.at night See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, at night. *LoE:III*

Note: Chlorphenamine is sedating.

CAUTION
Do not give an antihistamine to children < 2 years of age

If itch not controlled or more severe daytime itch, switch to:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily. *LoE:III*

For itching in children < 2 years of age:

- Calamine lotion, applied on the skin.

REFERRAL

» No improvement after a week.
» Severe acute moist or weeping eczema.

5.8.3 DERMATITIS, SEBORRHOEIC

L21.0-1/L21.8-9

DESCRIPTION

Dandruff is an uninflamed form of seborrhoeic dermatitis.
Pruritus may or may not be present in seborrhoeic dermatitis.
The scalp, face, ears and skin folds e.g. axillae, groins, under the breasts are commonly affected.
May become very extensive, particularly in infants and HIV infected patients.

GENERAL MEASURES

» Trim nails.
» Avoid scratching.
» Avoid perfumed soap.

MEDICINE TREATMENT

- Hydrocortisone 1%, topical, apply twice daily until improved.
  - Then apply once or twice weekly for maintenance as needed.

For severe dermatitis:

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed).
- Betamethasone 0.1%, topical, apply ointment once daily for 5–7 days.

Do not apply to face neck and flexures.

LoE:I[88]

For itching scalp, scaling and dandruff:

- Selenium sulphide, 2.5% suspension, apply weekly.
  - Lather on the scalp.
  - Rinse off after 10 minutes.
  - Apply weekly, until improved and every second week to maintain control.

5.9 NAPPY RASH

L22

DESCRIPTION

A diffuse reddish eruption in the nappy area, usually caused by irritation from:

» persistent moisture and irregular cleaning and drying of the nappy area,
» diarrhoeal stools,
» underlying skin conditions in some cases, or
» improper rinsing of nappies to remove urine and stool breakdown products.

Rash is predominantly on areas in contact with the nappy, and spares the flexures.

GENERAL MEASURES

» Prompt changing of soiled nappies.
» Avoid waterproof pants. Expose nappy area to air if possible especially with severe nappy dermatitis.
» Educate caregiver on:
  - washing, rinsing and drying of the nappy when soiled.

MEDICINE TREATMENT

- Zinc and castor oil, topical, apply ointment after each nappy change.

If rash involves the flexures, suspect candida:

- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply cream beneath zinc and castor oil ointment after each nappy change until symptoms are resolved.

REFERRAL

No improvement after 3 days of treatment.

5.10 ALLERGIES

5.10.1 URTICARIA

L50.0-6/L50.8-9

DESCRIPTION

Urticaria is a skin disorder characterised by itchy wheals (hives). There are many causes, including allergic, toxic or physical. Allergic urticaria may be caused by drugs, plant pollen, insect bites or foodstuffs, e.g. fish, eggs, fruit, milk and meat.
Note: Commonly caused by medicines e.g. aspirin, NSAIDs and codeine.

GENERAL MEASURES

» Take detailed history to determine trigger factors.
» Lifestyle adjustment.

MEDICINE TREATMENT

Children
Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults
Chlorphenamine, oral, 4 mg, 6–8 hourly.

CAUTION
Do not give an antihistamine to children < 2 years of age.

- Calamine lotion, applied on the skin.
  - The use of oral corticosteroids should be avoided. *LoE:III*

REFERRAL
No improvement or response after 24 hours.

5.10.2 ANGIOEDEMA
T78.3 + (Y14.99/Y34.99/Y57.9)

DESCRIPTION
Localised oedema of the subcutaneous tissue affecting particular parts of the face i.e. lips, eyes and tongue. May also affect the larynx, causing life threatening airway obstruction and anaphylaxis.
ACE-inhibitors are the most common cause in adults.
Other causes include other medicines and allergies.

GENERAL MEASURES
» Stop all suspected agents e.g. ACE-inhibitor.
» In the case of airway obstruction, a definitive airway must be established if oedema is extensive or progressing.

MEDICINE TREATMENT

In severe cases where airway obstruction is present:

Adults
- Adrenaline (epinephrine), 1: 1000 solution, 0.5 mL into the lateral thigh, administered immediately and repeated every 5 to 15 minutes as needed.

Children
- Adrenaline (epinephrine), IM, 0.01 mL/kg of 1:1000 solution, administered immediately.
  - Maximum dose of 0.3 mL

AND
- Hydrocortisone, IV, 100 mg as a single dose.

If urticaria and/or itch present (no imminent airway compromise):
- Cetirizine, oral, 10 mg as a single dose. *LoE:III*

OR
- Promethazine, IM, 25–50 mg immediately.

CAUTION
Do not give an antihistamine to children < 2 years of age

Observe all cases until resolution.

REFERRAL
» Failure to respond.
» No obvious cause found.
» Severe ACE-inhibitor induced angioedema.

5.10.3 FIXED DRUG ERUPTIONS

L27.0-1

DESCRIPTION

Dark coloured round macules that can occur anywhere on the body following the ingestion of a medicine to which the patient has become allergic.
They recur on the same spot and increase in number with each successive attack.
In the acute stage they are itchy, red around the edge or even bullous.

GENERAL MEASURES (all patients)

Stop the offending medicine.

MEDICINE TREATMENT (all patients)

Acute/active stage

- Hydrocortisone 1%, topical, apply daily for 5 days. *LoE:III*

REFERRAL

Widespread eruptions.

5.10.4 PAPULAR URTICARIA

L50.8

DESCRIPTION

Hypersensitivity response to insect bites.
Initial lesion is a red papule, which may blister, become excoriated, and then heal with hyperpigmentation. Usually occur in crops over several months.
Common and often severe in HIV infections (Papular pruritic eruption, PPE).

GENERAL MEASURES

Reduce exposure to insects by treating pets, using mosquito nets and fumigating houses regularly. Use of insect repellents may be helpful.

MEDICINE TREATMENT

New, inflamed lesions:

- Hydrocortisone 1%, topical, apply daily for 5 days.

For relief of itch:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and in mild cases may be used only at night.

For long term use in adults and school going children:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL
Non-responsive and chronic cases.

5.10.5 ERYTHEMA MULTIFORME
L51.9

DESCRIPTION
A self-limiting and commonly recurrent inflammatory eruption of the skin. Sometimes involves mucous membrane (but not more than one surface) and without systemic symptoms. Usually lasts for 10–14 days before complete recovery occurs.
Symmetrically distributed crops of target lesions (dark centre, an inner, pale ring surrounded by an outer red ring) occur on the extremities and in particular on the backs of the hands and forearms, palms and soles. This condition is usually due to an infection, commonly herpes simplex or mycoplasma.

REFERRAL
» All patients with systemic symptoms or mucosal involvement.
» Unsure of the diagnosis.

5.10.6 SEVERE CUTANEOUS ADVERSE DRUG REACTIONS

5.10.6.1 STEVENS-JOHNSON SYNDROME (SJS)/TOXIC EPIDERMAL NECROLYSIS (TEN)
L51.1/ L51.2

DESCRIPTION
An acute, systemic condition with vesico-bullous lesions involving the skin and mucous membranes (≥ 2 mucosal surfaces), but occasionally only the mucous membranes.
The eruption may start as widespread red irregular macules and patches. There may be a vesicle or bulla in the central area of the lesion. The blisters rupture leaving denuded areas of skin. Mucous membrane erosions often with slough covering the surface are frequently seen.
Toxic epidermal necrolysis (TEN) is a more severe form of the condition and is suggested if the skin lesions cover > 30% of the body surface area. The mucous membranes such as the mouth, eyes and vagina are also more severely affected.
The condition is usually caused by medicines e.g. sulphonamides, anti-retrovirals (nevirapine), anti-epileptics (phenytoin, phenobarbitone, carbamazepine, lamotrigine).
Systemic involvement with multi-organ dysfunction is common.

GENERAL MEASURES
Immediate withdrawal of offending medicine.
Patients usually require care in a high or intensive care unit with dedicated nursing.

REFERRAL
All patients.

5.10.6.2 DRUG REACTION WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS)
L27.0 + (D72.0)

DESCRIPTION
Severe hypersensitivity reaction to a medicine.
Typically occurs within 3 months of starting the offending medicine.
Clinical symptoms include:
» maculopapular rash
» fever > 38o C
» lymphadenopathy
» hepatitis or other organ involvement
» blood count abnormalities especially eosinophilia
Medicines that commonly induce the DRESS syndrome include phenobarbital, carbamazepine, phenytoin, lamotrigine, allopurinol, sulphonamides, abacavir, nevirapine.

REFERRAL
All patients.

5.11 PITYRIASIS ROSEA
L42

DESCRIPTION
A common disease of unknown cause, probably due to a viral infection as it occurs in minor epidemics. Most common in young adults but any age may be affected. The rash involves the trunk, neck and mainly proximal parts of the limbs.
Presents as pink papules and macules. The macules are oval, and have a thin collar of scale towards, but not at the periphery of the lesions. The eruption is usually preceded by a few days by one larger, oval, slightly scaly area (“herald patch”), commonly found in the scapular area or abdomen. The macules on the thorax characteristically lie parallel to the long axis of the ribs (“Christmas tree” distribution).
The itch is usually mild and there are few or no constitutional symptoms. It is self-limiting within about 6–8 weeks.

GENERAL MEASURES
Explain about the benign but prolonged nature of the condition.

MEDICINE TREATMENT
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose at night. See dosing table, pg 23.3.

Adults
- Chlorphenamine, oral, 4 mg at night.

Note: Chlorphenamine is sedating.

If itch not controlled or more severe daytime itch, switch to:

Children: 2–6 years of age
- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults
- Cetirizine, oral, 10 mg once daily.

LoE:III

CAUTION
Do not give an antihistamine to children < 2 years of age.

- Aqueous cream, applied 3 times daily.

5.12 MOLLUSCUM CONTAGIOSUM

B08.1

DESCRIPTION

Infectious disease caused by a poxvirus. Presents with dome-shaped papules with a central depression (umbilication). Varies from occasional lesions to large crops of lesions particularly in immunocompromised or HIV-infected patients.
Papules are commonly seen on the face in children, but may be found at any skin site, except on the palms and soles. They may also occur on the genitalia as an STI.
Most infections resolve spontaneously except in the immunocompromised.

GENERAL MEASURES

In non-genital molluscum contagiosum:
» Allow lesions to heal spontaneously if the lesions are few in number and the patient not immunocompromised.
» In adults, contents can be expressed manually remembering it is contagious.

In genital molluscum contagiosum:
» Counsel on risk reduction for transmission of STIs.
» Notify that the partner(s) must be examined and treated.

MEDICINE TREATMENT

- Tincture of iodine BP, applied to core of individual lesions using an applicator.

CAUTION
Beware of hypersensitivity to iodine.

REFERRAL

» Extensive disease.
» Those failing to respond to simple measures.
» Peri-ocular lesions to an ophthalmologist.

5.13 HERPES SIMPLEX

B00.0-4/B00.7-9

DESCRIPTION

Infection caused by herpes simplex virus type 1 or 2.
Primary herpes infection involving gingivostomatitis (usually type 1) or the genital area (usually type 2) may be extensive, but may occur at other sites, e.g. the face.
It is characterised by grouped crusted vesicles surrounded by erythema. The vesicles rupture soon producing discrete ulcers.
Recurrences are usually mild and last a few days, except in immunosuppressed patients. Recurrences of oral herpes may be triggered by other respiratory tract infections or exposure to ultraviolet light.
Sufferers of atopic eczema are particularly susceptible to the virus and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).
Herpes simplex mucocutaneous ulceration that persists for > 1 month is an AIDS–defining illness. See Section 11.3.10: Herpes simplex ulcers, chronic. Herpes simplex infection may be the precipitating event in many cases of erythema multiforme.

GENERAL MEASURES

Keep the skin lesions clean and dry.

MEDICINE TREATMENT

Extensive herpes, eczema herpeticum or chronic mucocutaneous ulcerations:

Children < 15 years of age

- Aciclovir, oral, 250 mg/m2/dose, 8 hourly for 7 days. See dosing table, pg 23.1

Children ≥ 15 years of age and adults

- Antiviral, (active against herpes simplex) e.g.: *LoE: II*[89]
- Aciclovir, oral, 400 mg, 8 hourly for 7 days.

5.14 HERPES ZOSTER

See Section 11.3.11: Herpes zoster (Shingles).

5.15 WARTS

DESCRIPTION

A common, infectious, self-limiting condition of the skin or mucous membrane caused by papilloma virus.

5.15.1 COMMON WARTS

B07

DESCRIPTION

Seen most often on the hands and fingers, but can be found anywhere on the body.

Raised nodules with a rough 'warty' surface.

GENERAL MEASURES
In most cases they should be left alone, as they will spontaneously resolve.

MEDICINE TREATMENT
- Salicylic acid, 15 to 30%, topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash well, dry, reapply the wart paint and occlude.
  - Repeat process daily until the wart disappears.

LoE:III[90]

REFERRAL
Extensive warts.

5.15.2 PLANE WARTS
B07

DESCRIPTION
Very small warts that are just slightly raised.
Present as smooth, flat, skin-coloured or slightly pigmented surface.
They occur particularly on the face, backs of the hands and knees.
Commonly seen in the immunocompromised.

MEDICINE TREATMENT
These warts are notoriously difficult to treat with a poor response.
- Salicylic acid, 2%, topical.

LoE:III[91]

REFERRAL
» Failure to respond.
» Extensive cases involving the face.

5.15.3 PLANTAR WARTS
B07

DESCRIPTION
Appear commonly on the pressure-bearing areas of the soles and can be painful and interfere with walking. Because pressure forces them deep into the dermis they are flat, almost circular lesions, with a rough surface and are often thick and hard due to increased keratin formation. They are contagious and walking barefoot in communal areas should be discouraged.

MEDICINE TREATMENT
- Salicylic acid, 15 to 30%, topical liquid application.
  - Protect surrounding skin with petroleum jelly.

- Apply daily to wart and allow to dry.
- Occlude for 24 hours.
- Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
- Wash well, dry, reapply the wart paint and occlude.
- Repeat process daily until the wart disappears.

LoE:III[92]

REFERRAL

» No response to treatment.
» Diabetic patients.

5.15.4 GENITAL WARTS: CONDYLOMATA ACCUMINATA

See Section 12.12: Genital warts (GW): condylomata accuminata.

5.16 PSORIASIS

L40.0-5/L40.8-9

DESCRIPTION

Inflammatory condition of the skin and joints of unknown aetiology.
Scaly itchy plaques occur especially on the extensor surfaces of the knees, elbows, sacrum and scalp.
Psoriasis may spread to involve any other sites, although the face is usually spared.
The nails and skin folds are often involved.
Often aggravated by stress and may be provoked by HIV disease.

GENERAL MEASURES

» Counselling regarding precipitating factors and chronicity.
» HIV test, if acute onset and risk factors present.
» Encourage sun exposure as tolerated.

MEDICINE TREATMENT

For flares (if delay experienced in obtaining a dermatological consultation):

- Coal tar (Liquor picis carbonis (LPC) BP 5%, topical.

OR

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed).
- Betamethasone 0.1%, topical, apply 12 hourly.
  - Decrease according to severity, reduce to hydrocortisone 1%, topical, and then stop.

REFERRAL

All patients, if diagnosis is not already confirmed.
Complications such as pustular psoriasis, acute flares, chronic local plaques.

5.17 HIDRADENITIS SUPPURATIVA

L73.2

DESCRIPTION

A chronic disorder of the apocrine glands involving the formation of abscesses and cysts, often accompanied by scarring and sinus tract formation.
Commonly found in axillae, groin, between the thighs, perianal and perineal areas.
Flare-ups may be triggered by perspiration, hormonal changes (such as menstrual cycles), humidity and heat, and friction from clothing.

GENERAL MEASURES

Avoid tight clothing and clothing made of heavy non-breathable material.

REFERRAL

Refer all patients with abscesses, infected cysts or sinuses and suspicion of the diagnoses.

5.18 HYPOPIGMENTORY DISORDERS

5.18.1 ALBINISM

E70.3

DESCRIPTION

Congenital disorder characterised by the complete or partial absence of pigment in the skin, hair and eyes.
Albinism is associated with a number of vision defects such as photophobia, nystagmus, squint and amblyopia.
Lack of skin pigmentation increases a person's susceptibility to sunburn and skin cancers.

GENERAL MEASURES

To avoid sunburn and skin damage:

» Avoid going out when the sun is at its strongest (between 10 am and 3 pm).
» When out in the sun to wear a wide-brimmed hat and long-sleeved top.
» To wear sunscreens with a high sun protection factor (SPF); a SPF of between 20 and 30 will provide adequate protection. The product should also provide protection against both UVA and UVB rays.
» To reduce photophobia and prevent retinal damage:
  - Wear sunglasses that preferably have UV filters
  - Check skin regularly for signs of skin cancer such as a new spot or growth on their skin.

MEDICINE TREATMENT

- Zinc oxide, topical ointment.
  - Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun.

LoE:III[93]

OR

- Titanium dioxide, topical ointment/cream (UV block).

- Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun. *LoE:III*[94]

REFERRAL
» To dermatologist for regular skin checks.
» To ophthalmologist for visual rehabilitation and regular eye checks.

5.18.2 VITILIGO
L80
Autoimmune disease characterised by patches of the skin losing their pigment. Often the patches begin in areas of skin that are exposed to the sun.
New patches appear over time and can occur over large portions of the body or located to a particular area.
Presents as pale patchy areas of depigmented skin which tend to occur on the extremities. They are most prominent on the face, hands and wrists. The loss of pigmentation is particularly noticeable around body orifices such as the mouth, eyes, nostrils genitalia and umbilicus.

GENERAL MEASURES
Avoid sun exposure when the sun is at its strongest particularly between 10:00 and 15:00. As moderate sun exposure is beneficial, sunscreen is not needed at other times.

MEDICINE TREATMENT
- Titanium dioxide, topical ointment/cream (UV block),
  - Only use when sun is at it is strongest i.e. between 10:00 and 15:00.
  - Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun during this time. *LoE:I*[95]

REFERRAL
All patients.

5.19 PRESSURE ULCERS/SORES
L89.0-3/L89.9

DESCRIPTION
Localised damage to the skin and underlying tissue that usually occurs over bony prominences as a result of pressure, or pressure in combination with sheer and/or friction. The most common sites are the skin overlying the sacrum, coccyx, heels or the hips but other sites can be affected.
Pressure ulcers most commonly develop in individuals who are immobile, such as being bedridden or confined to a wheelchair.
Other factors increasing the risk of pressure ulcer development are:
» Skin wetness e.g. incontinence.
» Reduced blood flow e.g. arteriosclerosis.
» Reduced skin sensation e.g. paralysis or neuropathy.

GENERAL MEASURES

Skin care
The skin should be kept clean and dry. Ensure that the skin folds are dried thoroughly.

Wound odour
Regular cleansing, debridement and management of infection.
Activated charcoal dressings may be used.

Pressure redistribution
» Repositioning and turning at regular intervals, every 2-4 hours. For individual receiving palliative care they should be repositioned in accordance with the Individual's wishes, comfort and tolerance.
» If erythema is present avoid positioning the individual on the area.

MEDICINE TREATMENT

Cleanse the skin prior to application of a barrier product.

- Zinc and castor oil, topical ointment. *LoE:II*[96]

For pain:
See chapter 20: Pain.

PHC Chapter 6: Obstetrics & gynaecology

Obstetrics

Gynaecology

6.15 Vaginal discharge/lower abdominal pain in women

OBSTETRICS

6.1 BLEEDING IN PREGNANCY

6.1.1 PREGNANCY, ECTOPIC

See Section 6.10: Pregnancy, ectopic.

6.2 MISCARRIAGE

O02.1/O03.4/O03.9

DESCRIPTION

Bleeding from the genital tract < 22 weeks' gestation, which may or may not be associated with lower abdominal pain (LAP).

» Miscarriage is classified as follows:

Cervix closed on digital examination	Cervix dilated on digital examination
» Threatened miscarriage: – mild vaginal bleeding, usually no – associated LAP – cervix closed on digital examination – fetus is still in the uterus	» Inevitable miscarriage: – moderate vaginal bleeding with associated LAP – cervix dilated on digital examination – fetus is still in the uterus
» Complete miscarriage: – complete passage of all products of conception – bleeding and pain have settled – usually still requires referral for confirmation	» Incomplete miscarriage: – vaginal bleeding often with clots – partial expulsion of products of conception – cervix remains open to a varying degree

» Miscarriage is considered to be safe or unsafe (septic) miscarriage:

Safe miscarriage	Unsafe (septic) miscarriage
– Normal vital signs: pulse, BP, temperature, respiratory rate, Hb – No clinical signs of infection, e.g. chills, malaise – Uterus < 12 weeks in size – No offensive products of conception – No purulent vaginal discharge	– History of interference – Abnormal vital signs: tachycardia, hypotension, pyrexia, tachypnoea, Hb < 10 g/dL – Clinical signs of infections, e.g. chills, malaise – Uterus palpable abdominally (≥ 12 weeks in size) – Offensive vaginal discharge/ products of conception

For perinatal mortality audit and statistics (DHIS or PPIP), all fetuses ≥ 500 g are included.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.
» Counselling and support.

» There is no specific treatment for threatened miscarriages: reassure the patient that bleeding usually stops spontaneously. Advise to return if bleeding worsens or persists or abdominal pain develops.

MEDICINE TREATMENT

For inevitable/incomplete miscarriages:

- Oxytocin, IV, 20 units, diluted in 1000 mL sodium chloride 0.9% and infused at 125 mL/hour (avoid where threatened miscarriage is suspected).

For all miscarriages in Rh-negative, non-sensitised women: (O36.0)

- Anti-D immunoglobulin, IM, 50 mcg preferably within 72 hours but may be given up to 7 days following management of miscarriage. *LoE:II*[97]

If unsafe (septic) miscarriage is suspected, also give before referral:
O03.0/O08.0 + (A41.9/R57.2)

- Ceftriaxone, IV, 1 g as a single dose

CAUTION: USE OF CEFTRIAXONE
Do not administer calcium-containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

AND

- Metronidazole, oral, 400 mg as a single dose.

REFERRAL

Urgent

» All patients with unsafe miscarriage
» Suspected ectopic pregnancy.
» Previous miscarriage or previously diagnosed incompetent cervix.

Note: For patients with safe miscarriage the need for referral is determined by skills and facilities at the primary health care level. A local referral policy should be in place. Ideally, midwife obstetric units and community health centres should be able to manage safe miscarriage using manual vacuum aspiration or medical management.

6.2.1 MANAGEMENT OF INCOMPLETE MISCARRIAGE IN THE 1ST TRIMESTER, AT PRIMARY HEALTH CARE LEVEL

O02.1

Both Manual Vacuum Aspiration (MVA) and medical evacuation are equally effective for miscarriage.

GENERAL MEASURES

» Counselling.
» Evacuation of the uterus.

MEDICINE TREATMENT

Medical evacuation:
O04.9

- Misoprostol, PV, 800 mcg every 3 hours for 2 doses.
  - Repeat after 24 hours if necessary.

OR

- Misoprostol, SL, 600 mcg every 3 hours for 2 doses
  - Repeat after 24 hours if necessary.

LoE:III[98]

Manual vacuum aspiration:

Routine analgesia for vacuum aspiration:

- Morphine, IM, 0.1 mg/kg 30 minutes before aspiration procedure, to a maximum of 10 mg (Doctor prescribed).

LoE:III[99]

Alternatively, consider paracervical block if trained in technique.

Oral analgesia as required for 48 hours:

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

LoE:III[100]

AND

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.

LoE:III[101]

Follow up after one week to ensure that bleeding has stopped.

REFERRAL

» Unsafe miscarriage.
» Miscarriage ≥ 13 weeks' gestation.
» Anaemia.
» Haemodynamic instability.
» Failed medical evacuation.

6.2.2 ANTEPARTUM HAEMORRHAGE

O46.0/O46.8-9

DESCRIPTION

Vaginal bleeding in pregnancy from 22 weeks' gestation.
Important causes include the following:

» abruptio placentae
» placenta praevia
» uterine rupture (particularly when misoprostol was used to attempt an unlawful TOP).

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.
Avoid vaginal examination, unless placenta praevia excluded with ultrasound.

MEDICINE TREATMENT

- Sodium chloride 0.9%, IV.

LoE:III

REFERRAL

Urgent

All patients.

6.3 TERMINATION OF PREGNANCY (TOP)

DESCRIPTION

Under the Choice of Termination of Pregnancy Act, 1996, as amended, a TOP may be carried out in the following circumstances:

Women eligibility

If gestation ≤ 12 weeks and 0 days:
» On request.

If gestation 12 weeks and 1 day to 20 weeks and 0 days:
If doctor is satisfied that:
» Pregnancy was from rape or incest, or
» There is a substantial risk that the fetus would suffer from a severe mental or physical abnormality, or
» The continued pregnancy would pose a risk to mother's physical or mental health, or
» Continued pregnancy will significantly affect the social or economic circumstances of the woman.

If gestation ≥ 20 weeks and 1 day:
» If the doctor after consulting with a second doctor or registered midwife or registered nurse is satisfied that continuing the pregnancy would endanger the mothers' life, pose a risk of injury to the fetus, or result in a severe fetal malformation.

Venue
An accredited facility with staff trained in performing TOP, designated by the Member of Executive Council at provincial level.

Practitioner

If gestation ≤ 12 weeks and 0 days:
» Doctor, midwife or registered nurse with appropriate training.

If gestation ≥ 12 weeks and 1 day:
» Doctor is responsible for decision and prescription of medication. Registered nurse/midwife may administer medication according to prescription.

GENERAL MEASURES

» Pre- and post-termination counselling is essential.
» Consent for TOP and related procedures (e.g. laparotomy) may be given by minors. Minors are encouraged to consult parents or others, but parental consent is not mandatory.
» Consent of spouse/partner is not necessary.
» Offer contraception post TOP.

REFERRAL

» If service not available (facility not accredited), refer to designated district or regional facility as soon as possible (within 2 weeks).
» If gestation ≥ 12 weeks and 1 day.

6.3.1 MANAGEMENT OF TERMINATION OF PREGNANCY AT PRIMARY HEALTH CARE LEVEL: GESTATION ≤ 12 WEEKS AND 0 DAYS

O04.9

GENERAL MEASURES

» Confirm pregnancy with urine pregnancy test.
» Determine gestational age with ultrasound. If ultrasound is unavailable, use dates (LMP) and bimanual (pelvic) examination.
» If unsure of dates, or examination disagrees with dates, or uterus palpable abdominally, or the woman is obese or difficult to examine, arrange pre-procedure ultrasound.
» Ultrasound is mandatory if suspected ectopic pregnancy – refer if uncertain.
» Counselling.
» Outpatient procedure by nursing staff with specific training.
» Screen for STIs (if treatment needed, do not delay TOP).
» Arrange Pap smear if needed.
» Check HIV status, Hb and blood group (Rh).
» Counsel and start contraception post TOP, before leaving facility. Arrange contraception follow-up.

MEDICINE TREATMENT

Medical TOP - if gestation ≤ 9 weeks and 0 days:

- Mifepristone, oral, 200 mg, immediately as a single dose. *LoE:III*[102]

Followed 24–48 hours later by:

- Misoprostol, SL, 800 mcg by self-administration
  - If expulsion does not occur within 4 hours of misoprostol administration, a second dose of misoprostol 400 mcg, oral/PV may be given. *LoE:III*[103]

Note: Bleeding may persist for up to 1 week. If there is no bleeding after the second dose of misoprostol, the woman must return to the facility as soon as possible as there is a possibility of an incomplete procedure or ectopic pregnancy. *LoE:III*[104]

<u>For pain:</u>
After administration of mifepristone, start:

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours. *LoE:III*[105]

ADD
After expulsion is complete:

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal. *LoE:III*[106]

OR

TOP using manual vacuum aspiration (MVA) - if gestation ≤ 12 weeks and 0 days:

- Misoprostol, PV, 400 mcg 3 hours before vacuum aspiration of the uterus. *LoE:III*[107]

Routine analgesia for vacuum aspiration:

- Morphine, IM, 0.1 mg/kg 30 minutes before aspiration procedure, to a maximum of 10 mg (Doctor prescribed). *LoE:III*[108]

Alternatively, consider paracervical block if trained in technique.

Oral analgesia as required for 48 hours:

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours. *LoE:III*[109]

AND

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal. *LoE:III*[110]

For both medical and surgical TOPs (MVA):

In Rh-negative, non-sensitised women: (O36.0)

- Anti-D immunoglobulin, IM, 50mcg preferably within 72 hours but may be given up to 7 days following TOP. *LoE:III*[111]

Contraception:

Counsel all women on effective contraception, especially long-acting reversible methods. All methods can be given at the time of the procedure, with the exception of the IUCD at a medical TOP. *LoE:III*[112]

Review all patients after 7 days: if bleeding persists, arrange urgent ultrasound.

REFERRAL

» If gestation ≥12 weeks and 1 day.
» If gestation uncertain.
» If any signs or symptoms of ectopic pregnancy or other early pregnancy complications.
» Co-morbid conditions (heart disease, asthma, diabetes, anaemia, clotting disorder, seizure disorder, substance abuse, hypertension).
» Large fibroids (may interfere with determining gestation age and/or MVA).
» Any signs of sepsis (tachycardia, hypotension, pyrexia, tachypnoea, offensive vaginal discharge).
» If gestation ≥ 9 weeks and 1 day and MVA not available or declined, refer.

6.4 ANTENATAL CARE

6.4.1 ANTENATAL SUPPLEMENTS

Z36.9 + (Z29.9)

DESCRIPTION

Supplements before and during pregnancy and lactation can help to prevent, or lessen the effect of, a number of conditions or complications associated with pregnancy. Specifically:

» Folic acid, given for at least one month before conception and during pregnancy (particularly the first 12 weeks) can help to prevent neural tube defects (abnormal development of spinal cord/brain).
» Ironcan help to prevent anaemia.
» Calcium can help to prevent pre-eclampsia.

GENERAL MEASURES

» Eat a balanced diet to prevent nutritional deficiency.
» Avoid unpasteurised milk, soft cheeses, raw or undercooked meat, poultry, raw eggs and shellfish.
» Cut down on caffeine. Reduce intake of tea. Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT

Prevention of Neural Tube Defects (NTD)

- Folic acid, oral, 5 mg daily:
  - All women intending to become pregnant or pregnant women (first trimester of pregnancy).
  - If high risk, throughout pregnancy, i.e.:
  - on anticonvulsants - especially valproic acid and carbamazepine
  - previous child with NTD; or
  - family history of NTD.

LoE:I[113]

CAUTION

Children born to women taking valproic acid are at significant risk of birth defects (10%) and persistent developmental disorders (40%).

Valproic acid is contra-indicated and should be avoided in pregnancy and women of child-bearing potential.

LoE:III[114]

Prevention of anaemia:

During pregnancy, after delivery and during lactation:

- Ferrous sulphate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.

LoE:III[115]

OR

- Ferrous fumarate, oral, 200 mg once daily (± 65 mg elemental iron).
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability. (Note: Do not take iron tablets with milk).

If daily iron is poorly tolerated (e.g. epigastric pain, nausea, vomiting and constipation), intermittent iron supplementation may be administered:

- Ferrous sulphate compound BPC (dried), oral, 340 mg per week, (± 110 mg elemental iron), with meals.

OR

- Ferrous fumarate, oral, 400 mg per week (± 130 mg elemental iron).
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability (Note: Do not take iron tablets with milk). *LoE:I*[116]

Note: Established anaemia i.e. Hb < 10 g/dL, see Section 3.1: Anaemia.

Prevention of pre-eclampsia:

From confirmation of pregnancy:

- Calcium, elemental, oral, 1 g daily (given as calcium carbonate), 12 hourly.
  - Although the benefit is greatest in high-risk women, consider use of this agent in all pregnant women. See Section 6.4.2.4: Pre-eclampsia.
  - Calcium reduces iron absorption from the gastro-intestinal tract. Take supplements 4 hours apart from each other. *LoE:I*[117]

6.4.2 HYPERTENSIVE DISORDERS IN PREGNANCY

DESCRIPTION

Hypertension in pregnancy, pre-eclampsia and eclampsia may have very serious and fatal consequences for both the mother and the baby.

Hypertension is defined by:

» A systolic BP ≥ 140 and/or a diastolic BP ≥ 90 mmHg measured on 2 occasions, 4 hours apart.

OR

» A systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg measured on a single occasion.

(Always measure BP in the left lateral, and not supine position).

Hypertensive disorders of pregnancy can be classified as:

» **Chronic hypertension:**
  - Hypertension diagnosed before pregnancy or < 20 weeks of pregnancy.

» **Gestational hypertension:**
  - Hypertension without proteinuria, diagnosed ≥ 20 weeks of pregnancy.

» **Pre-eclampsia:**
  - Hypertension with proteinuria, diagnosed ≥ 20 weeks of pregnancy (high risk patients include: nulliparity, obesity, multiple pregnancy, chronic hypertension, kidney disease, diabetes, pre-eclampsia in a previous pregnancy, advanced maternal age or adolescent pregnancy).

» **Eclampsia:**
  - Generalised tonic-clonic seizures in women with pre-eclampsia.

» **Chronic kidney disease:**
  - Proteinuria with/without hypertension, diagnosed at < 20 weeks of pregnancy.

LEVELS OF SEVERITY OF HYPERTENSION

Level of hypertension	BP Level mmHg		
	Systolic		Diastolic
mild	140–149	or	90–99
moderate	150–159	or	100–109
severe	≥160	or	≥ 110

REFERRAL
» Chronic hypertension.
» Severe gestational hypertension.
» Pre-eclampsia (all levels of severity).
» Chronic kidney disease.

6.4.2.1 CHRONIC HYPERTENSION
O10.0

Stop ACE-inhibitors when pregnancy is planned or as soon as pregnancy is diagnosed, change to methyldopa and refer for assessment and management.

MEDICINE TREATMENT
- Methyldopa, oral, 250 mg 8 hourly.
  - Maximum dose: 750 mg 8 hourly.

REFERRAL
Urgent
All cases.

LoE:III

6.4.2.2 GESTATIONAL HYPERTENSION: MILD TO MODERATE
O13

DESCRIPTION
Hypertension occurring for the first time at ≥ 20 weeks' gestation with no proteinuria.

GENERAL MEASURES
» May be managed without admission before 38 weeks' gestation, provided no proteinuria.
» Review the following on a weekly basis:
  - BP
  - weight
  - urine analysis
  - height of fundus
  - fetal heart rate and movements

» Educate on signs requiring urgent follow-up (headache, epigastric pain, visual disturbances, vaginal bleeding etc.).

MEDICINE TREATMENT
- Methyldopa, oral, 250 mg 8 hourly.
  - Titrate to a maximum dose: 750 mg 8 hourly.
  - When using iron together with methyldopa, ensure that iron and methyldopa are not taken concurrently.

LoE:III[118]

REFERRAL
» All patients with gestational hypertension at 38 weeks for delivery.
» Pre-eclampsia (all levels of severity).
» Poor control of hypertension.
» Severe hypertension.

6.4.2.3 GESTATIONAL HYPERTENSION: SEVERE

O13

DESCRIPTION

A systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg, with no proteinuria.
(Always measure BP in the left lateral and not supine position).

MEDICINE TREATMENT

Aim to reduce BP to 140/100 mmHg.

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after 30 minutes if diastolic BP remains ≥ 110 mmHg.

REFERRAL

Urgent
All cases.

6.4.2.4 PRE-ECLAMPSIA

O11/O14.0-2/O14.9

DESCRIPTION

» A systolic BP ≥ 140 and/or diastolic BP ≥ 90 mmHg with proteinuria, after 20 weeks of pregnancy (significant proteinuria defined as ≥ 1+ proteinuria).
» Severe pre-eclampsia is acute severe hypertension (systolic BP ≥ 160 and/or diastolic BP ≥ 110) with ≥ 1+ proteinuria, or any level of hypertension with 3+ proteinuria.
» Imminent eclampsia is pre-eclampsia with severe persistent headache, visual disturbances, epigastric pain (not discomfort), hyper-reflexia or clonus.
» The following indicate a higher risk of developing pre-eclampsia: nulliparity, obesity, multiple pregnancy, chronic hypertension, kidney disease, diabetes, pre-eclampsia in a previous pregnancy, advanced maternal age or adolescent pregnancy.

GENERAL MEASURES

» Advise all pregnant patients to urgently visit the clinic if severe persistent headache, visual disturbances, epigastric pain (not discomfort).
» If severe pre-eclampsia or imminent eclampsia:
  - Insert a Foley's catheter and monitor urine output hourly.
  - Monitor BP and check reflexes every 30 minutes.

MEDICINE TREATMENT

Prevention of pre-eclampsia
From confirmation of pregnancy:

- Calcium carbonate, oral 12 hourly (equivalent to 1 g elemental calcium daily).
  - Although the benefit is greatest in high-risk women, consider use of this agent in all pregnant women.
  - Calcium reduces iron absorption from the gastro-intestinal tract. Take supplements 4 hours apart from each other.

LoE:I[119]

Treatment

If severe pre-eclampsia or imminent eclampsia:

- Magnesium sulphate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

AND

- Magnesium sulphate, IM, 10 g given as 5 g in each buttock.
  - Then IM, 5 g every 4 hours in alternate buttocks.

CAUTION: USE OF MAGNESIUM SULPHATE

Stop magnesium sulphate if knee reflexes become absent or if urine output < 100 mL/4 hours or respiratory rate < 16 breaths/minute.

If respiratory depression occurs:

- Calcium gluconate 10%, IV, 10 mL given slowly at a rate not > 5 mL/minute.

AND

If systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg:

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after 30 minutes if diastolic BP remains ≥ 110 mmHg.

LoE:III[120]

REFERRAL

Urgent

Severe pre-eclampsia and imminent eclampsia

Non urgent

All women with pre-eclampsia (within 24 hours).

6.4.2.5 ECLAMPSIA

O15.0-2/O15.9

GENERAL MEASURES

» Stabilise prior to urgent referral.
» Ensure safe airway.
» Place patient in left lateral position.
» Insert a Foley's catheter and monitor urine output hourly.
» Monitor BP and check reflexes every 30 minutes.

MEDICINE TREATMENT

- Administer oxygen.
- Magnesium sulphate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

AND

- Magnesium sulphate, IM, 10 g given as 5 g in each buttock
  - Then IM, 5 g every 4 hours in alternate buttocks.

CAUTION: USE OF MAGNESIUM SULPHATE

Stop magnesium sulphate if knee reflexes become absent or if urine output < 100 mL/4 hours or respiratory rate <16 breaths/minute.

If respiratory depression occurs:
- Calcium gluconate 10%, IV, 10 mL given slowly at a rate not >5 mL/minute. *LoE:III*[121]

If recurrent eclamptic seizures despite magnesium sulphate loading dose administration:
- Magnesium sulphate, IV, 2 g over 10 minutes. *LoE:III*[122]

If seizures still persist and are continuous, there may be another cause of the seizures: treat as for status epilepticus (see Section 21.2.11: Seizures and status epilepticus).
AND
If systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg and patient becomes alert:
- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after 30 minutes if diastolic BP remains ≥ 110 mmHg.

LoE:III

REFERRAL
Urgent
All cases.

6.4.3 ANAEMIA IN PREGNANCY
O99.0 + (D64.9)

DESCRIPTION
Anaemia in pregnancy is a Hb < 11 g/dL, most commonly due to iron deficiency. Hb levels should be checked at the booking visit, repeated again between 28 and 32 weeks, and at ± 36 weeks.
Treatment is recommended when the Hb falls below 10g/dL.
Women with iron deficiency often have 'pica', e.g. eating substances such as soil, charcoal, ice, etc.

GENERAL MEASURES
» A balanced diet to prevent nutritional deficiency.
» Reduce intake of tea.
» Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT

Established anaemia with Hb < 10 g/dL:
- Ferrous sulphate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability (Note: Do not take iron tablets with milk).

OR
- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.
  - Continue for 3 months after the Hb normalises in order to replenish body iron stores. Hb is expected to rise by at least 1.5 g/dL in two weeks.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability. (Note: Do not take iron tablets with milk). *LoE:I*[123]

REFERRAL

Urgent (same day)

» Hb < 6 g/dL.
» Hb = 6-7.9 g/dL with symptoms (dizziness, tachycardia, shortness of breath at rest).

Non-urgent (within 1 week)

» Hb = 6-7.9 g/dL without symptoms (high-risk clinic if available).
» Hb = 8-9.9 g/dL and no improvement after one month of treatment (high-risk clinic, if available).
» Hb < 10 g/dL at 36 weeks' gestation or more: transfer to hospital for further antenatal care and delivery.

6.4.4 SYPHILIS IN PREGNANCY

O98.1

DESCRIPTION

A sexually transmitted infection with many manifestations that has a latent phase and may be asymptomatic in pregnant women. It is caused by the spirochaete, T pallidum. Vertical transmission to the fetus occurs in up to 80% of cases in untreated mothers. Untreated maternal syphilis may lead to miscarriage, stillbirth, non-immune hydrops fetalis, or congenital syphilis in the newborn.

DIAGNOSIS

» All pregnant women should have a syphilis test at the first booking visit.
» Women who booked in the first trimester and tested negative should have a repeat test done around 32 weeks' gestation.
» Diagnosis is made by positive serology. There are 2 types of diagnostic tests:

Specific treponemal test (e.g. TPAb//TPHA/FTA-ABS):	Non-treponemal test (e.g. RPR):
» Specifically picks up syphilis. » Available as a rapid on-site specific finger-prick syphilis test. » Once positive, specific treponemal test generally remains positive for life, and therefore the presence of specific treponemal antibodies cannot differentiate between current and past infections. » A person with previously successfully treated syphilis will retain lifelong positive specific treponemal test results.	The RPR can be used: » To determine if the patient's syphilis disease is active or not, » To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or » To determine a new re-infection. **Note:** – False RPR positive reactions may occur, notably in patients with connective tissue disorders (these are usually low titre < 1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test. – If specific treponemal test e.g. TPAb is performed first and gives a positive result, serum can be further tested for RPR to determine the presence of active syphilis (reverse testing algorithm). – Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤ 1:8), which does not change by more than one dilution difference over time (so-called serofast patients).

GENERAL MEASURES

» Encourage partner notification and treatment.
» Provide counselling and promote HIV testing.
» Educate on treatment adherence.
» Promote condom use.

MEDICINE TREATMENT

Pregnant woman

- Benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 weeks.
  - Reconstitute with 6 mL of lidocaine1% without adrenaline (epinephrine).
  - Follow up at 3 months after the last injection to confirm a fourfold (i.e. 2 dilution) reduction in RPR titres, provided the initial titre was ≥ 1:8. If initial titre < 1:8, further reductions may not occur (serofast reaction).

LoE:III[124]

Severe penicillin allergy:
Z88.0
Refer for in-patient penicillin desensitisation.

Newborn baby

If baby asymptomatic, well and mother not fully treated > 1 month before delivery, give:

- Benzathine benzylpenicillin (depot formulation), IM, 50 000 units/kg as a single dose into the lateral thigh.

CAUTION

Benzathine benzylpenicillin (depot formulation must never be given intravenously.

REFERRAL (BABY)

» Mother was not treated.
» Mother has received < 3 doses of benzathine benzylpenicillin.
» Mother delivered within 4 weeks of commencing treatment.
» Baby has any of the following:
  - Hepatosplenomegaly
  - Snuffles
  - Jaundice
  - Purpura
  - Pseudoparesis
  - Oedema
  - Anaemia
  - Desquamative rash (especially involving palms and soles)

6.4.5 URINARY TRACT INFECTION, IN PREGNANCY

6.4.5.1 CYSTITIS

O23.1

DESCRIPTION

This condition usually presents with lower abdominal pain, frequency of micturition and/or dysuria. There are no features of sepsis, e.g. fever.
Urine dipstick testing usually shows nitrites and/or leukocytes; protein and/or blood may also be detected.

GENERAL MEASURES

» Encourage oral fluid intake
» Midstream urine for microscopy, culture and sensitivity

MEDICINE TREATMENT

See section 8.4: Urinary tract infection.

REFERRAL

» No response to treatment, or resistant organism on culture.
» Features of pyelonephritis (See Section 6.4.5.2: Pyelonephritis, acute, in pregnancy).

6.4.5.2 PYELONEPHRITIS

O23.0

DESCRIPTION

Features of pyelonephritis include: temperature ≥38°C, renal angle tenderness, vomiting, tachypnoea, tachycardia, hypotension, confusion.
This condition is more serious and may result in preterm labour.

GENERAL MEASURES
» Midstream urine for microscopy and culture and sensitivity.
» Ensure adequate hydration with IV fluids while awaiting transfer.

MEDICINE TREATMENT
Empiric therapy:
- Ceftriaxone, IV, 1 g as a single dose.

CAUTION: USE OF CEFTRIAXONE

Do not administer calcium-containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone. *LoE:III*

REFERRAL
All cases.

6.4.6 LISTERIOSIS
A32.0-1/A32.7-9

Note: If you have any questions or concerns, visit www.nicd.ac.za or call the NCID hotline on 082 883 9920.

DESCRIPTION
Listeriosis is a preventable and treatable bacterial disease spread through food. Most listerial infections are sporadic but outbreaks do occur. Pregnancy is a predisposing factor for developing serious Listeriosis.
Patients present with a flu-like illness (with fever). They may also have sore joints, backache, diarrhoea and vomiting, and/or signs of meningitis (headache, neck stiffness, confusion).
Listeriosis has been added to the national list of notifiable diseases.

GENERAL MEASURES
Educate your patients on how to prevent it: wash hands, knives, and cutting boards after handling uncooked food, avoid luncheon meats/delicatessen meats, wash raw vegetables thoroughly, avoid unpasteurised milk, thoroughly cook raw food from animal sources.

MEDICINE TREATMENT
During outbreaks, if signs of meningitis are present, give pre-referral treatment (see Section 15.4.2: Meningitis, acute). *LoE:III*[125]

REFERRAL
All cases.

6.4.7 PRETERM LABOUR (PTL) AND PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

6.4.7.1 PRETERM LABOUR (PTL)

O60.0

DESCRIPTION

Regular painful contractions: 3 per 10 minutes, occurring < 37 weeks of gestation.

Note: Women with a previous spontaneous preterm delivery are at higher risk for preterm delivery in the next pregnancy. Refer the following high-risk cases for cervical screening:

» A history of 2nd trimester miscarriage (between 16 and 26 weeks).
» Previous history of spontaneous preterm birth between 27 and 34 weeks.
» No need to refer previous late preterm deliveries (34-37 weeks). *LoE:III*[126]

GENERAL MEASURES

<26 weeks:
» Refer without tocolysis (medicines to inhibit uterine contractions).

26–34 weeks of gestation:
» Refer with initial tocolysis and corticosteroids.

>34 weeks of gestation:
» Allow labour to continue at midwife obstetric unit.

MEDICINE TREATMENT

To improve fetal lung maturity at 26–34 weeks:
Z29.2
- Betamethasone, IM, 12 mg, 2 doses 12 hours apart. *LoE:I*[127]

Tocolysis:
Z29.2
Preload with:
- Sodium chloride 0.9%, IV, 200 mL.

THEN
- Nifedipine, oral, 20 mg as a single dose.
  - Follow with 10 mg after 30 minutes, if contractions persist.
  - Then 10 mg every 4 hours until patient is transferred.
  - Maximum duration: 24 hours.

REFERRAL

All cases before 34 weeks.

6.4.7.2 PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

O42.0-1/O42.9

DESCRIPTION

Rupture of the membranes before 37 weeks' gestation.
Confirmed with a sterile speculum examination demonstrating leakage of amniotic fluid.
If there is clinical uncertainty test for pH – liquor is alkaline.
Avoid digital vaginal examination.

MEDICINE TREATMENT

To improve fetal lung maturity at 26–34 weeks:(Z29.2)

- Betamethasone, IM, 12 mg, 2 doses 12 hours apart. *LoE:I*[128]

Initiate antibiotic therapy:(Z29.2)

- Amoxicillin, oral, 500 mg 8 hourly, until referral. *LoE:III*[129]

AND

- Metronidazole, oral, 400 mg 8 hourly, until referral. *LoE:III*[130]

Severe penicillin allergy:(Z88.0)

- Azithromycin, oral, 500 mg daily, until referral. *LoE:III*

AND

- Metronidazole, oral, 400 mg 8 hourly, until referral.

REFERRAL

All cases, but refer urgently if PPROM < 34 weeks.

6.4.7.3 PRELABOUR RUPTURE OF MEMBRANES AT TERM (PROM)

O42.0-1/O42.9

DESCRIPTION

Rupture of membranes before the onset of labour at term (>37 weeks).
A sterile speculum examination is required to visually confirm amniotic fluid draining through the cervical os.

GENERAL MEASURES

» If PROM is followed by uterine contractions at >34 weeks' gestation, allow labour to proceed.
» If the woman does not develop uterine contractions within 12 hours of PROM, commence antibiotics and transfer for induction of labour.

MEDICINE TREATMENT

Prolonged rupture of membranes >12 hours/ suspected chorio-amnionitis:

Initiate antibiotic therapy:
O41.1

- Ampicillin, IV, 1 g as a single dose.

AND

- Metronidazole, oral, 400 mg as a single dose and refer.

Severe penicillin allergy:
Z88.0

- Azithromycin, oral, 500 mg as a single dose.

AND

- Metronidazole, oral, 400 mg as a single dose and refer. *LoE:III*

REFERRAL

Urgent

» Suspected chorio-amnionitis (refer after starting antibiotics).
» Prolonged rupture of membranes (>12 hours).
» Meconium stained liquor.

6.5 INTRAPARTUM CARE

O80.0-1/O80.8-9

For the comprehensive management of women in labour refer to the most recent National Maternity Care Guidelines.

DESCRIPTION

Labour is divided into 4 stages:
» First stage
  - onset of regular painful uterine contractions at term to full dilatation of cervix.
» Second stage
  - full dilatation to delivery of the baby.
» Third stage
  - delivery of the baby to delivery of the placenta.
» Fourth stage
  - 1 hour post-delivery of the placenta.

GENERAL MEASURES

» Encourage companion support.
» Ensure that the mother is adequately hydrated (can be done orally).
» Monitor progress of labour on partogram.

MEDICINE TREATMENT

First stage with cervical dilatation <10 cm:

Analgesia:
O62.9 + (Z51.2)
- Morphine, IM, 0.1 mg/kg to a maximum of 10 mg, 4 hourly. *LoE:III*[131]

OR

Especially in advanced first stage of labour:
- Nitrous oxide 50% mixed with oxygen 50%, given by mask.

AND

For nausea and sedation, if needed:
- Promethazine, IM, 25 mg 4 hourly.

Second stage

If episiotomy is needed, local anaesthetic:
O62.9 +(R10.2+Z51.2)
- Lidocaine1%.
  - Do not exceed 20 mL.

Fetal distress during labour
O75.9
Place the woman in the left lateral position.

- Salbutamol, IV, 0.5 mg/mL, 250 mcg administered slowly over 2 minutes and refer.
  - Reconstitute the tocolytic as follows:
  - Salbutamol 1 mL (0.5 mg/mL) added to 9 mL of water for injection, to make a 50 mcg/mL solution. Monitor pulse.
  - Inject 5 mL (250 mcg) over at least 2 minutes. Monitor pulse.
  - If pulse increases > 120 beats/minute, discontinue the injection.
  - Do not administer if mother has cardiac disease.

Third stage

Prevention of post-partum haemorrhage (PPH):
Z29.2
» Check for twins.
- Oxytocin, IM, 10 units.

» Clamp and cut cord after 1 minute.
» Controlled cord traction of the placenta.

If > 500 mL blood loss, manage as postpartum haemorrhage (see Section 6.7.1: Postpartum haemorrhage (PPH)).

Rh-negative mother
O36.0
Administer to Rh-negative mother, if baby is Rh-positive or baby's Rh group is unknown:
- Anti-D immunoglobulin, IM, 100 mcg, preferably within 72 hours but can be given up to 7 days after delivery.

Care of the newborn baby
If baby not crying/breathing well, see Section 6.6.2: Neonatal Resuscitation.
For routine care of the neonate, see Section 6.6.1: Routine care of the neonate.
Observe mother and neonate for 1–2 hours before transfer to the postnatal ward.

For pain after delivery
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

OR
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 5 days. *LoE:III*

REFERRAL
» Prolonged labour according to charting on partogram.
» Post-partum haemorrhage.
» Retained placenta.
» Other complications of mother or baby.

6.6 CARE OF THE NEONATE

6.6.1 ROUTINE CARE OF THE NEONATE
Z76.2

For the comprehensive management of the newborn refer to the most recent Newborn Care Charts.

GENERAL MEASURES

Routine care for baby after delivery

» Dry the baby thoroughly at birth.
» If there is meconium, clear the airway first.
» If baby is not crying
- Clear airway, stimulate.
- If baby not breathing well, clamp and cut the cord and start resuscitation (see Section 6.6.2: Neonatal Resuscitation).

» If the baby is crying and breathing well
- Place on mother's chest, keep warm and check breathing.
- Clamp and cut cord after 1 minute.
- Monitor with mother and initiate breastfeeding.

Check and record the Apgar score:

Apgar score	0	1	2
Heart rate	Absent	< 100/min	> 100/min
Respiration	Absent	Slow or irregular	Good, crying
Muscle tone	Limp	Slight flexion	Active, moves
Response to stimulation	No response	Grimace	Vigorous cry
Colour	Blue or pale	Body pink, limbs blue	Pink all over

Check baby from head to toe including baby's back

» Check weight and head circumference.
» If any of the following, provide immediate management (see Section 6.6.3: Care of sick and small neonates) and refer to a neonatal unit:
- Grunting or chest indrawing
- Central cyanosis
- Fast breathing
- Abnormal tone (floppy/stiff)
- Less than normal movements
- Major congenital abnormality
- Head circumference > 39cm
- Birth weight < 2.5 kg

Identify the infant at risk or needing special treatment

» Birth weight < 2.5 kg.
» Suspected chorio-amnionitis (membranes ruptured for > 18 hours, offensive liquor at birth).
» Neurological or congenital problem.
» Hospital stay > 3 days after delivery.
» Mother blood group O and/or Rh –ve.
» Possible social problem (mother has died or is ill, teenage caregiver, social deprivation).
» Mother diabetic.
» Mother syphilis positive (partially treated or untreated or treated < 1 month before delivery).
» Mother HIV-infected.
» Infant not breastfed.
» Mother on TB treatment.

Initiate bonding and feeding

» Place the baby skin-to-skin with mother and initiate breastfeeding immediately.

Identify and record
» Formally identify the baby with the mother.
» Place a label with the mother's name and folder number, baby's sex, time and date of birth on the baby's wrist and ankle.
» After giving vitamin K and chloramphenicol eye ointment, give the baby back to the mother, unless there is a reason for the baby to be transferred to a neonatal unit.

MEDICINE TREATMENT

Bleeding prophylaxis
Z29.2
- Vitamin K, IM, 1 mg immediately after birth routinely.
  - Administer in the antero lateral aspect of the mid-thigh.

Neonatal conjunctivitis prophylaxis
Z29.2
- Chloramphenicol ophthalmic ointment 1%, applied routinely to each eye after birth.

Routine EPI immunisation:
- BCG vaccination, intradermal, once neonate is stable. (Z32.2)
- bOPV (polio vaccine), oral, once neonate is stable. (Z24.0)

No baby must be sent home without immunisation.

REFERRAL
Refer to a neonatal unit if:
» Baby needed resuscitation.
» Apgar score < 8 at 5 minutes.

6.6.2 NEONATAL RESUSCITATION
P29.8

Be prepared Be at the delivery Check the equipment and emergency medicines

» Follow the algorithm at the end of the section.
» Check that each step has been effectively applied before proceeding to the next step. The algorithm follows the assumption that the previous step was unsuccessful and the baby is deteriorating.
» Use oxygen concentration that alleviates central cyanosis, obtains target pulse oximetry readings (if pulse oximeter is available), and restores a heart rate >100 beats/minute. Bag and mask ventilation should be initially done with room air. (There is evidence that routine resuscitation with 100% oxygen is potentially harmful to the baby).

An unsatisfactory response to resuscitation includes:
» A sustained slow heart rate, usually ≤ 60 beats/minute or a progressive decrease in heart rate until cardiac arrest occurs.

» Episodes of cardiac arrest, with a progressively weaker response to chest compressions, positive pressure ventilation and medicines.
» A decreasing blood pressure, increasing acidosis, severe hypotonia with central cyanosis or intense pallor.
» Apnoea or weak, irregular and inefficient respiratory efforts.

MEDICINE TREATMENT

If baby's response to resuscitation is inadequate once ventilation and circulation are adequately supported the following steps should be carried out:

If the mother is known or suspected to have had narcotic pain relief and the baby has normal heart rate and colour response to bag-mask ventilation, but has not initiated sustained regular respiratory effort:

- Naloxone, IV, 0.1 mg/kg.

Check the blood glucose of the baby.

If hypoglycaemia is present:
E16.0-2

- Dextrose 10%, IV, 2.5–5 mL/kg.

Medicines used during neonatal resuscitation

Medicine and dose	Indications	Effect
• Adrenaline (epinephrine) o 0.1 mL/kg of a 1:10 000 dilution IV, (0.01 mg/kg/dose) o ET, up to 1 mL/kg of a 1:10 000 dilution (0.1 mg/kg/dose)	» Asystole » Heart rate < 60 beats/minute	» ↑Heart rate » ↑Myocardial contractility. » ↑Arterial pressure
• Naloxone, IV/IM, 0.1 mg/kg o May need repeating after 2 hours	» Maternal administration of opiates with apnoeic infant	» Corrects apnoea and/or hypoventilation
• Dextrose,10% IV o 2.5–5 mL/kg of 10% dextrose (250–500 mg/kg) o 10% solution: draw up 4 mL of 50% dextrose into a 20 mL syringe then draw up 16 mL water for injection – mix by agitating the syringe	» Hypoglycaemia (usually only occurs after acute resuscitation)	» Corrects hypoglycaemia
Fluid for volume expansion: • Sodium chloride 0.9%, IV, 10–20 mL/kg, slow IV (5–10 minutes)	» Hypovolaemia (usually history of blood loss, child pale shocked with poor pulses and perfusion)	» ↑Blood Pressure and improve tissue perfusion

If no adequate response has occurred by this stage, a person skilled in neonatal resuscitation should be consulted and the baby transferred with ongoing resuscitation to a higher level of care:

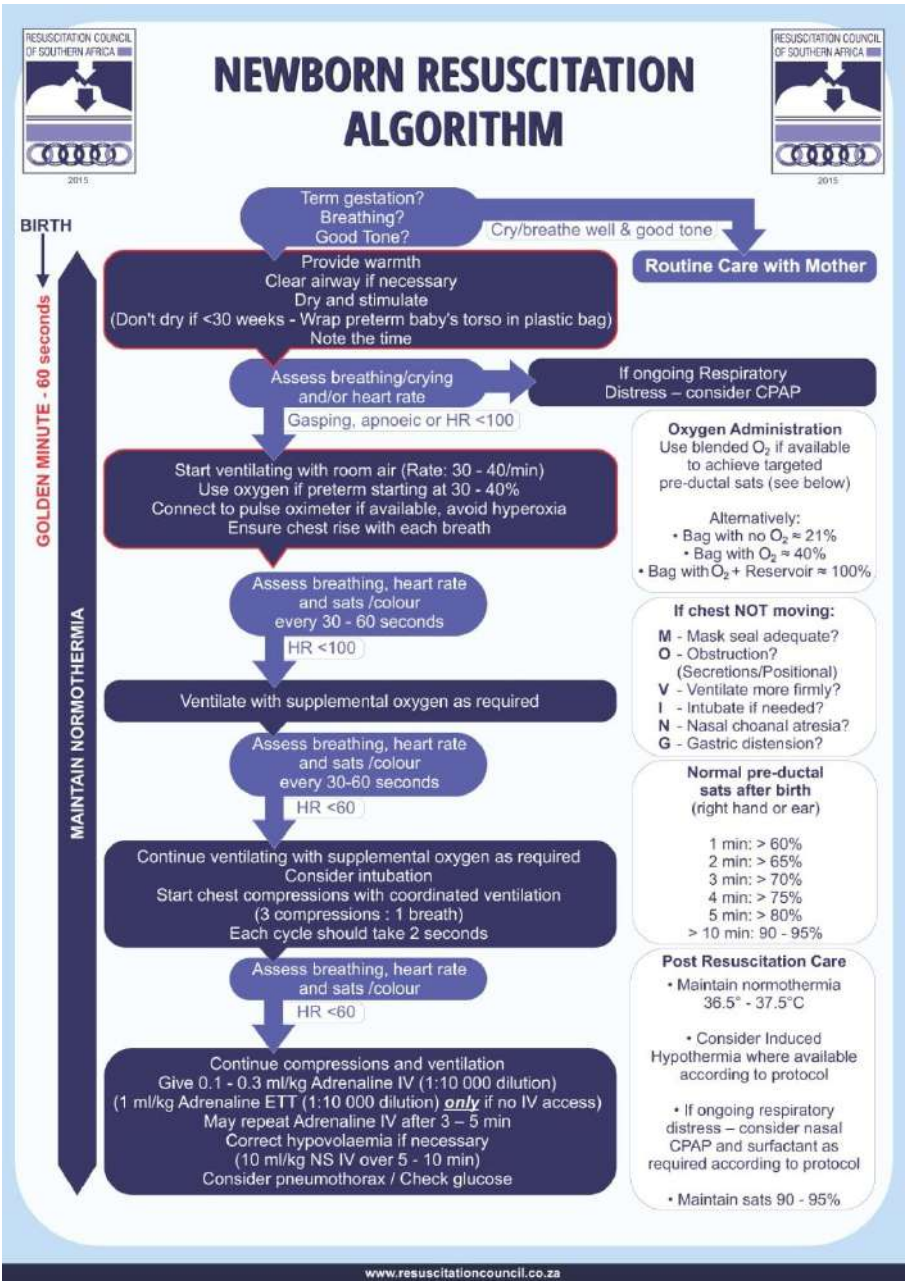
» Discontinue resuscitation if the unsatisfactory response to resuscitation persists for > 20 minutes and underlying conditions e.g. pneumothorax, diaphragmatic hernia has

been excluded or > 10 minutes of unresponsive cardiac arrest (asystole) and/or > 20 minutes of unsustained respiration.

» Babies requiring minimal resuscitation with prompt and complete response may be watched with their mothers.

» Babies with a favourable response to resuscitation should be referred to a neonatal high or intensive care unit, if available, for post resuscitation care.

» Babies, who, after resuscitation, are not completely normal, should be referred to a higher level for care using transport with necessary support, e.g. oxygen, temperature control.


RESUSCITATION COUNCIL OF SOUTHERN AFRICA
2015
NEWBORN RESUSCITATION ALGORITHM
RESUSCITATION COUNCIL OF SOUTHERN AFRICA
2015
BIRTH
GOLDEN MINUTE - 60 seconds
MAINTAIN NORMOTHERMIA
Term gestation?
Breathing?
Good Tone?
Cry/breathe well & good tone
Routine Care with Mother
Provide warmth
Clear airway if necessary
Dry and stimulate
(Don't dry if <30 weeks - Wrap preterm baby's torso in plastic bag)
Note the time
Assess breathing/crying and/or heart rate
If ongoing Respiratory Distress – consider CPAP
Gasping, apnoeic or HR <100
Start ventilating with room air (Rate: 30 - 40/min)
Use oxygen if preterm starting at 30 - 40%
Connect to pulse oximeter if available, avoid hyperoxia
Ensure chest rise with each breath
Assess breathing, heart rate and sats /colour every 30 - 60 seconds
HR <100
Ventilate with supplemental oxygen as required
Assess breathing, heart rate and sats /colour every 30-60 seconds
HR <60
Continue ventilating with supplemental oxygen as required
Consider intubation
Start chest compressions with coordinated ventilation
(3 compressions : 1 breath)
Each cycle should take 2 seconds
Assess breathing, heart rate and sats /colour
HR <60
Continue compressions and ventilation
Give 0.1 - 0.3 ml/kg Adrenaline IV (1:10 000 dilution)
(1 ml/kg Adrenaline ETT (1:10 000 dilution) only if no IV access)
May repeat Adrenaline IV after 3 – 5 min
Correct hypovolaemia if necessary
(10 ml/kg NS IV over 5 - 10 min)
Consider pneumothorax / Check glucose
Oxygen Administration
Use blended O_2 if available to achieve targeted pre-ductal sats (see below)
Alternatively:
• Bag with no O_2 ≈ 21%
• Bag with O_2 ≈ 40%
• Bag with O_2 + Reservoir ≈ 100%
If chest NOT moving:
M - Mask seal adequate?
O - Obstruction? (Secretions/Positional)
V - Ventilate more firmly?
I - Intubate if needed?
N - Nasal choanal atresia?
G - Gastric distension?
Normal pre-ductal sats after birth
(right hand or ear)
1 min: > 60%
2 min: > 65%
3 min: > 70%
4 min: > 75%
5 min: > 80%
> 10 min: 90 - 95%
Post Resuscitation Care
• Maintain normothermia 36.5° - 37.5°C
• Consider Induced Hypothermia where available according to protocol
• If ongoing respiratory distress – consider nasal CPAP and surfactant as required according to protocol
• Maintain sats 90 - 95%
www.resuscitationcouncil.co.za

6.6.3 CARE OF SICK AND SMALL NEONATES

Z76.2

DESCRIPTION

Neonates can become ill very rapidly and signs of disease are often not readily appreciated unless specifically looked for. Neonates should be referred urgently.
Neonates < 2.5 kg are at higher risk of feeding and growth problems and need careful follow-up.

Urgently manage and refer neonates with a possible serious bacterial infection and jaundice:

- » Convulsions
- » Lethargic/ unconscious
- » Bulging fontanelle
- » Apnoea (< 30 breaths/min)
- » Severe chest indrawing
- » Nasal flaring or grunting
- » Swollen eyes; pus draining from eye
- » Low or high temperature
- » Not able to feed
- » Passing blood per rectum
- » Pallor
- » Jaundice in 1st 24 hours of life
- » Diarrhoea
- » Many or severe skin pustules
- » Fast breathing (> 60 breaths/min)
- » Vomiting everything/bile-stained vomitus
- » Only moves when stimulated
- » Umbilical redness extending to the skin and draining pus

GENERAL MEASURES

- » Keep the neonate warm (skin-to-skin/kangaroo mother care or in an incubator), the axillary temperature should be 36.5–37oC.
- » Check blood glucose and treat if low (< 2.6 mmol/L). Repeat glucose in 15 minutes. If normal, feed 2-3 hourly. If still low, treat as severe hypoglycaemia.
- » Check mother able to successfully establish breastfeeding in the small neonate and check health and weight gain more frequently.

MEDICINE TREATMENT

If grunting or severe chest indrawing

P22.0-1/P22.8-9

- Oxygen, using nasal catheter at 1 L/minute.

If infection is suspected and jaundice has been excluded

Z29.2

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**.
  - Administer into the lateral thigh.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

- » If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
- » Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.

- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

If blood glucose < 2.6 mmol/L and baby able to suckle or take orally:

» Breastfeed or give expressed breastmilk (only if breastfeeding is not possible, give replacement milk feed 10 mL/kg)

» If unable to take orally consider nasogastric tube feeding. Repeat glucose in 15 minutes. If still < 2.6 mmol/L, manage as below.

If blood glucose < 1.4 mmol/L or remains < 2.6 mmol/L after an oral feed:

- Dextrose 10%, IV, 2 mL/kg as a bolus.

AND

- Dextrose 10%, IV, 3 mL/kg/hour. *LoE:III*[132]
  - Repeat in 15 minutes.
  - If blood glucose still low, repeat dextrose bolus.

REFERRAL

Urgent

» All neonates with a possible serious bacterial infection.

» All neonates with jaundice on the first day of life, with pallor or with poor feeding.

» All other neonates with increasing, deep or persistent (> 10 days) jaundice should be referred as soon as possible.

» All small neonates (< 2.5 kg) not able to feed.

» Persistent hypoglycaemia despite treatment.

(If possible, always send mother with the neonate as well as any clinical notes).

6.6.4 CARE OF THE HIV-EXPOSED INFANT

See Section 11.5: The HIV-exposed infant.

6.6.5 PERINATAL TRANSMISSION OF HEPATITIS B

P00.2

DESCRIPTION

Babies born to mothers with acute hepatitis B infection at the time of delivery or to mothers who are HBsAg-positive or HBeAg-positive.

MEDICINE TREATMENT

- Hepatitis B immunoglobulin, IM, 0.5 mL within 12 hours of delivery. *LoE:III*[133]

AND

- Hepatitis B vaccine, IM, 0.5 mL, first dose within 12 hours of delivery. *LoE:III*[134]
  - Continue hepatitis B immunisation according to the recommended immunisation schedule.

» Check the baby's hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (HBsAb) at 9 months:
  - If HBsAg positive: baby has hepatitis B infection – refer.
  - If HBsAg negative and HBsAb negative: repeat vaccination with hepatitis B containing vaccine, with a repeat dose in 1 month. Repeat HBsAb one month after the second dose; if still HBsAb negative then refer.
  - If HBsAb positive: baby is immune to hepatitis B. Reassure parents, no further testing required.

Note: Do not check hepatitis B serology before 9 months of age as antibodies from the birth dose of immunoglobulin might still be present. Refer if hepatitis B serology is not available.

6.7 POSTPARTUM CARE

6.7.1 POSTPARTUM HAEMORRHAGE (PPH)

O72.0-3

DESCRIPTION

Primary postpartum haemorrhage (PPH) is blood loss >500 mL that occurs within 24 hours of birth.
Secondary PPH occurs 24 hours to 12 weeks after delivery (late or delayed PPH).
The most common cause is an atonic uterus.

GENERAL MEASURES

» Massage fundus and expel clots from vagina.
» Empty the bladder.
» Two intravenous lines (wide bore if possible).
» Bimanually compress the uterus to stop the bleeding.
» If no response to medicine treatment, insert a condom catheter (an open condom slipped over a large Foley's catheter and secured at its base with string to provide a makeshift balloon catheter) into uterus, inflate with 400-500mL of saline and clamp. Pack vagina with swabs to prevent expulsion and refer urgently.

MEDICINE TREATMENT

Replace fluids:

- Sodium chloride 0.9%, IV, infused as fast as possible in one IV line.

AND

- Oxytocin, IV 20 units in 1 000 mL sodium chloride 0.9% infused at 250 mL/hour in 2nd IV line. *LoE:I*[135]

<u>If no response:</u>

- Ergometrine, IM, 0.5 mg. *LoE:III*

OR

- Oxytocin/ergometrine, IM, 5 units/0.5 mg.
  - Avoid ergometrine in hypertensive women and those with heart disease, unless haemorrhage is life threatening (women haemodynamically unstable).

- Repeat after 10–15 minutes if no response to 1st dose, while arranging referral.

Only in settings where oxytocin is not available:

- Misoprostol, sublingual/rectal, 600 mcg as a single dose. *LoE:I*[136]

REFERRAL

All cases.

6.7.2 PUERPERAL SEPSIS

O86.0-4/O86.8

DESCRIPTION

Clinical features include a temperature ≥ 38°C (usually ≥ 2 days), often accompanied by offensive vaginal discharge (lochia) and/or abdominal pain within the first 10 days postpartum.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.

MEDICINE TREATMENT

- Ceftriaxone, IV, 1 g as a single dose.

CAUTION: USE OF CEFTRIAXONE

Do not administer calcium-containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

AND

- Metronidazole, oral, 400 mg as a single dose.

REFERRAL

All cases.

6.7.3 CRACKED NIPPLES DURING BREASTFEEDING

O92.1

DESCRIPTION

The areola and nipple are protected by the secretion of a lubricant from Montgomery's glands. Cracked nipples may lead to infection and mastitis.

Causes of cracked nipples include:

» poor positioning of the baby and incorrect attachment to the breast
» removing the baby from the breast before suction is broken
» the four signs of good attachment are:
  - chin touching breast (or very close)
  - mouth wide open
  - lower lip turned outward
  - more areola visible above than below the mouth

GENERAL MEASURES
» Apply expressed breast milk to the nipples between feeds and air dry.
» If too painful, express the milk and nurse the baby on the other breast until improvement.
» Keep areola and nipple clean and dry.
» Avoid use of soap, creams and lotions on the nipples.

MEDICINE TREATMENT
- Zinc and castor oil ointment.
  - Apply between feeds.

If oral thrush is present, treat neonate with:
- Nystatin solution, oral. See Section 1.2: Candidiasis, oral (thrush).

REFERRAL
No improvement after 2 days.

6.7.4 MASTITIS
O91.2

DESCRIPTION
Inflammation of the breast tissue surrounding the milk ducts.
Risk factor includes retrograde infection from a fissured nipple and milk stasis.
Commonly isolated pathogens include S. aureus and S. epidermidis. Presentation includes painful breast(s), fever, erythema and malaise.

GENERAL MEASURES
Compresses.
Regular expressing of breast milk.
Do not stop breastfeeding, unless a breast abscess has developed.
If breast abscess present, refer for incision and drainage.

MEDICINE TREATMENT
- Flucloxacillin, oral, 500mg 6hourly for 5 days.

<u>Severe penicillin allergy:</u>
Z88.0
- Macrolide, e.g.:
- Azithromycin, oral, 500mg daily for 3 days.

<u>Pain:</u>
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4g in 24 hours.

REFERRAL
» Breast abscess.
» No improvement after 2 days.

6.8 HIV IN PREGNANCY

O98.7

DESCRIPTION

HIV is currently the commonest cause of maternal deaths in South Africa. Transmission of HIV from mother to infant may occur during pregnancy, delivery and/or breastfeeding. Without intervention, 25–40% of infants born to HIV-infected women may become infected. With appropriate interventions, maternal mortality as well as perinatal transmission of HIV can be substantially reduced. In South Africa, 4% of women who were initially HIV-negative become positive later during pregnancy. Repeat HIV testing is essential.

For comprehensive information on the care of HIV-infected pregnant women refer to the current National Consolidated Guidelines for the Prevention of Mother-to-Child Transmission of HIV (PMTCT) and the management of HIV in Children, Adolescents and Adults as well as the current Guidelines for Maternity Care in South Africa.

GENERAL MEASURES

HCT in all pregnant and breastfeeding women

» Provide routine counselling and voluntary HIV testing to all pregnant women at their very first antenatal visit, and treat other STIs if necessary.
» All women who test negative must be offered repeat HIV testing every 3 months throughout pregnancy, at labour/delivery, at the 6-week EPI visit and 3 monthly throughout breastfeeding.

Women who choose not to be tested

» Provide with individual 'post-refusal' counselling and offer HIV testing at every subsequent visit.
» Perform a TB symptom screen at each visit.
» Counsel on risks of MTCT to unborn baby, HIV risk reduction behaviour and offer HIV prevention services.

Pregnant women who test HIV positive

» Confirm result with a 2nd rapid HIV test of another type in compliance with current HCT policy.
» If results are discordant, repeat both first and confirmatory rapid HIV tests and if still discordant, send blood for a laboratory HIV ELISA.
  - All confirmed HIV-infected women must be fast-tracked for ART regardless of CD4 count.
» Perform clinical staging and TB symptom screen, and take a blood sample for CD4 cell count and creatinine, on the day of testing. Obtain results within a week.
  - If CD4 < 100 cells/mm3, do a serum cryptococcal antigen (CrAg) test.
» Start ART on the day of diagnosis (unless there are symptoms of TB).
» Investigate all those with TB symptoms before ART initiation. If TB treatment is started, defer ART for 2 weeks.
» HIV-infected women must return 1 week after their initial ANC visit to get their creatinine, and CD4 cell count results and be managed accordingly.
» Refer women with unwanted pregnancies < 20 weeks' gestation for termination of pregnancy (TOP) services.

Pregnant women already known to be HIV-infected

» If not on ART, do clinical staging; take blood for CD4 count (to determine eligibility for cotrimoxazole prophylaxis) and creatinine. If CD4< 100 cells/mm3, do a serum cryptococcal antigen (CrAg) test.
  - Start ART the same day if no contraindication.
» If already on ART for > 3 months, take blood for viral load irrespective of when it was last done.

Antenatal support

» Counsel about the importance of adherence and virological suppression for PMTCT.
» Counsel on infant feeding, safer sex, family planning, postnatal contraception, partner testing, routine cervical cancer screening.
» Perform TB symptom screening at each visit.
» Provide appropriate nutritional care and support including iron, folate and calcium supplementation and Hb testing.

Postpartum support

» Provide adequate support and counselling, particularly addressing ART adherence during breastfeeding.
» Educate mothers about the benefits of breastfeeding. Only in circumstance where the mother has confirmed 2nd or 3rd line ART regimen failure, advise not to breastfeed and prescribe replacement feeds.
» Refer mother to appropriate services to continue lifelong ART as part of the general adult ART population.

MEDICINE TREATMENT

Opportunistic infection treatment and prophylaxis for HIV-infected pregnant women:

Pregnant women diagnosed with pulmonary TB:

» First line TB treatment is safe and effective in pregnant women.
» See Section 17.4.1: Pulmonary tuberculosis (TB) in adults.

Pregnant women on ART with no symptoms of TB:

» See Section 11.2.2: Tuberculosis preventive therapy (TPT).

Women with CD4 ≤ 200 cells/mm3 or WHO clinical stage 2, 3 or 4:

- Cotrimoxazole, oral, 160/800 mg daily, until CD4 > 200 cells/mm3.

If CrAg-positive, consult an infectious disease expert, or refer.

See Section 11.3.4: Cryptococcosis.

CAUTION

» Although fluconazole should be avoided in the 1st trimester, pregnant women should be counselled that the benefits of fluconazole outweigh the risks in the management of cryptococcosis.
» All pregnant women <20 weeks gestation exposed to fluconazole should have an ultrasound scan to detect congenital abnormalities. *LoE:III*[137]
» Fluconazole is present at concentrations similar to maternal plasma concentrations in breast milk. *LoE:III*[138]

FIRST-LINE ART REGIMENS *(Also see Section 11.1 Antiretroviral therapy)*		
1ST ANC VISIT		
» Pregnant women ≥6 weeks gestation » Breastfeeding women not actively wishing to conceive » Those who make an informed choice to use DTG	• Tenofovir, oral 300 mg daily. **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide as a fixed dose combination (FDC)	» Contraindication to TDF: renal insufficiency, other nephrotoxic medicines e.g. aminoglycosides. » Contraindication to DTG: pregnant women <6 weeks gestation or actively wanting to conceive or intolerance to DTG
Pregnant women <6 weeks gestation or actively wanting to conceive	• Tenofovir, oral, 300 mg daily. **AND** • Lamivudine, oral, 200 mg daily **AND** • Efavirenz, oral, 600 mg at night **Note:** Provide as a fixed dose combination (FDC)	» Contraindication to EFV: active psychiatric illness.
Contraindications to EFV and DTG	• Tenofovir, oral, 300 mg daily. **AND** • Lamivudine, oral, 300 mg daily **AND** • Lopinavir/ritonavir, oral, 400/100 mg 12 hourly	» High-risk pregnancy: doctor consult or refer immediately if acute psychiatric illness.
If renal insufficiency or other nephrotoxic medicines e.g. aminoglycosides (TDF may be contraindicated)	Start alternative regimen (Doctor consult): • Abacavir, oral, 600 mg, daily. **AND** • Lamivudine, oral, 300 mg, daily. **AND** • Efavirenz, oral, 600 mg at night. *LoE:III*[139]	
Pregnant women currently on ART	• Continue current ART regimen.	» Do a VL as soon as pregnancy is confirmed.
Pregnant women not currently on ART but ART exposed (previous PMTCT or ART loss to follow-up)	<u>If previous VL (while on ART) < 50 c/mL:</u> • Tenofovir, oral, 300 mg daily. **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide as a fixed dose combination (FDC) If previous VL (while on ART) > 50 c/mL, or no VL result available: • Zidovudine, oral, 300 mg twice daily. **AND** • Lamivudine, oral, 300 mg daily **AND**	*LoE:III*[140]

	• Dolutegravir, oral, 50 mg daily	
2ND ANC VISIT (1 WEEK LATER)		
Creatinine ≤ 85 mmol/L	• Continue FDC: TDF+3TC+DTG	
Creatinine > 85 mmol/L (TDF is contra-indicated)	• Stop tenofovir Start alternative regimen (Doctor consult): • Abacavir, oral, 600 mg, daily. **AND** • Lamivudine, oral, 300 mg, daily **AND** • Dolutegravir, oral, 50 mg daily. *LoE:III*[141]	» High-risk pregnancy: change to alternate triple therapy within 2 weeks (doctor consult) **and refer for renal dysfunction investigation**.
VL < 50 c/mL (Pregnant women currently on ART)	If still on EFV-based ART, offer switch to: • TDF+3TC+DTG	
VL ≥ 50 c/mL (Pregnant women currently on ART)	Continue current regimen whilst investigating and managing cause of elevated VL. Determine if the client should switch to 2nd line.	» Doctor/ expert consult or refer for expert advice. » Pregnant women with confirmed 2nd or 3rd line ART regimen failures should not breastfeed their infants, if they can safely formula feed.
WOMEN DIAGNOSED HIV POSITIVE IN LABOUR		
All unbooked women who test positive during labour should be given prophylactic ART during labour and initiated on lifelong ART before being discharged.	• Nevirapine, oral, 200 mg single dose as early as possible in labour. **AND** • Tenofovir, oral, 300 mg daily. **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide TDF + 3TC + DTG as a FDC	Before discharge: Start lifelong ART the day after delivery, if there are no contraindications, regardless of CD4: • TDF+3TC+DTG as a FDC
POST-DELIVERY		
The mother should start ART within 24 hours of delivery to protect the baby during breastfeeding.	Start lifelong ART regardless of CD4: TDF+3TC+DTG as a FDC	
BABY		
See Section 11.5: The HIV-exposed infant to decide whether infant is low risk or high risk and what HIV prophylactic management is needed.		

LoE:III[142]

Note:

» eGFR and creatinine clearance are not reliable for diagnosing renal impairment in pregnancy.

» Monitor response to ART within 3 months of ART initiation with a plasma VL. If VL is not suppressed, refer or consult for expert advice.

Viral load monitoring for 1st line regimen in pregnant and breastfeeding women:
Newly diagnosed and initiated ART for the first time:
» Do 1st VL at 3 months on ART.
» If VL < 50 c/mL, repeat VL at delivery.

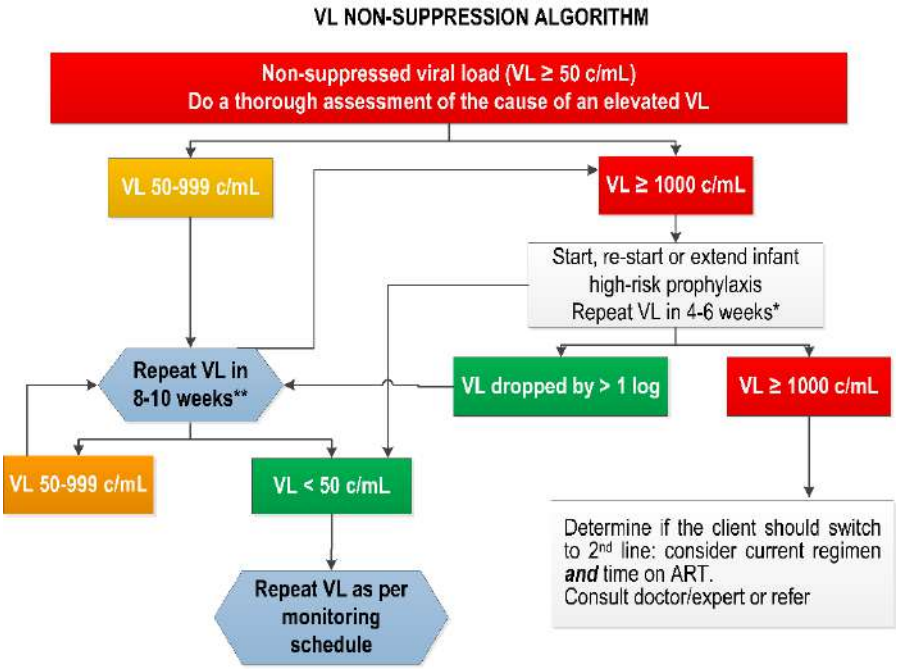
Known HIV-positive women already on ART:

» VL at first/booking visit in ANC,
» If VL < 50 c/mL, repeat VL at delivery. *LoE:III*[143]

Known HIV-positive women, who are not currently on ART, but are ART exposed (e.g. previous PMTCT, or ART loss to follow-up) and who are initiating a DTG-containing regimen:

» Do 1st VL at 3 months on ART.
» If VL < 50 c/mL, repeat VL at delivery.

If the VL is ≥ 50 c/mL in any of the above scenarios, manage as per the VL non-suppression algorithm below. *LoE:III*[144]



*The shorter 4-week interval between the 1st VL > 1000 c/mL and the repeat VL is preferred, wherever possible
If the 1st elevated VL is the delivery-VL, the next VL may only occur at the next 6-week post-natal visit
HbSAg can be done at the same time, to inform switch to 2nd line ART

**The shorter 8-week interval between the first VL 50-999 c/ml Reading and the repeat VL is preferred wherever possible
If the 1st elevated VL is the delivery-VL, the next VL may only occur at the 10-week EPI visit

Women on TDF+FTC+EFV with a 2nd VL 50-999 c/ml may be switched to TDF+3TC+DTG, provided the elevated VL has been managed and investigateded and appropriate counselling has been provided

REFERRAL

» Refer mothers suspected of non-adherence early.

Urgent

» Creatinine > 85 mmol/L.
» ALT > 100 IU/L.
» Pregnant women who are CrAg+, and
  - LP cannot be performed, or
  - symptomatic (headache, confusion), or
  - asymptomatic, but in the 1st trimester.

6.9 MATERNAL MENTAL HEALTH

In vulnerable women, pregnancy exacerbates the risk of developing a mental illness. Approximately one in three women in South Africa have depression and/or anxiety in the perinatal period. Globally, postpartum psychosis affects 1 to 2 women in every 1000 after childbirth .

Risk factors for maternal mental illness include past history of mental illness, recent major life event, (e.g. bereavement) early childhood adversity/ abuse, domestic violence, a history of trauma, displacement from home of origin, low socio-economic status, food insecurity. Women who learn that they are HIV positive during pregnancy have a particular vulnerability to mental health conditions.

Untreated maternal mental illness is associated with the following:

» unplanned and unwanted pregnancy
» poor adherence to health advice; poor uptake of antenatal services
» tobacco, alcohol and other substance use
» self-harm and suicide
» relapse of the mental illness during the pregnancy or postpartum
» gestational hypertension and/or diabetes
» poor pregnancy outcomes, including preterm labour and low birth weight
» increased risk of neonatal morbidity and stillbirth in mothers with bipolar and psychotic disorders
» poor engagement with the infant
» poor family relationships; paternal mental health conditions
» behavioural and neurodevelopmental disorders in the offspring

Suspect maternal mental illness if:

» unreliable antenatal clinic attendance
» continued smoking and/or other substance use during pregnancy
» any odd or eccentric speech or behaviour
» screened positive using the 3-item tool in the Maternity Case Record

Pre-conception care:

» Identify at-risk women – any current or past symptoms of mental illness, emotional problems, substance use, poor social support, abusive relationships, recent trauma, socio-economic deprivation.
» Initiate management for mental disorders/ substance use/ psychosocial stress as needed.
» Use medicines which are safe in pregnancy, unless benefit outweighs risk and patient consents to use (if valproate use, sign acknowledgement of risk form
» http://www.sahpra.org.za/wpcontent/uploads/2020/08/6.28_Valproate_Annual_Risk_Acknowledgement_Form_Dec18_v1.pdf
» Discuss planning for pregnancy and initiate contraception according to individual choice.

6.9.1 PERINATAL DEPRESSIONAND/OR ANXIETY

O28.8-9 + (F32.0-3/F32.8-9/ F33.0-4/F33.8-9/F34.1/F53.0-1/F53.8-9)

DESCRIPTION

See Sections 16.4.1: Depressive disorders and 16.3 Anxiety disorders, for symptoms of depression and/or anxiety. Note that these conditions may occur together in the same person.

» Depression and /or anxiety may be antenatal or postpartum. Postpartum depression usually begins within a month of delivery but can present up to a year after delivery.
» Anxiety disorders may present as fear of labour and childbirth, or other fears e.g. needle phobia. Such fears may interfere with antenatal and postnatal care if they are not addressed.
» Postpartum blues last less than a week, are characterised by irritability, tearfulness, anxiety beginning by day 3-5 postpartum. Usually resolve with gentle support but may progress to depression.

CAUTION: Suicide

» Highest risk period is from 6 weeks before to 12 weeks after delivery.
» Adolescent mothers are at particular risk.
» Those with a prior history of self-harm at particular risk.
» See PHC STGs and EML, 2018 – section 16.7: Suicide risk assessment.
» Inform all healthcare providers involved of suicide risk.
» Ensure psychosocial support – partner/ family/ NGO/ welfare support.
» Optimise treatment of mental illness.
» Do not leave unattended if high risk of self-harm.

GENERAL MEASURES

Antenatal

» Don't stop psychiatric medication if stable on treatment: assess course of illness, severity, and suicide risk. Refer if any signs of severity.
» Discuss potential benefits/harms of medication to patient and baby as well as alternatives (see Adult Hospital Level STGs and EML, Sections 15.2: Anxiety and obsessive-compulsive disorders and 15.3.1: Depressive disorders).
» Antenatal care: provide active adherence support; provide regular, frequent CHW home visits; watch for preterm labour and/or SGA baby; follow-up on any up-referral
» Explore and address psychosocial stressors:
  - Mobilise patient's support system.
  - Stress management/coping skills – refer for counselling e.g. at www.sadag.org
  - Relationship and family issues – refer for counselling, e.g. at www.famsa.org.za
  - Abuse or interpersonal violence - refer to a social worker and for support, e.g. by www.genderjustice.org.za or www.powa.co.za

Postnatal

» Continue close home-based support of mother and baby for at least the first year
» Encourage breastfeeding, if not contraindicated medically.
» Optimise treatment of mental illness and co-morbid physical health conditions.
» Optimise psychosocial and parenting support – utilise support groups e.g. at www.sadag.org

» Refer to Social Welfare if suspect child-care is seriously impaired.

MEDICINE TREATMENT

See Sections 16.4.1: Depressive disorders and 16.3: Anxiety disorders, for symptoms of depression and/or anxiety.

» Mild to moderate anxiety – refer for psychotherapy if available and monitor response.
» Moderate – severe anxiety and/ or depression - antidepressant (SSRI) treatment for early symptom control and prevention of relapse is generally necessary.

REFERRAL

» All severe depression where functioning is severely impaired.
» Poor response to psychological and supportive medication.
» Poor response to first line SSRI (antidepressant) medication.
» Factors requiring urgent admission, invoke the MHCA if necessary:
  - Suicide risk
  - Any possible psychotic features
  - Risk to infant

6.9.2 BIPOLAR, SCHIZOPHRENIA, AND RELATED DISORDERS

O90.8/9 + (F28/F29/F53.0-1/F53.8-9)

DESCRIPTION

See Section 16.5: Psychosis and Adult Hospital Level STGs and EML, Sections 15.3.2: Bipolar and related disorders for description of disorders and management Bipolar Disorder (BD) in perinatal period and 15.5: Psychotic disorders.

» Associated with increased risk of pre-eclampsia, placental abnormalities, preterm delivery, LBW and SGA babies, neonatal morbidity, and maternal suicide.
» Risk of relapse increased, particularly postpartum. May present with antenatal or postnatal depression, hypomania, mania or psychosis. Index episode often occurs postpartum – may be no prior history of mental illness.
» Women with bipolar disorder have a 1 in 4 chance of postpartum psychosis.

Schizophrenia and related disorders:

» Poor pregnancy outcomes as with BD plus increased risk of diabetes, stillbirth, sudden infant death syndrome.
» The rate of deterioration from a non-psychotic to psychotic state may be more rapid in the postpartum period than usual. Take any reports of unusual behaviour by family members as serious and urgent.

CAUTION: Psychosis

» Is a medical emergency; requires urgent hospitalisation.
» Always exclude delirium due to puerperal sepsis.
» May present with subtle, odd behaviour and/or thoughts; women may be blunted, withdrawn, agitated, or aggressive.
» High risk for harm to self or others, suicide, infanticide.
» May severely impair mother-infant bonding and child-care.
» Manage aggressive or disruptive behaviour (See Section 16.1.2: Aggressive disruptive behaviour in adults).

GENERAL MEASURES

» Manage all pregnancies as high-risk in conjunction with obstetrician and psychiatrist.
» Don't stop psychiatric medication – discuss with doctor/ psychiatrist.
» Actively monitor adherence to antenatal care and hospital referrals.
» Provide regular, frequent CHW home visits.
» Arrange for hospital delivery.
» Postpartum – keep in hospital, monitor mother and new-born, and ensure home-based care and outpatient follow-up before discharge

Factors requiring urgent admission, invoke the MHCA if necessary:

» Suicide risk.
» Any possible psychotic features.
» Risk to infant.

REFERRAL

All patients.

GYNAECOLOGY

6.10 ECTOPIC PREGNANCY

O00.0-2/O00.8-9

DESCRIPTION

Pregnancy outside the uterus, usually presenting with the combination of:

» amenorrhoea (missed menstrual period)
» sudden lower abdominal pain/ pelvic pain
» vaginal bleeding (os closed)
» dizziness
» shock
» anaemia
» urine pregnancy test usually positive
» shoulder tip pain

Note: Consider ectopic pregnancy in young women who complain of lower abdominal pain.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.

MEDICINE TREATMENT

- Sodium chloride 0.9%, IV.

REFERRAL

Urgent

All suspected cases of ectopic pregnancy.

6.11 VAGINAL BLEEDING

Note: Women should receive regular screening for cervical cancer after the age of 30 years. Any opportunity to perform screening should be taken; this includes taking pap smears during pregnancy.

6.11.1 ABNORMAL VAGINAL BLEEDING DURING REPRODUCTIVE YEARS

N92.0-2

DESCRIPTION

Increased vaginal blood flow in either volume, duration, and/or frequency, including menorrhagia or dysfunctional uterine bleeding.

GENERAL MEASURES

» Assess current contraceptives used.
» Exclude pregnancy complication or organic disease e.g. cervical cancer, fibroids.

MEDICINE TREATMENT

- Combined oral contraceptive pill (ethinylestradiol/levonorgestrel) for 3–6 months.
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for 2–3 days.
  - Ibuprofen may reduce blood loss in menorrhagia associated with intrauterine contraceptive device (IUCD) or chronic salpingitis (See Chapter 12: Sexually transmitted infections).

If blood loss has been severe or there are signs of anaemia:

- Ferrous sulphate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.

OR

- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.
  - Continue for 3 months after Hb normalises - to replenish body iron stores.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability (**Note:** Do not take iron tablets with milk).

LoE:III[145]

REFERRAL

» No improvement.
» Girls < 12 years of age with vaginal bleeding before the development of their secondary sexual characteristics.
» For investigation of other causes such as:
  - sexual abuse
  - foreign bodies
  - tumours of the genital tract
» Severe anaemia.

6.11.2 POST-MENOPAUSAL BLEEDING

N95.0

DESCRIPTION

Vaginal bleeding six months following the complete cessation of menstruation.
Note: If bleeding is profuse, stabilise before referral.

REFERRAL

All cases, to exclude underlying malignancy and other pathology.

6.12 DYSMENORRHOEA

N94.4-6

DESCRIPTION

Pain associated with menstrual cycles. In primary dysmenorrhoea there is no known cause. Secondary dysmenorrhoea usually has an organic cause.

GENERAL MEASURES

» Advise and reassure women with primary dysmenorrhoea about the nature of the condition.
» Encourage patient to carry on with normal everyday activities.

MEDICINE TREATMENT

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for 2–3 days.

ADD

- Combined oral contraceptive pill, if symptoms still problematic, and if pregnancy is not planned.

Treat for pelvic infection when present.

REFERRAL

» Poor response to treatment.
» If an organic cause is suspected, e.g. fibroids.

6.13 HORMONE THERAPY (HT)

N95.1-2/N95.8-9

Indications:

Short-term symptomatic relief for severe menopausal symptoms.
For menopausal women, treatment should be ≤ 5 years.
Risk-benefit assessment should be individualised in all patients.

Contra-indications include:

» Known or suspected estrogen-dependent malignant tumours (such as endometrial cancer).
» Coronary heart disease.
» Active liver disease.
» Women ≥ 60 years of age.
» Current, past or suspected breast cancer.
» Thrombophilia.
» Undiagnosed genital bleeding.
» Previous idiopathic or current venous thromboembolism.
» Untreated endometrial hyperplasia.
» Porphyria cutanea tarda.

GENERAL MEASURES

Prior to starting HT:

» Do breast and gynaecological examination.
» Cervical screening.
» Where the facility is available, arrange mammography before starting HT. However, lack of access to mammography should not delay HT if indicated for severe menopausal symptoms if the woman has no other special risk factors for breast cancer (e.g.: family history of breast cancer in first degree relative). *LoE:I*[146]

MEDICINE TREATMENT (doctor initiated)

Uterus present (no hysterectomy)

HT can be offered as sequentially opposed or continuous combined preparations. Continuous combined preparations are often preferred if the woman had her last menstrual period (menopause) over a year ago, as they will not usually cause bleeding then. For women who are still menstruating or have recently stopped, sequentially

opposed preparations are preferred and will result in regular menstrual periods, whereas continuous combined may result in irregular bleeding.

CONTINUOUS COMBINED THERAPY
• Estradiol/norethisterone acetate, oral, 1mg/0.5mg for 28 days.
OR
• Estradiol/norethisterone acetate, oral, 2mg/1mg for 28 days.
OR
• Conjugated estrogens, oral, 0.3–0.625 mg for 28 days. **AND** • Medroxyprogesterone acetate, oral, 2.5–5mg daily for 28 days.

OR

SEQUENTIALLY OPPOSED THERAPY
• Estradiol valerate/cyproterone acetate, oral: • Estradiol valerate, oral, 2 mg for 11 days. • Estradiol valerate/cyproterone acetate, oral, 2mg/1mg for 10 days. • Placebo, oral, for 7 days.
OR
• Estradiol valerate, oral, 1–2 mg daily for 21 days. **ADD** • Medroxyprogesterone acetate, oral, 5 -10 mg daily from day 12–21. Followed by no therapy from day 22–28.
OR
• Conjugated estrogens, oral, 0.3–0.625 mg daily for 21 days. **ADD** • Medroxyprogesterone acetate, oral, 5–10 mg daily from day 12–21. Followed by no therapy from day 22–28.

LoE:III[147]

Note: Where a dose range is provided start at the lowest possible dose to alleviate symptoms. The need to continue HT should be reviewed annually.

Women with no uterus (post-hysterectomy)

HT is given as estrogen only.

- Estradiol valerate, oral, 1–2 mg daily.

OR

- Conjugated estrogens, oral, 0.3 mg daily to a maximum of 1.25 mg daily.

REFERRAL

» Premature menopause, i.e. < 40 years of age.
» Severe osteoporosis
» Management difficulties, e.g. where oestrogen therapy is contra-indicated, poorly tolerated, or ineffective.
» Post-menopausal bleeding.
» If HT needed (symptoms persist) after 5 years of HT or woman ≥ 65 years.

6.14 VAGINAL ULCERS

See Section 12.5: Genital ulcer syndrome (GUS).

6.15 VAGINAL DISCHARGE/LOWER ABDOMINAL PAIN IN WOMEN

See Sections 12.1: Vaginal discharge syndrome (VDS) and 12.2: Lower abdominal pain (LAP).

PHC Chapter 7: Family planning

Introduction to contraception

7.1 Intrauterine contraceptive device (IUCD)

7.2 Contraception, hormonal

7.2.1 Subdermal implant

7.2.2 Injectable

7.2.3 Oral

7.2.4 Missed pills

7.3 Contraception, barrier methods

7.4 Contraception, emergency

7.5 Voluntary sterilisation, male and female

7.6 Breakthrough bleeding with contraceptive use

INTRODUCTION TO CONTRACEPTION

Consult the most recent National Contraception Clinical Guidelines (especially in women with medical conditions).

The appropriate choice of family planning method should be decided on by the woman in consultation with the health care professional taking into consideration safety, efficacy, acceptability and access. A complete medical and sexual history must be obtained and an appropriate physical examination performed in order to ensure that there are no contra-indications to using a particular method. Always exclude pregnancy before commencing contraception.

Contraceptive methods

Hormonal contraception and IUCDs do not prevent sexually transmitted infections (STIs), including HIV. Dual protection i.e. the use of a condom in combination with another contraceptive method is recommended to reduce the risk of STIs, including HIV.

Contraceptive method	Advantages include:	Disadvantages include:
Copper IUCD (see Section 7.1)	» Suitable for most women, including nulliparous women. » Provides long-term protection i.e. 5years » Convenient, does not require regular follow up. » Works immediately on insertion. » Non-hormonal therefore no interaction with other medication and no hormonal side effects. » Fertility returns on removal of IUCD in women of child-bearing age.	» Some discomfort or cramping during and following insertion. » IUCD must be inserted or removed by a trained health care professional. » Should not be used in women with menorrhagia, active pelvic inflammatory disease (PID), purulent cervicitis, unexplained uterine bleeding, cervical and endometrial cancers or other uterine abnormalities.
Hormonal subdermal: progestin-only implant (see Section 7.2.1)	» Provides long-term protection i.e. 3 years (etonogestrel) or 5 years (levonorgestrel). » Convenient, does not require regular follow up. » Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of venous thromboembolism. » Fertility returns on removal of implant in women of child-bearing age.	» Frequent bleeding irregularities. » Implant must be inserted or removed by a trained health care professional under aseptic conditions to prevent infection. » Incorrect insertion and removal technique may result in complications.
Hormonal injectable: progestin-only (see Section 7.2.2)	» Daily adherence is not required. » Long-acting i.e. given every 8 or 12 weeks. » Interactions with other medicines do not lower contraceptive effect.	» Delayed return to fertility of up to ≥ 9 months, after last injection. » Frequent bleeding irregularities (irregular,

	» Can be used postpartum. » Can be used in women >35 years who are obese, who smoke, has diabetes, hypertension, or a history of venous thromboembolism.	prolonged and/or heavy bleeding, or amenorrhoea). *LoE:III*[148]
Hormonal oral: progestin-only (see Section 7.2.3)	» Fertility returns within 3 months of discontinuing the pill. » Can be used postpartum. » Can be used in women >35 years who are obese, who smoke, has diabetes, hypertension, or a history of venous thromboembolism.	» Daily adherence is required. » Interactions with other medicines can lower contraceptive effect. » Lower efficacy compared with COC. » Frequent bleeding irregularities.
Hormonal oral: combined oral contraceptive (COC) (see Sections 7.2.3 and 7.2.4)	» Non-contraceptive benefits, e.g.: alleviation of dysmenorrhoea, premenstrual syndrome and menorrhagia. » Fertility returns within 3 months of discontinuing COC.	» Daily adherence is required. » Interactions with other medicines can lower contraceptive effect. » Cannot be used in women with heart disease, stroke and a history of active venous thromboembolism. » Cannot be used immediately postpartum.
Barrier: male and female condoms (see Section 7.3)	» Protects against STIs, including HIV.	» Possibility of breakage or slipping off. » Possible allergic reaction to latex. » Lower efficacy than other contraceptive methods therefore advised as dual contraception.

(Refer to the most recent MCC/SAHPRA registered package inserts for detailed information).

Effectiveness of family planning methods

Rates of unintended pregnancies per 100 women:

Contraceptive method	**Failure rate in 1styear (%)**	
	Consistent and correct use	As typically used
Copper IUCD	0.6	0.8
Progestin-only subdermal implant	0.05	0.05
Progestin-only injectable	0.3	3
Progestin-only oral pill (not breastfeeding)	0.3	8
Progestin-only oral pill (during breast feeding)	0.5	1
Combined oral contraceptive (COC) pill	0.3	3
Barrier: female condoms	5	21
Barrier: male condoms	2	15
Sterilisation: male – vasectomy	0.1	0.15
Sterilisation: female - tubal ligation	0.5	0.5
No method	85	85

Key: 0-0.9: very effective 10-25: moderately effective
1-9: effective 26-32: less effective

7.1 INTRAUTERINE CONTRACEPTIVE DEVICE (IUCD)

Z30.0/Z30.1/Z30.5

Dual protection with barrier methods is recommended to reduce the risk of STIs including HIV.

The IUCD is an effective, safe, reversible long-term contraceptive method requiring no patient effort to adhere to the method, has no hormonal adverse effects and is not prone to drug interactions.

HIV infection is NOT a contra-indication to the use of an IUCD.

IUCDs are often the most suitable contraceptive for women on ARVs and other enzyme-inducing medicines, because of the absence of drug interactions.

- Copper IUCD, e.g.:
- Cu T380A, 380mm² copper device.

Devices with lower copper surface area are not recommended.

The IUCD can be inserted any time during the menstrual cycle once pregnancy has been excluded (by clinical history or with a pregnancy test if required). Insertion at menstruation may be easier for the patient resulting in less discomfort and spotting.

Copper IUCDs may be inserted immediately postpartum or post miscarriage (within 48 hours) by specially trained heath care professionals, providing that no contra-indications are present (chorioamnionitis, ruptured membranes for more than 18 hours and postpartum haemorrhage).

Women should be counselled to return if they experience complications (excessive bleeding, excessive pain, fever or foul smelling discharge).

Alternatively, an IUCD may be inserted at least 4 weeks postpartum. *LoE:I*[149]

Advise the patient when to return:
» Expulsion of IUCD or if strings of the IUCD protrude.
» Complications (see below).
» Routine follow-up after 3–6 weeks. *LoE:III*[150]

Copper IUCD is not recommended for women with menorrhagia, active pelvic inflammatory disease (PID), purulent cervicitis, unexplained uterine bleeding, cervical and endometrial cancers or other uterine abnormalities.

For mild pain and discomfort after insertion:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 3 days.

REFERRAL

» Excessive pain or bleeding after insertion.
» Signs of infection within 7 days of insertion (e.g. fever, abdominal pain and/or foul-smelling discharge).
» Abnormal bleeding for > 3 months.

7.2 CONTRACEPTION, HORMONAL

7.2.1 SUBDERMAL IMPLANT

Z30.0/Z30.4/Z30.8

Dual protection with barrier methods is recommended to reduce the risk of STIs, including HIV.

The subdermal implant is an effective, safe, reversible and convenient long-term contraceptive method requiring no patient effort once inserted and no regular follow-up.

- Progestin-only subdermal implant contraceptive, e.g.:
- Etonogestrel, subdermal, 68 mg, single-rod implant.

The progestin-only subdermal implant can be inserted any time during the menstrual cycle, once pregnancy has been excluded. If the implant is inserted within 7 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of insertion.

The main reason for discontinuation of the implant is irregular bleeding. This is often overcome by good counselling before the implant is inserted so that women know that this side effect can occur and that they can get treatment should it occur. See Section 7.6: Breakthrough bleeding with contraceptive use.

Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding, active liver disease. Consult the package insert in this regard.

CAUTION

Medicines that induce the metabolism of progestins could reduce contraceptive efficacy. These medicines include efavirenz, rifampicin, phenytoin, carbamazepine and phenobarbital.

Women on these medicines should be advised to use alternate contraceptive methods such as the copper IUCD or DMPA.

If the client chooses to use the implant, then she should be advised to use dual contraception.

LoE:III[151]

Insertion and removal procedures

» Participation in a training session is strongly recommended to become familiar with the use of the subdermal implants and techniques for insertion and removal.
» Only health care professionals familiar with these procedures should insert and remove subdermal implants under aseptic conditions.
» Insert the implant **subdermally just under the skin of the upper non-dominant arm.**
» **Important: Refer to the package inserts, for detailed information**.

Insertion of etonogestrel 68 mg implant:

» Insertion should only be performed with the preloaded applicator.
» Have the women lie on her back on the examination table with her non-dominant arm flexed at the elbow and externally rotated so that her wrist is parallel to her ear and her hand is positioned next to her head:

- » Identify anatomical surface markings to establish area of insertion which is the inner side of the non-dominant upper arm about 8–10 cm above the medial epicondyle of the humerus, avoiding the sulcus (groove) between the biceps and triceps muscle and the large blood vessels and nerves situated in the neurovascular bundle deeper in the subcutaneous tissue.
- » Clean the insertion site with an antiseptic solution.
- » Anaesthetise the insertion area.
- » Mark the insertion site with a marker.
- » Insert subdermally at inner side of the non-dominant upper arm about 8–10 cm above the medial epicondyle of the humerus.
- » Remove the transparent protection cap by sliding it horizontally in the direction of the arrow away from the needle.
- » Puncture the skin with the tip of the needle slightly angled less than 30°.
- » Lower the applicator to a horizontal position. While lifting the skin with the tip of the needle, slide the needle to its full length. You should be able to see the applicator just below the skin. Be seated, looking at the applicator from the side and NOT from above to clearly see the insertion and positioning of the needle just under the skin.
- » While keeping the applicator in the same position and the needle inserted to its full length, unlock the purple slider by pushing it slightly down. Move the slider fully back until it stops.
- » The implant is now in its final subdermal position. Remove the applicator.
- » Always verify the presence of the implant in the patients arm immediately after insertion by palpation and allow the patient to feel the implant as well.
- » Apply sterile gauze with a pressure bandage to minimise bruising. The patient may remove the pressure bandage in 24 hours and the small bandage over the insertion site after 3–5 days.

<u>Insertion of levonorgestrel 2 x 75 mg implants:</u>

- » Clean the patient‘s upper arm with an antiseptic solution.
- » The optimal insertion area is in the medial aspect of the upper arm about 6-8 cm above the fold of the elbow.
- » The implants will be inserted subdermally through a small 2 mm incision, in the shape of a narrow V, opening towards the armpit.
- » Anaesthetise the insertion area.
- » Mark the insertion site with a marker.
- » Open the implant pouch by pulling apart the film of the pouch and let the two implants drop on a sterile cloth. Note: Always use sterile gloves or forceps when handling the implants. If an implant is contaminated, e.g. falls on the floor leave it for later disposal. Open a new package and continue with the procedure.
- » The implant is provided with a disposable trocar that is sharp enough to penetrate the skin directly. Thus the disposable trocar can be used to puncture the skin and insert the rods, without the need for an incision.
- » The trocar has two marks. One mark is close to the handle and one close to the tip. When inserting the implants, the mark closest to the handle indicates, how far the trocar should be introduced under the skin before the loading of each implant. The mark closest to the tip indicates how much of the trocar should be left under the skin after the insertion of the first implant. When inserting the trocar, avoid touching the part of the trocar that will go under the skin.

» Once the tip of the trocar is beneath the skin it should be directed along the skin horizontally by pointing slightly up-wards toward the raising the skin (tenting) to keep the implant in the subdermal plane. Throughout the insertion procedure, the trocar should be oriented with the bevel up.
» It is important to keep the trocar subdermal by tenting the skin with the trocar, as failure to do so may result in deep placement of the implants causing a more difficult removal. Advance the trocar beneath the skin about 5.5 cm from the incision to the mark closest to the handle of the trocar. Do not force the trocar, and if you feel any resistance, try another direction.
» Remove the plunger when the trocar is advanced to the correct mark.
» Load the first implant into the trocar either with tweezers or fingers.
» Push the implant gently with the plunger to the tip of the trocar until you feel resistance. Never force the plunger.
» Hold the plunger steady and pull the trocar back along it until it touches the handle of the plunger. It is important to keep the plunger steady and not to push the implant into the tissue.
» Do not completely remove the trocar until both implants have been placed. The trocar is withdrawn only to the mark closest to its tip.
» When you can see the mark near the tip of the trocar in the incision, the implant has been released and will remain in place beneath the skin. You can check this by palpation.
» Insert the second implant next to the first one, to form a V shape. Fix the position of the first implant with the left fore-finger and advance the trocar along the side of the finger. This will ensure a suitable distance between implants. To prevent expulsions, leave a distance of about 5 mm between the incision and the ends of the implants. You can check their correct position by cautious palpation of the insertion area.
» After inserting the second implant, the edges of the incision are pressed together, closed with a skin closure and dressed.
» Advise the patient to keep the insertion area dry for 3 days.
» The gauze and the bandage may be removed as soon as the incision has healed, usually after 3–5 days.

<u>For pain after insertion:</u>

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 5 days.

<u>Removal of progestin-only subdermal implants:</u>

Remove etonogestrel implants at the end of 3 years and levonorgestrel implants at the end of 5 years.

» Locate the implant by palpation. If impalpable refer for ultrasound removal.
» Clean the removal site with an antiseptic solution.
» Anaesthetise the removal area.
» Push down the proximal end of the implant and a bulge may appear to indicate the distal end of the implant.
» Make a 2-4 mm vertical incision with the scalpel close to the distal end of the implant, towards the elbow.
» Remove the implant very gently, using a small forceps (preferably curved mosquito forceps). Where an implant is encapsulated, dissect the tissue sheath to remove the implant with the forceps.

» Confirm that the complete implant has been removed by measuring the length (etonogestrel rod: 40 mm; levonorgestrel rods: 43 mm). Close the incision with a steristrip or plaster and dress.
» Advise the patient to keep the arm dry for a few days.
» Confirm that the entire implant has been removed by measuring its length.

REFERRAL

» Heavy or prolonged bleeding, despite treatment with COCs.
» Infection at insertion site, inadequately responding to initial course of antibiotic treatment. See Section 5.4.3: Cellulitis.
» Failure to locate an implant (in the arm) by palpation.

7.2.2 INJECTABLE

Z30.0/Z30.4

Dual protection with barrier methods is recommended to reduce the risk of STIs, including HIV.

- Progestin-only injectable contraceptive, e.g.:
- Medroxyprogesterone (long-acting), IM, 150 mg, 12 weekly. *LoE:I*[152]

Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding. Consult the package insert in this regard.

When to start the injection

» The injection can be started anytime within the menstrual cycle, provided pregnancy has been excluded. If the first injection is given within 7 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of the first injection.
» If started after day 7, abstinence from intercourse or use condoms for the next 7 days.
» Can be used postpartum. *LoE:III*[153]

Late injection

» If it has been < 2 weeks since the missed injection, the next injection can be given without loss of protection. Continue with dual contraceptive method, i.e. condom in combination with the injection.
» If it has been > 2 weeks since the missed injection, exclude pregnancy:

Pregnancy test positive	Pregnancy test negative or unavailable
» Refer for ante-natal care (See Section 6.4: Antenatal care). ***or*** » TOP, see Section 6.3: Termination of pregnancy (TOP).	» Provide emergency contraception, if indicated (see Section: 7.4 Contraception, emergency). » Administer the next injection. » Abstain from intercourse or use condoms to prevent pregnancy for the next 7 days.

LoE:III[154]

There is uncertainty of the risk of HIV acquisition associated with progestin injectable contraceptives (Refer to the WHO MEC 2017 guidelines[155]). Dual protection is recommended.

REFERRAL

Heavy or prolonged bleeding, despite adequate treatment with combined oral contraceptives. See Section 7.6: Breakthrough bleeding with contraceptive use.

7.2.3 ORAL

Z30.0/Z30.4

Dual contraception with barrier methods, are preferred to reduce the risk of STIs, including HIV.

Monophasic preparations:

- Progestin only pills, e.g.:
- Levonorgestrel, oral, 30mcg daily. *LoE:III*[156]
- Progestins and estrogen, fixed combinations, e.g.:
- Ethinylestradiol/ levonorgestrel, oral, 30 mcg/150 mcg:
  - 21 tablets ethinylestradiol/levonorgestrel, 30 mcg/150 mcg and
  - 7 tablets placebo. *LoE:III*[157]

Triphasic preparations:

- Progestins and estrogen, sequential preparations, e.g.:
- Ethinylestradiol/levonorgestrel, oral:
  - 6 tablets ethinylestradiol/levonorgestrel,30 mcg/50 mcg
  - 5 tablets ethinylestradiol/levonorgestrel, 40 mcg/75 mcg and
  - 10 tablets ethinylestradiol/levonorgestrel,30 mcg/125 mcg and
  - 7 tablets placebo. *LoE:III*[158]

Patient counselling:

» Hormonal oral pills must be taken at the same time every day without interruption.
» Taking the hormonal oral pill with food or at bedtime may alleviate nausea.
» If the patient is not using dual contraception with hormonal oral contraceptives and vomits within 2 hours, or has severe diarrhoea within 12 hours of taking the hormonal oral pill, repeat the dose as soon as possible. Recommend condom use.
» Women who have persistent vomiting or severe diarrhoea resulting in two or more missed pills follow instructions for missed pills. See section 7.2.4, Recommend the use of condoms.

Contraindications and guidance to starting the oral pill

	Progestin only	**Combined estrogen/progestin**
Contra-indications	Progestin only preparations are contraindicated in certain conditions (Consult the package insert in this regard). Contraindications include: » Abnormal uterine bleeding of unknown cause. » Myocardial infarction/stroke. » Liver disease. » Cancer of the breast/ genital tract. » Known or suspected pregnancy. *LoE:III*[159]	Combination preparations contraindicated in certain conditions (Consult the package insert in this regard). Contraindications include: » Women >35 years of age who smoke ≥ 15 cigarettes a day or have risk factors for cardiovascular disease: – heart disease – liver disease – thromboembolism – certain cancers
When to start the pill	» Start anytime within the menstrual cycle, but it is advisable to start during menses. » If the first pill is given between days 1 and 5 of the menstrual cycle the contraceptive effect is achieved immediately.	

	» Dual contraception use is recommended irrespective of when the pill is started in the menstrual cycle.

Medicine interactions

Enzyme-inducing medicines interacting with oral contraceptives		Recommendation
Therapeutic class	**Examples**	
Anti-tuberculosis	Rifampicin	Use IUCD or alternatively use dual contraception e.g. condoms in combination with COCs.
Anti-epileptics	Phenobarbital	
	Phenytoin	
	Carbamazepine	
Antiretrovirals	Nevirapine	
	Lopinavir/ritonavir	
	Efavirenz	

Non-liver enzyme inducing medicines

Lamotrigine:

» Lowering of contraceptive effect not expected.

» Oral contraceptives may reduce lamotrigine concentration by 50%, increasing the risk of seizures. Consider alternative dual contraception method.

Breastfeeding

» Women who are intending to breastfeed should delay initiation of COCs until cessation of breastfeeding or at 6 months postpartum, whichever occurs earlier.

REFERRAL

Abnormal vaginal bleeding for > 3 months.

7.2.4 MISSED PILLS

Progestin only pills

Efficacy is rapidly lost if one pill is forgotten or taken > 3 hours late. Recommend dual contraception for all scenarios.

Scenario	Action
One pill forgotten or if pill taken >3 hours late and unprotected sexual intercourse has not occurred in the past 5 days.	Take pill as soon as remembered and continue taking one pill daily at the same hour.
One pill forgotten or if taken > 3 hours late and unprotected sexual intercourse has occurred in the past 5 days.	Give emergency contraception (see Section 7.4). Take one pill the next day and continue taking one pill daily at the same hour.

Combination of progestin and estrogen in each pill

Missing active pills and extending hormone free interval leads to decreased contraceptive efficacy. Recommend dual contraception for all scenarios. *LoE:III*[160]

Scenario	Action
One active pill forgotten.	Take pill as soon as remembered and take next one at usual time.
≥ Two pills forgotten during the first 7 active pills of the pack and sexual intercourse has occurred in the past 5 days.	Give emergency contraception (see Section 7.4). Restart active pills 12 hours later.

≥ Two pills forgotten during the middle 7 active pills of the pack.	Take the most recent missed pill immediately (discard the others). Continue taking remaining pills as usual. No emergency contraception required.
≥ Two pills forgotten in the last 7 active pills of the pack and sexual intercourse has occurred in past 5 days.	Continue active pills of current pack. Omit the inactive pills and immediately start the active pills of the next pack.

7.3 CONTRACEPTION, BARRIER METHODS

Z30.0/Z30.4/Z30.5

Condoms (male and female) alone are not the most effective contraceptive method and should be used in combination with other contraceptive methods (e.g. copper IUCD). Condoms are recommended to reduce the risk of the acquisition of STIs and HIV infection.

Condoms (male and female) or other barrier methods may be an option for contraception where other methods are contraindicated.

7.4 CONTRACEPTION, EMERGENCY

Z30.0/Z30.4

Emergency contraception is the use of a contraceptive method following an episode of unprotected sexual intercourse to reduce the risk of pregnancy. Women should be told that their period should be on time, very rarely it is delayed but it will not be more than 7 days late. If this occurs, they should come back for a pregnancy test.

Emergency contraception is indicated to prevent pregnancy after unprotected intercourse in women not using contraception or where contraception is likely to be ineffective:

» forgotten tablets (See Section 7.2.4: Missed pills)
» slipped or broken condom
» injection given > 2 weeks late
» sexual assault

- Levonorgestrel 1.5 mg, oral, as a single dose as soon as possible after unprotected intercourse, and not later than 5 days.
  - Repeat the dose, if woman vomits within 2 hours.

OR

- Copper IUCD, e.g.:
- Cu T380A, inserted as soon as possible after unprotected intercourse and not later than 5 days.

CAUTION

Emergency contraceptive tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse, and not later than 5 days.

Enzyme inducers (including efavirenz, carbamazepine) cause a significant reduction in levonorgestrel concentrations. Women on these medicines should preferably have copper IUCD inserted or alternatively double the dose of levonorgestrel, because of significant reduction of levonorgestrel. Women > 80 kg or BMI ≥ 30 should also be given twice the standard dose.

LoE:III[161]

REFERRAL
Patients in need of emergency contraception must be referred for HIV counselling and testing and PEP.

7.5 VOLUNTARY STERILISATION, MALE AND FEMALE
Z30.2

Female sterilisation
Also known as tubal occlusion or tubal ligation. This is a permanent, surgical contraceptive method for women who do not intend to have more children.
Women who opt for sterilisation should be adequately counselled and referred.

Male sterilisation
Also known as vasectomy. This is a permanent surgical contraceptive method for men who do not want more any children.
Men who opt for this method should be adequately counselled and referred.

CAUTION
Sterilisation does not protect against sexually transmitted infections (STIs), including HIV. If there is a risk of STI/HIV, the correct and consistent use of condoms is recommended.

LoE:III[162]

7.6 BREAKTHROUGH BLEEDING WITH CONTRACEPTIVE USE
N92.0/N92.1/N92.4

DESCRIPTION
Breakthrough bleeding refers to unscheduled or irregular vaginal bleeding which often presents as spotting, prolonged or frequent bleeding in women using hormonal contraception. The pattern and duration of these unscheduled bleedings vary with the contraceptive method used.

GENERAL MEASURES
Counselling prior to commencement of hormonal contraception must be offered to women regarding possible bleeding patterns, both initially and in the longer term.

Clinical assessment:

» Current method of contraception and duration of use.
» Drug interactions.
» Cervical screening history.
» Risk of sexual transmitted infections (e.g. Chlamydia trachomatis).
» Menstrual and break though bleeding history prior to current method being initiated.
» Exclude pregnancy.

MEDICINE TREATMENT

CAUTION
Before starting hormonal contraception, women should be advised about the expected bleeding patterns, both initially and in the longer term.

Hormonal contraceptives causing breakthrough bleeding	Treatment
Progestin-only injectables	• COC containing 30 mcg ethinylestradiol, oral, for 14 days. *LoE:III*[163]
Progestin subdermal implants	• Ethinylestradiol/levonorgestrel, oral, 30/150 mcg, daily for 20 days.
Combined oral contraceptive pill » Unscheduled bleeding with COC usually settles with time. » Changing to another COC in the first 3 months is not recommended.	• Change COC to a COC containing the lowest dose of ethinylestradiol, oral, daily. If bleeding persists: • Change COC to a COC containing 35 mcg ethinylestradiol, oral, daily. *LoE:III*

REFERRAL

» Pelvic pain.
» Pelvic mass.
» Heavy bleeding.
» Abnormal cervix on speculum examination (e.g. polyps).
» Bleeding not controlled by treatment above.

PHC Chapter 8: Kidney and urological disorders

Kidney disorders

Urology disorders

KIDNEY DISORDERS

8.1 CHRONIC KIDNEY DISEASE (CKD)

N18.1-5/N18.9

CAUTION
Check all medicines for possible dose adjustment based on eGFR/CrCl.

The doses of many medicines need to be adjusted in renal impairment. Recommendations for medicines that require dose adjustment in renal impairment can be found in the SAMF, package insert, and from many online resources e.g.: http://www.globalrph.com/index_renal.htm

LoE:III[164]

DESCRIPTION

Structural or functional kidney damage present for > 3 months, with or without a decreased glomerular filtration rate (eGFR).

Markers of kidney damage include:

» abnormalities in urine e.g. proteinuria or haematuria
» abnormalities in blood e.g. serum creatinine or low eGFR
» abnormalities in imaging tests e.g. small kidneys or cysts on ultrasound
» abnormalities on pathological specimens e.g. glomerular disease on renal biopsy

Common causes of chronic kidney disease include:

» hypertension
» diabetes mellitus
» glomerular diseases
» polycystic kidney disease
» HIV/AIDS

Chronic kidney disease can be entirely asymptomatic, BUT early detection and management can improve the outcome of this condition.

Treatment and prevention strategies according to prognostic category

Estimation of the degree of kidney damage is important to guide management to prevent adverse outcomes of chronic kidney disease.

Use eGFR and albumin creatinine ratio to put patient into prognostic category - see table below.

Note:

» Adults with mild to moderate decline in eGFR and no albuminuria can all be managed at primary care level once the cause and plan for care has been established.
» All children should be referred for investigation and initial management.

Prognosis of CKD by GFR and albuminuria categories: KDIGO 2012

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				ACR* <30 mg/g <3mg/mmol	ACR* 30–300 mg/g 3–30 mg/mmol	ACR* >300 mg/g >30 mg/mmol
eGFR categories (ml/min per 1.73m2) description and range	G1	Normal or high	≥90		Refer	Refer
	G2	Mildly decreased	60–89		Refer	Refer
	G3a	Mildly to moderately decreased	45–59		Refer	Refer
	G3b	Moderately to severely decreased	30–44	Refer	Refer	Refer
	G4	Severely decreased	15–29	Refer	Refer	Refer
	G5	Kidney failure	<15	Refer	Refer	Refer

*ACR: albumin to creatinine ratio in urine specimen.

Green: low risk (if no other markers of kidney disease, no CKD); yellow: moderately increased risk; orange: high risk; red: very high risk; A1, A2, A3 = categories of albuminuria; G1, G2, G3a, G3b, G4, G5 = categories of eGFR

Adapted from: Levin A, Stevens PE. Summary of KDIGO 2012 CKD Guideline: behind the scenes, need for guidance, and a framework for moving forward. Kidney Int. 2014 Jan;85(1):49-61. https://www.ncbi.nlm.nih.gov/pubmed/24284513

Send blood annually for measurement of creatinine in all patients at increased risk. (eGFR will be calculated by the laboratory, based on the serum creatinine).

GENERAL MEASURES

» Reduce salt intake.
» Low protein diet is indicated in the presence of CKD stage 4 and 5.
» Reduce cardiovascular disease risk factors. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.
» Avoid nephrotoxic drugs e.g. NSAIDs, tenofovir.
» Screen for proteinuria.
  - If urine dipstick 1+ or greater, repeat on a properly collected midstream urine specimen on another occasion. If proteinuria persists, quantify protein with a spot urine protein creatinine ratio. Significant proteinuria = spot urine protein creatinine ratio of > 0.1 g/mmol. This is equivalent to 1g per 24 hours.
  - **Note:** Proteinuria is screened for differently in diabetics. See Section 9.4.3: Diabetic nephropathy.

MEDICINE TREATMENT

Treat underlying conditions.

Proteinuria

Measure serum potassium at baseline.

Adults

- ACE-inhibitor, e.g.:

- Enalapril, oral, start with 5 mg 12 hourly.
  - Titrate up to 10 mg 12 hourly, if tolerated.
  - Start with low dosage of ACE-inhibitor and titrate up to the maximum dose or until the proteinuria disappears – whichever comes first. Ensure BP remains in normal range and no side effects are present.
  - Monitor creatinine and potassium:
    - 1–2 weeks after treatment initiation, if eGFR < 60 mL/min and after 4 weeks, if eGFR > 60 mL/min.
    - If creatinine increases by > 20% from the baseline, stop ACE-inhibitor and refer.
    - If stable, monitor thereafter at regular clinic visits. *LoE:III*

» ACE-inhibitors are contraindicated in, amongst others:
- hyperkalaemia
- known hypersensitivity to an ACE-inhibitor or an ARB
- bilateral renal artery stenosis
- pregnancy
- severe renal impairment (eGFR < 30 mL/min)

Hyperlipidaemia
If hyperlipidaemia is a co-existent risk factor, manage according to Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Diabetes mellitus
» In diabetics, optimise control according to Section 9.1.2: Diabetes mellitus type 2, in adults.
» Replace oral sulphonylureas with insulin when eGFR < 60 mL/min, because of an increased risk of hypoglycaemia.
» Replace metformin with insulin when eGFR < 30 mL/min, because of the potential risk of lactic acidosis.
» Insulin is preferred to control blood glucose in patients with eGFR < 30 mL/min.

Hypertension
Treat if present. See Section 4.7: Hypertension.

Fluid overload
Treat fluid overload if present and refer.

Adults
- Furosemide, slow IV or oral, 40–80 mg, 12 hourly.
  - If poor response, repeat after 1 hour.
  - Do not give IV fluids – use heparin lock or similar IV access.

Children
- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 23.5.
  - Do not put up a drip or run in any IV fluids.

Note: Exclude heart failure in patients with persistent pedal oedema.

REFERRAL
» All cases of suspected chronic kidney disease stages 3–5 for assessment and planning.

» All children.
» All cases of CKD with:
  - haematuria
  - significant proteinuria with urine protein creatinine ratio of > 0.1 g/mmol
  - eGFR < 60 mL/min for initial assessment and planning
  - eGFR < 30 mL/min
» Uncontrolled hypertension/fluid overload.
» CKD associated with hyperlipidaemia.
» No reduction of proteinuria with ACE-inhibitor therapy.
» If ACE-inhibitors are contra-indicated.
» If ACE-inhibitors are not tolerated.

Patients who might qualify for dialysis and transplantation or who have complications should be referred early to ensure improved outcome and survival on dialysis, i.e. as soon as eGFR drops < 30 mL/min, or as soon as diagnosis is made/suspected.

8.2 ACUTE KIDNEY INJURY

N17.9

DESCRIPTION

This is (potentially) reversible kidney failure, commonly as a result of:

» hypovolaemia and fluid loss
» medicines/toxins
» urinary tract obstruction
» acute tubular necrosis
» acute glomerulonephritis

It is often recognised by:

» fluid overload (e.g. pulmonary oedema)
» decreased or no urine output
» abnormalities of serum urea, creatinine and/or electrolytes
» convulsions in children

GENERAL MEASURES

» Give oxygen, and nurse in Semi-Fowlers position if patient has respiratory distress. Early referral is essential.
» If fluid overloaded:
  - stop all IV fluids
» If dehydrated or shocked:
  - treat immediately as shock. See Section 21.2.9: Shock.
» Stop and avoid any nephrotoxic medicines e.g. NSAIDs, aminoglycosides.

MEDICINE TREATMENT

Children

<u>If fluid overloaded (rapid respiration, chest indrawing):</u>

- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing table, pg 23.5.
  - Do not put up a drip or run in any IV fluids.

If hypertension present:

< 6 years of age: > 120 mmHg systolic BP **or** > 90 mmHg diastolic BP
6–15 years: > 130 mmHg systolic BP **or** > 95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - Withdraw contents of 5 mg capsule with a 1 mL syringe:

10–25 kg:	2.5 mg
25–50 kg:	5 mg
>50 kg:	10 mg

Adults

If fluid overloaded/respiratory distress:

- Furosemide, as an IV bolus, 80 mg.
  - Do not put up a drip and do not give a fluid infusion.

If hypertension present:

Diastolic BP > 100 mmHg or systolic BP > 150 mmHg:

- Amlodipine, oral, 5 mg as a pre-referral dose.

AND

- Furosemide, oral, 40–80 mg as a pre-referral dose (if current eGFR unknown or < 30 mL/min).

LoE:III[165]

REFERRAL

All cases.

8.3 GLOMERULAR DISEASES (GN)

DESCRIPTION

Glomerular disease may be a result of a primary condition of the kidney, or may be secondary to a systemic disorder. Can present with any, or a combination of the following:

» proteinuria
» reduced eGFR
» haematuria
» hypertension and oedema

Approach to care is outlined under the syndromes which follow.

Diabetic nephropathy

See Section 9.4.3 Diabetic nephropathy.

REFERRAL

» Unexplained haematuria on two to three consecutive visits.
» Proteinuria > 1 g/24 hours or PCR > 0.1 g/mmol
» Elevated or rising creatinine.
» Nephritic syndrome.
» Nephrotic syndrome.
» Chronic Kidney Disease.

Note: Where facilities are available, investigation should be done e.g. creatinine to calculate the eGFR or PCR.

8.3.1 NEPHRITIC SYNDROME

N05.9

DESCRIPTION

Presents with a varied combination of:

» painless macroscopic turbid, bloody or brownish urine
» peripheral and periorbital oedema
» pulmonary oedema (circulatory overload)
» hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions
» little or no urine excretion

In children, this is commonly due to acute post streptococcal glomerulonephritis.

GENERAL MEASURES

» Give oxygen, and nurse in Semi-Fowlers position if patient has respiratory distress.
» Early referral essential, especially if patient had a hypertensive episode or fluid overload.
» If dehydrated or shocked: Treat immediately. (See Section 21.2.9: Shock).

MEDICINE TREATMENT

For management see Section 8.2: Acute kidney injury.

REFERRAL

All cases.

The definitive treatment of nephritis depends on the cause – an assumption of acute post streptococcal nephritis or any other disease cannot be made without specific investigation which may include renal biopsy.

8.3.2 NEPHROTIC SYNDROME

N04.9

DESCRIPTION

Glomerular disease characterised by:

» severe proteinuria defined as:
  - children: ≥ 3 + proteinuria on dipstick test, or urine protein: creatinine ratio (PCR) ≥ 0.2 g/mmol on spot urine sample
  - adults: ≥ 2.5 g/day, as determined by a spot urine protein measurement, i.e. PCR > 0.25 g/mmol
» and resultant 'classic' clinical picture (not always present) which includes:
  - oedema,
  - hypoalbuminaemia,
  - hyperlipidaemia.

Accurate diagnosis requires a renal biopsy.

MEDICINE TREATMENT

The management of glomerular disease depends on the type/cause of the disease and is individualised, guided by a specialist according to the biopsy result.

REFERRAL
All cases.

8.4 URINARY TRACT INFECTION (UTI)
N30.9/N39.0/O23.4

DESCRIPTION
Urinary tract infections may involve the upper or lower urinary tract. Infections may be complicated or uncomplicated. Uncomplicated UTI is a lower UTI, where there are no functional or anatomical anomalies in the urinary tract, no renal impairment, or no concomitant disease that would promote the UTI.

Differentiation of upper from lower urinary tract infection in young children is not possible on clinical grounds.

Upper UTI is a more serious condition and requires longer and sometimes intravenous treatment.

Features of upper UTI (pyelonephritis) that may be detected in adults and adolescents include:

» flank pain/tenderness
» temperature 38oC or higher
» other features of sepsis, i.e.:
  - tachypnoea,
  - tachycardia,
  - confusion
  - hypotension
» vomiting

In complicated, recurrent or upper UTIs, urine should be sent for microscopy, culture and sensitivity.

Features of urinary tract infections in children

Signs and symptoms are related to the age of the child and are often non-specific.
Uncomplicated urinary tract infections may cause very few signs and symptoms.
Complicated infections may present with a wide range of signs and symptoms.
Neonates may present with:

» fever
» poor feeding
» vomiting
» failure to thrive
» hypothermia
» sepsis
» prolonged jaundice
» renal failure

Infants and children may present with:

» failure to thrive
» persisting fever
» abdominal pain
» diarrhoea
» frequency
» dysuria
» enuresis or urgency

In any child with fever of unknown origin, the urine must be examined, to assess whether a urinary tract infection is present.

Perform a dipstix test on a fresh bag urine specimen.

DIPSTIX RESULT	ACTION
No leukocytes/ nitrites	UTI unlikely
Leukocytes only	Repeat dipstix on a second specimen. If leucocytes on second specimen, suspect UTI and treat empirically. Collect urine aseptically if possible for urine MC&S.
Leukocytes or nitrites with symptoms of UTI	Treat empirically for UTI. Collect urine aseptically if possible for urine MC&S.
Leukocytes and nitrites	Collect urine aseptically if possible for urine MC&S. Treat empirically for UTI.

GENERAL MEASURES

» Women with recurrent UTIs should be advised to:
» void bladder after intercourse and before retiring at night
» not postpone voiding when urge to micturate occurs
» change from use of diaphragm to an alternative type of contraception

MEDICINE TREATMENT

Empirical treatment is indicated only if:
» positive leukocytes and nitrites on freshly passed urine, or
» leucocytes or nitrites with symptoms of UTI, or
» systemic signs and symptoms.

Alkalinising agents are not advised.

Uncomplicated cystitis

Adults

- Gentamicin, IM, 160 mg, as a single dose.
  - **Note:** Gentamicin should not be used in patients with known chronic kidney disease or pregnancy. *LoE:II*[166]

If gentamicin is unavailable/ contra-indicated:

- Fosfomycin, oral, 3 g as a single dose. *LoE:I*[167]

If fosfomycin is unavailable:

- Nitrofurantoin, oral, 100 mg 6 hourly for 5 days. *LoE:III*[168]

Complicated cystitis

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 7 days.

Children ≤ 35 kg who do not meet criteria for urgent referral:

- Amoxicillin/clavulanic acid, oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 7 days.

Weight kg	**Dose** mg (amoxicillin component)	**Use one of the following**			**Age** months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months

>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

LoE:III[169]

Acute pyelonephritis

N10

Outpatient therapy is only indicated for women of reproductive age, who do not have any of the manifestations requiring referral (see referral criteria below). All other patients should be referred.

- Ciprofloxacin, oral, 500 mg 12 hourly for 7–10 days.
  - It is essential to give at least a 7-day course of therapy.

REFERRAL

Urgent

» Acute pyelonephritis with:
  - vomiting
  - sepsis
  - diabetes mellitus

» Acute pyelonephritis in:
  - pregnant women
  - women beyond reproductive age
  - men

» Children >3 months of age who appear ill.

» Children <3 months of age with any UTI.

Ill patients awaiting transfer

» Ensure adequate hydration with intravenous fluids.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing tables, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

Non-urgent

» All proven UTIs (positive culture) in children after completion of treatment.

» No response to treatment.

» UTI > 3 times within a one-year period in women, and more than once in men.

» Recurrent UTI in children for assessment and consideration of prophylaxis.

8.5 PROSTATITIS

N41.0/N41.9 + (N34.2)

DESCRIPTION

Infection of the prostate caused by urinary or STI pathogens.
Clinical features include:

» perineal, sacral or suprapubic pain
» dysuria and frequency
» varying degrees of obstructive symptoms which may lead to urinary retention
» sometimes fever
» acutely tender prostate on rectal examination

The condition may be chronic, bacterial or non-bacterial, the latter usually being assessed when there is failure to respond to antibiotics.

MEDICINE TREATMENT

Acute bacterial prostatitis

In men ≤ 35 years of age or if there are features of associated urethritis (STI regimen):

- Ceftriaxone, IM, 250 mg as a single dose.

AND

- Azithromycin, oral, 1 g as a single dose.

In men > 35 years of age or if there is associated cystitis:

- Ciprofloxacin, oral, 500 mg 12 hourly for 14 days. *LoE:III*[170]

REFERRAL

» No response to treatment.
» Urinary retention.
» High fever.
» Chronic/relapsing prostatitis.

UROLOGY DISORDERS

8.6 HAEMATURIA

R31

DESCRIPTION

Bleeding from the urinary tract, which can be from the kidneys, collecting system, bladder, prostate and urethra.

Glomerular disease is suggested if proteinuria, red blood cell casts and/or dysmorphic red blood cells are present on microscopy.

Exclude schistosomiasis (bilharzia), a common cause of haematuria.

When haematuria is accompanied by colicky pain a kidney stone should be excluded.

Note: The presence of blood on the urine test strips does not indicate infection and should be investigated as above.

MEDICINE TREATMENT

If evidence of schistosomiasis, treat as in Section 10.12: Schistosomiasis.

If symptoms of UTI; leucocytes and/or nitrite test positive in urine, treat as UTI.

If haematuria does not resolve rapidly after treatment referral for formal investigation will be required, i.e. next 48 hours.

REFERRAL

» All cases not associated with schistosomiasis or UTI.
» All cases not responding to specific medicine treatment.
» When glomerular disease is suspected.

8.7 BENIGN PROSTATIC HYPERPLASIA (BPH)

N40

DESCRIPTION

BPH is a noncancerous (benign) growth of the prostate gland.

May be associated with both obstructive (weak, intermittent stream and urinary hesitancy) and irritative (frequency, nocturia and urgency) voiding symptoms.

Digital rectal examination reveals a uniform enlargement of the prostate.

Urinary retention with a distended bladder may be present in the absence of severe symptoms, therefore it is important to palpate for an enlarged bladder during examination.

GENERAL MEASURES

Annual follow-up with digital rectal examination.

For patients presenting with urinary retention, insert a urethral catheter as a temporary measure while patient is transferred to hospital.

Remove medicines that prevent urinary outflow e.g. tricyclic antidepressants, neuroleptics.

REFERRAL

All patients with suspected BPH.

8.8 PROSTATE CANCER

C61/D07.5/D29.1/D40.0

DESCRIPTION

Usually occurs in men >50 years of age and is most often asymptomatic.
Systemic symptoms, i.e. weight loss, bone pain, etc. occurs in 20% of patients.
Obstructive voiding symptoms and urinary retention are uncommon.
The prostate gland is hard and may be nodular on digital rectal examination.
As the axial skeleton is the most common site of metastases, patients may present with back pain or pathological spinal fractures.
Lymph node metastases can lead to lower limb lymphoedema.

REFERRAL

All patients with suspected cancer.

8.9 ENURESIS

F98.0

DESCRIPTION

Enuresis is bedwetting that occurs in children > 5 years of age.
It is a benign condition which mostly resolves spontaneously.
It is important, however, to differentiate between nocturnal enuresis and daytime wetting with associated bladder dysfunction.
Secondary causes of enuresis include:

» diabetes mellitus
» urinary tract infection
» physical or emotional trauma

Note:

» Clinical evaluation should attempt to exclude the above conditions.
» Urine examination should be done on all patients.

GENERAL MEASURES

» Motivate, counsel and reassure child and parents.
» Advise against punishment and scolding.
» Spread fluid intake throughout the day.
» Diapers are not advised, as this will lower the child's self-esteem.

REFERRAL

» Suspected underlying systemic illness or chronic kidney disease.
» Persistent enuresis in a child.
» Diurnal enuresis.

8.10 IMPOTENCE/ERECTILE DYSFUNCTION

N48.4/F52.2

DESCRIPTION

The inability to attain and maintain an erect penis with sufficient rigidity for penetration. Organic causes include neurogenic, vasculogenic, endocrinological (e.g. diabetes mellitus) as well as many systemic diseases and medications.

GENERAL MEASURES
» Thorough medical and psychosexual history.
» Physical examination should rule out gynaecomastia, testicular atrophy or penile abnormalities.
» Consider the removal of medicines (e.g. beta-blockers) that may be associated with the problem.
» A change in lifestyle or medications may resolve the problem, e.g. advise cessation of smoking and alcohol use.

TREATMENT
Treat the underlying condition.

8.11 RENAL CALCULI
N20.0

DESCRIPTION
This is a kidney stone or calculus which has formed in the renal tract i.e. pelvis, ureters or bladder as a result of urine which is supersaturated with respect to a stone-forming salt.
Clinical features of obstructing urinary stones may include:
» sudden onset of acute colic, localised to the flank, causing the patient to move constantly,
» nausea and vomiting,
» referred pain to the scrotum or labium on the same side as the stone moves down the ureter.

Urinalysis usually reveals microscopic or macroscopic haematuria.

GENERAL MEASURES
Ensure adequate hydration.

MEDICINE TREATMENT
Adults:
Analgesia for pain, if needed:
- Morphine, IM, 0.1 mg/kg 30 minutes before aspiration procedure, to a maximum of 10 mg (Doctor initiated). *LoE:III*

REFERRAL
All patients.

PHC Chapter 9: Endocrine conditions

9.1 TYPE 1 DIABETES MELLITUS

DESCRIPTION

Type 1 diabetes mellitus, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM), occurs because of a lack of insulin. The result is an increase in blood glucose concentration.

CLINICAL PRESENTATION

- » hunger
- » polyuria
- » ketoacidosis
- » thirst
- » unexplained weight loss
- » tiredness

DIAGNOSIS

Type 1 diabetes mellitus is diagnosed when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:

- » Random blood glucose ≥ 11.1 mmol/L.
- » Random is defined as any time of day without regard to time since last meal.

OR

- » Fasting blood glucose ≥ 7.0 mmol/L.
- » Fasting is defined as no caloric intake for ≥ 8 hours.

OR

- » 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l. *LoE:III*[171]

GENERAL MEASURES

- » Education regarding diabetes and its complications.
- » Even and regular meal consumption.
- » Dietary emphasis should be on regulating carbohydrate, fibre and fat intake (See Section 9.2.2: Type 2 Diabetes mellitus, in adults for recommended diet plan).
- » Increased physical activity: aim for 30 minutes 5 times a week.
- » Appropriate weight loss if body mass index > 25 kg/m2.
- » Education about foot care.
- » Monitor for development of depression.
- » All patients should wear a notification bracelet.

REFERRAL

All patients.

9.1.1 TYPE 1 DIABETES MELLITUS, IN CHILDREN AND ADOLESCENTS

E10.9

MEDICINE TREATMENT

Oral anti-diabetic medicines should not be used to treat children with type 1 diabetes mellitus.

REFERRAL

All children with confirmed or suspected type 1 diabetes mellitus must be referred to a hospital immediately for management.

9.1.2 TYPE 1 DIABETES MELLITUS, IN ADULTS

E10.9

Type 1 diabetes mellitus is a rare condition and should be diagnosed and monitored at hospital level. Only stable patients may be down referred for chronic medicines.

MONITORING FOLLOWING DOWN REFERRAL

At every visit:

» Finger-prick blood glucose.
» Weight.
» Blood pressure.

Annually:

» HbA1c, one month before next hospital appointment.

TARGETS FOR CONTROL

Glycaemic targets for control:

Patient type	Target HbA1c	Target FBG*	Target PPG*
» Young, low risk » Newly diagnosed » No CVS disease	< 6.5%	4.0–7.0 mmol/L	4.4–7.8 mmol/L
» Majority of patients	< 7.0%	4.0–7.0 mmol/L	5.0–10.0 mmol/L
» Elderly » High risk » Hypoglycaemic unawareness » Poor short-term prognosis	< 7.5%	4.0–7.0 mmol/L	< 12.0 mmol/L

***FBG: fasting blood glucose; PPG: post-prandial blood glucose.**

Non-glycaemic targets:

» Body mass index ≤ 25 kg/m2.
» BP < 140/90 mmHg.

The increased risk of hypoglycaemia must always be weighed against the potential benefit of reducing microvascular and macrovascular complications.

MEDICINE TREATMENT

As type 1 diabetes mellitus usually presents with diabetic ketoacidosis, treatment is usually initiated with insulin and the patient is stabilised at hospital level. Oral anti-diabetic medicines should not be used to treat type 1 diabetics.

Insulin dose requirements will decrease as kidney disease progresses.

Types of insulin

- Insulin, short acting, SC, three times daily, 30 minutes before meals.
  - Regular human insulin.
  - Onset of action: 30 minutes.

  - Peak action: 2–5 hours.
  - Duration of action: 5–8 hours.
- Insulin, intermediate acting, SC, once or twice daily usually at night at bedtime, approximately 8 hours before breakfast.
  - Intermediate acting insulin.
  - Onset of action: 1–3 hours.
  - Peak action: 6–12 hours.
  - Duration of action: 16–24 hours.
- Insulin, biphasic, SC, once or twice daily.
  - Mixtures of regular human insulin and intermediate acting insulin in different proportions, e.g. 30/70 (30% regular insulin and 70% intermediate acting insulin).
  - Onset of action: 30 minutes.
  - Peak action: 2–12 hours.
  - Duration of action: 16–24 hours.

Insulin regimens

Basal bolus regimen

All type 1 diabetics should preferentially be managed with the "basal bolus regimen" i.e. combined intermediate acting (basal) and short acting insulin (bolus). This consists of pre-meal, short acting insulin and bedtime intermediate acting insulin not later than 22h00.

The initial total daily insulin dose:

  - 0.6 units/kg body weight.

The total dose is divided into:

  - 40–50% basal insulin
  - The rest as bolus insulin, split equally before each meal.

Adjust dose on an individual basis.

Pre-mixed insulin

Twice daily pre-mixed insulin, i.e. a mixture of intermediate- or short acting insulin provides adequate control when used with at least daily blood glucose monitoring. It is a practical option for patients who cannot monitor blood glucose frequently.

Education related to insulin therapy

» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.
» Diet:
  - Meal frequency, as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night, about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patient receiving fixed mealtime doses of insulin.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.

Drawing up insulin from vials

» Clean the top of the insulin bottle with an antiseptic swab.

» Draw air into the syringe to the number of marks of insulin required and inject this into the bottle; then draw the required dose of insulin into the syringe.
» Before withdrawing the needle from the insulin bottle, expel the air bubble if one has formed.

Injection technique
» The skin need not be specially cleaned.
» Repeated application of antiseptics hardens the skin.
» Stretching the skin at the injection site is the best way to obtain a painless injection. In thin people, it may be necessary to pinch the skin between thumb and forefinger of one hand.
» The needle should be inserted briskly at almost 90□ to the skin to almost its whole length (needles are usually 0.6–1.2 cm long).
» Inject the insulin.
» To avoid insulin leakage, wait 5–10 seconds before withdrawing the needle.
» Injection sites must be rotated to avoid lipohypertrophy.

Prefilled pens and cartridges
In visually impaired patients and arthritic patients, prefilled pens and cartridges may be used.

Home blood glucose monitoring
Patients on basal/bolus insulin should measure glucose 3-4 times daily.
Once patient is stable, reduce the frequency of monitoring. *LoE:III*

REFERRAL
All patients.

9.2 TYPE 2 DIABETES MELLITUS

9.2.1 TYPE 2 DIABETES MELLITUS, IN ADOLESCENTS
E11.9

DESCRIPTION
The majority of adolescent diabetics are of type 1. However, an increasing number of adolescents are being diagnosed with type 2 diabetes mellitus.

Criteria for screening for diabetes in children
» Body mass index > 85th percentile for age and sex.
» Family history of type 2 diabetes mellitus.
» Presence of hyperlipidaemia, hypertension or polycystic ovarian syndrome.

AND
» Physical signs of puberty or age > 10 years of age.

DIAGNOSIS
» Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
  - Random is defined as any time of day without regard to time since last meal.
  - Classic symptoms of diabetes mellitus include polyphagia, polyuria, polydipsia.

OR

» Fasting blood glucose ≥ 7.0 mmol/L.
  - Fasting is defined as no caloric intake for ≥ 8 hours.

OR

» 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l. *LoE:III*[172]

It is difficult to distinguish type 2 from type 1 diabetes mellitus, as many type 1 diabetics may be overweight, or have a family history of type 2 diabetes mellitus, given the increasing prevalence of both obesity and type 2 diabetes mellitus. The diagnosis of type 2 diabetes mellitus in adolescents should be made in consultation with a specialist.

REFERRAL

All patients.

9.2.2 TYPE 2 DIABETES MELLITUS, ADULTS

E11.9

DESCRIPTION

Type 2 diabetes mellitus is a chronic debilitating metabolic disease characterised by hyperglycaemia with serious acute and chronic complications. It is an important component of the metabolic syndrome (see Section 9.5.1: Obesity in diabetes).
Most type 2 diabetes mellitus adults are overweight with a high waist to hip ratio.
In adults, the condition might be diagnosed when presenting with complications, e.g.:

» ischaemic heart disease
» peripheral artery disease
» stroke
» deteriorating eyesight
» foot ulcers
» erectile dysfunction

CLINICAL PRESENTATION

Symptoms of hyperglycaemia are:

» thirst, especially noticed at night
» polyuria
» tiredness
» periodic changes in vision due to fluctuations in blood glucose concentration
» susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note: It is important to distinguish type 2 diabetes mellitus from type 1diabetes mellitus. Suspect type 1 diabetes mellitus among younger patients with excessive weight loss and/or ketoacidosis.

DIAGNOSIS

» Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
  - Random is defined as any time of day without regard to time since last meal.

OR

» Fasting blood glucose ≥ 7.0 mmol/L.
  - Fasting is defined as no caloric intake for ≥ 8 hours.

OR

» 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l.

Note: If screening and not symptomatic: 2 positive tests done on separate days are required for diagnosis. *LoE:III*[173]

MONITORING

At every visit:
» Finger-prick blood glucose.
» Weight.
» Blood pressure.

Baseline:
» Serum creatinine concentration (and calculate eGFR).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy).
  - If dipstix positive, see Section 9.4.3: Diabetic nephropathy.
» BMI for cardiovascular risk assessment if appropriate (See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis).
» Blood lipids (fasting total cholesterol, triglycerides, HDL and LDL cholesterol).
» Foot examination.
» Eye examination to look for retinopathy.
» Abdominal circumference.

Annually:
» Serum creatinine concentration (and calculate eGFR).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy.)
» HbA1c, in patients who meet treatment goals (3–6 monthly in patients whose therapy has changed, until stable).
» Eye examination to look for retinopathy.
» Foot examination.

TARGETS FOR CONTROL

Glycaemic targets for control:

Patient type	Target HbA1c	Target FBG*	Target PPG*
» Young, low risk » Newly diagnosed » No CVS disease	< 6.5%	4.0–7.0 mmol/L	4.4–7.8 mmol/L
» Majority of patients	< 7.0%	4.0–7.0 mmol/L	5.0–10.0 mmol/L
» Elderly » High risk » Hypoglycaemic unawareness » Poor short-term prognosis	< 7.5%	4.0–7.0 mmol/L	< 12.0 mmol/L

***FBG: fasting blood glucose; PPG: post-prandial plasma glucose.**

» In the elderly, the increased risk of hypoglycaemia must be weighed against the potential benefit of reducing microvascular and macrovascular complications.
» Prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma.

Non-glycaemic targets:
» Body mass index ≤ 25 kg/m2.
» BP ≤ 140/90 mmHg and ≥ 120/70 mmHg.

Management of type 2 diabetes mellitus includes:

» Treatment of hyperglycaemia.
» Management of chronic conditions associated with diabetes. For treatment of hypertension and dyslipidaemia after risk-assessment, see Section 4.7: Hypertension and Section 4.1: Prevention of Ischaemic heart disease and atherosclerosis.
» Prevention and treatment of microvascular complications. See Section 9.4: Microvascular complications of diabetes.
» Prevention and treatment of macrovascular complications. See Section 9.5: Cardiovascular risk in diabetes.

GENERAL MEASURES

» Lifestyle modification, including self-care practices.
» Refer to a dietician if available for annual follow-up.
» Refer to a support group if available.
» Education about diabetes and its complications.
» Increased regular physical activity, aim for 30 minutes 5 times a week.
» Appropriate weight loss if weight exceeds ideal weight.
» Discourage smoking.
» Moderate or no alcohol intake (≤ 2 standard drinks per day for males and ≤ 1 for females).
» Education about foot care.
» All patients should wear a notification bracelet.

Diet

Encourage: *LoE: III*[174]

» regular, evenly-spaced meals, with small portions
» nutritionally balanced meals, with a variety of healthy foods
» meals that consist of one meat dish option with an option of vegetarian for those who are vegetarian, one starch option, two vegetable options, one fruit option and water

Carbohydrates

» Strict control of carbohydrate intake:
  - encourage small portions of healthy carbohydrates, such as vegetables, fruits, whole grains (e.g. whole wheat bread, oats, brown rice, pearled wheat, maise meal porridge, sorghum porridge, samp, wheat rice), legumes (lentils, beans), and dairy products
  - discourage intake of less healthy, highly processed/refined carbohydrate foods, especially those with added fats, sugars, or salt (e.g. takeaways, deep-fried foods, pies, doughnuts, cakes, biscuits, white bread, sugary drinks)

Fruit and vegetables

» Aim for 5 servings of fruit or vegetables per day (e.g. vegetables: spinach, morogo, cabbage, tomato, imifino (amadumbe, amaranth, cowpea, pumpkin and sweet potato leaves); fruit: apple, orange, naartjie, banana, mango, pear, peach)

» Limit fruit to 2 servings per day, preferably in small portions throughout the day rather than all at one meal
» Limit intake of starchy vegetables like potatoes, sweet potatoes, mielies, butternut, and pumpkin
» Limit intake of concentrated fruit sources such as dried or tinned fruit, or juices.

Legumes

» Soy beans, dry beans, chickpeas, lentils, and split peas are an economical source of protein and fibre
» They do contain starch, so contribute to total carbohydrate intake (see portion sizes below)

Dairy

» Advise fat-free or lower fat options.

Meat, fish, and eggs

» Encourage less fatty cuts of meat if possible.
» Encourage low fat cooking methods such as baking, grilling, or steaming. Trim excess fat from meat and remove skin from chicken before cooking.
» Encourage patients to eat oily fish e.g. sardines and pilchards 2-3 times a week.
» Limit eggs to 1 per day.
» Avoid processed meats such as polony and viennas.

Fats

» Replace unhealthy animal fats (fatty beef, pork, lamb and chicken) and tropical oils (e.g. coconut and palm kernel oil) with healthier fats (e.g. avocado pear, fatty fish such as pilchards and plant oils such as canola, olive, sunflower, or peanut butter).
» Do not reheat oil, and use softer margarines where possible.
» Limit intake of takeaway foods, and rather prepare food at home most of the time.

Sugar

» Avoid sugar and sugary foods and drinks, such as: table sugar, honey, sugary drinks (fizzy drinks, fruit juices, energy drinks, sport drinks, sweetened flavoured milk/drinking yoghurt, flavoured water), sweets, desserts and baked goods.
» If eaten on special occasions, advise in very small portions.

Salt

» Do not exceed a half teaspoon of salt per day. This includes hidden salt in processed foods (e.g. stock cubes, gravy and soup powders, deli meats like polony and viennas, take-away foods, chips/crisps).
» Avoid adding salt to food.
» Use less salt when preparing food. Use herbs and spices to enhance the flavour of foods instead of salt.

Portion control guide

A portion is the amount of food that a person eats at one time, for a meal or snack. Advise the following portion sizes:

» Make protein (e.g. fish, chicken, or meat) food portions the size of the palm of your hand (about 90 g or 1/2 cup).

» Make fruit, vegetables and starchy food (such as rice, pasta and potatoes) portions no greater than the size of your clenched fist (1 cup).
» Make healthy fat portions the size of the tip of your thumb (1 teaspoon).
» Make hard cheese or peanut butter portions the length of your thumb (1 tablespoon).

MEDICINE TREATMENT

Oral blood glucose lowering agents

Stepwise approach:
» Add metformin to the combination of dietary modifications and physical activity/exercise.
» Combination therapy with metformin plus a sulphonylurea is indicated if therapy with metformin alone (together with dietary modifications and physical activity/exercise) has not achieved the HbA1c target.
» For persisting HbA1c above acceptable levels and despite adequate adherence to oral hypoglycaemic agents: add insulin and withdraw sulphonylurea.
» Ensure patient is adherent at each step.
» Oral agents should not be used in type 1 diabetes mellitus, renal impairment or clinical liver failure.

STEP 1

Lifestyle modification plus metformin

Entry to Step 1	Treatment and duration	Target
» Typical symptoms - thirst, tiredness, polyuria. **AND** » Random blood glucose >11.1mmol/L. **OR** » Fasting blood glucose ≥ 7 mmol/L.	» Lifestyle modification for life. » Appropriate diet. » Weight loss until at ideal weight. Initiate drug therapy with: • Metformin. » Assess monthly.	» 2-hour post-prandial finger-prick blood glucose: 8–10 mmol/L. **OR** » fasting finger-prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

- Metformin, oral, 500 mg daily with meals.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose concentrations to a maximum dose of 850 mg 8 hourly.
  - Contraindicated in:
    - uncontrolled congestive cardiac failure
    - severe liver disease
    - patients with significant respiratory compromise
    - renal impairment i.e. eGFR <30 mL/minute,

In patients with renal impairment, adjust dose according to table:

eGFR	Metformin dose
» eGFR >60 mL/min	Normal daily dose (see above).
» eGFR 45–60 mL/min	Standard dose, measure eGFR 3–6 monthly.
» eGFR 30–45 mL/min	**Maximum dose 1 g per day**; measure eGFR 3–6 monthly.
» eGFR <30 mL/min	Stop metformin.

LoE:III[175]

STEP 2

Add sulphonylurea:

Entry to Step 2	Treatment and duration	Target
» Failed step 1: HbA1c > 8 % or fasting finger-prick blood glucose >8 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months. **OR** » 2-hour post-prandial finger-prick blood glucose >10 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months.	» Lifestyle modification. **AND** » Combination oral hypoglycaemic agents, i.e.: • Metformin, oral. **AND** • Sulphonylurea.	» 2-hour post-prandial finger prick blood glucose < 8–10 mmol/L. **OR** » fasting finger prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

- Sulphonylurea derivatives
- Glimepiride, oral, daily with breakfast.
  - Titrate the dose by 1 mg at weekly intervals up to 6 mg daily (according to blood glucose levels). *LoE:III*[176]
  - Usual dose: 4 mg daily.
  - Maximum dose: 8 mg daily.
  - Preferred in the elderly.

OR

- Glibenclamide, oral, 2.5 mg daily 30 minutes with breakfast.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose levels to a maximum of 15 mg daily.
  - When ≥ 7.5 mg per day is needed, divide the total daily dose into 2, with the larger dose in the morning.
  - **Avoid in the elderly and patients with renal impairment.**

All sulphonylureas should be avoided in patients with renal impairment i.e. eGFR < 60 mL/minute.

Sulphonylureas are contraindicated in:
» severe hepatic impairment
» pregnancy

Missing meals while taking sulphonylureas may lead to hypoglycaemia.

STEP 3

Insulin therapy: See Section 9.1.2: Type 1 diabetes mellitus, in adults.

» Insulin is indicated when oral combination therapy fails.
» Continue lifestyle modification.
» Insulin therapy must be initiated and titrated by a doctor until stabilised.
» Stop sulphonylurea once insulin therapy is initiated but continue metformin.

LoE: III[177]

Education for patients on insulin therapy:
» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.
» Diet:
  - Meal frequency, this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patients receiving fixed mealtime doses of insulin.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.

Insulin type	Starting dose	Increment
Add on therapy: • Insulin, intermediate to long acting, SC	10 units in the evening before bedtime, but not after 22h00.	If 10 units not effective: increase gradually to 20 units (2–4 units increase each week).
Substitution therapy: • Insulin, biphasic, SC	Twice daily. Total daily dose: Start with 0.3 units/kg/day* divided as follows: *LoE: III*[178] o 2/3 of total daily dose, 30 minutes before breakfast. o 1/3 of total daily dose, 30 minutes before supper.	4 units weekly. First increment is added to dose before breakfast. Second increment is added to dose before supper.

*Example of a dose calculation:
  - For a 70 kg adult: 0.3 units x 70 kg = 21 units per day; divided as 14 units 30 minutes before breakfast and 7 units 30 minutes before breakfast.

REFERRAL

Urgent (same day)
» Acidotic breathing.
» Dehydration and hypotension.
» Nausea, vomiting and abdominal pain.
» Ketonuria (more than 1+).
» Hyperglycaemia >25 mmol/L.
» Gangrene.
» Sudden deterioration of vision.
» Serious infections.

Note: Consider IV infusion with sodium chloride 0.9%, before transferring very ill patients.

Non-urgent
» Pregnancy.
» Failure of step 3 to control diabetes.
» eGFR< 30 mL/minute.

» Ischaemic heart disease.
» Cerebrovascular disease.
» Refractory hypertension.
» Progressive loss of vision.

9.3 DIABETIC EMERGENCIES

DESCRIPTION

Diabetics may present with a decreased level of consciousness owing to:
» hyperglycaemia diabetic ketoacidosis (DKA) or hyperosmolar hyperglycaemic state (HHS), or
» hypoglycaemia.

DIAGNOSIS

Check blood glucose concentration and test urine for ketones, immediately.

	Hyperglycaemia		Hypoglycaemia
	DKA	HHS	
Blood glucose	≥ 11.1 mmol/L	Usually > 40 mmol/L	< 4 mmol/L
Urine test for ketones	Usually positive and > 1+	Usually negative	Usually negative

If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently. Low blood glucose presents the most immediate danger to life.

9.3.1 HYPOGLYCAEMIA IN DIABETICS

E10.0/E11.0/E12.0/E13.0/E14.0

DESCRIPTION

Diabetic patients on therapy may experience hypoglycaemia for reasons such as intercurrent illness (e.g. diarrhoea); missed meals; inadvertent intramuscular injections of insulin or miscalculated doses of insulin or progressive renal failure leading to decreased insulin clearance; alcohol ingestion; and exercise without appropriate dietary preparation.

Risk factors include age < 6 years of age, low HbA1c, and longer duration of diabetes.

Hypoglycaemia in diabetic patients can be graded according to the table below:

Mild/moderate hypoglycaemia	Severe hypoglycaemia
» Capable of self-treatment*.	» Semi-conscious **or** » Unconscious/comatose.
» Conscious, but requires help from someone else.	» Requires medical help.

**Except children < 6 years of age.*

Autonomic symptoms/signs	Neurological symptoms/signs
» Tremors » Palpitations » Sweating » Hunger » Fatigue	» Headache » Mood changes » Low attentiveness » Slurred speech » Dizziness

» Pallor	» Unsteady gait » Depressed level of consciousness/ convulsions

***Note:**

» Children, particularly < 6 years of age, generally are not capable of self-management and are reliant on supervision from an adult.

» Patients may fail to recognise that they are hypoglycaemic when neuroglycopenia (impaired thinking, mood changes, irritability, dizziness, tiredness) occurs before autonomic activation.

DIAGNOSIS

» Blood glucose < 4mmol/L with symptoms in a known diabetic patient.

» Blood glucose concentrations should be measured with a glucometer to confirm hypoglycaemia.

Hypoglycaemia must be managed as an emergency.
If a diabetic patient presents with an altered level of consciousness and a glucometer is not available, treat as hypoglycaemia.

EMERGENCY TREATMENT

» Measure blood glucose concentration with glucometer/testing strip, immediately.

Conscious patient, able to feed

Breastfeeding child

- give breast milk

Older children

- a formula feed of 5 mL/kg

OR

- oral sugar solution

dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water, administer 5 mL/kg

OR

- sweets, sugar, glucose by mouth

Adults

- sweets, sugar, glucose by mouth

OR

- oral sugar solution
  - dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water, administer 5 mL/kg

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5mL/kg
  - Add 1 part 50% dextrose water to 4 parts water to make a 10% solution.

OR

- milk

OR

- sugar solution
  - dissolve 3 teaspoons of sugar (15 g) in 200 mL of water; administer 5 mL/kg

Unconscious patient

Children

- Dextrose 10%, IV, 2–5 mL/kg.

IV administration of dextrose in children with hypoglycaemia:

» Establish an IV line. Do not give excessive volumes of fluid: usually can keep line open with 2mL/kg/hour.
» Take a blood sample for emergency investigations and blood glucose.
» Check blood glucose.
  - **If low, i.e. < 2.5 mmol/L or if testing strips are not available, administer 2–5 mL/kg of 10% dextrose solution IV rapidly.**
    In the majority of cases, an immediate clinical response can be expected.
» Re-check the blood glucose after infusion.
  - If still low, repeat 2 mL/kg of 10% dextrose solution.
» After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious.

Adults

- Dextrose 10% solution, IV, 2–5 mL/kg.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected.
  - Do not give excessive volumes of fluid.
  - If hypoglycaemia is treated:
    - re-check blood glucose 10–15 minutes later;
    - if still low, give a further bolus of dextrose 10%, IV, 2 mL/kg, and commence dextrose 5 or 10%, infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.

Assess continuously until the patient shows signs of recovery. *LoE:III*[179]

Alcoholics (or where alcohol intake cannot be excluded)

- Thiamine, IV/IM, 100 mg immediately.

CAUTION
Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children with documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence.

9.3.2 SEVERE HYPERGLYCAEMIA (DIABETIC KETOACIDOSIS (DKA) & HYPEROSMOLAR HYPERGLYCAEMIC STATE (HHS)

E10.0-1/E11.0-1/E12.0-1/E13.0-1/E14.0-1

DESCRIPTION

Clinical features of severe hyperglycaemia include:

- » dehydration
- » abdominal pain
- » vomiting
- » deep sighing respiration
- » drowsiness, confusion, coma
- » acetone/fruity-smelling breath
- » elevated blood glucose

MEDICINE TREATMENT

Adults

Average fluid deficit 6 L, and may be as much as 12 L.
Be cautious in renal and cardiac disease.
In the absence of renal or cardiac compromise:

- Sodium chloride 0.9%, IV, 15–20 mL/kg in the first hour.
  - Subsequent infusion rate: 10 mL/kg/hour with 20 mL/kg boluses if shocked.
  - Do not exceed 50 mL/kg in the first 4 hours.
  - Correct estimated deficits over 24 hours.

Refer urgently with drip in place and running at planned rate.

When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:

- Insulin, short acting, IM, 0.1 unit/kg.
  - When giving insulin IM, do not use insulin needle.

CAUTION

Do not administer short acting insulin if the serum electrolyte status, especially potassium, is not known.

Continue with fluids, but delay giving insulin in these cases in consultation with referral facility as this delay should not negatively affect the patient, but hypokalaemia with resultant cardiac dysrhythmias definitely will.

Children

If in shock:

- Sodium chloride 0.9%, IV, 20 mL/kg as a bolus.
  - If shock not corrected, repeat the bolus.
  - If a 3rd bolus is required, consult with a paediatrician.

If no shock or aftershock is corrected:

- Sodium chloride 0.9%, IV.

Fluid rates of sodium chloride 0.9%, IV (if no shock) in children awaiting transfer.	**Check regularly for shock or increasing dehydration**
Weight range kg	**Rate**(mL/hr) (2–10 kg: 6 mL/kg/hr) (>10–20 kg: 5 mL/kg/hr) (>20–40 kg: 4 mL/kg/hr)
>4–6	25
>6–10	40
>10–15	60

>15–20	85
>20–30	100
>30–45	150
>45–80	200

Refer urgently with drip in place and running at planned rate.

When referral will take > 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed and provided glucose is monitored hourly:

- Insulin, short acting, IM, 0.1 units/kg after 1st hour of infusion of saline
  - When giving insulin IM, do not use insulin needle.

9.4 MICROVASCULAR COMPLICATIONS OF DIABETES

9.4.1 DIABETIC NEUROPATHY

E10.4/E11.4 + (G63.2*/G99.0*/G59.0*)

DESCRIPTION

Neuropathies are a common complication of diabetes. They play an important role in the morbidity and mortality suffered by people with diabetes.

There are three major categories:

» peripheral neuropathy
» autonomic neuropathy
» acute onset neuropathies

GENERAL MEASURES

» Educate patient regarding appropriate footwear and good foot care.
» Patients with neuropathy should have their feet examined at every visit.

MEDICINE TREATMENT

Ensure appropriate glycaemic control.

Exclude or treat other contributory factors e.g.:

» alcohol excess
» uraemia
» vitamin B12 deficiency, if suspected
» HIV infection

Pain

- Amitriptyline, oral, 10–25 mg at night increasing to 100 mg, if necessary.

AND/OR

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Gastroparesis:

- Metoclopramide, oral, 10 mg 8 hourly before meals.

REFERRAL

For further treatment, if the above measures do not control symptoms adequately.

9.4.2 DIABETIC FOOT ULCERS

L97/L08.8 + (E10.5/E11.5/E12.5/E13.5/E14.5)

DESCRIPTION

Ulcers develop at the tips of the toes and on the plantar surfaces of the metatarsal heads and are often preceded by callus formation.

If the callus is not removed, then haemorrhage and tissue necrosis occur below the plaque of callus, which leads to ulceration. Ulcers can be secondarily infected by staphylococci, streptococci, coliforms, and anaerobic bacteria which can lead to cellulitis, abscess formation, gangrene, and osteomyelitis.

DIAGNOSIS

The three main factors that lead to tissue necrosis in the diabetic foot are:

» neuropathy,
» infection, and
» ischaemia.

GENERAL MEASURES

» Metabolic control.
» Treat underlying comorbidity.
» Relieve pressure: non-weight bearing is essential.
» Smoking cessation is essential.
» Frequent (e.g. weekly) removal of excess keratin by a chiropodist with a scalpel blade to expose the floor of the ulcer and allow efficient drainage of the lesion.
» Cleanse with sodium chloride 0.9% solution daily and apply non-adherent dressing.

MEDICINE TREATMENT

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 10 days.

Severe penicillin allergy:
Z88.0
Refer.

REFERRAL

Urgent

Threatened limb, i.e. if the ulcer is associated with:

» cellulitis,
» severe hyperglycaemia,
» abscess,
» discolouration of surrounding skin, or
» crepitus.

Non-urgent

» Claudication.
» Ulcers not responding to adequate treatment.
» Severe penicillin allergy.

9.4.3 DIABETIC NEPHROPATHY

E10.2/E11.2/E12.2/E13.2/E14.2 + (N18.1-5/N18.9)

DESCRIPTION

Screening

» Check annually for proteinuria using dipstix.
» A diagnosis of nephropathy can be made on either a positive dipstix or, if dipstix negative, send urine to laboratory for albumin: creatinine ratio. If ratio > 30 mg/g (3 mg/mmol), diagnose nephropathy.
» Measure serum creatinine annually and estimate eGFR. *LoE: III*[180]

Diet and lifestyle

» Limit protein intake < 0.8 g/kg daily, if proteinuric.
» Advise smoking cessation.

MEDICINE TREATMENT

Start treatment with an ACE-inhibitor and increase gradually to maximal dose if tolerated.

- ACE-inhibitor, e.g.:
- Enalapril, oral, initiate with 5 mg 12 hourly.
  - Increase to maximum daily dose of 20 mg.
  - Monitor potassium, at baseline, within 1 month, and annually. *LoE: I*[181]

Persistent proteinuria

See Chapter 9: Kidney and urological disorders.

Hypertension

Target BP: < 140/90 mmHg. See Section 4.7: Hypertension.

Diabetes mellitus

Target HbA1c < 7.5%.

Intensify other renal and cardiovascular protection measures (not smoking, aspirin therapy, lipid-lowering therapy).

REFERRAL

To specialist: When eGFR<30 mL/minute or earlier if symptomatic.

9.5 CARDIOVASCULAR RISK IN DIABETES

E10.5-9/E11.5-9

See section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

9.5.1 OBESITY IN DIABETES

E66.0/E66.8-9 + (E10.5-9/ E11.5-9)

DESCRIPTION

Abdominal obesity is a waist circumference >94 cm in men, and > 80 cm in women. BMI is determined by weight in kg/height in m2.

BMI (kg/m^2)	
18.5–24.9	normal
25.0–29.9	overweight
30.0–34.9	mildly obese
35.0–39.9	moderately obese

>40	extremely obese

GENERAL MEASURES
A decrease in food intake together with an increase in physical activity is crucial to losing weight.

MEDICINE TREATMENT
Treat the metabolic risk factors, i.e. dyslipidaemia, hypertension, and hyperglycaemia.

9.5.2 DYSLIPIDAEMIA IN DIABETES
E78.0-6/E78.8-9

DESCRIPTION
Dyslipidaemia in type 2 diabetes is usually characterised by increased fasting plasma triglycerides (> 1.7 mmol/L), decreased HDL cholesterol (< 1.0 mmol/L in men and < 1.3 mmol/L in women) and to a lesser extent, increased LDL cholesterol. In those with type 1 diabetes, triglycerides, and to a lesser extent cholesterol concentration, are usually increased.

MONITORING
See Section 9.2.2: Type 2 diabetes mellitus in adults.

MEDICINE TREATMENT
Dyslipidaemia may successfully be treated through lifestyle modifications alone.

- HMGCoA reductase inhibitor (statin) therapy should be added to lifestyle modifications, regardless of baseline lipid concentrations, for all type 2 diabetic patients, who:
  - are > 40 years of age;
  - have had diabetes for > 10 years;
  - have existing cardiovascular disease (for example angina pectoris, previous myocardial infarction, peripheral vascular disease or stroke);
  - have chronic kidney disease (eGFR < 60 mL/minute);
  - type 1 diabetes with microalbuminuria *LoE:I*[182]
- e.g., Simvastatin, oral, 10 mg at night.

In patients < 40 years of age, risk assess as for dyslipidaemia; patients on protease inhibitors or amlodipine, see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

REFERRAL
Random cholesterol > 7.5 mmol/L.
Fasting (14 hours) triglycerides > 10 mmol/L.

9.5.3 HYPERTENSION IN DIABETES
I10

BP lowering in hypertensive patients reduces cardiovascular risk. The diagnosis of hypertension is confirmed if the blood pressure remains > 140/90 mmHg on two separate days. See Section 4.7: Hypertension.

9.6 HYPOTHYROIDISM

9.6.1 HYPOTHYROIDISM IN NEONATES

E03.0-5/E03.8-9

DESCRIPTION

Congenital deficiency of thyroid hormone due to aplasia/hypoplasia of the thyroid gland, defects in thyroid hormone biosynthesis or intrauterine exposure to antithyroid medicines. Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children. Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairment.

DIAGNOSIS

Clinical

- » prolonged jaundice
- » feeding difficulties
- » lethargy
- » constipation
- » swollen hands, feet and genitals
- » decreased muscle tone
- » delayed achievement of milestones
- » enlarged tongue

REFERRAL

All patients for investigation and initiation of therapy.

9.6.2 HYPOTHYROIDISM IN CHILDREN AND ADOLESCENTS

E03.0-5/E03.8-9

DESCRIPTION

Hypothyroidism in children causes decreased growth, lethargy, cold intolerance and dry skin. Physical signs may include goitre, short stature, bradycardia and delayed deep tendon reflexes.

Congenital hypothyroidism may present in childhood. Acquired hypothyroidism in children and adolescents may be caused by:

- » chronic lymphocytic thyroiditis
- » iodine deficiency
- » surgery
- » radioactive iodine
- » infiltrations

DIAGNOSIS

Elevated TSH and low T4 concentrations.

MEDICINE TREATMENT

- Levothyroxine, oral, 100 mcg/m2 once daily, preferably on an empty stomach (Doctor initiated).

REFERRAL

All cases for investigation and initiation of therapy.

9.6.3 HYPOTHYROIDISM IN ADULTS

E03.0-5/E03.8-9

DESCRIPTION

Hypothyroidism causes general slowing of metabolism, which results in symptoms that include fatigue, slow movement and speech, hoarse voice, weight gain, constipation, cold intolerance, depression and impaired memory. Physical signs may include bradycardia, dry, coarse skin, hair loss and delayed relaxation of deep tendon reflexes.

Common causes of primary hypothyroidism are:

» thyroiditis
» amiodarone
» post-surgery
» radio-active iodine

Secondary hypothyroidism (< 1% of cases) may be due to any cause of anterior hypopituitarism.

DIAGNOSIS

» Check TSH concentration. If elevated, check T4 concentration.
» If TSH is elevated, and T4 is low, diagnose hypothyroidism.

MEDICINE TREATMENT

- Levothyroxine, oral, 100 mcg daily, preferably on an empty stomach.
  - If there is a risk of ischaemic heart disease, start at 25 mcg daily and increase by 25 mcg every 4 weeks.
  - In the elderly, start at 50 mcg daily, increased by 25 mcg at 4 week intervals, according to response.
  - Check TSH and T4 after 2–3 months and adjust dose if required.
  - Once stable, check TSH andT4 annually.

REFERRAL

» Suspected hypopituitarism.
» Hypothyroidism in pregnancy.

9.7 HYPERTHYROIDISM

9.7.1 HYPERTHYROIDISM IN CHILDREN AND ADOLESCENTS

E05.0-5/E05.8-9

DESCRIPTION

Hyperthyroidism is a pathological syndrome in which tissue is exposed to excessive amounts of circulating thyroid hormones. The most common cause is Grave's disease, although thyroiditis may also present with thyrotoxicosis.

DIAGNOSIS

Clinical

» fatigue
» nervousness or anxiety
» tachycardia
» warm moist hands

- » weight loss
- » palpitations
- » heat insensitivity
- » thyromegaly
- » tremor

REFERRAL
Urgent
All patients.

9.7.2 HYPERTHYROIDISM IN ADULTS
E05.0-5/E05.8-9

DESCRIPTION
Most common cause of hyperthyroidism is Graves' disease, which is an autoimmune condition resulting from the presence of thyroid stimulating autoantibodies. Other common causes are toxic single or multinodular goitre and sub-acute thyroiditis.

DIAGNOSIS
Suppressed TSH and elevated T4.
Note: T4 may be normal in hyperthyroidism.

REFERRAL
Urgent
All patients.

PHC Chapter 10: Infections and related conditions

10.1 ANTISEPTICS AND DISINFECTANTS

DESCRIPTION

Disinfectants are used to kill micro-organisms on working surfaces and instruments, but cannot be relied on to destroy all micro-organisms.

Antiseptics are used for reducing bacterial load on skin and mucous membranes.

Disinfecting surfaces

Guidelines for the use of disinfectants

» Cleansing (removal of visible soiling) is the first and most important step in chemical disinfection.
» The disinfectant fluid must entirely cover the object and penetrate all crevices.
» Use the recommended strengths for specific purposes.
» Disinfectants cannot sterilise surgical instruments.
» No chemical agent acts immediately; note the recommended exposure time.
» Equipment must be rinsed with sterile water after immersion in a chemical disinfectant e.g. chlorhexidine solution, 0.5% in 70% alcohol.
» Avoid recontamination at this stage.
» Make sure that the rinsing water and all other apparatus are sterile.
» Equipment must not be stored in chemical disinfectants.
» The best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  - Solutions must be freshly prepared.
  - Discard after 24 hours to disinfect properly.
  - Do not use on the skin.

Intact skin

» Use alcohol swabs to clean skin surface before injections are administered.
» Use antiseptics like povidone iodine or chlorhexidine for surgical scrubbing.

Wounds and mucous membranes

- Use chlorhexidine 0.05% aqueous solution to clean dirty wounds.
- Use sodium chloride 0.9% and sterile water on clean wounds.

Disinfectant	Indications	Directions for application
• Chlorhexidine solution: o 0.05% aqueous solution. o 0.5% in 70% alcohol.	» Cleaning dirty wounds. » Skin disinfection before surgery.	» Remove all dirt, pus and blood before use. » Clean dirty wounds with 0.05% aqueous solution. » Do not use for normal cleaning. » Use the correct concentration for a specific purpose.
• Povidone iodine: o solution 10%. o ointment 10%. o cream 5%.	» Skin and wound infections **Contraindication**: iodine allergy.	» Use ointment for skin infection. » Use solution for cleaning skin and wounds. » **Avoid** using on large wounds because of danger of iodine absorption.

Articles and instruments
Adhere to the appropriate cleansing and disinfection policy.

10.2 CHICKENPOX

B01.9/B01.8

DESCRIPTION

A mild viral infection that presents 2–3 weeks after exposure, with:
» mild fever preceding the rash
» lesions beginning on the trunk and face, later spreading to the arms and legs
» small, red, itchy spots that turn into blisters and crusts. These stages may all be present at the same time.

Chickenpox is infective from the start of the fever until 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting, with a duration of about 1 week.
Complications such as secondary bacterial infection, encephalitis, meningitis and pneumonia may occur (more common in adults and immunocompromised patients).

GENERAL MEASURES

» Isolate from immunocompromised people and pregnant women until all lesions have crusted.
» Ensure adequate hydration.
» Cut fingernails short and discourage scratching.

MEDICINE TREATMENT

CAUTION
Avoid the use of aspirin in children and adolescents < 16 years of age with acute febrile illness because of risk of Reye's syndrome.

For itch:

- Calamine lotion, applied as needed.

In severe cases

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

CAUTION
Do not give an antihistamine to children < 2 years of age.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For fever with distress:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

If skin infection is present due to scratching, treat as for bacterial skin infection. See Section 5.4: Bacterial infections of the skin.

Treatments with antiviral agents are recommended for:

» Immunocompromised patients.
» All patients with severe chickenpox (irrespective of duration of rash).
  - Extensive rash.
  - Haemorrhagic rash.
  - Visceral involvement.
  - Presence of complications.
» Adults and adolescents presenting within 48 hours of the onset of the rash.
» Pregnant women.

Children

- Aciclovir, oral, 20 mg/kg/dose 6 hourly for 7 days (Doctor prescribed).

Weight kg	**Dose** mg	**Use one of the following:**			**Age** months/years
		Susp 200 mg /5 mL	**Tablet** 200 mg	400 mg	
>3.5–5	100	2.5 mL	–	–	>1–3 months
>5–7	140	3.5 mL	–	–	>3–6 months
>7–9	160	4 mL	–	–	>6–12 months
>9–11	200	5 mL	1 tablet	½ tablet	>12–18 months
>11–14	240	6 mL	–	–	>18 months–3 years
>14–25	300	7.5 mL	1½ tablet	–	>3–5 years
>25–35	500	15 mL	2 ½ tablets	–	>7–11 years
>35–55	700	–	3 ½ tablets	–	>11–15 years

Adults

- Antiviral, (active against varicella zoster) e.g.:
- Aciclovir, oral, 800 mg 6 hourly for 7 days (Doctor prescribed). *LoE:III*[183]

REFERRAL

» Complications such as:
  - meningoencephalitis
  - pneumonia
» Severely ill patients.
» Pregnant women.
» Asymptomatic neonates whose mothers had developed chickenpox during the period from 7 days before to 7 days after delivery.
» Neonates with clinical chickenpox.

10.3 CHOLERA

See Chapter 2: Gastrointestinal conditions.

10.4 DYSENTERY, BACILLARY

See Chapter 2: Gastrointestinal conditions.

10.5 FEVER

R50.0-1/R50.8-9

DESCRIPTION

Fever, i.e. temperature ≥ 38°C, is a natural and sometimes useful response to infection, inflammation or infarction.

Fever alone is not a diagnosis.

Fever may be associated with convulsions in children < 6 years of age, but is not a cause of the convulsions.

Note:

» Temperature > 40°C needs urgent lowering in children.
» Fluid losses are increased with fever.
» Malaria must be considered in anyone with fever who lives in a malaria endemic area, or who has visited a malaria area in the past 12 weeks.

GENERAL MEASURES

Children

» Caregivers should offer the child fluids regularly to keep them well hydrated (where a baby or child is breastfed the most appropriate fluid is breast milk).
» Dress child appropriately for the weather.
» Ensure the child is rested.
» Following contact with a healthcare professional, parents and carers who are looking after their feverish child at home should seek further advice if:
  - the child has a convulsion
  - the child develops a non-blanching rash
  - the parent or carer feels that the child is less well than when they previously sought advice
  - the parent or carer is more concerned than when they previously sought advice
  - the fever lasts > 2 days

Note: Tepid sponging and evaporative cooling are not recommended, as this causes the child to shiver which actually increases the core temperature.

Adults

Maintain hydration.

MEDICINE TREATMENT

Consider treatment with paracetamol in adults with associated tachycardia, possibility of worsening cardiac conditions, and adults and children who are in distress.

Antipyretic agents are not indicated with the sole aim of reducing body temperature in children and adults with fever.

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

CAUTION

Do not treat undiagnosed fever with antibiotics, except in children < 2 months of age who are classified as having

POSSIBLE SERIOUS BACTERIAL INFECTION.

Do not give aspirin to children and adolescents with acute febrile illness.

Children < 2 months of age, fulfilling any criterion of possible serious bacterial infection (see referral criteria):

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL

» All children < 2 months of age with any one of the following criteria of possible serious bacterial infection:
  - axillary temperature > 37.5°C
  - bulging fontanelle
  - decreased movement/only moves when stimulated
  - convulsions with current illness
  - decreased level of consciousness
  - breathing difficulties, i.e. respiratory rate > 60, nasal flaring, chest in-drawing or apnoea
  - pus forming conditions, i.e. umbilical redness extending to the skin or draining pus, many or severe skin pustules, pus draining from eye
» All children in whom a definite and easily managed cause is not found.
» Fever that lasts > 2 days without finding a treatable cause.
» Fever that recurs.

» Fever combined with:
  - signs of meningitis
  - toxic-looking patient
  - convulsion
  - coma or confusion
  - jaundice
  - failure to feed

10.6 GIARDIASIS

See Chapter 2: Gastrointestinal conditions.

10.7 MALARIA

Note: notifiable medical conditions.

Refer to the most recent Malaria Treatment Guidelines from the Department of Health for the most suitable management in the various endemic areas.

Global malaria endemic areas: https://www.iamat.org/risks/malaria?gclid=CjwKEAiAjIbBBRCitNvJ1o257WESJADpoUt072u5_X4Wb0fVtkQLiEFrWye263Ef_on8eykkOwLK_hoCFtDw_wcB

Local endemic areas:

https://www.santhnet.co.za/index.php/travel-health-advice/travel-advice/malaria-advice-for-travellers/item/330-malaria-risk-map-for-south-africa-2017.html

DESCRIPTION

Malaria is an infection of red blood cells by a parasite micro-organism called Plasmodium. Five species of Plasmodium are known to cause malaria in humans in Africa. The five species are:

» *Plasmodium falciparum (P. falciparum)*
» *Plasmodium vivax (P. vivax)*
» *Plasmodium ovale (P. ovale)*
» *Plasmodium malariae (P. malariae)*
» *Plasmodium knowlesi (P. knowlesi)*

The parasites are usually transmitted to humans by the bite of a vector mosquito. In South Africa, P. falciparum is the most common and the most dangerous of the malaria species. Malaria caused by P. falciparum is an acute febrile illness that may progress rapidly to severe disease if not diagnosed early and treated adequately.

Symptoms and signs of malaria are non-specific.

The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Any person resident in or returning from a malaria area **and** who presents with fever (usually within 3 months of possible exposure to vector mosquito bites) should be tested for malaria. The progression of P. falciparum malaria to severe disease is rapid and early diagnosis and effective treatment is crucial. **Pregnant women, young children ≤ 5 years of age and people living with HIV/AIDS are at particularly high risk of developing severe malaria**.

Symptoms and signs of malaria may include:

» severe headache
» shivering episodes

- » fever > 38°C
- » muscle and joint pains
- » diarrhoea
- » nausea and vomiting
- » flu-like symptoms
- » dry cough

Severe disease may present with one or more of the following additional clinical features:

- » prostration (severe general body weakness)
- » sleepiness, unconsciousness or coma, convulsions
- » respiratory distress and/or cyanosis
- » jaundice
- » renal failure
- » shock
- » repeated vomiting
- » hypoglycaemia
- » severe anaemia (Hb < 7 g/dL)
- » haemoglobinuria/black urine
- » abnormal bleeding

DIAGNOSIS

Microscopic examination of thick and thin blood smears. Thick films are more sensitive than thin films in the detection of malaria parasites.

Where rapid diagnostic tests, e.g. HRP2 antigen dipsticks are available, these can be used to diagnose malaria within 10–15 minutes.

Note:

- » Rapid tests may remain positive up to 1 month after successful treatment
- » One negative malaria test does not exclude the diagnosis of malaria. Request 2nd test.

GENERAL MEASURES

- » Provide supportive and symptomatic relief.
- » Monitor for complications.
- » Ensure adequate hydration.
- » Carefully observe all patients with P. falciparum malaria for the first 24 hours for features of severe malaria.

MEDICINE TREATMENT

All first doses of antimalarial medicines must be given under supervision and patients must be observed for at least an hour as vomiting is common in patients with malaria. Treatment must be repeated if the patient vomits within the first hour. Vomiting oral treatment is one of the commonest reasons for treatment failure.

In areas with high incidence of malaria (whether locally transmitted or imported) it should be definitively diagnosed and treated at PHC level. In other areas, patients should be referred for treatment.

10.7.1 MALARIA, NON-SEVERE/UNCOMPLICATED

B51.9/B52.9/B53.0/B54

Note: notifiable medical condition.

MEDICINE TREATMENT

- Artemether/lumefantrine, oral, 20/120 mg, with fat-containing food/full cream milk to ensure adequate absorption.
  - Give the first dose immediately.
  - Follow with second dose 8 hours later.
  - Then 12 hourly for another 2 days (total number of doses in 3 days = 6).

Weight kg	**Tablet** Artemether/lumefantrine 20/120 mg	**Age** months/years
>5–15	1 tablet	6 months–3 years
>15–25	2 tablets	>3–8 years
>25–35	3 tablets	>8–12 years
>35	4 tablets	>12 years and adults

For fever in children < 5 years of age:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

REFERRAL

Urgent

» All patients in areas that do not stock antimalarials.
» Vomiting leading to inability to retain medication.
» Patients not responding to oral treatment within 48 hours.
» After 1st dose of artemether/lumefantrine 20/120 mg:
» All patients with any sign of severe (complicated) malaria, see Section 10.7.2: Malaria, severe/complicated.
» All children < 2 years of age.
» Pregnant women.
» Patients with co-morbidities such as HIV, diabetes etc.
» Patients > 65 years of age.

10.7.2 MALARIA, SEVERE/COMPLICATED

B50.0/B50.8

Note: notifiable medical condition.

DESCRIPTION

Any one of the following is a sign of severe (complicated) malaria, is associated with a higher mortality, and requires urgent referral (after initial quinine dose as below):

» prostration (severe general body weakness)
» sleepiness, confusion, unconsciousness or coma, convulsions
» respiratory distress and/or cyanosis
» jaundice

» renal failure
» shock
» repeated vomiting
» hypoglycaemia
» severe anaemia (Hb<7g/dL)
» haemoglobinuria/black urine
» abnormal bleeding

MEDICINE TREATMENT

Treatment may be commenced before referral in clinics designated by the regional malaria control programme provided they have facilities to diagnose malaria (either microscopy or rapid antigen point of care tests) and healthcare workers trained in the management of severe malaria.
Correct hypoglycaemia immediately, if present.

The preferred agent is parenteral artesunate:

- Artesunate IM, 2.4 mg/kg IM immediately as a single dose and refer urgently.
  - If transferral to referral hospital is delayed, administer second dose at 12 hours and third dose at 24 hours.

If parenteral artesunate is not available:

- Quinine, IV or IM, 20 mg/kg immediately as a single dose and refer urgently. See dosing table pg 23.9.
  - IV: dilute with 5–10 mL/kg of dextrose 5% and administer **over 4 hours**. If facilities not available for IV administration then:
  - IM: dilute quinine dihydrochloride in sodium chloride 0.9% to between 60 and 100 mg/mL. Inject half the volume immediately as a single dose in each thigh (anterolateral) to reduce pain and prevent sterile abscess formation.

Note: For all patients requiring referral, the patient must be transferred to reach the referral hospital **within 6 hours** of being seen at the PHC facility.
Advise referral hospital that a loading dose has been administered.

REFERRAL

Urgent
All patients.

10.7.3 MALARIA, PROPHYLAXIS (SELF-PROVIDED CARE)

Z29.1

In South Africa, malaria prophylaxis should be used, together with preventive measures against mosquito bites, from September to May in high-risk areas. State facilities do not provide prophylactic therapy. It is recommended that persons intending to travel to high-risk areas take the relevant prophylactic therapy.

Preventative measures against mosquito bites between dusk and dawn include:
» Use of di-ethyl 3-methylbenzamid (DEET) insecticide impregnated mosquito nets, insecticide coils or pads.
» Application of insect repellent to exposed skin and clothing.

» Wearing long sleeves, long trousers and socks, if outside, as mosquitoes are most active at this time.
» Visiting endemic areas only during the dry season.

CAUTION
Immunocompromised patients, pregnant women and children <5 years of age should avoid visiting malaria-endemic areas, as they are more prone to the serious complications of malaria.

Refer to National Department of Health Malaria Guidelines.

10.8 MEASLES

B05.0-4/B05.8-9
Note: notifiable medical condition.

CASE DEFINITION

» Fever.
AND
» Red maculopapular (blotchy) rash.
AND
» Cough or coryza (runny nose) or conjunctivitis.

Inform the local EPI co-ordinator about all cases of suspected measles, (i.e. which fulfil the case definition criteria). Send clotted blood and throat swabs to confirm (or exclude) a diagnosis of measles.

DESCRIPTION

A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.
Initial clinical features, that occur 7–14 days after contact with an infected individual, include:

» Coryza
» Fever
» diarrhoea
» conjunctivitis which may be purulent
» cough

After 2–3 days of the initial clinical features, a few tiny white spots, like salt grains appear in the mouth (Koplik spots).
The skin rash appears 1–2 days later, lasting about 5 days and:
» usually starts behind the ears and on the neck
» then on the face and body
» thereafter, on the arms and legs

Secondary bacterial infection (bronchitis, bronchopneumonia, and otitis media) may occur, especially in children with poor nutrition or other concomitant conditions.

GENERAL MEASURES

» Isolate the patient in the clinic to prevent spread.
» In the clinic utilise face masks and gloves when examining the patient.
» Counsel the caregiver to isolate the patient in the home (if feasible).

» Reduce exposure of children < 12 months of age and pregnant women to the index patient.
» Ensure that the caregiver and other close contacts have been previously immunised.

MEDICINE TREATMENT

All children < 5 years of age with measles should be given an extra dose of vitamin A, unless the last dose was received within a month:

- Vitamin A (retinol), oral, as a single dose.

Age range	**Dose** units	**Capsule** 100 000 IU	**Capsule** 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

In children < 5 years of age, give the 1st dose immediately. If the child is sent home, the caregiver should be given a 2nd dose to take home, which should be given the following day.

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.

For fever with distress:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Children with diarrhoea:

Treat according to Section 2.9.1: Acute diarrhoea in children.

Children with pneumonia (1st dose before referral):

- Amoxicillin, oral, 45 mg/kg/dose. See Section 17.3.4.1: Pneumonia in children.

Children with otitis media:

- Amoxicillin, oral, 45 mg/kg/dose. See Section 19.4.2 Otitis media, acute.

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. See dosing table, pg 23.2. *LoE:III*[184]

Purulent conjunctivitis:

- Chloramphenicol, 1%, ophthalmic ointment 8 hourly into lower conjunctival sac.

REFERRAL

» All adults.
» Children <6 months of age.
» Children who are malnourished or immunocompromised, or who have TB.
» Where serious complications are present. These include:
  - stridor/croup
  - pneumonia
  - dehydration
  - neurological complications
  - severe mouth and eye complications

Provide emergency treatment, if needed, before referral.

10.9 MENINGITIS

See Chapter 15: Central nervous system.

10.10 MUMPS

B26.0-3/B26.8-9

DESCRIPTION

Incubation period: 14–21 days.
A viral infection primarily involving the salivary glands.
Signs and symptoms:

» Fever.
» Pain on opening the mouth or eating.
» About two days later a tender swelling appears below the ears at the angle of the jaw, often first on one side and later on the other. The swelling disappears in about 10 days.

GENERAL MEASURES

» Bed rest during febrile period.
» Advise on oral hygiene.
» Recommend plenty of fluids and soft food during acute stage.
» Patient is infectious from 3 days before parotid swelling to 7 days after it started. Isolate until swelling subsides.
» Children may return to school 1 week after initial swelling.

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.

- Maximum dose: 4 g in 24 hours.

REFERRAL

» Abdominal pain (to exclude pancreatitis).
» Painful swollen testes (orchitis).
» Suspected meningo-encephalitis.

10.11 RUBELLA (GERMAN MEASLES)

B06.0/B06.8-9

DESCRIPTION

Incubation period: 14–21 days. A viral infection with skin lesions that is less severe than measles and lasts only 3–4 days.
A maculopapular red rash starts on the face spreading to the trunk, arms and legs. It usually fades as it spreads.

Note: If cough, coryza or conjunctivitis are also present, it is essential to exclude measles. See case definition of measles (Section 10.8: Measles).

Clinical features include:
» mild rash
» swollen and tender lymph nodes behind the ears or at the back of the neck(suboccipital)
» in adults, a small joint arthritis may occur

Note: Infection during the first or second trimester of pregnancy may lead to severe permanent deformities in the baby. All pregnant women should be referred for confirmation of diagnosis of rubella and counselling.

GENERAL MEASURES

» Bed rest, if needed.
» Isolate from pregnant women for 7 days after onset of the rash.

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

Urgent

» Pregnant women with rubella.
» Pregnant women who have been in contact with a patient with rubella.

10.12 SCHISTOSOMIASIS (BILHARZIA)

B65.0-3/B65.8-9

Note: notifiable medical condition.

DESCRIPTION

A parasitic infestation with:

» *Schistosoma haematobium: primarily involves the bladder and renal tract, or*
» *Schistosoma mansoni: primarily involves the intestinal tract.*

Infestation occurs during washing, bathing or paddling in water harbouring snails shedding this parasite.

Clinical features vary with the location of the parasite.

Most cases are asymptomatic.

Chronic schistosomiasis may present with local or systemic complications due to fibrosis, including urinary tract obstruction with ensuing renal failure, portal hypertension or other organ involvement.

	Schistosoma haematobium	**Schistosoma mansoni**
Clinical features	» blood in the urine » recurrent cystitis » other urinary symptoms	» diarrhoea with blood and mucus in the stools » colicky abdominal pain » enlarged liver and spleen
Diagnosis	» eggs in urine or stool on microscopy » rectal biopsy	

Acute schistosomiasis occurs several weeks after exposure and may present with non-specific signs such as fever, cough, headache and urticaria.

Life threatening cardiac and neurological complications may occur.

Refer all suspected cases for diagnosis and further management.

Diagnosis is made by assessing for eosinophilia and conducting serological testing.

GENERAL MEASURES

If bilharzia is endemic, educate the community to avoid contact with contaminated water:

» Do not urinate or pass stools near water used for drinking, washing or bathing.
» Do not swim in contaminated water.
» Collect water from rivers and dams at sunrise when risk of infestation is lowest.
» Boil all water before use.

MEDICINE TREATMENT

In endemic areas where urine microscopy cannot be done patients should be treated empirically after first excluding possible glomerulonephritis, i.e. no raised blood pressure, no oedema, and no shortness of breath. See Section 8.3: Glomerular diseases (GN).

In non-endemic areas treatment should be given only if eggs of *S. haematobium* or *S. mansoni* are found in the urine/faeces.

Children

- Praziquantel, oral, 40 mg/kg as a single dose. See dosing table pg 23.8.

Adults

- Praziquantel, oral, 40 mg/kg as a single dose. *LoE:I*[185]

Note: Praziquantel may cause life-threatening deterioration if given in acute schistosomiasis. If the acute phase is suspected, consult with a specialist.

REFERRAL

» Children < 2 years of age.
» Ongoing urinary tract symptoms including haematuria persisting for 60 days after treatment.
» Signs of bleeding disorders or glomerulonephritis.
» Suspected acute schistosomiasis.

10.13 SHINGLES (HERPES ZOSTER)

B02.0-3/B02.7-9

DESCRIPTION

Dermatomal eruption of vesicles on an erythematous base due to varicella zoster virus (lies dormant in nerve ganglia following chickenpox).

GENERAL MEASURES

» Isolate patient from immunocompromised or pregnant non-immune individuals (who may develop severe chickenpox).
» Offer HIV test, especially to patients.

MEDICINE TREATMENT

Antiviral therapy, indicated for herpes zoster:

» in immunocompetent individuals - only of benefit within 72 hours of onset, and
» in immunocompromised patients - beyond 72 hours, provided that there are active lesions.

- Antiviral, (active against herpes zoster) e.g.:
- Aciclovir, oral, 800 mg five times daily for 7 days (4 hourly missing the middle of the night dose). *LoE:I*[186]

For pain:

Pain is often very severe and requires active control. A combination of different classes of analgesics is often necessary.

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

AND/OR *LoE:III*[187]

During acute presentation if pain is severe and not adequately controlled:

- Tramadol, oral 50mg 6 hourly (Doctor prescribed).
  - If response not adequate, increase dose to 100mg 6 hourly. *LoE:III*[188]

To treat post-herpetic neuralgia:

Initiate treatment with adjuvant therapy early.

- Amitriptyline, oral, 25 mg at night (Doctor prescribed).

- Titrate as necessary to a maximum of 75 mg. *LoE:III*[189]

REFERRAL

» Herpes zoster with secondary dissemination or neurological involvement.
» Ocular involvement (if the tip of the nose is involved then ocular involvement is more likely).
» Uncontrolled pain.

10.14 TICK BITE FEVER

A79.8/A79.9

DESCRIPTION

Tick-borne infection due to *Rickettsia conorii*, acquired from dogs, or *Rickettsia africae*, acquired from cattle and game. The hallmark of tick bite fever is the eschar, i.e. round black lesion ± 5 mm in diameter with an inflammatory halo. A rash develops on about the third day of illness in about two thirds of patients with *R. conorii* and in fewer cases of *R. africae* infection. In *R. conorii* infection the rash is maculopapular and involves the palms and soles. In *R. africae* infection the rash is sparse and may be vesicular. The classic triad of fever, eschar and rash occurs in 50-75% of patients. Signs of severe tick bite fever include severe headache, hypotension, shortness of breath and neurological manifestations.

GENERAL MEASURES

» Application of insect repellent to exposed skin and clothing.
» Wearing long sleeves, long trousers and socks, if outside.
» Inspect clothing for presence of ticks after suspected exposure.

Complications include:

» vasculitis
» encephalitis
» thrombosis
» renal failure
» myocarditis
» pneumonitis
» thrombocytopaenia

MEDICINE TREATMENT

Antibiotic therapy:

Treatment must be started before confirmation of diagnosis by serology.
Although not recommended for children < 8 years of age, doxycycline is still regarded as the medicine of choice for children with tick bite fever. However, due to the unavailability of lower dosage forms of doxycycline alternative medicines are considered in children < 8 years of age or those weighing < 45kg with mild infection.

Mild to moderate infection:

Children < 45 kg

- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. See dosing table pg 23.2. *LoE:II*[190]

Children ≥ 45 kg and adults

- Doxycycline, oral, 100 mg 12 hourly, for at least 3 days after the fever subsides with clinical improvement.
  - Maximum duration of treatment is 7 days. *LoE:III*[191]

In pregnancy:

- Azithromycin, oral, 500 mg 12 hourly for 3 days.
  - In severe cases, initiate therapy with 1–2 days of doxycycline. *LoE:III*[192]

For headache and fever:

Children

- Paracetamol, oral, 15 mg/kg/dose, 6 hourly as required. See dosing table, pg 23.8. *LoE:III*[193]

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours *LoE:III*[194]

REFERRAL

» Patients unable to take oral therapy.
» Patients not responding to adequate therapy, e.g. fever persisting for > 48 hours after initiation of treatment.
» Patients with complications.
» Patients with severe tick bite fever.

10.15 TYPHOID FEVER

See Section 2.13: Typhoid fever.

10.16 TUBERCULOSIS

See Chapter 17: Respiratory conditions. Section 17.4: Pulmonary tuberculosis.
Note: notifiable medical condition.

10.17 TUBERCULOSIS, EXTRAPULMONARY

A18.0-9
Note: notifiable medical condition.

DESCRIPTION

Extra-pulmonary tuberculosis is defined as infection of organ systems other than the lung with Mycobacterium tuberculosis. Extra-pulmonary TB can present with non-specific symptoms such as unintentional weight loss (> 1.5kg in a month), night sweats and fever for more than 2 weeks. Other symptoms depend on the organ affected. The most common types of extra-pulmonary TB are listed below along with commonly associated signs and symptoms:

Extra-pulmonary TB type	Common presenting sign/symptom
TB lymphadenitis	» Audible wheeze or typical brassy cough caused by large mediastinal lymph nodes. » Peripheral TB lymphadenopathy occurs in neck and armpits. Typically nodes are large (> 2 cm), tender, non-symmetrical, matted, firm to fluctuant and rapidly growing.
TB pleural effusion (usually single-sided)	» Non-productive cough. » Chest pain. » Shortness of breath. » High temperature. » Tracheal and mediastinal shift away from the side of the effusion. » Decreased chest movement. » Stony dullness on percussion on the side of the effusion.
TB of spine, bones and joints	» Decreased movement in the joints. » Excessive sweating, especially at night. » Joint swelling with warm, tender joints. » Low-grade fever. » Muscle atrophy and/or spasms. » Numbness, tingling, or weakness below the infection (if the spine is involved).
TB pericardium	» Chest pain. » Shortness of breath. » Dizziness and weakness from low cardiac output » Signs and symptoms of right-sided heart failure (tachycardia, low BP, peripheral oedema, liver congestion, ascites).
TB meningitis	» During the early phase of TB meningitis, malaise, low-grade fever, headache and personality change may be present. » With suspected established infection assess for: – gradual onset of headache – malaise – confusion – decreased consciousness – vomiting – neck stiffness and positive Kernig's sign » In children, TB meningitis may be acute, sub-acute or chronic and typically presents between 23-49 months of age with: – altered level of consciousness – history of fever – irritability – headache – convulsions – poor feeding and failure to thrive – vomiting – cough – meningism
Disseminated/miliary TB	» Most often seen in children and young adults. » Fever. » Cough. » Generalised lymphadenopathy. » Hepatomegaly.

	» Consider in febrile patients presenting with HIV wasting syndrome.
TB empyema	» Similar to pleural effusion, but aspiration reveals thick pus.
TB peritoneum	» Ascites with no signs of portal hypertension. » Possible palpable abdominal masses. » Possible bowel obstruction.

REFERRAL

All suspected cases of extra-pulmonary TB should be referred immediately to secondary or tertiary care for diagnosis and further management.

10.18 VIRAL HAEMORRHAGIC FEVER (VHF)

A98.0/A98.1/A98.2/A98.3/A98.4/A98.4/A98.5/A98.8/A99/A91

Note: notifiable medical conditions.

Consult the most recent Viral Haemorrhagic Fever Guidelines from the National Department of Health.

DESCRIPTION

Viral haemorrhagic fevers (VHF) are uncommon conditions in South Africa. They may present with non-specific signs (fever, headache, conjunctivitis, pharyngitis, myalgia (especially lower back pain), diarrhoea, vomiting, abdominal pain) or with signs strongly suggestive of VHF (petechial rash, ecchymoses, other haemorrhagic signs e.g. epistaxis, haematemesis and melaena). Other symptoms and organ involvement may be variable.

More than 90% of suspected cases of VHF in South Africa prove to be severe forms of common diseases. Many of the diseases mistaken for VHF are treatable if diagnosed early.

These include:

- » Severe tick bite fever.
- » Severe falciparum malaria.
- » Severe bacterial infections, particularly *N.meningitidis*.
- » Fulminant hepatitis.
- » Leptospirosis.

Endemic causes of VHF in South Africa are Crimean-Congo fever and Rift Valley Fever, both of which may be transmitted between humans by means of blood and body fluids. Imported conditions include Lassa, Ebola and Marburg Fever amongst others.
Obtaining a history of possible exposure to infection (including a detailed travel history) is crucial to diagnosing VHF. Relatives and friends often provide more reliable information than severely ill patients.

GENERAL MEASURES

All suspected, probable VHF cases and contacts of VHF cases must be discussed and managed in consultation with the Regional Virologist or Infectious Diseases Consultant at the referral centre.
Cases should also be discussed with the Special Pathogens Unit of the National Institute for Communicable Diseases (NICD):

Tel: 011 386 6000, Outbreak hotline: 082 883 9920

Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potentially contagious and life threatening agent.

Viral haemorrhagic fevers (VHF) are readily transmitted to healthcare workers, so it is essential to apply strict contact precautions.
ISOLATE ALL SUSPECTED SYMPTOMATIC CASES AT ALL TIMES

If VHF is considered, isolate patient in a single room and take proper precautions to limit further exposure. These include where available:
» long-sleeved disposable gown,
» waterproof apron if the patient is bleeding,
» two pairs of latex gloves, one underneath the gown and one with the wrist of the glove pulled over the gown wrist,
» disposable face mask (preferably with a visor),
» goggles if a mask without the visor is used,
» waterproof boots or 2 pairs of overshoes, one over the other.

Note: Do not touch your own skin with your gloved hands.

MANAGEMENT

Signs strongly suggesting VHF	Non-specific signs that may occur with VHF
» Petechial rash. » Ecchymoses. » Other haemorrhagic signs (e.g. epistaxis, haematemesis, melaena). » Non-specific signs of infection.	» Fever. » Headache. » Conjuctivitis. » Pharyngitis. » Myalgia (especially lower back pain). » Vomiting. » Abdominal pain. » Diarrhoea.

Management of VHF contact
» Consult clinician, discuss with NICD and isolate patient (See above).
» Record and follow-up all patient contacts.

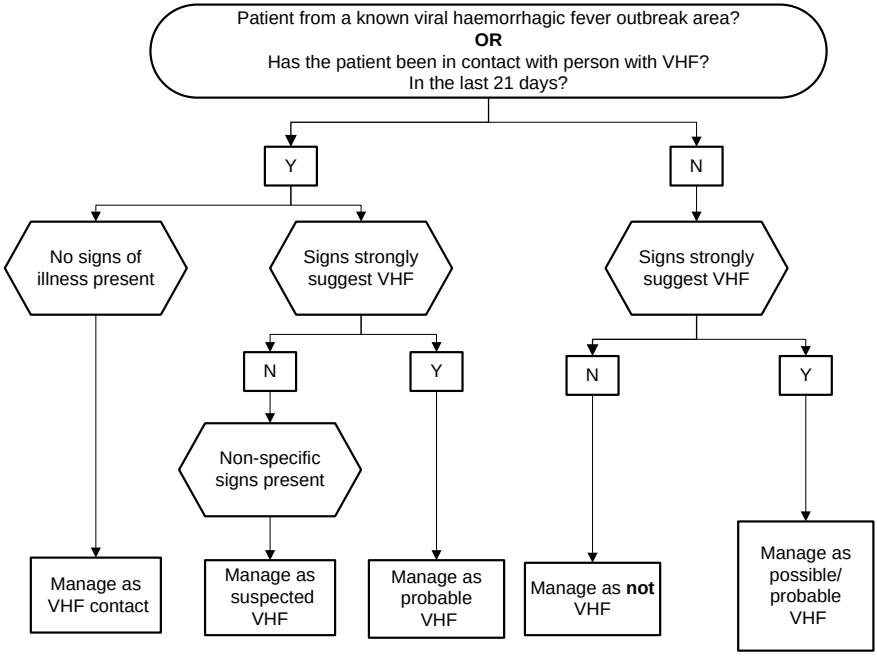
Management of suspected/possible/probable VHF
» Non-specific signs:
  - Consult with clinician, discuss with NICD, isolate patient, initiate ceftriaxone and record and follow-up all patient contacts.
» Signs strongly suggestive of VHF:
  - Consult with a clinician, discuss with NICD, isolate patient, initiate ceftriaxone and arrange transfer with EMS (providing patient's VHF status, and names, addresses and telephone numbers of patient contacts).

Adults
- Ceftriaxone, IV, 2 g immediately. *LoE:III*[195]

Children
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.



REFERRAL

» All cases, after consultation with clinician, discussion with NICD, isolation of patient and management of acute condition.

Manage all contacts of VHF cases according to the current national guidelines. Ensure that contact details are obtained and that there is a plan to manage contacts.

10.19 EMERGING RESPIRATORY PATHOGENS, E.G. COVID-19: CORONAVIRUS DISEASE-19; MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS INFECTION: MERS COV

Note: notifiable medical conditions.

Consult the most recent guidelines from the National Department of Health or NICD.

DESCRIPTION

Viral respiratory illness caused by coronaviruses, including Middle East respiratory syndrome (MERS-CoV), severe acute respiratory syndrome (SARS) and severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). SARS-CoV-2 causes coronavirus infectious disease-2019 (COVID-19).

Individuals present with a wide spectrum of clinical presentation ranging from asymptomatic infection to acute upper respiratory illness, and rapidly progressing lower respiratory illness; respiratory failure, septic shock and multi-organ failure resulting in death.

A typical presentation includes:

» fever (>38°C), chills or rigors, cough, shortness of breath

Presentation may include:

» hemoptysis, sore throat, myalgias, diarrhoea, vomiting, abdominal pain

Complications:

» severe pneumonia
» ARDS
» acute renal failure
» refractory hypoxaemia

GENERAL MEASURES

All suspected, probable cases and contacts must be discussed and managed in consultation with the regional virologist or infectious diseases specialist at the referral centre.
Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potential contagious and life threatening agent.
Droplet precautions should be added to the standard precautions. Airborne precautions should be applied when performing aerosol-generating procedures.

Isolate suspected symptomatic cases at all times.

If MERS coronavirus is suspected, isolate patient to limit further exposure.

Management
Treatment
Treatment is supportive.
No antiviral agents or vaccines are currently available.
Management of contact: consult with NICD and isolate contact.
Record and follow-up all patient contacts.
Prevention
Handwashing and the careful disposal of materials infected with nasal secretions. Antiseptic/disinfectant solutions: choroxylenol, benzalkonium chloride, and cetrimide. Chlorhexidine has been shown to be ineffective.

REFERRAL
All cases, after consultation with infectious diseases and NICD.

10.19.1 COVID-19: CORONAVIRUS DISEASE-19
U07.1/U07.2
Note: notifiable medical condition.

Consult the most recent NICD guidelines on the clinical management of suspected or confirmed Covid-19 disease available at: https://www.nicd.ac.za/diseases-a-z-index/covid-19/covid-19-guidelines/

DESCRIPTION
» Viral respiratory illness caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). SARS-CoV-2 causes coronavirus infectious disease-2019 (COVID-19).
» The mean incubation period is 4-5 days but may be up to 14 days. Patients may however be infectious for 2-3 days prior to the onset of symptoms.
» The elderly are at high risk for severe COVID-19 disease. Other risk factors include cardiopulmonary comorbidities, obesity, HIV, and diabetes mellitus.
» Covid-19 presents as an asymptomatic infection; or as a respiratory tract infection that may range from mild to severe, with atypical manifestations such as diarrhoea, skin manifestations, hyperglycaemic syndromes and large vessel strokes.

» A suspected Covid-19 case includes any person presenting with an acute (≤14 days) respiratory tract infection or other clinical illness compatible with Covid-19, or an asymptomatic person who is a close contact to a confirmed case.
» In the context of Covid-19, the key respiratory syndrome consists of ANY of:
  - Cough
  - Sore throat
  - Shortness of breath
  - Anosmia (loss of smell) or dysgeusia (loss of taste)
» This may present with or without other symptoms (such as fever, weakness, myalgia or diarrhoea).

Testing
» PCR-based tests are recommended for the diagnosis of acute Covid-19 infection. Upper respiratory tract (nasopharyngeal or oropharyngeal) samples should be sent on all patients. Sputum can be sent when available.
» A single positive PCR test is sufficient proof of Covid-19 infection.
» Due to poor sensitivity within the first 1-2 weeks after symptom onset, serology (antibody test) is not recommended for the diagnosis of acute Covid-19 infection.
» All healthcare workers should wear appropriate personal protective equipment (PPE) for both contact and respiratory precautions when obtaining specimens
» Record and report and notify all confirmed Covid-19 cases

GENERAL MEASURES
» Manage patients who are asymptomatic or who meet criteria for mild disease at home, provided they can safely self-isolate and seek urgent health care if required.

» Give strict advice to patients who self-isolate at home and how to reduce possible transmission to others.

Criteria for management at home (for age >12 years):

Mild disease:

» SpO2 ≥95%
» Respiratory rate <25 breaths/minute
» HR <120 beats/minute
» Mental status normal

Able to safely self-isolate:

» Separate bedroom available for patient to self-isolate in
» Able to maintain physical distancing at home
» Able to maintain hand hygiene
» Patient able to contact, and return to, healthcare facility in case of deterioration

MEDCINE TREATMENT

Paracetamol is recommended for symptomatic treatment of patients with pain in preference to nonsteroidal anti-inflammatory drugs (NSAIDs).

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Note:

» Any deterioration in the ability to perform activities of daily living at home as a result of dyspnoea should prompt re-evaluation at a healthcare facility.
» Corticosteroids should not be used for the treatment of Covid-19 in patients who do not require supplemental oxygen or mechanical ventilation. However, systemic corticosteroids should not be withheld from patients who require them for another reason such as an acute exacerbation of asthma or chronic obstructive pulmonary disease.

COVID-19 HOTLINE NUMBERS
Clinicians: 080011131
Public: 080002999
http://www.nicd.ac.za/ ; https://sacoronavirus.co.za/

Infection Prevention and Control (IPC)

» Practice hand hygiene.
» Use healthcare worker PPE: gloves, gown (or apron), and a medical mask.
» Practice safe waste management.
» Use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use.

» Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms.

Comprehensive national IPC guidelines for Covid-19 are available at the NICD's website: https://www.nicd.ac.za/diseases-a-z-index/covid-19/covid-19-guidelines/

REFERRAL

All cases who do not meet the criteria for management at home. *LoE:III*[196]

PHC Chapter 11: Human immunodeficiency virus and acquired immune deficiency syndrome (HIV AND AIDS)

HIV infection in adults

HIV infection in children

HIV prevention

Side effects and complications of ART

HIV INFECTION IN ADULTS

Consult the most recent HIV Guidelines from the National Department of Health.
https://www.knowledgehub.org.za/elibrary/2019-art-clinical-guidelines-management-hiv-adults-pregnancy-adolescents-children-infants

DESCRIPTION

HIV replicates in CD4 lymphocytes and monocytes, leading to progressive destruction of CD4 lymphocytes and impaired immunity.
Primary infection is characterised by:
» glandular fever-type illness
» maculopapular rash
» small orogenital ulcers
After primary infection, patients may have generalised lymphadenopathy and are usually asymptomatic for several years. Subsequently inflammatory skin conditions and an increased frequency of minor infections occur, followed by more severe infections (especially tuberculosis), weight loss or chronic diarrhoea. Eventually severe opportunistic infections, HIV-associated cancers or other severe HIV manifestations develop, known as the Acquired Immune Deficiency Syndrome (AIDS).

DIAGNOSIS

» Adequate pre- and post-test counselling must be provided.
» Ensure patient confidentiality.
» HIV in adults must be confirmed with a 2nd rapid test from a different manufacturer. If the screening and confirmation rapid test result differ, repeat the tests. If the repeated test series differ, a laboratory test would be required (usually ELISA).
» HIV antibodies are not detected during the 1st few weeks in primary infection. This is known as the window period.

PROGNOSIS

» Progression of HIV diseases is variable. The CD4 lymphocyte count and clinical features of immune suppression (see WHO staging below) both provide independent information on prognosis. Patients may be asymptomatic with very low CD4 counts or have severe clinical features with well-preserved CD4 counts. CD4 counts < 200 cells/mm3 indicate severe immune suppression. All HIV-infected patients must have a CD4 count requested and WHO clinical staging done.
» All HIV-infected patients are eligible for ART, irrespective of CD4 count or WHO stage. Patients should be counselled about the benefits and risks of early ART initiation, and encouraged to initiate ART as soon as feasible. However, should a patient elect to defer ART, the CD4 count should be repeated every 6 months until ART can be initiated.

South African modified WHO staging of HIV/AIDS for adults and adolescents

Clinical stage 1
» Asymptomatic.
» Persistent generalised lymphadenopathy.

Clinical stage 2

» Unexplained moderate weight loss (< 10% of presumed or measured body weight).
» Recurrent respiratory tract infections (sinusitis, otitis media and pharyngitis).
» Herpes zoster (shingles).
» Angular stomatitis.
» Recurrent oral ulceration.
» Papular pruritic eruption.
» Seborrhoeic dermatitis.
» Fungal nail infections.

Clinical stage 3

» Unexplained severe weight loss (> 10% of presumed or measured body weight).
» Unexplained chronic diarrhoea for > 1 month.
» Unexplained persistent fever (> 37.5ºC intermittent or constant for > 1 month).
» Persistent oral candidiasis (thrush).
» Oral hairy leukoplakia.
» Pulmonary TB.
» Severe bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, or bacteraemia).
» Acute necrotizing ulcerative stomatitis, gingivitis, or periodontitis.
» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5 × 109/L) and/or chronic thrombocytopaenia (< 50 × 109/L).

Clinical stage 4

» HIV wasting syndrome.
» Extrapulmonary tuberculosis.
» Pneumocystis pneumonia.
» Recurrent severe bacterial pneumonia.
» Chronic herpes simplex infection (orolabial, genital or anorectal of > 1 month duration or visceral at any site).
» Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs).
» Kaposi's sarcoma.
» Cytomegalovirus infection (retinitis or infection of other organs).
» Central nervous system toxoplasmosis.
» HIV encephalopathy.
» Extrapulmonary cryptococcosis including meningitis.
» Disseminated non-tuberculous mycobacterial infection.
» Progressive multifocal leukoencephalopathy.
» Chronic cryptosporidiosis.
» Chronic isosporiasis.
» Disseminated mycosis (extrapulmonary histoplasmosis or coccidiomycosis).
» Recurrent septicaemia (including non-typhoidal Salmonella).
» Lymphoma (cerebral or B cell non-Hodgkin).
» Invasive cervical carcinoma.
» Atypical disseminated leishmaniasis.
» Symptomatic HIV-associated nephropathy or symptomatic HIV-associated cardiomyopathy.

GENERAL MEASURES

» Patients and their families must be supported and encouraged to join support or peer groups.
» Counsel patients on preventive methods of reducing the spread of HIV:
  - use condoms during sexual intercourse
  - ART in HIV-infected
  - PrEP where indicated
  - seek early treatment for sexually transmitted infections
  - safe handling of blood spills.

11.1 ANTIRETROVIRAL THERAPY, ADULTS

B24

Antiretroviral therapy (ART) suppresses viral replication (measured with the viral load test), increases the CD4 count and reduces HIV-associated diseases and death. ART guidelines are regularly updated, so it is important to consult the current National Guidelines.

ELIGIBILITY FOR ART

All adults with confirmed HIV infection, irrespective of CD4 count or WHO clinical stage. *LoE: I*[197]

Timing of ART initiation:
ART may be started on the same day if the patient has no clinical contraindication, and the patient is willing to start after receiving pre ART counselling. In general, ART should be started as soon as possible, within 2 weeks of CD4 count result availability. For clinical indications for deferring ART initiation, see below.

Immediate initiation:
ART should be initiated immediately in pregnancy and during breastfeeding. *LoE:III*[198]

Fast-tracking (within 7 days):
Unless contra-indicated (see table below), ART should be initiated within one week in the following cases:
» CD4 count < 200 cells/mm3 (except TB patients and cryptococcal meningitis).
» WHO stage 4 (except TB meningitis and cryptococcal meningitis).

Clinical indications for deferring ART initiation:
Early ART initiation increases the risk of the immune reconstitution inflammatory syndrome (IRIS) (see Section 11.13.1: Immune Reconstitution Inflammatory Syndrome (IRIS)). Defer ART in patients with cryptococcal meningitis (see Section 11.3.4.2: Cryptococcal meningitis) or TB meningitis (see Section 10.17: Tuberculosis, extrapulmonary) as there is increased risk of mortality due to IRIS with early initiation (see below for timing).

TB co-infection:

Initiating ART in patients with TB co-infection
Start with TB treatment first, followed by ART initiation. Start ART as follows:

» In TB patients with CD4 counts < 50 cells/mm3 (except TB meningitis), start ART within 2 weeks after starting TB treatment. *LoE:I*[199]

» In patients with TB meningitis (irrespective of CD4 count), defer ART until 8 weeks after starting TB treatment. *LoE:I*[200]

» In TB patients with CD4 count > 50 cells/mm3, defer ART until 8 weeks after starting TB treatment, which has shown to be safe and reduces the risk of deterioration due to the immune reconstitution inflammatory syndrome (IRIS). *LoE:I*[201]

Cryptococcal meningitis:

Initiating ART in patients with cryptococcal meningitis

In patients with cryptococcal meningitis, ART should be deferred until 4–6 weeks after starting antifungal treatment (earlier initiation has been shown to increase the risk of death).

PSYCHOSOCIAL INDICATORS OF READINESS FOR ART

It is essential that patients have good insight into the need for long-term therapy and high levels of adherence. Give careful attention to adherence planning. Encourage patients to disclose their HIV status to somebody who should act as a treatment supporter. If this is not possible then the patient should join a support group.

Manage depression.

Active substance abuse/alcohol is an impediment to adherence and, where possible, should be addressed prior to initiating ART. *LoE:III*[202]

Women of childbearing potential (WOCP) should be given all necessary information on the benefits and potential risks of neural tube defects (NTDs) with dolutegravir use periconception. *LoE:III*[203]

FIRST-LINE ART REGIMENS	
Treatment-naïve patients	» Men ≥35kg and ≥10 years of age » WOCP not actively wishing to conceive » Pregnant women ≥6 weeks gestation, and those who make an informed choice to use DTG • TDF + 3TC + DTG <u>Patients with TB:</u> • TDF + FTC + EFV <u>Pregnant women <6 weeks gestation or actively wanting to conceive:</u> • TDF + FTC + EFV (Also see section 6.7: HIV in pregnancy) *LoE:I*[204]
Contraindications and intolerance to EFV	• TDF + 3TC + DTG WOCP actively wanting to conceive and pregnant women <6 weeks gestation require adequate counselling to make an informed choice to use DTG
Contraindications to EFV and DTG	Start protease inhibitor-based regimen: • TDF + 3TC/FTC + LPV/r
Contraindication to TDF » eGFR <50 mL/minute. » Use of additional nephrotoxic drug e.g. aminoglycoside.	Replace TDF+ 3TC/FTC with either • ABC+ 3TC or • AZT + 3TC *LoE:I*[205]
Contraindication to TDF and ABC intolerance » eGFR <50 mL/minute. » Use of additional nephrotoxic agent e.g. aminoglycoside. » Hypersensitivity.	• AZT+ 3TC with DTG or EFV
Note: In the unlikely scenario where there is intolerance/contraindication to all currently available NRTIs, an alternative dual-therapy regimen may be used, e.g. DTG+ 3TC (if no resistance/intolerance to 3TC and VL <500 000 copies/mL) or EFV + LPV/r or DTG + LPV/r may be used. Consult a specialist. *LoE:I*[206]	

LoE:III[207]

Currently available ARV FDC preparations on contract circular:

- TDF 300mg + DTG 50 mg + 3TC 300 mg
- TDF 300 mg + FTC 200 mg + EFV 600 mg
- ABC 600 mg + 3TC 300 mg
- TDF 300 mg + FTC 200 mg
- AZT 300 mg + 3TC 150 mg
- LPV 800 mg + ritonavir 200 mg

LoE:III[208]

Note: In patients who have interrupted ART:

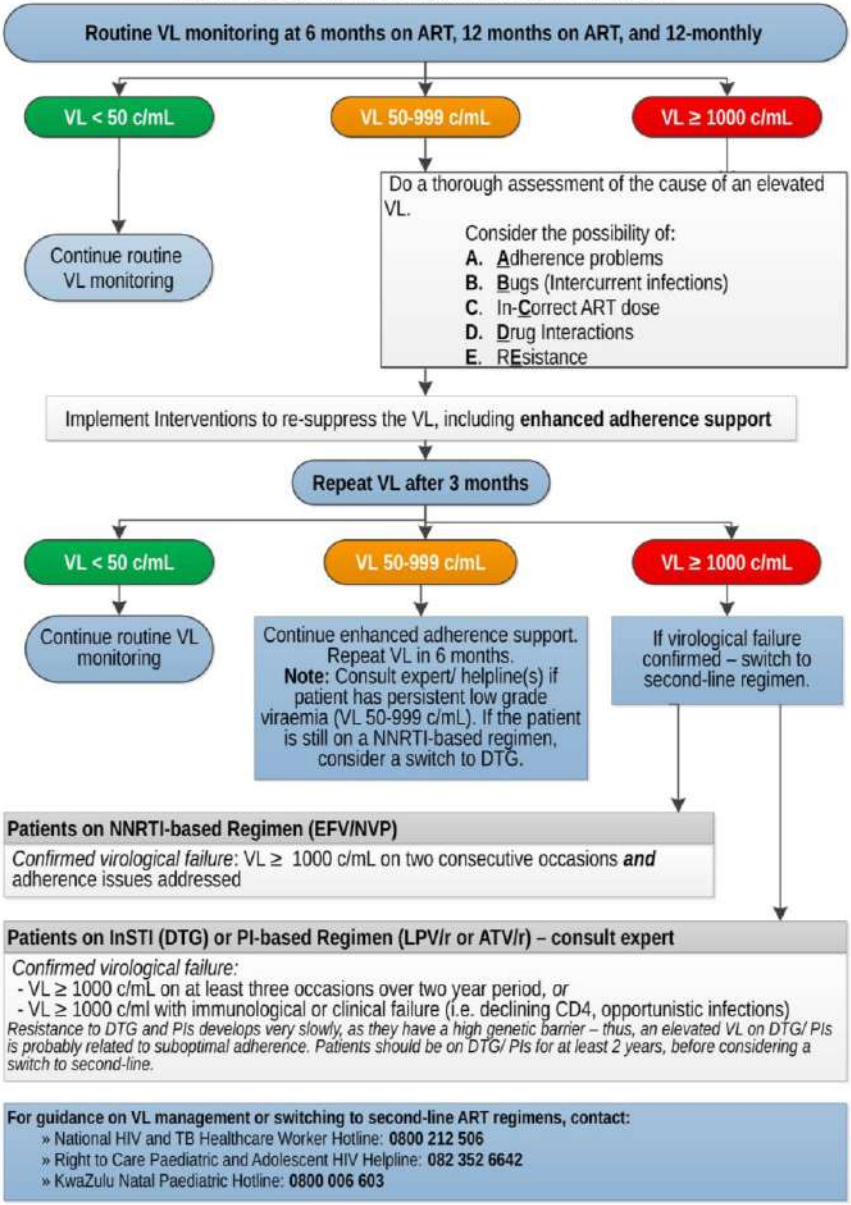
» Recommence previous regimen and
» Do VL, recommence ART regimen, monitor at the routine 3- or 6-month VL test.
» Target is greater than 1 log (10 fold) decrease.

LoE:III[209]

MONITORING ON ART **Standardised national monitoring for adults and adolescents with HIV**	
At HIV Diagnosis	» Confirm HIV positive result with antibody test. » WHO staging. » Check CD4 count. » CD4 <100 cells/mm3: Check cryptococcal antigen (If symptomatic, perform LP). *LoE:III*[210] » CD4 <200 cells/mm3: Fast track for ART initiation, initiate cotrimoxazole prophylaxis. » CD4 <350 cells/mm3: Prioritise for ART. » Screen for pregnancy or ask if planning to conceive. » Screen for mental health, STIs and NCDs. » Screen for TB using the WHO screening questionnaire (any one of cough, fever, night sweats, or weight loss) – in pregnancy do sputum XpertMTB/RIF Ultra® in all at HIV diagnosis. » Do urine LAM testing if patients have a CD4 ≤100 cells/mm3 and there are symptoms of tuberculosis. *LoE:III*[211] » Urine dipstick for proteinuria and haematuria. *LoE:III*[212]
Prior to initiating ART	» Check creatinine (avoid TDF if eGFR <50 mL/minute). » Check HB, and if abnormal, do FBC (avoid AZT if Hb <8 g/dl). » Check HBsAg (if positive, TDF should form part of the regimen).
On ART	» VL at 6 and 12 months after initiating ART and every 12 months thereafter, if virologically suppressed. » CD4 at 12 months after initiating ART*. » Creatinine at 3, 6 and 12 months after initiation, and every 12 months thereafter if on TDF. » FBC and differential count at 3 and 6 months after initiating AZT, then every 12 months and repeat if clinically indicated.. » ALT if symptoms of hepatitis develop. *Stop CD4 count monitoring when >200 cells/mm3 and virologically suppressed. However, if virological or clinical failure occurs, then a CD4 count should be done as cotrimoxazole may need to be commenced/recommenced. Repeat CD4 count every 6 months if VL remains > 1000 copies/mL

LoE:III[213]

VIRAL LOAD MONITORING AND MANAGEMENT



LoE:III[214]

SECOND-LINE ART REGIMENS	
Failing a NNRTI-based 1st line regimen *(TDF* + 3TC/FTC + EFV)* VL ≥ 1000 copies/mL (on 2 tests), and adherence issues addressed	• AZT + 3TC + DTG. If HBsAg positive, add TDF: • AZT + 3TC + DTG + TDF If DTG contraindicated/ not tolerated: • AZT + 3TC +LPV/r If HBsAg positive: • TDF** + 3TC + LPV/r If AZT and TDF contraindicated/ not tolerated (e.g. anaemia and renal impairment): • ABC + 3TC + LPV/r
Note: *Always check for hepatitis B co-infection before stopping TDF. If patient has chronic hepatitis B, stopping TDF may lead to a fatal hepatitis flare. If hepatitis B positive, TDF should be continued as a fourth medicine in the 2nd line regimen. *LoE:III*[215] **AZT is omitted from LPV/r-containing regimens when TDF is continued due to HBV co-infection. Resistant NRTIs may be recycled with an active PI if no other feasible options are available. *LoE:I*[216]	
Failing a DTG- based 1st line regimen for > 2 years (TDF+3TC+DTG) » Resistance testing for adults and adolescents failing a DTG-based regimen and who meet the definition of confirmed virological failure may be authorized by an expert on a case-by-case basis.	• AZT + 3TC +LPV/r If HBsAg positive: • TDF + 3TC/FTC +LPV/r *LoE:III*
Dyslipidaemia requiring lipid-lowering therapy or diarrhoea associated with LPV/r	• Switch LPV/r to ATV/r

LoE:III[217]

THIRD-LINE ART REGIMENS
Failing any 2nd line regimen Refer to a specialist. Resistance to LPV/r or ATV/r and/or DTG must be shown on genotype antiretroviral resistance test in order to qualify for 3rd line – this test is expensive and should only be done in patients with ≥2 years exposure to a PI or DTG and objective evidence of good adherence. Application for 3rd line using the standard motivation form is required (available from TLART@health.gov.za) –the regimen will be determined by an Expert Committee based on the pattern of resistant mutations and the prior history of antiretroviral exposure. Alternative urls: https://www.righttocare.org/what-we-do/third-line-art/; https://sahivsoc.org/Files/Application%20for%20third%20line%20antiretrovirals_092017.pdf

LoE:III[218]

ABC=Abacavir, 3TC= Lamivudine, TDF= Tenofovir disoproxyl fumarate, AZT=Zidovudine, FTC= Emtricitabine, LPV/r=Lopinavir/ritonavir, DTG= Dolutegravir, EFV= Efavirenz

ANTIRETROVIRAL MEDICINES: DOSE AND COMMON ADVERSE DRUG REACTIONS (ADRs)

Generic name	Class	Usual dose	Renal adjusted dose LoE:III[219]	Important adverse drug reactions and timing
Tenofovir (TDF)	NRTI	300 mg daily	Avoid in renal impairment (eGFR <50 mL/min)	» Acute kidney injury (rare - weeks to months). » Decline in eGFR (months to years) » Fanconi syndrome (rare – months to years) » Reduced bone mineral density (months to years). LoE:III[220] » Hyperlactataemia/ steatohepatitis (very low risk - months).
Abacavir (ABC)	NRTI	600 mg daily	Dose adjustment not required	» Hypersensitivity reaction (1 to 6 weeks) fever, rash, constitutional symptoms, gastrointestinal symptoms and respiratory symptoms. » Hyperlactataemia/ steatohepatitis (very low risk - months).
Zidovudine (AZT)	NRTI	300 mg 12 hourly	CrCl <10 mL/min: 300 mg daily	» Anaemia, neutropenia (weeks to months). » Gastro-intestinal upset. » Headache. » Myopathy (rare). » Hyperlactataemia / steatohepatitis (medium risk - months). » Lipoatrophy (months to years).
Lamivudine (3TC))	NRTI	300 mg daily (or150 mg 12 hourly)	CrCl 10-50 mL/min: • 150 mg daily CrCl <10 mL/min: • 50 mg daily	» Anaemia due to pure red cell aplasia (rare). » Hyperlactataemia / steatohepatitis (very low risk - months).
Emtricitabine (FTC)	NRTI	200 mg daily	CrCl 30-50 mL/min: • 200 mg every 2 days CrCl 15-29 mL/min: • 200 mg every 3 days CrCl <15 mL/min: • 200 mg every 4 days	» Palmar hyperpigmentation. » Hyperlactataemia / steatohepatitis (very low risk - months). » Anaemia due to pure red cell aplasia (rare). LoE:III[221]
Dolutegravir (DTG)	InSTIs	50 mg once daily	Dose adjustment not required	» Hypersensitivity (rare, weeks) » Insomnia (common) » Headache (common)

				» Weight gain (common) *LoE:III*[222] » Nausea, diarrhea (common) » Hepatitis (uncommon) » Other neuropsychiatric symptoms » Increase in serum creatinine due to inhibition of creatinine secretion by DTG; this is clinically insignificant as glomerular filtration rate is not reduced but will modestly affect eGFR which is determined using serum creatinine.
Efavirenz (EFV)	NNRTI	600 mg at night	Dose adjustment not required	» Central nervous system symptoms: vivid dreams, problems with concentration, confusion, mood disturbance, psychosis (days to weeks). » Encephalopathy, often with cerebellar features (uncommon – months to years). *LoE:III*[223] » Rash (1 to 6 weeks). » Hepatitis (weeks to months) » Gynaecomastia.
Lopinavir/ ritonavir (LPV/r)	Boosted PI	400/100 mg 12-hourly **OR** 800/200 mg daily (only if PI-naïve)	Dose adjustment not required	» Gastrointestinal upset. » Dyslipidaemia (weeks). » Rash and/or Hepatitis (1 to 6 weeks).
Atazanavir/ ritonavir (ATV/r)	Boosted PI	300 mg with ritonavir 100 mg daily	Dose adjustment not required	» Unconjugated hyperbilirubinaemia (common, but benign)). » Dyslipidaemia (low risk). » Hepatitis (rare - 1 to 6 weeks). » Renal stones (not common).

NRTI = nucleoside reverse transcriptase inhibitor; NtRTI = nucleotide reverse transcriptase inhibitor; NNRTI = non-nucleoside reverse transcriptase inhibitor; PI = protease inhibitor, InSTI = integrase strand transfer inhibitor

LoE:III[224]

The time-onset information with respect to ADRs serves as an estimate. Patients may present with ADRs with the onset deviating from that indicated in the table. *LoE:III*[225]

ART: DRUG-DRUG INTERACTIONS

Information can be accessed from:

» https://www.hiv-druginteractionslite.org/checker
» http://www.mic.uct.ac.za/ and download the ARV/EML interaction checker.
» Package inserts.

ART INTERACTIONS WITH RIFAMPICIN AND RECOMMENDATIONS FOR ADMINISTRATION			
Class	**ARV**	**Interaction with rifampicin**	**Dose of ARV with rifampicin**
NRTI	3TC/FTC/TDF/ AZT/ABC	No clinically significant pharmacokinetic interactions	No dose adjustment required.
NNRTI	EFV	Non-significant change (EFV) concentrations may increase in patients who are genetic slow metabolisers of EFV due to inhibition by INH)	No dose adjustment required (600 mg at night).
InSTI	DTG	Significant reduction in concentration of DTG	Dosing frequency increased to 50 mg 12 hourly.*
	RAL	Significant reduction in RAL concentration	Dosing frequency to be increased to 400 mg 12 hourly.
PI	LPV/r	LPV plasma concentrations significantly decreased	Double the dose of LPV/r to 800/200 mg 12-hourly. **Note:** There is an increased risk of ALT/AST elevations and gastrointestinal disorders. Dose adjustments should be gradually titrated upward over 1-2 weeks.*
	All other PIs	Marked reduction in PI concentrations	Do not prescribe concomitantly – replace rifampicin with rifabutin 150 mg daily (see monitoring instructions below).

*Dose adjustments should be continued for 2 weeks after rifampicin is stopped. *LoE:III*[226]

DRUG INTERACTIONS WITH Dolutegravir		
Interacting medicine	**Effect of co-administration**	**Recommendation**
Preparations containing polyvalent cations (Mg^{2+}, Ca^{2+}, Fe^{2+}, Al^{3+}, Zn^{2+}) Antacids Sucralfate Multivitamins Nutritional supplements	Significant reduction in concentration of DTG	Magnesium- and aluminum-containing preparations should be taken 6 hours before or 2 hours after DTG Calcium- and iron- containing preparations can be taken with DTG together with food. **Note:** Iron and calcium should be taken at least 4 hours apart from one another.

Anticonvulsants: Carbamazepine Phenobarbital Phenytoin	Significant reduction in concentration of DTG	Avoid co-administration if possible. Consider valproate or lamotrigine. *For carbamazepine:* Double DTG dose to 50 mg 12 hourly.
Metformin	Significant increase in metformin levels	Administer metformin to a maximum of 500 mg 12 hourly.
Rifampicin	Significant reduction in concentration of DTG	Double DTG dose to 50 mg 12 hourly.

LoE:III[227]

DRUG INTERACTIONS WITH BOOSTED PIs		
Interacting medicine	**Effect of co-administration**	**Recommendation**
Substrates of cytochrome P450 3A4 (e.g. most statins, calcium channel blockers, most SSRIs, most benzodiazepines)	Significant increase in levels of CYP3A4 substrates	Avoid co-administration or use lower doses of CYP3A4 substrates (always consult interaction resources)
Anticonvulsants: Carbamazepine Phenobarbital Phenytoin	Significant reduction in concentration of PI	Avoid co-administration. Consider valproate or lamotrigine.
Proton pump inhibitors	Significant reduction in ATV levels	Avoid co-administration. *LoE:III*[228]
Rifampicin	Significant reduction in levels of PI	Double LPV/r dose. Avoid co-administration of other PIs (replace rifampicin with rifabutin)

LoE:III[229]

REFERRAL

» Contra-indications to commencing ART.
» Failing second-line ART regimen.

11.2 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN ADULTS

11.2.1 COTRIMOXAZOLE PROPHYLAXIS

Z29.2 + (B24)

DESCRIPTION

Primary prophylaxis reduces the probability of developing many infections, e.g.:

» Pneumocystis pneumonia
» Toxoplasmosis
» bacterial pneumonia
» Bacteraemia
» cystoisosporiasis

Indications for primary prophylaxis:

» WHO Clinical stage II, III or IV.
» CD4 count < 200 cells/mm3.

LoE:III[230]

MEDICINE TREATMENT

Prophylaxis

- Cotrimoxazole, oral, 160/800 daily. LoE:I[231]

Note:

Once the CD4 >200 cells/mm3 (as measured at the routine CD4 count done at 1 year on ART), discontinue prophylaxis. If the CD4 count was >200 cells/mm3 when cotrimoxazole was commenced (e.g. patients with TB) continue for 6 months.
(See Section 17.3.4.2.4: Pneumocystis pneumonia for secondary prophylaxis).

Note: Cotrimoxazole hypersensitivity is common and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of cotrimoxazole, the medicine must be immediately and permanently stopped and the patient referred to hospital. LoE:III[232]

11.2.2 TUBERCULOSIS PREVENTIVE THERAPY (TPT)

Z29.2 + (B24)

Patients with HIV infection are more susceptible to TB infection than HIV-uninfected patients at any CD4 count. TPT is an effective intervention for reducing the incidence of TB in HIV-infected patients

Eligibility

All HIV-infected patients, irrespective of CD4 count and ART status.

Exclusions

- » Suspected or confirmed TB
- » Liver Disease
- » Previous MDR- or XDR-TB
- » Painful peripheral neuropathy
- » Alcohol abusers

Note:

- » TB must be excluded prior to initiating TPT by screening for the following:
  - Cough (any duration)
  - Fever
  - Weight loss
  - Night sweats
- » TPT should not be initiated in patients if any of the above is present. These patients require further investigation for active TB.

Start TPT together with ARVs:

- Isoniazid, oral, 300 mg daily for 12 months. LoE:I[233]

AND

- Pyridoxine, oral, 25 mg once daily for 12 months.
  - Educate patients on the symptoms of hepatotoxicity (nausea, vomiting, yellow eyes, brown urine, and pain in right upper quadrant).
  - Instruct patient to present early if any of these symptoms arise.
  - Patients should be followed up monthly for the first 3 months.

In pregnant women, starting ART:

» <u>If CD4 >350 cells/mm^3.</u> » Defer TPT until after delivery.	» <u>If CD4 ≤350 cells/mm^3.</u> » Exclude active TB with symptom screen and TB Xpert MTB/RIF Ultra ®, then give TPT. LoE:II[234] LoE:III[235]

11.3 OPPORTUNISTIC INFECTIONS, TREATMENT IN ADULTS

11.3.1 APHTHOUS ULCERS IN HIV INFECTION

K12.0 + (B24)

DESCRIPTION

Painful ulcers in the mouth, except the gums, hard palate and dorsum of the tongue.
Minor ulcers (< 1 cm diameter) usually heal within 2 weeks.
Major ulcers (> 1 cm diameter) are very painful, often very deep and persist. Major ulcers generally resolve rapidly on ART.
Herpes simplex, histoplasmosis and mycobacteria may also present with major mucosal ulcers.

MEDICINE TREATMENT

Minor aphthous ulcers:

- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.

REFERRAL

Major aphthous ulcers for further diagnostic evaluation.

11.3.2 CANDIDIASIS, ORAL

B20.4

See Section 1.2: Candidiasis, oral (thrush).

- Commence ART.

11.3.3 CANDIDIASIS, OESOPHAGEAL

B20.4

DESCRIPTION

Infection of the oesophagus with candida, a fungus causing oral thrush.
Patients with oral thrush who have pain or difficulty on swallowing may have oesophageal candidiasis.
See Section 1.2: Candidiasis, oral (thrush).

GENERAL MEASURES

Maintain hydration.

MEDICINE TREATMENT

- Fluconazole, oral, 200 mg daily for 14 days.
- Commence ART within 7 days (unless patient has cryptococcal or TB meningitis).
  See section: 11.1 Antiretroviral therapy, adults.

LoE:III[236]

REFERRAL

» Inability to swallow.
» Frequent relapses.
» Poor response to fluconazole.

11.3.4 CRYPTOCOCCOSIS

B20.5

DESCRIPTION

A life-threatening fungal infection caused by the fungus Cryptococcus. The fungi remain inactive unless a person's immune system is weakened, such as in transplant recipients or persons with untreated HIV.

INVESTIGATIONS

» All ART-naïve patients with CD4 < 100 cells/mm3 should have cryptococcal antigen (CrAg) test done on serum (unless they have had a diagnosis of cryptococcal infection).
» All patients with a positive serum CrAg test should have a lumbar puncture (LP) to exclude cryptococcal meningitis.

MEDICINE TREATMENT

If CSF Crag positive:

Refer for amphotericin B, IV (induction phase) - See Adult Hospital STGs and EML, Section 10.2.4: Cryptococcosis.

Patients may be down referred for secondary prophylaxis; see maintenance phase, below.

If there is any delay in performing LP, start oral fluconazole therapy:

- Fluconazole, oral, 1200 mg immediately. *LoE:III*[237]

No symptoms present and CSF CrAg negative (LP):

Induction phase

- Fluconazole, oral 1200 mg daily for 14 days. *LoE:III*[238]

Consolidation phase

Follow with:

- Fluconazole, oral, 800 mg daily for 8 weeks.

Maintenance phase

- Fluconazole, oral, 200 mg daily.
  - Continue for at least 1 year provided that the CD4 count increases to >200 cells/mm3 on ART. If the CD4 count does not increase continue treatment indefinitely.
- Commence ART: See section 10.1: Antiretroviral therapy. *LoE:III*[239]
  - Cryptococcal meningitis: After 4–6 weeks after starting antifungal therapy.
  - Asymptomatic cryptococcosis: After completion of the induction phase i.e. at 2 weeks after starting antifungal therapy.

CAUTION

» Although fluconazole should be avoided in the 1st trimester, pregnant women should be counselled that the benefits of fluconazole outweigh the risks in the management of cryptococcosis.
» All pregnant women <20 weeks gestation exposed to fluconazole should have an ultrasound scan to detect congenital abnormalities. *LoE:III*[240]

» Fluconazole is present at concentrations similar to maternal plasma concentrations in breast milk *LoE:III*[241]

REFERRAL
» If LP unavailable: Refer all serum CrAg positive patients for LP
» If LP available:
- Refer all patients with CSF CrAg positive (cryptococcal meningitis).
- Refer all symptomatic patients with CSF CrAg negative (non-meningeal cryptococcosis).

» All patients with complications.

11.3.5 DIARRHOEA, HIV-ASSOCIATED
B20.8 + (A07.2-3)

DESCRIPTION
Diarrhoea that persists for > 2 weeks.
Often associated with wasting.
Stool for ova, cysts and parasites should be requested in all cases.

MEDICINE TREATMENT
If stool is negative for parasites or shows *Cryptosporidium*:
Note: A negative stool specimen does not exclude *Cryptosporidium*. If cryptosporidium infection is suspected, request specific laboratory testing for the parasite.
- Loperamide, oral, 2 mg as required.
  - Maximum 8 mg daily.
- Commence ART.

If stool shows *Isospora belli*:
- Cotrimoxazole, oral, 320/1600 mg (4 tablets) 12 hourly for 10 days.
  - Followed by 160/800 mg (2 tablets) daily until CD4 > 200 cells/mm3 on ART.
- Commence ART.

Diarrhoea persisting for 4 weeks is a WHO stage 3 condition (if there is weight loss or fever it is stage 4) and ART should be commenced.

REFERRAL
Stool contains blood or mucus.

11.3.6 ECZEMA, SEBORRHOEIC
See section 5.8.3: Dermatitis, seborrhoeic.

11.3.7 FUNGAL NAIL INFECTIONS
B20.5
This is common in HIV-infected patients and can involve multiple nails. Treatment is not generally recommended because it is mostly of only cosmetic importance and therefore the risk of systemic therapy is not warranted. It generally resolves when patient is on ART.

11.3.8 FUNGAL SKIN INFECTIONS

B20.5

See Section 5.5: Fungal infections of the skin.

11.3.9 GINGIVITIS, ACUTE NECROTISING ULCERATIVE

See Section 1.3.3: Necrotising periodontitis.

11.3.10 HERPES SIMPLEX ULCERS, CHRONIC

B20.3 + (B00.1-2)

DESCRIPTION

Painful ulcers due to herpes simplex virus, involving the skin around the anogenital area or in and around the mouth and nostrils in patients with advanced HIV infection. Ulcers persist for weeks and may be several centimetres in diameter.

GENERAL MEASURES

Keep affected areas clean with soap and water or diluted antiseptic solution.

MEDICINE TREATMENT

- Antiviral (active against herpes simplex) e.g.: *LoE: III*[242]
- Aciclovir, oral, 400 mg 8 hourly for 7 days.
- Commence ART.

Pain:

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» No response to therapy.
» Frequent recurrences

11.3.11 HERPES ZOSTER (SHINGLES)

B20.3 + (B02.0-3/B02.7-9)

DESCRIPTION

Painful vesicular rash in a dermatomal distribution, usually presenting as a band on one side of the body, due to recrudescence of the varicella-zoster virus that causes chickenpox. The surrounding skin is inflamed and the vesicles often contain cloudy fluid. Secondary bacterial infection is often suspected, but is very uncommon.
The elderly and HIV-infected are most affected.
Severe pain can occur after shingles has healed (post-herpetic neuralgia).
Shingles is less infectious than varicella and isolation is not warranted.

MEDICINE TREATMENT

If fresh vesicles are present:

- Antiviral (active against herpes zoster) e.g.:
- Aciclovir, oral, 800 mg five times daily for 7 days (4 hourly missing the middle of the night dose). *LoE:I*[243]

If secondary infection is present:

ADD

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Pain:

- Paracetamol, oral, 1 g 4–6 hourly when required to a maximum of 4 doses per 24 hours.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

If inadequate pain relief

ADD

- Tramadol, oral, 50 mg 6 hourly (Doctor prescribed).

For prolonged pain occurring after shingles has healed (post-herpetic neuralgia), or if pain not responding to paracetamol and tramadol:

- Amitriptyline, oral, 25 mg at night.
  - Increase dose to 50 mg after two weeks if needed.
  - Increase further to 75 mg after a further two weeks if needed.

REFERRAL

» Involvement of the eye.
» Disseminated disease (many vesicles extending beyond the main area).
» Features of meningitis (headache and neck stiffness).
» Severe post-herpetic neuralgia not responding to amitriptyline.

11.3.12 PAPULAR PRURITIC ERUPTION

L29.8

DESCRIPTION

Itchy inflamed papules at different stages of evolution. Healed lesions are often hyperpigmented. The itch is difficult to manage. May flare after starting ART, but generally improves as the CD4 count increases. It is essential to exclude scabies.

GENERAL MEASURES

Minimise exposure to insect bites, e.g. by regularly dipping pets.

MEDICINE TREATMENT

- Cetirizine, oral, 10 mg daily.
- Hydrocortisone 1%, topical cream, applied twice daily for 7 days.
  - Apply sparingly to the face.

11.3.13 PNEUMONIA, BACTERIAL

See Section 17.3: Respiratory infections.

11.3.14 PNEUMONIA, PNEUMOCYSTIS

See Section 17.3.4.2.4: Pneumocystis pneumonia.

11.3.15 TOXOPLASMOSIS

B20.8

Initial diagnosis can only be made at hospital level.

MEDICINE TREATMENT

- Cotrimoxazole, oral, 320/1600 mg 12 hourly for 4 weeks.
  - Then 160/800 mg 12 hourly for 12 weeks.

Secondary prophylaxis

- Cotrimoxazole, oral 160/800 mg daily.
  - Continue until the CD4 count has risen to >200 cells/mm3 on ART.
- Commence ART.

11.3.16 TUBERCULOSIS (TB)

See Section 17.4: Pulmonary tuberculosis (TB).

11.4 HIV AND KIDNEY DISEASE

N04.9/N05.9/N17.9 + (B24)

DESCRIPTION

Various forms of kidney disorders are described among patients who are HIV-infected. Early detection of HIV kidney disease may be beneficial in an attempt to protect the kidney from further disease progression and for adjusting the dose of relevant medicines (See table: Antiretroviral medicines: Dose and common adverse drug reactions, section: 11.1 Antiretroviral therapy, adults).

Screen all patients for renal disease at time of HIV diagnosis.

Patients at high risk or susceptible for HIV renal disease include:

» CD4 count < 200 cells/mm^3.
» History of nephrotoxic medications.
» Comorbidity such as diabetes mellitus, hypertension, or hepatitis C virus co-infection.

Screening for renal disease in HIV

» Tests should include:
  - Urine dipstix for haematuria and proteinuria.
  - Serum creatinine and eGFR.
» If there is no evidence of kidney disease at the initial evaluation, screening should be repeated annually.

» Monitor creatinine on initiation and at months 3, 6, 12 and then 12 monthly for patients receiving tenofovir.

REFERRAL

» Patients with persistent significant proteinuria (1+ or more).
» Unexplained haematuria on 2 consecutive visits
» Estimated creatinine clearance < 60 mL/min.

HIV INFECTION IN CHILDREN

DESCRIPTION

HIV is a retrovirus affecting immune cells, especially CD4 T-lymphocytes. In advanced HIV disease the body loses its ability to fight infections and this is characterised by organ damage, opportunistic infections, malignancies and very low CD4 counts.

In infants and children, most infection is transmitted from mother to child. In adolescents and adults sexual spread is the usual cause.

Infants born of HIV-infected mothers may be:

» HIV-infected,
» HIV-exposed uninfected, or
» HIV-exposed, unknown infection status (at risk of becoming HIV-infected).

To exclude HIV infection in HIV-exposed infants/children, an HIV PCR test (if ≥ 18 months of age: an HIV rapid or ELISA test) performed ≥ 6 weeks following cessation of breastfeeding should be negative and the infant should be ≥6 weeks of age.

If an HIV test result is indeterminate, or if the positive HIV status of a child already initiated on ART is disputed, consult with the closest referral centre for additional HIV testing.

For the purpose of the ART guidelines:

» Children <10 years of age: follow the paediatric antiretroviral therapy (ART) guidelines.
» Adolescents (10–19 years of age): follow the adult ART guidelines. *LoE:III*[244]

DIAGNOSIS IN CHILDREN

Testing must be done with counselling of parent/legal guardian/primary caregiver and, where appropriate, the child. The appropriate consent/assent should be obtained.

WHEN AND HOW TO TEST IN CHILDREN

Which test

Child <18 months of age

HIV PCR test: Always confirm with 2nd HIV PCR test if the first test is positive. This should not delay ART initiation, which should be done with the first positive result.

Child ≥ 18 months of age

HIV rapid or ELISA test: If 1st rapid test is positive, confirm the result with:

» A HIV PCR test if infant between 18-24 months
» A second rapid test using a kit of a different manufacturer, and preferably on a different blood specimen if infant is > 24 months.
» HIV rapid tests may be less reliable in children with advanced disease. If clinical findings suggest HIV infection but the rapid test is negative, send a further specimen of blood to the laboratory for HIV ELISA testing. If HIV status is still unclear, do an HIV PCR test.

When to test HIV-exposed children (See section: 11.5 The HIV-exposed infant).

» Birth (HIV PCR).
» Repeat at 10-week visit (HIV PCR).
» Repeat at 6-month visit (HIV PCR)

» At any time when clinical signs indicate possible HIV infection.
» 6 weeks after breastfeeding has stopped.
» Do Universal HIV rapid/ELISA test at 18 months (HIV rapid test for ALL children regardless of HIV exposure, except in those who previously tested HIV positive and are on ART). *LoE:III*[245]

Also perform PCR testing AT BIRTH on:
» Infants born to mothers who were on TB treatment for active TB during their pregnancy.
» Infants with congenital pneumonia.
» Infants with clinical features suggestive of HIV infection.
» High risk infants requiring urgent HIV diagnosis.

If the HIV PCR result is not available at discharge, the mother should return within 1 week for the result.

» If the HIV PCR result is negative, repeat at 10 weeks:
  - If HIV PCR result at 10–18 weeks, or an age-appropriate test 6 weeks after breastfeeding has stopped, is still negative, perform HIV rapid test at 18 months of age.
  - If positive at any time, start infant ART.

Note:
» Negative tests do not exclude infection until 10-18 weeks after birth and 6 weeks after exposure to other risk of HIV infection (including cessation of breastfeeding).
» Children with discordant HIV test results must be discussed with an expert.
» Do not repeat HIV rapid/ELISA tests in children on established ART.

Also perform age-appropriate testing at any time on:
» Parental request to test the child.
» HIV-infected father or sibling.
» Death of mother, father or sibling.
» Mother's HIV status and her whereabouts are unknown.
» Clinical features suggest HIV infection.
» Infant has acute severe illness.
» Breastfed infant of newly diagnosed HIV-infected breastfeeding mother.
» IMCI classification of SUSPECTED SYMPTOMATIC HIV INFECTION or POSSIBLE HIV INFECTION.
» TB diagnosis, history of TB treatment or new TB exposure.
» Suspicion of sexual assault.
» Wet-nursed/breastfed infant fed by a woman of unknown or HIV-infected status (and repeat age-appropriate test 6 weeks later).
» Children considered for adoption or fostering.

Newborn child whose mother is of unknown HIV status, has died or is not available due to abandonment or other reasons:
» Perform both infant HIV PCR and HIV rapid tests. Initiate PMTCT as for high risk exposure.
» Perform age-appropriate HIV testing in an HIV-uninfected child at any other time if clinical symptoms suggest HIV infection.

Clinical indications that HIV infection should be considered in a child are:

» If the mother is HIV-infected or if the mother's HIV status is not known.
» If the child was HIV PCR-negative but was subsequently breastfed.
» If a child has any of the following features:
  - Rapid breathing or chest indrawing now ("Pneumonia").
  - Persistent diarrhoea now or in the past.
  - Ear discharge now or in the past.
  - Low weight for age/height or unsatisfactory weight gain.
  - ≥ 2 enlarged glands of: neck, axilla or groin.
  - Oral thrush.
  - Parotid enlargement.

All infants/children accessing care should have their HIV exposure status (recent maternal HIV status) and/or HIV status determined.
Women who previously tested HIV-positive should not be retested.
Where mothers tested negative in pregnancy, maternal HIV status should be determined 3-monthly whilst breastfeeding.

WHO clinical staging of HIV and AIDs for infants and children
https://www.who.int/hiv/pub/guidelines/arv2013/annexes/WHO_CG_annex_1.pdf

Adapted WHO clinical staging of HIV and AIDS for infants and children For persons ≤15 years of age with confirmed laboratory evidence of HIV infection
Clinical Stage 1 » asymptomatic » persistent generalised lymphadenopathy (PGL)
Clinical Stage 2 » unexplained persistent weight loss » hepatosplenomegaly » papular pruritic eruptions » extensive human papilloma virus infection » extensive molluscum contagiosum » fungal nail infections » recurrent oral ulcerations » lineal gingival erythema (LGE) » unexplained persistent parotid enlargement » herpes zoster » recurrent or chronic RTIs, i.e. » otitis media » otorrhoea » sinusitis
Clinical Stage 3 » moderate unexplained malnutrition (not adequately responding to standard therapy) » unexplained persistent diarrhoea (14 days or more) » unexplained persistent fever (above 37.5°C, intermittent or constant, for longer than one month) » persistent oral candidiasis (after first 6-8 weeks of life) » oral hairy leukoplakia » acute necrotising ulcerative gingivitis/periodontitis » lymph node TB » pulmonary TB » severe recurrent bacterial pneumonia » chronic HIV-associated lung disease including bronchiectasis

- » symptomatic lymphoid interstitial pneumonitis (LIP)
- » unexplained anaemia (< 8 g/dL), and or neutropaenia (< 500/mm3) and/or thrombocytopaenia (< 50 000/mm3) for more than one month

Clinical Stage 4

- » unexplained severe wasting, stunting or severe malnutrition not adequately responding to standard therapy
- » pneumocystis pneumonia
- » recurrent severe presumed bacterial infections, e.g.
  - empyema
  - bone or joint infection
  - pyomyositis
  - meningitis
- » *but* excluding pneumonia
- » chronic herpes simplex infection; (orolabial or cutaneous of more than one month's duration or visceral at any site)
- » extrapulmonary TB
- » Kaposi's sarcoma
- » oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs)
- » CNS toxoplasmosis (outside the neonatal period)
- » HIV encephalopathy
- » CMV infection (CMV retinitis or infections of organs other than liver, spleen or lymph nodes; onset at age one month of more)
- » extrapulmonary cryptococcosis including meningitis
- » any disseminated endemic mycosis, e.g.
- » extrapulmonary histoplasmosis
- » coccidiomycosis
- » chronic cryptosporidiosis
- » chronic isosporiasis
- » disseminated non-tuberculous mycobacteria infection
- » HIV associated recto-vaginal fistula
- » cerebral or B cell non-Hodgkin lymphoma
- » progressive multifocal leukoencephalopathy (PML)
- » HIV-associated cardiomyopathy or HIV-associated nephropathy

11.5 THE HIV-EXPOSED INFANT

Z20.6

DESCRIPTION

An infant whose mother is HIV-infected, or in whom HIV infection has not been confirmed or excluded.

Transmission of HIV infection from mother to child may occur during pregnancy, during delivery or via breastfeeding. Prevention of transmission of infection from mother to child can be effectively carried out with a very high success rate by means of suppressing the mother's VL and giving ARVs to the infant.

Where the mother's VL cannot be suppressed the risk of breast milk transmission remains significant.

When to test HIV-exposed children

- » Birth (HIV PCR).
- » For recommendations on when to perform additional tests, refer to the guidance on "When to Test" (See section above: HIV infection in children).

MEDICINE TREATMENT

Mother

The PMTCT plan starts with initiation of ART in the mother (either pre or post conception). See Section 6.8: HIV in pregnancy.

Infant

Thereafter, the HIV-exposed infant may be classified into one of the following categories which determines the appropriate infant prophylaxis regimen:

» Low risk.
» High risk.
» Unknown risk, e.g. abandoned infant (manage as high risk). *LoE:II*[246]

Situation	Feeding advice	Comment
<u>Low Risk</u> (at birth) • **NVP** at birth and then daily for 6 weeks.		
Mother is on lifelong ART, and VL <1000 copies/ml (most recent VL taken during the last 12 weeks, *prior to delivery*) **or** Maternal VL <1000 copies/ml *at delivery*	– Encourage breast feeding.	» HIV testing* – Do HIV PCR at birth.* – Do HIV PCR at 10 weeks. – Do HIV PCR at 6 months. – Do infant HIV testing 6 weeks' post-cessation of breastfeeding (either HIV PCR or ELISA depending on age). » Encourage maternal ART adherence.
<u>High Risk</u> (at birth) • **NVP daily for at least 12 weeks and AZT 12 hourly for 6 weeks.**** ○ (initiate as soon as possible) *LoE:I*[247]		
Mother is on lifelong ART, and VL >1000 copies/ml (most recent VL taken during the last 12 weeks, *prior to delivery*) **or** Maternal VL >1000 copies/ml at delivery. **or** Mother with no VL result in the last 12 weeks. **or** Mother not on ART.	<u>Mothers failing on 1st line treatment:</u> – Encourage breastfeeding. <u>Mothers on 2nd or 3rd line regimens and VL >1000 copies/ml:</u> – Advise not to breast feed. – Refer for infant replacement feeding.	» Immediate initiation of maternal ART - see Section 6.8: HIV in pregnancy. » HIV testing* – Do infant HIV PCR at birth/ immediately, if infant tests HIV PCR+, do repeat HIV PCR test and initiate ART immediately. – Do HIV PCR at 10 weeks. – Do HIV PCR at 6 months. – Do infant HIV testing 6 weeks post-cessation of breastfeeding (either HIV PCR or rapid test depending on age). » Encourage maternal ART adherence. » If maternal VL ≥ 1000 copies/ml continue infant NVPprophylaxis.

<table>
<tr><td colspan="3">High Risk (during breastfeeding)
• NVP daily for at least 12 weeks and AZT 12 hourly for 6 weeks.
○ Initiate as soon as possible.</td></tr>
<tr><td>Breastfeeding mother newly diagnosed HIV positive > 72 hours after delivery.

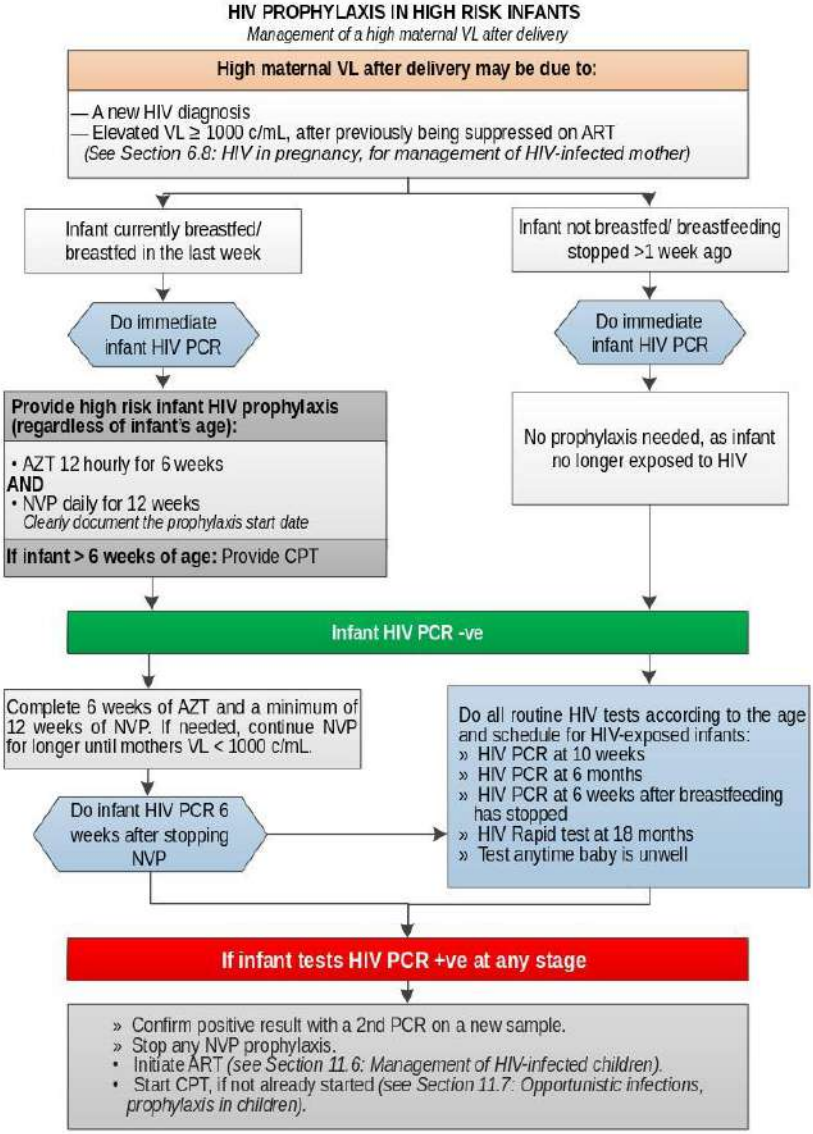
Mother on ART with latest VL > 1000 copies/ml during breastfeeding.</td><td><u>Mothers failing on 1st line treatment:</u>
– Encourage breast feeding.

<u>Mothers on 2nd or 3rd line regimens and VL >1000 copies/ml:</u>
– Advise not to breast feed.
– Refer for replacement feeding**</td><td>» If new maternal HIV diagnosis, initiate ART (see Section 6.8: HIV in pregnancy).
» If mother on ART with elevated VL, encourage ART adherence, and re-suppress maternal VL as a matter of urgency (see Section 6.8: HIV in pregnancy).
» Do immediate infant HIV PCR*.
» If infant currently breastfeeding, or has breastfed in the last week: provide high-risk infant prophylaxis.
» If breastfeeding never started or stopped > 1 week ago: no prophylaxis needed.
» Repeat HIV PCR 6 weeks after stopping NVP
» Do all other routine HIV tests according to the age and schedule for HIV exposed infants*.
» See algorithm below: Management of high maternal VL after delivery.</td></tr>
<tr><td colspan="3">UNKNOWN RISK (abandoned/orphaned infant)
• NVP daily for 6 weeks and AZT 12 hourly for 6 weeks.
○ Initiate as soon as possible. LoE:III[248]</td></tr>
<tr><td>Unknown maternal status because orphaned or abandoned. (Treat all as high-risk HIV-exposed infants)</td><td></td><td>» Do an HIV PCR* and HIV rapid test
» Start high risk infant prophylaxis for 6 weeks.
» Repeat HIV PCR at 10 weeks of age, or 4 weeks after stopping NVP
» Do all other routine HIV tests according to the age and schedule for HIV-exposed infants*.
» See algorithm below: Management of infant of unknown risk (abandoned infant).</td></tr>
</table>

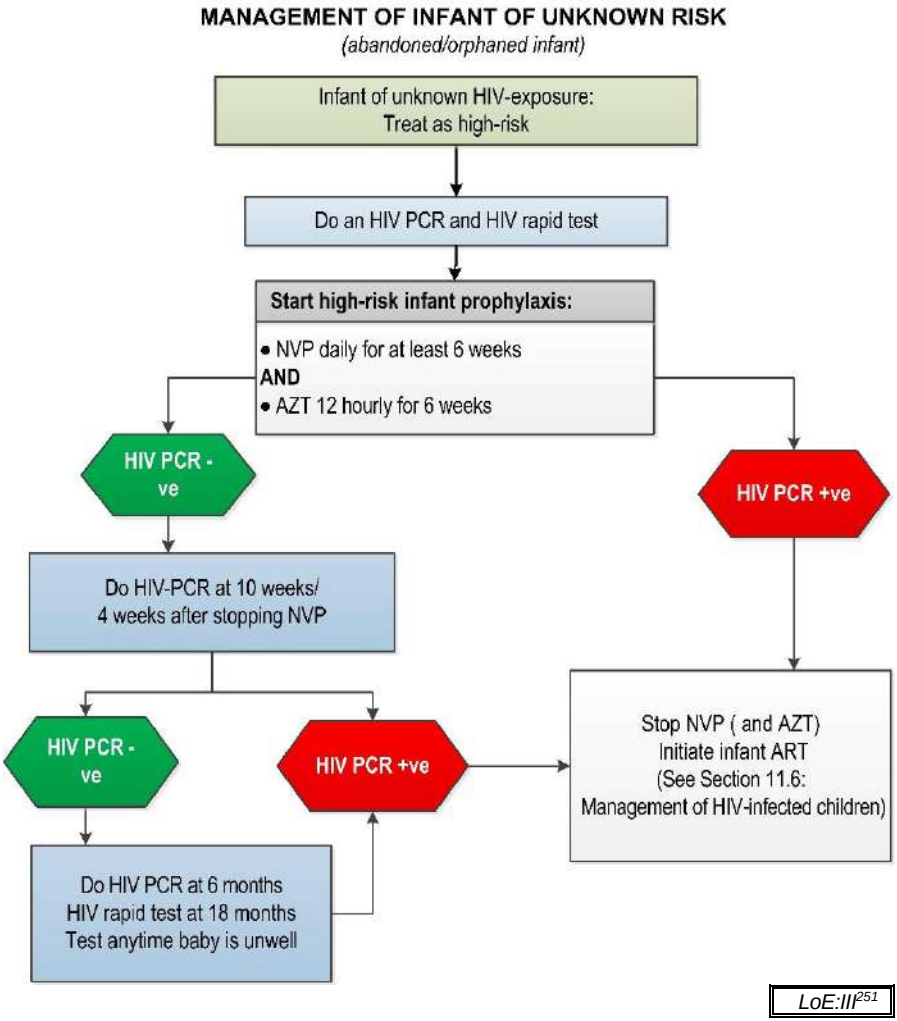
Note:

* If infant tests HIV-positive at any stage, confirm positive result, stop any ART prophylaxis, and initiate ART. See Section 11.6: Management of HIV-infected children.

**High-risk infants, who are exclusively formula fed from birth: give NVP daily for 6 weeks and AZT 12 hourly for 6 weeks. *LoE:III*[249]


HIV PROPHYLAXIS IN HIGH RISK INFANTS
Management of a high maternal VL after delivery
High maternal VL after delivery may be due to:
— A new HIV diagnosis
— Elevated VL ≥ 1000 c/mL, after previously being suppressed on ART
(See Section 6.8: HIV in pregnancy, for management of HIV-infected mother)
Infant currently breastfed/ breastfed in the last week
Infant not breastfed/ breastfeeding stopped >1 week ago
Do immediate infant HIV PCR
Do immediate infant HIV PCR
Provide high risk infant HIV prophylaxis (regardless of infant's age):
• AZT 12 hourly for 6 weeks
AND
• NVP daily for 12 weeks
Clearly document the prophylaxis start date
If infant > 6 weeks of age: Provide CPT
No prophylaxis needed, as infant no longer exposed to HIV
Infant HIV PCR -ve
Complete 6 weeks of AZT and a minimum of 12 weeks of NVP. If needed, continue NVP for longer until mothers VL < 1000 c/mL.
Do all routine HIV tests according to the age and schedule for HIV-exposed infants:
» HIV PCR at 10 weeks
» HIV PCR at 6 months
» HIV PCR at 6 weeks after breastfeeding has stopped
» HIV Rapid test at 18 months
» Test anytime baby is unwell
Do infant HIV PCR 6 weeks after stopping NVP
If infant tests HIV PCR +ve at any stage
» Confirm positive result with a 2nd PCR on a new sample.
» Stop any NVP prophylaxis.
• Initiate ART (see Section 11.6: Management of HIV-infected children).
• Start CPT, if not already started (see Section 11.7: Opportunistic infections, prophylaxis in children).

LoE:III[250]



Non-breastfeeding mother diagnosed HIV positive > 72 hours after delivery:
Do not start NVP. Perform an HIV test on infant and if positive initiate ART.

Infant PMTCT dosages:
Daily prophylaxis for 6 or 12 weeks administered to infants, as indicated above:
» Give 1st dose as soon as possible after birth.
» If baby vomits: Repeat dose once only.
» If infant HIV PCR is positive at any time, stop prophylactic ARV, confirm with 2nd PCR and initiate/refer for ART, while awaiting 2nd PCR result.

» Continue normal breastfeeding and start cotrimoxazole prophylaxis if > 6 weeks of age.

Nevirapine (NVP) dose for infant on PMTCT:

Newborns ≥ 2 kg and infants:

- Nevirapine, oral, 4 mg/kg daily.

Weight kg	Dose mg	Syrup 10 mg/mL	Age Months
2–2.5 kg	10 mg	1 mL	Birth–6 weeks
> 2.5 kg	15 mg	1.5 mL	
> 2.5–7 kg	20 mg	2 mL	> 6 weeks–6 months

LoE:III[252]

Children >6 months of age requiring prophylaxis should use treatment doses. See the Paediatric Hospital STGs and EML, section 9.1.3 The HIV Infected Infant/Child.

Zidovudine (AZT) dose for infant on PMTCT:

Newborns ≥ 2 kg and infants:

- Zidovudine, oral, 4mg/kg/dose 12 hourly.

Weight kg	Dose mg	Syrup 10 mg/mL	Age Months
2–2.499kg	10mg	1 mL	Birth–6 weeks
≥ 2.5 kg	15 mg	1.5 mL	
≥ 2.5–7 kg	60 mg	6 mL	> 6 weeks–6 months

Children >6 months of age requiring prophylaxis should use treatment doses. See dosing table, pg 23.9.

LoE:III[253]

Feeding advice

» Exclusive breastfeeding is strongly recommended for the 1st 6 months, after which the nutritional needs of the child will require the introduction of complementary foods, while breastfeeding continues
» Mothers failing 2nd or 3rd line regimens should not breastfeed. However, a sustainable supply of formula must be provided.
» If women are switched from 1st to 2nd line therapy during pregnancy or breastfeeding, consult with a practitioner experienced and knowledgeable of the factors informing the feeding option decision.
» Mothers on effective ART should be encouraged to breastfeed as the advantages of breastfeeding exceed the risks of HIV transmission.
» Use of flash pasteurisation or Pretoria pasteurisation to reduce HIV transmission is supported but may pose significant barriers to successful breast milk feeding due to the effort involved.

Cotrimoxazole prophylaxis

Initiation:

» All HIV-exposed or infected infants, starting from 6 weeks of age.

Discontinuation:

» If birth and 10 weeks PCR are both negative.

» If HIV-infected – see Section: 11.6 Management of HIV-infected children. LoE:III[254]

REFERRAL
Mother declines infant ARV prophylaxis.

11.6 MANAGEMENT OF HIV-INFECTED CHILDREN (<10 YEARS)
B24

DESCRIPTION
HIV-infected child: An infant/child in whom HIV infection has been confirmed with two age-appropriate tests. See Section 11.5. The HIV-exposed infant.

GENERAL AND SUPPORTIVE MEASURES
» Identify a caregiver who can supervise the child's treatment.
» Link the HIV interventions to the regular well infant visits/nutritional care. Ensure the road to health booklet is correctly completed and used to reflect and guide care.

Counselling is a vital part of the successful care of children with HIV infection and their families. Specific matters requiring attention are:
» The implications of the disease to the family.
» Implications of treatment and understanding of the condition and its care.
» The disclosure process within the family and extended family should be encouraged. Besides the caregiver, help from the family is often useful.
» Disclosure to the child appropriate to age and maturity with the parents' support.
  - Find out what the child understands of their illness and what they would like to know.
  - Disclosure should be child led in terms of information required, language used and educational/emotional readiness.
  - Anticipate the effects of disclosure on the child, family and other contacts such as friends and school colleagues.
  - Ensure that in disclosure the child is constantly reassured of the parents'/caregivers' love.

Treatment of mothers, caregivers and other family members:
» Always ask about the caregiver's health, and the health of other family members.
» Ensure that mothers and other family members have timeous access to medical care including ART.
» Encourage breastfeeding in all mothers with HIV-infected children, with introduction of complementary foods from 6 months of age.
» At every visit ask about TB contacts and symptoms in children and their caregivers.

STANDARDISED NATIONAL MONITORING FOR INFANTS & CHILDREN WITH HIV

AT INITIAL DIAGNOSIS OF HIV	PURPOSE
Verify HIV status.	To ensure that national testing algorithm has been followed.
Document weight, height, head circumference (< 2 years of age) and development.	To monitor growth and development.
Screen for TB symptoms.	To identify TB and HIV co-infection

Do CD4 count.	Children < 5 years: Baseline. Do not wait for CD4 count to start ART.
	Children ≥ 5 years: To assist in determining eligibility for OI prophylaxis.
Hb or FBC if available.	To detect anaemia or neutropaenia.
AT ROUTINE FOLLOW-UP VISITS, IF NOT CURRENTLY ON ART	**PURPOSE**
Document weight, height, head circumference (< 2 years) and development.	To monitor growth and development.
If > 5 years: Check that a CD4 count has been done in the last 6 months.	To determine eligibility for OI prophylaxis.
If > 5 years: WHO clinical staging.	To determine eligibility for OI prophylaxis and identify new OIs.
Screen for TB symptoms.	To identify TB/HIV co-infection.
AT INITIATION OF ART (BASELINE)	**PURPOSE**
Hb or FBC.	If < 8 g/dL: Manage appropriately.
CD4 count (if not performed in last 6 months).	Baseline assessment.
ALT (If jaundiced or on TB treatment).	To detect liver dysfunction.
ON ART	**PURPOSE**
Height, weight, head circumference (if child < 2 years) and development.	To monitor growth and development. Adjust dosing at each visit according to weight gain.
Clinical assessment including medicine-related adverse events.	To monitor response to ART and detect adverse effects.
CD4: At 1 year on ART, and then every 6 months until meets criteria to stop cotrimoxazole. Thereafter stop CD4 count monitoring if patient remains virologically supressed. If not virologically supressed monitor CD4 count every 6 months.	To monitor response to ART. Stop cotrimoxazole prophylaxis if indicated.
Viral load: At month 6 on ART, after 12 months on ART, then every 12 months.	To monitor viral response to ART. To identify treatment failure and adherence problems. For management of an elevated VL, see algorithm, below: Monitoring and management of viral loads.
Hb or FBC at months 3 and 6 if on AZT. Thereafter, repeat if clinically indicated	To identify AZT-related anaemia.
If on PI-based regimen: Cholesterol + triglyceride at month 3. If above acceptable range, do fasting cholesterol and TGs; and if still above acceptable range consult with doctor/specialist.	To monitor for PI-related metabolic side effects.

LoE:III[255]

MEDICINE TREATMENT

Cotrimoxazole prophylaxis

Initiation:

» All HIV-infected infants (< 1 year), starting from 6 weeks of age.

» Any child 1–5 years of age with CD4% < 25%.
» Any child > 5 years of age with CD4 count < 200 cells/mm^3.
- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 23.4.

Discontinuation:
» HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4% > 25% or > 5 years: CD4 count > 200 cells/mm3 on two tests at least 3–6 months apart).
» Child is HIV-infected with PJP infection: after treatment, continue cotrimoxazole prophylaxis until 5 years of age. *LoE:III*[256]

Immunisation, deworming and vitamin A programme
» Continue deworming and vitamin A programme as in the HIV-uninfected child.
» Continue immunisation as in the HIV-uninfected child (See Section 13.3: Vaccines for routine administration), except do not give birth BCG vaccine, if confirmed HIV positive diagnosis - commence ART.

Nutritional support

Specific nutritional conditions should be treated appropriately.

Antiretroviral therapy

Initiation of ART in well, uncomplicated infants shown to be PCR-positive should be carried out at PHC level.

The preparation of the child and family to start ART is critical to the success of the treatment. Failure to achieve adherence and understanding may lead to resistance and adversely affect the prognosis of the child.

Eligibility for ART

Clinical criteria

» Confirmation of diagnosis of HIV infection, irrespective of CD4 count/percentage or WHO clinical stage. *LoE:III*[257]

AND

» No medical contraindication (e.g. major organ dysfunction). If medical contraindications are present refer to hospital for rapid review and planning.

Social issues that must be addressed to ensure successful treatment

These are extremely important for success and impact on adherence. Social challenges should be overcome and not be barriers to care. Adherence to treatment must at least be considered probable. Disclosure to another adult living in the same house is encouraged so that there is someone else who can assist with the child's treatment. However, absence of disclosure should not preclude ART initiation.

» Mandatory component: At least one identifiable caregiver able to supervise the child and/or administer medication. All efforts should be made to ensure that the social circumstances of vulnerable children (e.g. orphans) be addressed to facilitate treatment.
» Adherence:
  - High levels of adherence are required for adequate virological response and prevention of viral resistance. This can be achieved with regular education and support.

- All efforts to encourage this level of adherence should be made.
- Viral load measurements are useful for monitoring adherence.
- Sensitive, age-appropriate disclosure facilitates adherence.

» Mother and other family members should be assessed and treated.

Requirements before ART is initiated:

The child's family (parents, caregivers) should understand:

» ART is life-long.
» The prognosis of the condition (treated and untreated).
» Medicines' adverse effects and modes of action, and the risk and implications of developing resistance, if incorrectly used.
» That all medicines should be given - if two ARVs are missing from the medicine regimen, stop treatment until they are all available again.

ART regimens

» Are chosen according to age, weight, expected adverse effects, efficacy and prior antiretroviral exposure.
» Adjust the dosage of ART according to weight, during follow up visits.
» Do not change regimens or move to 2nd line therapy without clear guidance from a paediatric expert, as unnecessary loss of effective regimens can shorten life expectancy. Adherence problems need to be addressed thoroughly before switching to a 2nd or 3rd line regimen.
» Single medicine substitutions may only be made when medicine-specific adverse effects are encountered, on condition that virological suppression is documented and the matter is discussed with a practitioner experienced in child ARV medicine.

FIRST-LINE REGIMEN	
Infants < 4 weeks or < 3 kg: Consult paediatric expert on treatment regimen and dosage, or refer.	
If weight 3–19.9 kg, and child ≥ 4 weeks of age and ≥ 42 weeks gestational age:	ABC + 3TC + LPV/r.
If weight ≥ 20 to < 35 kg or < 10 years of age:	ABC + 3TC + DTG.
If weight ≥ 35 kg AND ≥10 years of age	TDF + 3TC + DTG

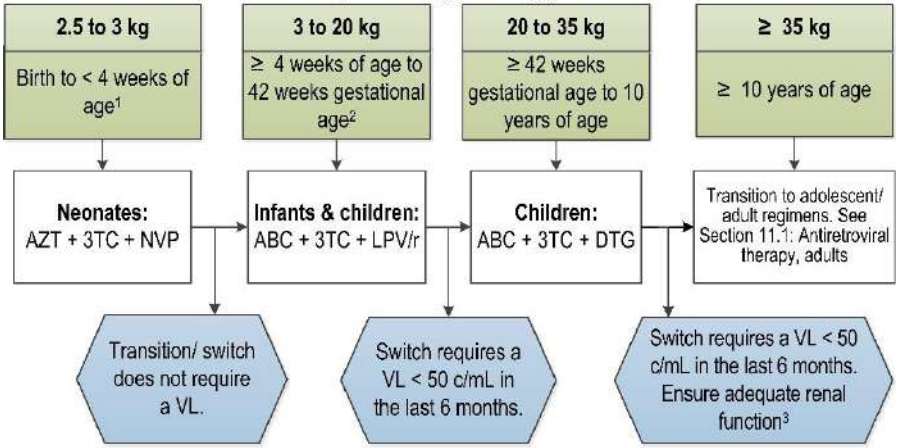
LoE:III[258]

General ART comments

» Switch to tablets or capsules from pellets, syrups or solutions as soon as possible.
» Fixed-dose combinations are preferred to single agents.
» If available, use daily dose regimens.

FIRST-LINE REGIMEN FOR NEONATES/ INFANTS/ CHILDREN

(Birth to 10 years of age)



1. For neonates with birth weight < 2.5 kg, or neonates with severe anaemia, obtain advice from an expert or HIV helpline.
2. For infants ≥ 4 weeks of age, ≥ 42 weeks gestational age, but < 3 kg, consult a paediatric expert to determine appropriate regimen.
3. Before switching to TDF, ensure adequate renal function by checking eGFR/ creatinine.

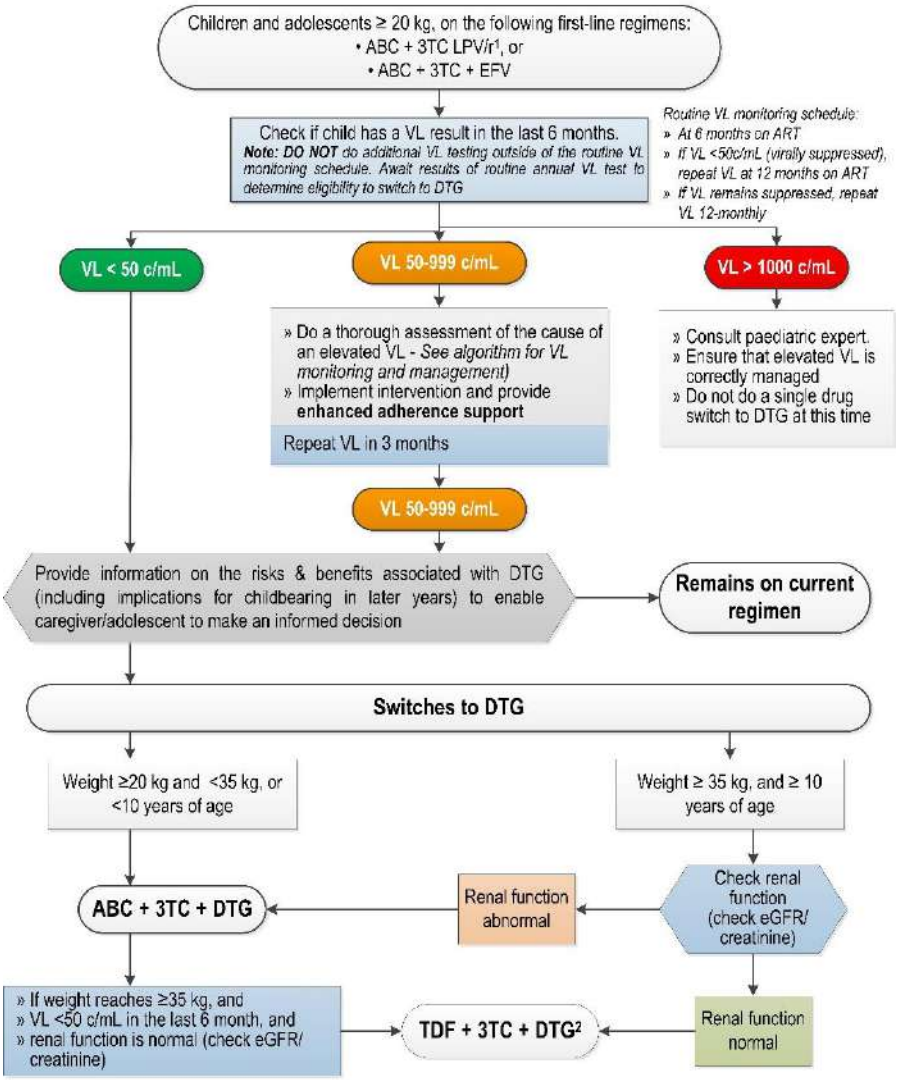
LoE:III[259]

ADJUSTMENT OF PREVIOUS FIRST-LINE REGIMENS	

EFV-containing first-line regimens:
(See algorithm, below: first-line regimen for neonates/ infants/ children).
	<u>Weight > 20 kg:</u>
	− If VL is < 50 c/mL: Change EFV to DTG.
	− If VL is 50-999 c/mL:
	  o Investigate cause of elevated VL and provide enhanced adherence support.
	  o Repeat VL in 3 months
	  o If VL remains below 1000 c/mL, switch EFV to DTG
	− If VL > 1000 c/mL at any stage
	  o Manage as virological failure. If VL remains high after enhanced adherence, refer for consideration of a change in regimen.
	<u>Weight < 20 kg:</u>
	Children that do not yet qualify for DTG (< 20kg), but who are already on EFV-containing regimen with a suppressed VL should remain on their EFV-containing regimen until they can switch to DTG (weight reaches 20 kg), or until an unsuppressed VL mandates an earlier switch to a LPV/r-containing second-line regimen

Transitioning between different regimens for children: *(See algorithm, above: first-line regimen for neonates/ infants/ children).*	<u>If child reaches weight of 20 kg:</u> − Transition from LPV/r to DTG − Transition requires VL < 50 c/mL in last 6 months <u>If child reaches weight of ≥ 35 kg and ≥ 10 years of age:</u> − Switch from ABC to TDF − Ensure adequate renal function − Transition requires VL < 50 c/mL in last 6 months

SWITCHING CHILDREN AND ADOLESCENTS ON FIRST-LINE PAEDIATRIC REGIMENS



1.Switching LPV/r to DTG in this algorithm applies strictly to first-line regimens only. If ABC + 3TC + LPv/r is used as a second-line regimen, refer or consult a paediatric expert (It is possible that both NRTIs May be inactive - DTG should be used with at least 1 active NRTI).

2.Discuss and provide sexual and reproductive health services for the sexually active adolescent.

LoE:III[260]

Initiating ART in children (the 6 steps/IMCI child NIMART)

(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STGs).

4. Record patient details and history
5. Decide if the child has confirmed HIV infection (see testing above).
6. Decide if the caregiver is able to give ART (If not, refer to appropriate level to ensure ability to take ART effectively and safely).
7. Decide if a nurse should initiate ART (i.e. NIMART suited patient).
   a. If any of the following are present refer:
      - Fast breathing.
      - TB.
      - Weight < 3 kg.
      - General danger signs or severe disease evident.
8. Assess and record baseline information.
   b. Record the following information:
      - Weight and height.
      - Head circumference in children < 2 years of age.
      - Assess for malnutrition and anaemia.
      - Feeding assessment and feeding problems.
      - Development.
      - Consider and screen for TB.
      - WHO clinical stage.
      - Laboratory results: Hb, CD4 count and percentage.
   c. If SEVERE MALNUTRITION, SEVERE ANAEMIA or TB refer to next level of care.
   d. If POSSIBLE TB provide appropriate follow up.
   e. If Hb < 10 g/dL (but not severe anaemia) treat as per IMCI. Do not delay ART. Send appropriate laboratory tests but do not wait for results to start ART.
9. Start ART:
   f. If weight 3–20 kg, and child > 4 weeks of age and > 42 weeks gestational age:
      - ABC + 3TC + LPV/r.
   g. If weight > 20 to < 35 kg or < 10 years of age: *LoE:III*[261]
      - ABC + 3TC + DTG.
   h. Continue (or start) cotrimoxazole prophylaxis.
   i. Follow up after 1 week:
      - To check ability to adhere.
      - To check outstanding laboratory results.
      - To resolve any problems that may have arisen.

Then proceed to long term follow up (the 7 steps/IMCI child NIMART).

(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STG, 2017).

Assess for problems:

1. Ask if there are any problems.
   a. Check for any danger signs.
   b. Check for ART danger signs:
      - Severe skin rash.

- Difficulty breathing or severe abdominal pain.
- Yellow eyes.
- Fever, vomiting, rash.

c. Check for any other symptoms.
d. Consider TB/ask if there has been TB contact and examine at each visit.

2. Monitor progress on ART:
   a. Record weight (and height every 3 months).
   b. Assess development every 6 months.
   c. Assess adherence and record (ask mother, self-assessment, record correct number of pills remain, watch body language).
   d. Assess for side effects. If present manage according to guidelines or refer:
      - yellow eyes
      - nausea and vomiting
      - fever
      - sleep disturbances
      - anxiety
      - lipoatrophy
      - rash
      - diarrhoea
      - headache
      - nightmares
      - tingling or numbness
   e. Assess clinical progress.
   f. Monitor blood results.
   g. Indications for referral to a doctor include:

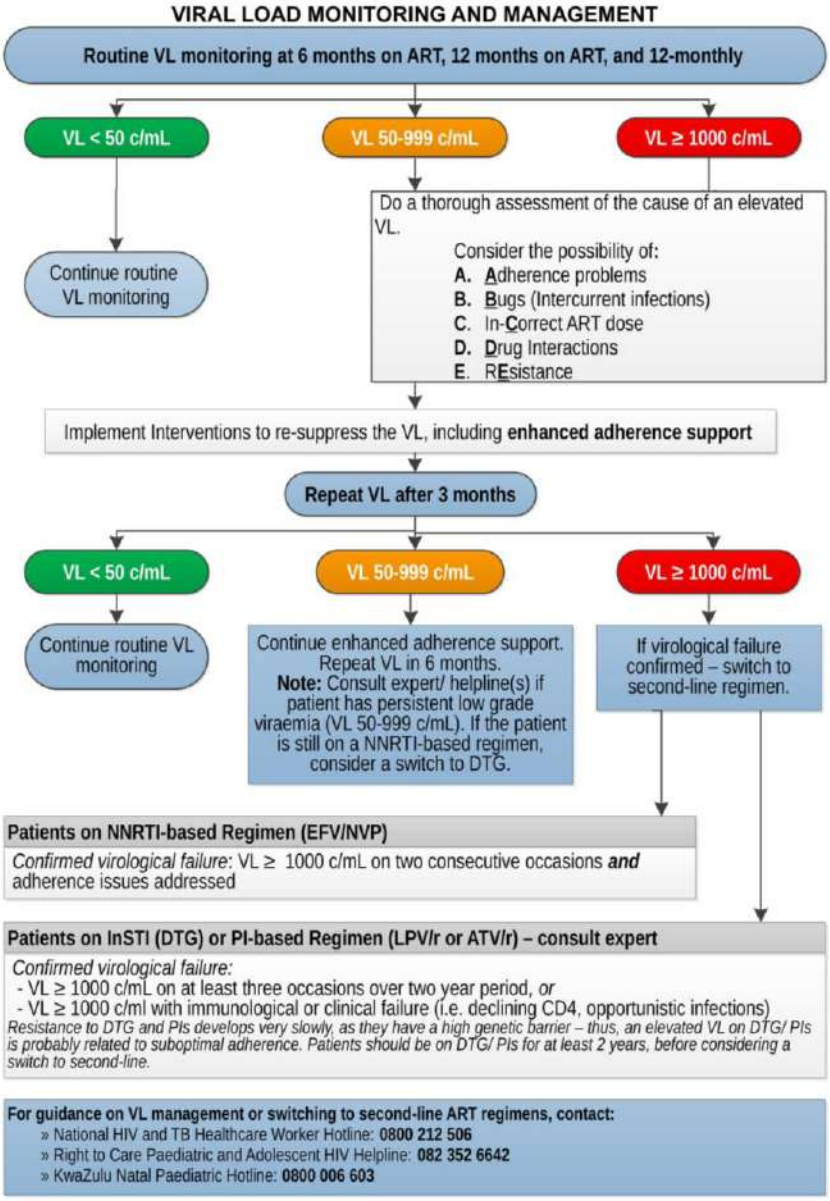
Not gaining weight for 3 months.
Regression of milestones.
Failure to attain milestones.
Poor adherence after adherence counselling.
Significant side effects despite appropriate management.
Deterioration of clinical stage.
CD4 count significantly dropping.
Detectable VL, despite adherence counselling.
Fasting total cholesterol > 4.43mmol/L.
Fasting TG > 5.6 mmol/L.

3. Provide further ART:
   a. Continue treatment if stable and no significant side effects.
      Note: Check dose is correct for current weight and adjust accordingly.
4. Provide other treatments:
   a. Continue cotrimoxazole prophylaxis until: 1–5 year: CD4% > 25%; or if > 5 years: CD4 > 350 cells/mm3; on two tests at least 3–6 months apart.
5. Provide routine care:
   a. Check immunisations, vitamin A, deworming etc. have all been done.
6. Counsel the mother/caregiver:
   a. Use the visit to check mother's knowledge and need for support.
   b. Check if family and mother are receiving own necessary care.
7. Arrange further follow up:
   a. Arrange follow up in 1 month (more frequently if other problems are present).

Treatment failure

» VL is the most sensitive method to detect failure of response to ART.
» Virological failure can be defined as a measurable viral load, despite optimal adherence and optimal dosing over a 4-month period. Clinical and immunological deterioration are late features of ART failure.

» The most common cause of treatment failure is poor adherence. Adherence has to be addressed, before switching to 2nd-line therapy.



LoE:III[262]

Side effects:

	Continue ART with careful monitoring. Get expert advice.	**Consider stopping treatment URGENTLY. Consult expert urgently.**
Symptomatic hyperlactataemia/lactic acidosis	Lactate: 2–5 mmol/L with no signs or symptoms	Lactate > 5 mmol/L, **or** acidosis, **or** signs or symptoms.
Anaemia	Hb: 7.0–9.9 g/dL	Hb < 7g/dL, **or** cardiac failure.
Neutropaenia	0.4–1.2 X 109/L	< 0.4 X 109/L
Increased liver enzymes and hepatitis	< 9.9 X upper normal limit	≥ 10.0 X upper normal limit
Increased serum triglycerides	1.54–8.46 mmol/L	≥ 8.47 mmol/L
Increased total cholesterol	4.43–12.92 mmol/L	≥ 12.93 mmol/L
Skin reactions	» diffuse maculopapular rash, or » dry desquamation	Vesiculation, **or** ulcers, **or** exfoliative dermatitis, **or** Stevens-Johnson syndrome, **or** erythema multiforme, **or** moist desquamation, **or** elevated ALT, **or** elevated AST.
Lipoatrophy (Subcutaneous fat loss of the face, extremities and/or buttocks. Caused by NRTIs, in particular ddI, d4T and sometimes AZT. ABC, TDF, FTC, 3TC are less likely to cause lipoatrophy).	» Look for and respond to clinical features of lipoatrophy. » Change regimen to include NRTIs less likely to cause lipoatrophy e.g. replace d4T or AZT with ABC or TDF (FDC preferred, where possible). » Seek specialist advice for switching if not virologically suppressed.	Not an indication to stop ART.
Other side effects: » peripheral neuropathy » myopathy » abdominal pain » nausea and vomiting » pancreatitis » headache	Clinical evaluation. **Discuss all cases with an HIV clinician, before interrupting therapy**.	

» fatigue » sedative effect » sleep disturbance » confusion » abnormal thinking » possible teratogenicity	

Note: Children may occasionally need to change a medicine from the first line regimen to one from the second line regimen because of intolerance or a serious adverse reaction. There is no need to change an entire regimen for a single adverse drug reaction.

» A single drug substitution can only be made if the viral load is undetectable or if the change is made in the first six months of starting a regimen.

» Refer or consult a doctor with antiretroviral experience. *LoE:III*[263]

ANTIRETROVIRAL MEDICINE DOSAGES BY WEIGHT BANDS

	Abacavir (ABC)		**Lamivudine (3TC)**		**Dolutegravir (DTG)**	**Efavirenz (EFV)**
Target dose	8 mg/kg 12 hourly **OR** ≥ 10 kg: 16 mg/kg once daily		4 mg/kg 12 hourly **OR** ≥ 10 kg: 8 mg/kg once daily		By weight band once daily	By weight band once daily
Available formula-tions	Sol. 20 mg/mL Tab 60 mg (scored, dispersible) Tab 300 mg (not scored), ABC/3TC 600/300 mg.		Sol. 10 mg/mL Tab 150 mg (scored),300 mg; Tab ABC/3TC 600/300 mg		Tab 50 mg	Caps 50,200 mg Tabs 50,200, 600 mg (not scored)
Weight Kg	Currently available tablet formulations of ABC (except 60 mg), EFV, and DTG must be swallowed whole and **not** chewed, divided or crushed.					
< 3	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg					
3–4.9	2 mL 12 hourly		2 mL 12 hourly			**Don't Use < 10kg or < 3 years**
5–6.9	3 mL 12 hourly		3 mL 12 hourly			
7–9.9	4 mL12 hourly		4 mL 12 hourly			
10–13.9	Choose only one option 6 mL 12 hourly **OR** 2x60* tabs 12 hourly	12 mL daily **OR** 4x60* tabs daily	Choose only one option 6 mL 12 hourly	12 mL daily	**Don't use if < 20 kg**	1x200* cap/tab at night
14–19.9	8 mL 12 hourly **OR** 2.5x60* tabs 12 hourly	1x300* tab daily **OR** 15 mL daily	8 mL 12 hourly **OR** ½x150* tab 12 hourly	1x150* tab daily **OR** 15 mL daily		1x200* cap/tab + 2x50* cap/tab at night
20–22.9	10 mL 12 hourly **OR** 3x60* tabs 12 hourly	20 mL daily **OR** 1x300*+ 1x60* tab daily	1x150* tab 12 hourly **OR** 15 mL 12 hourly	30 mL daily **OR** 1x300* tab daily **OR** 2x150* tab daily	1x50 mg tab once daily	
23-24.9		20 mL daily **OR** 1x300*+ 2x60* tabs daily				
25–29.9	1x300* tab 12 hourly	2x300 tabs daily **OR** 1 x ABC/3TC 600/300* tab daily	1x150 tab 12 hourly	2x150* tabs daily **OR** 1x300* tab daily **OR** 1 x ABC/3TC 600/300* tab daily		2x200* caps/tab at night
30–34.9						
35–39.9						
> 40						600 tab at night

*dosage in mg Sol: solution Tab: tablet Cap: capsule

For standard dosing of abacavir, see dosing table - pg 23.1; efavirenz - see dosing table pg 23.4; lamivudine - see dosing table pg 23.6; lopinavir/ritonavir - see dosing table pg 23.7; ritonavir - see dosing table pg 23.9

LoE:III[264]

ANTIRETROVIRAL MEDICINE DOSAGES BY WEIGHT BANDS					
	Lopinavir/ritonavir (LPV/r)				**Ritonavir (r) boosting**
Target dose	300/75mg/m2/dose LPV/r 12 hourly				**ONLY as booster for LPV/r when on rifampicin** 12 hourly (0.75xLPV dose 12 hourly)
Available formulations	Pellets 40/10 mg per capsule Sol. 80/20 mg/mL Adult Tabs 200/50 mg, Paeds Tabs 100/25 mg				Sol: 80 mg/mL
Weight Kg	Currently available tablet formulations of LPV/r must be swallowed whole and **not** chewed, divided or crushed.				
< 3	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg				
3–4.9	Choose one option				1 mL 12 hourly
	2 caps 12 hourly		1 mL 12 hourly		
5–5.9	2 caps 12 hourly		1.5 mL 12 hourly		1.5 mL 12 hourly
6–6.9 7–9.9	3 caps 12 hourly				
10–13.9	4 caps 12 hourly		2 mL 12 hourly		1.5 mL 12 hourly
14–19.9	Choose one option				2 mL12 hourly
	Either 5 caps 12 hourly	**OR** 2.5 mL 12 hourly	**OR** 2 x 100/25* tabs 12 hourly	**OR** 1 x200/50* tab 12 hourly	
20–22.9 23-24.9	**Either** 6 caps 12 hourly	**OR** 3 mL 12 hourly	**OR** 2x100/25* tabs 12 hourly	**OR** 1x200/50* tab 12 hourly	2.5 mL 12 hourly
25–29.9	**Either** 6 caps 12 hourly	**OR** 3.5 mL 12 hourly	**OR** 3x100/25* tabs 12 hourly	**OR** 1x200/50* tab +1x100/25* tab 12 hourly	3 mL 12 hourly
30–34.9	**Either** 8 caps 12 hourly	**OR** 4 mL 12 hourly			
35–39.9 > 40	**Either** 10 caps 12 hourly	**OR** 5 mL 12 hourly	**OR** 2x200/50* tabs 12 hourly		4 mL 12 hourly

*dosage in mg Sol: solution Tab: tablet Cap: capsule

For standard dosing of abacavir, see dosing table - pg 23.1; efavirenz - see dosing table pg 23.4; lamivudine - see dosing table pg 23.6; lopinavir/ritonavir - see dosing table pg 23.7; ritonavir - see dosing table pg 23.9.

Instructions on how to administer LPV/r pellets to children are as follows:

- Hold the capsule at both ends and, twisting in opposite directions, pull apart to pour out the pellets inside the capsule.
- Add the pellets (from the required number off capsules) to a spoonful of food a little at a time. For example, porridge can be used (must be at room temperature)
- Do not stir, crush, or dissolve the pellets: rather sprinkle over the food.
- Use only a small amount of food, to ensure child can consume all the pellets. Discard food with pellets after 2 hours.
- The capsule can be discarded with usual waste.

LoE:III[265]

11.7 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN CHILDREN

Z29.2 + (B24)

Cotrimoxazole prophylaxis

HIV-exposed infants:

Indications

» All HIV-exposed infants, starting from 6 weeks of age.

- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 23.4.

Discontinuation

» If birth and 10 weeks PCR are both negative.

HIV-infected children:

Initiation

» All HIV-infected infants (< 1 year), starting from 6 weeks of age.
» Any child 1–5 years of age with CD4% < 25%.
» Any child > 5 years of age with CD4 count < 200 cells/mm3.

- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 23.4.

Discontinuation

» HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4% > 25% or > 5 years: CD4 count > 200 cells/mm3 on two tests at least 3–6 months apart).
» Child is HIV-infected with PJP infection: after treatment, continue cotrimoxazole prophylaxis until 5 years of age.

LoE:III266

TB prophylaxis

See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Immunisation

Continue immunisation as in the HIV-uninfected child (See Section 13.3: Vaccines for routine administration), except do not give birth BCG vaccine, if confirmed HIV positive diagnosis - commence ART.

11.8 OPPORTUNISTIC INFECTIONS, TREATMENT IN CHILDREN

11.8.1 CANDIDIASIS, ORAL (THRUSH), RECURRENT

B20.4

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
  - In the older child, ask child to swirl in the mouth, prior to swallowing.
  - In the infant, advise mom to apply to front of the mouth and spread over the oral mucosa with a clean finger.
  - Continue for 48 hours after resolution of symptoms.

If there is oral candidiasis and the child cannot swallow, this indicates the presence of oesophageal candidiasis. See Section 11.8.2: Candidiasis, oesophageal.

11.8.2 CANDIDIASIS, OESOPHAGEAL

B20.4

MEDICINE TREATMENT

- Fluconazole, oral, 6 mg/kg once daily for 21 days. See dosing table, pg 23.5.

11.8.3 DIARRHOEA, HIV-ASSOCIATED

See Section 2.9: Diarrhoea.

11.8.4 PNEUMONIA

See Section 17.2: Respiratory infections.

11.8.5 MEASLES AND CHICKENPOX

Refer all patients.

11.8.6 SKIN CONDITIONS

These are common and include scabies, seborrhoeic eczema and others. See Chapter 5: Skin conditions.
If no response to care as directed in the chapter, refer.

11.8.7 TUBERCULOSIS (TB)

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0

DESCRIPTION

TB and HIV are often comorbid conditions. Exclude TB in all patients before starting ART. See Section 17.4.2: Pulmonary tuberculosis, in children.

Re-evaluate the risk for TB and TB contact at each visit on history (including contact history) and clinical examination.

TB should be considered early in non-resolving pneumonias. Tuberculin tests are often not reliable and a negative test does not exclude TB. If TB is suspected but cannot be proven, refer early for diagnostic evaluation.

MEDICINE TREATMENT

TB prophylaxis Z29.2 + (B24)

Give TB prophylaxis to all HIV-infected children in whom no evidence of TB disease is present and who are:

» Exposed to a close contact with infectious pulmonary TB or
» TST-positive (only the 1st time a positive TST is shown).

- Isoniazid, oral, 10 mg/kg/dose once daily for 6 months.

- Maximum dose 300 mg daily.
- See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Repeat course if an HIV-infected patient, irrespective of age, is re-exposed to a TB contact at any point after completing TB treatment or prophylaxis.

If patient has been exposed to a known MDR or XDR-TB source case or the contact case has failed standard TB treatment, refer.

TB treatment

If the child is not yet on ART:

» Commence TB treatment first. Follow with ART, usually after 2–8 weeks:
  - 2 weeks if CD4 < 50 cells/mm3
  - 8 weeks if CD4 > 50 cells/mm3
» Check ALT before commencing ART. If the ALT is raised, discuss this with an expert as it may not be an absolute contra-indication to treatment.
» Be aware of the possibility of Immune Reconstitution Inflammatory Syndrome (IRIS).

If the child is already on ART:

» Commence TB treatment taking into consideration possible medicine interactions.

If the child needs to take concomitant ART and rifampicin:

» Dolutegravir: use DTG 12 hourly.
» Efavirenz: use the normal recommended dosage as per dosing table on pg 23.4.
» Abacavir and lamivudine: no dose adjustment required.
» Lopinavir/ritonavir: Add additional ritonavir to ensure an equal dose in mg of lopinavir and ritonavir while on rifampicin. For example, for each mL of LPV/r solution (80/20 mg/mL), add 0.75 mL of ritonavir solution (80 mg/mL). See dosing table, pg 23.9.
» Give pyridoxine (vitamin B6) to all children on TB and ART, to avoid development of peripheral neuropathy.

11.9 DEVELOPMENTAL DELAY OR DETERIORATION

Refer for assessment.

11.10 ANAEMIA

See Section 3.1: Anaemia

HIV PREVENTION

11.11 PRE-EXPOSURE PROPHYLAXIS (PREP)

Z29.2

Consult the most recent National Department of Health Guideline for PrEP eligibility criteria.
PrEP is currently available at designated sites only.

DESCRIPTION

Pre-exposure prophylaxis (PrEP) is the use of antiretroviral medicines by HIV-negative individuals before potential exposure to HIV to prevent them from acquiring HIV infection. PrEP only protects against HIV infection; it does not offer protection against other STIs or pregnancy.

PrEP should be used as part of a package including condoms, lubricants for anal sex, STI management, screening and management of intimate partner violence, sexual and reproductive health services, medical male circumcision and HIV services, including counseling and testing, HIV management, ART, PEP, and PrEP.

Individuals initiated on PrEP must be:

» HIV-negative.
» At substantial risk of HIV infection.
» Willing and able to adhere to PrEP.
» Prepared to come for repeat HIV testing every 3 months.
» No contra-indications to tenofovir or emtricitabine.
» No suspicion of acute HIV-infection (see clinical features, below).

Clinical features of acute HIV infection

Symptoms	Signs
Malaise, anorexia, myalgia, headache, sore throat, sore glands, rash	Fever, sweating, viral meningitis, generalised lymphadenopathy, hepatosplenomegaly, pharyngitis, truncal rash, orogenital herpetiform ulceration, oral/oesophageal candidiasis, cervical adenopathy

CONTRA-INDICATIONS TO PREP

» Pre-existing HIV infection.
» Creatinine clearance or eGFR < 60 mL/min.
» Use of nephrotoxic medicines e.g. aminoglycosides.
» Young women/men < 35 kg or < 15 years of age who are not Tanner stage 3 (sexual maturity) or greater.
» Unwilling or unable to adhere to daily PrEP.

PREP REGIMEN

A fixed dose combination formulation of:

- Tenofovir, oral, 300 mg daily.

AND

- Emtricitabine, oral, 200 mg daily. *LoE:I*[267]

Note: To reach adequate protective levels in tissues, 7 days of daily dosing are required for anal sex and 20 days for vaginal sex.

LoE:III[268]

Screening investigations before starting PrEP

Investigation	Purpose	Action
HIV test (using algorithm in the HTS guidelines)	Assessment of HIV status.	If HIV-negative, consider PrEP If HIV-positive. Link to treatment and care services.
Creatinine clearance/ eGFR	To identify pre-existing renal disease.	Do not initiate PrEP if creatinine clearance/eGFR < 60 mL/min. Repeat creatinine clearance after two weeks. If renal function returns to normal and other PrEP criteria are met, PrEP may be initiated. Refer for further investigation if renal function remains abnormal.
Hepatitis B surface antigen (HBsAg)	To diagnose chronic hepatitis B infection. To identify those eligible for vaccination against hepatitis B.	Consider vaccination if available for HBsAg-negative. If HBsAg-positive, do ALT prior to PrEP initiation.
ALT if HBsAg-positive		If ALT persistently elevated or other abnormal liver function tests, refer for assessment.
Urine pregnancy test	To identify if pregnant.	Discuss the potential risks of TDF + FTC.
RPR	To diagnose syphilis infection for treatment.	Manage according to STI guidelines.
Syndromic STI screening	To diagnose and treat STI.	Manage according to STI guidelines.

Note:

» If symptoms or signs of acute HIV infection are present, PrEP should be postponed until symptoms subside and a repeat rapid HIV test after 4 weeks remains negative.

» TDF + FTC is active against hepatitis B (HBV) infection. HBV infection is not a contra-indication to PrEP, but will require LFT monitoring. Discontinuation of TDF + FTC in patients with HBV requires referral to a specialist because of a risk of a hepatitis flare.

Hepatitis B immune status and PrEP eligibility

Hepatitis B surface antigen (HBsAg)	Hepatitis B surface antibody (HBsAb)	Action
Negative (-)	Negative (-)	Start PrEP. Vaccinate concurrently if available
Negative (-)	Positive (+)	Start PrEP. No vaccine needed
Positive (+)	N/A	Refer for evaluation, if ALT > 2 times upper limit of normal.

Note:

» PrEP users with chronic hepatitis B infection who develop abnormal liver function tests should be referred for assessment.

PrEP follow up and monitoring

Activity	Frequency
Confirmation of HIV-negative status	At 1 month, then every 3 months
Address side effects	Every visit
Adherence counseling	Every visit
Creatinine clearance	At 1 month, then every 3 months for the first year, then 12-monthly
STI screening and treatment	Every visit
PrEP dispensing	1 month supply, then 3 monthly supply
Behavioural sexual risk reduction counseling	Every visit

PREP SAFETY

Relevant medicine interaction information

Medicine	Interaction information	Advise
Standard TB medicines	No interaction	No need for dose adjustments
MDR-TB medicines	Increase risk of renal side effects	Avoid PrEP. Advise other prevention methods
Hormonal contraception	No interaction	Hormonal contraception does not affect PrEP effectiveness, nor does PrEP affect hormonal contraceptive effectiveness
Nephrotoxic medicines	Increase risk of renal side effects	Avoid PrEP. Advise other prevention methods

Side effects of TDF + FTC combination

Major	Renal toxicity, decreased bone mineral density, extremely small risk of lactic acidosis and hepatic steatosis or steatohepatitis
Minor	Gastrointestinal symptoms (diarrhoea, nausea, vomiting and flatulence), unintentional weight loss

Note:

» Minor side effects are relatively common (approximately 1 in 10 individuals in the first 1-2 months).
» Mild and self-limiting; do not require discontinuation.
» Renal toxicity and decreased bone mineral density usually reversible upon stopping PrEP.

STOPPING PREP

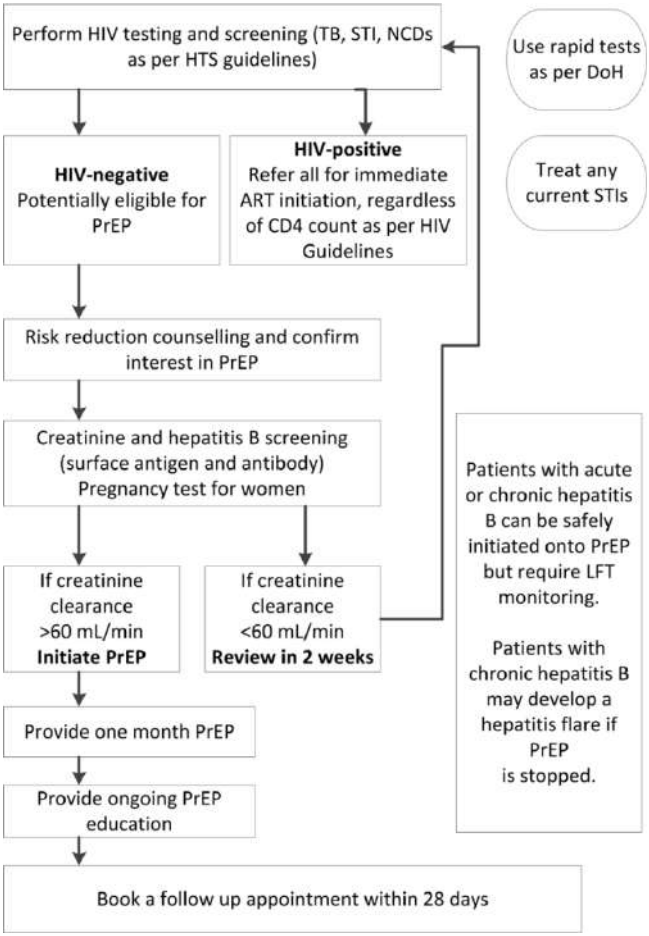
PrEP should be stopped if:

» Tests HIV-positive.
» Renal disease develops.
» Non-adherent to PrEP.
» Does not need or want PrEP.
» No longer meets eligibility criteria.
» There are safety concerns where the risks of PrEP use outweigh potential benefit.

Continue PrEP for 28 days after the last potential HIV exposure.

Note: Patients with chronic HBV may experience a hepatitis flare on discontinuation of PrEP.

PREP INITIATION ALGORITHM



REFERRAL

» HBsAg-positive, with abnormal ALT.
» Discontinuation of TDF + FTC in patients with HBV.

11.12 POST EXPOSURE PROPHYLAXIS

See Section 21.3.6: Post exposure Prophylaxis (PEP).

SIDE EFFECTS AND COMPLICATIONS OF ART

11.13 IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME (IRIS)

D89.3 + (Y41.5 + B24)

DESCRIPTION

Clinical deterioration can occur after starting ART due an improvement in the immune system response to organisms already causing infection, e.g.

» M.Bovis (BCG)
» M. tuberculosis (MTB)

There are 2 types of IRIS:

8. Unmasking: when a previously unsuspected condition becomes manifest.
9. Paradoxical: known condition on appropriate treatment becomes worse.

DIAGNOSTIC CRITERIA

» Exclude other active or inadequately treated diseases (including DR-TB).
» Presentation:
  - Usually during the first 6 weeks after starting ART.
  - Depends on the causative organism and the organ system involved, e.g. TB presents with fever, lymphadenopathy, worsening of the original tuberculous lesion, and/or deteriorating chest radiographic manifestations such as miliary pattern or pleural effusion.

REFERRAL

All.

11.14 LACTIC ACIDOSIS

E87.2 + (Y41.5 + B24)

DESCRIPTION

All nucleoside analogues have been associated with lactic acidosis, which is rare but life-threatening. Initial symptoms vary and occur between 1–20 months (median 4 months) after starting therapy. The risk is highest with stavudine, followed by didanosine and then zidovudine.

DIAGNOSTIC CRITERIA

Clinical

Clinical prodromal syndrome:

» Generalised fatigue
» Weakness and myalgia
» Gastrointestinal symptoms:
  - nausea
  - vomiting
  - diarrhoea
  - unexplained weight loss
  - vague abdominal pain
  - hepatomegaly
  - anorexia

» Respiratory symptoms: tachypnoea and dyspnoea.
» Neurologic symptoms, including motor weakness.

Investigations

» Laboratory abnormalities:
  - Hyperlactataemia
    - Raised: 2.1–5 mmol/L
    - Severely raised : > 5 mmol/L
  - Lactic acidosis, defined by:
    - Lactate: > 5 mmol/L
    - Bicarbonate: < 20 mmol/L
    - Severe acidosis i.e. pH < 7.3
    - Increased anion gap i.e. > 15 mEq/L

REFERRAL

All urgently.

PHC Chapter 12: Sexually transmitted infections

The syndromic approach to Sexually Transmitted Infections (STIs) diagnosis and management is to treat the signs or symptoms (syndrome) of a group of diseases rather than treating a specific disease. This allows for the treatment of one or more conditions that often occur at the same time and has been accepted as the management of choice.

Causative organisms and medicine management for STI syndromes:

ORGANISM	SYNDROME/S	MEDICINE MANAGEMENT
Neisseria gonorrhoeae	VDS, MUS, LAP	ceftriaxone + azithromycin *LoE:III*[269]
Chlamydia trachomatis	VDS, MUS, LAP, GUS, Bubo	azithromycin
Trichomonas vaginalis	VDS, LAP	metronidazole
Bacterial vaginosis (overgrowth of *Gardnerella vaginalis*, lactobacillus, anaerobes etc.)	VDS	metronidazole
Candida albicans	VDS	clotrimazole
Treponema pallidum	GUS	doxycycline/ benzathine benzylpenicillin
Herpes simplex	GUS	aciclovir
Haemophilus ducreyi	GUS, Bubo	azithromycin

It is important to take a good sexual history and undertake a thorough ano-genital examination in order to perform a proper clinical assessment. The history should include questions concerning symptoms, recent sexual history, sexual orientation, type of sexual activity (oral, vaginal, anal sex), the possibility of pregnancy (females), use of contraceptives including condoms, recent antibiotic history, antibiotic allergy, recent overseas travel and domestic violence. Refer to a social worker, as required.

Note: Standard referral letter for treatment failure must include the following:

» reason for referral: presumptive diagnosis (e.g. persistent cervicitis with suspected resistant gonorrhoea)
» clinical findings including speculum examination for vaginal discharge
» treatment history (including all medicines with dose and duration)
» details of notification and treatment history of partner(s)

Suspected STI in children should be referred to hospital for further investigation and management.

GENERAL MEASURES

» **C**ounselling and education, including HIV testing.
» **C**ondom promotion, provision and demonstration to reduce the risk of STIs.
» **C**ompliance/ adherence with treatment.
» **C**ontact treatment/ partner management.
» **C**ircumcision promotion (counselling to continue condom use).
» **C**ervical cancer screening.

Promote HIV counselling and testing.
For negative test results repeat test after 6 weeks, because of the window period.

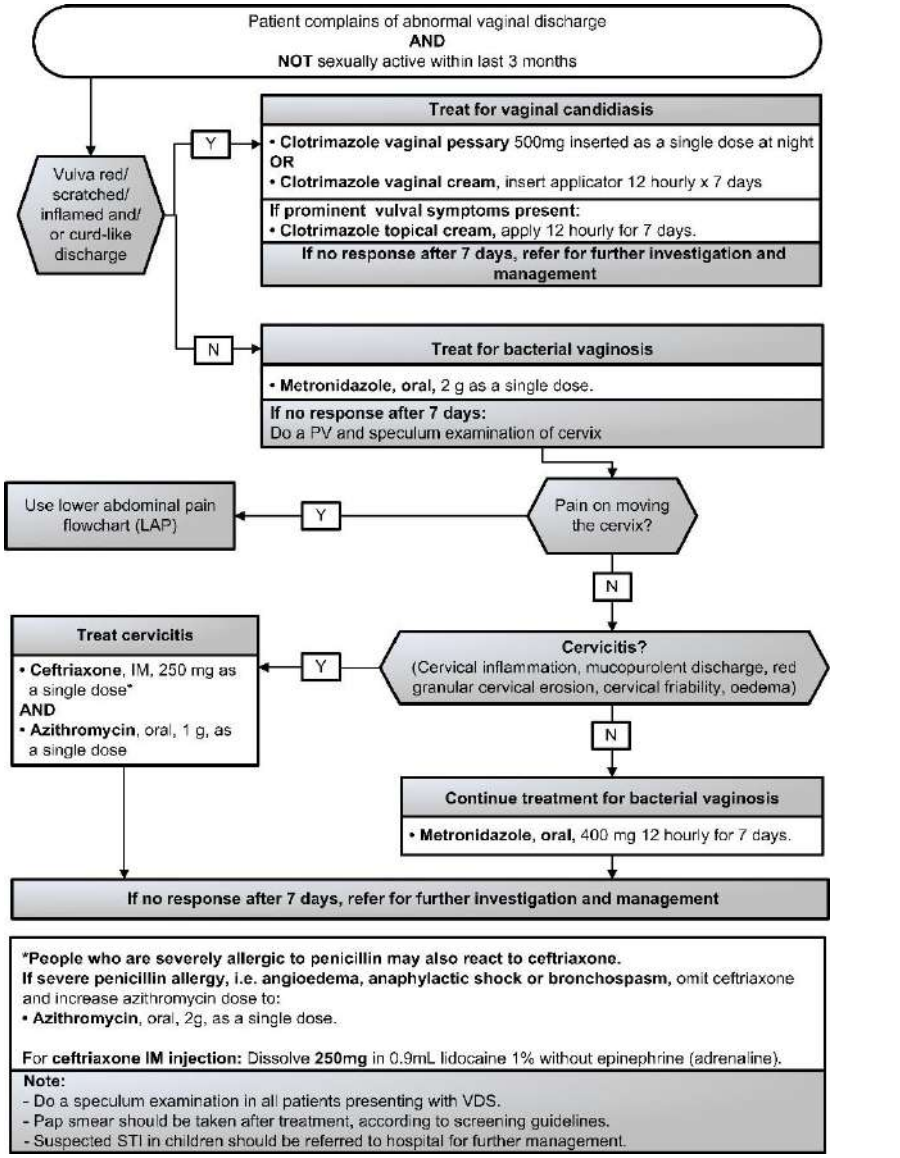
Benzathine benzylpenicillin

Benzathine benzylpenicillin remains the recommended treatment for syphilis. However, due to global shortage of benzathine benzylpenicillin (limited global supply of the active pharmaceutical ingredient) the algorithms now recommend doxycycline, oral except in pregnant women and children. Azithromycin is not recommended for the treatment of syphilis in pregnancy as azithromycin does not effectively treat syphilis in the fetus, and resistance develops rapidly to macrolides. Therefore, the limited stock of benzathine benzylpenicillin must be reserved for use in pregnant women and children.

12.1 VAGINAL DISCHARGE SYNDROME (VDS)

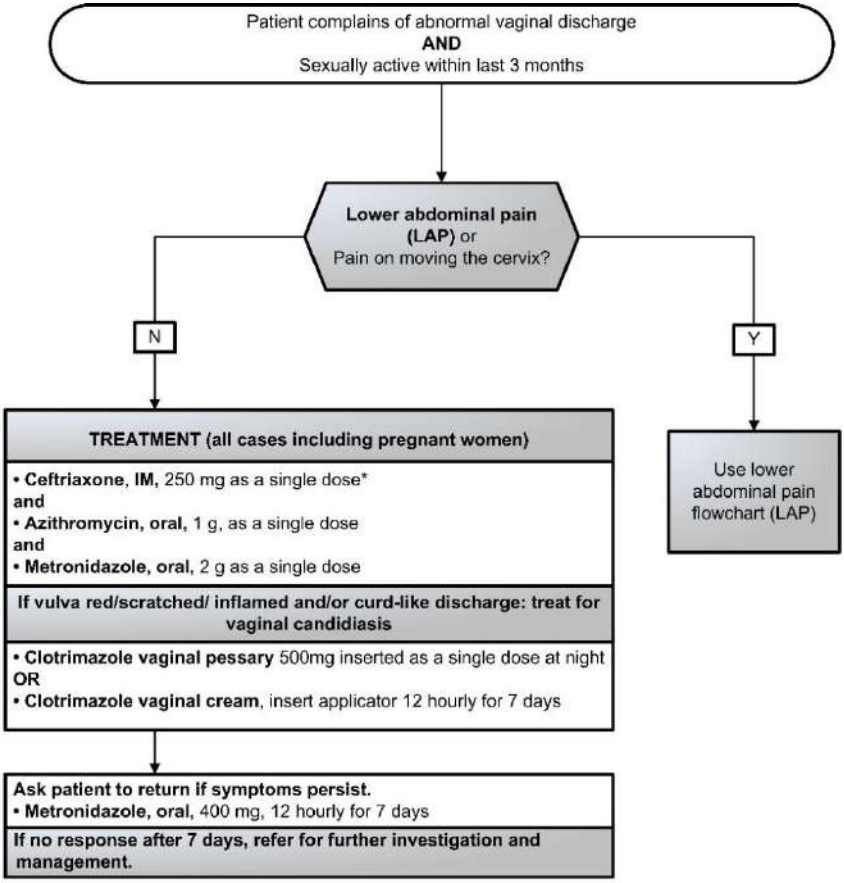
B37.3/N76.0/N89.8

12.1.1 SEXUALLY NON-ACTIVE WOMEN



LoE:III[270]

12.1.2 SEXUALLY ACTIVE WOMEN



*People who are severely allergic to penicillin may also react to ceftriaxone.
If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
• **Azithromycin,** oral, 2 g, as a single dose.

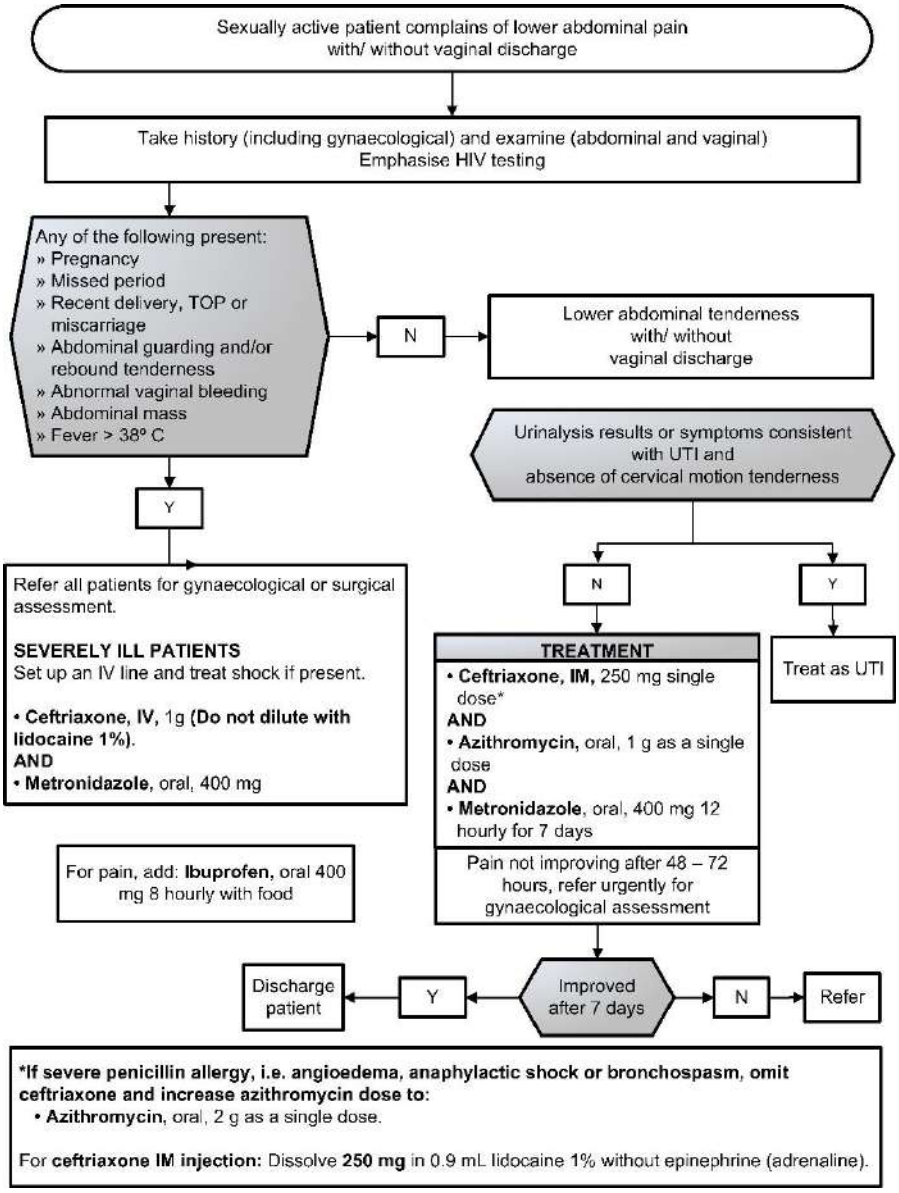
For **ceftriaxone IM injection:** Dissolve **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

Note:
- Do a speculum examination in all patients presenting with VDS.
- Pap smear should be taken after treatment, according to screening guidelines.
- Suspected STI in children should be referred to hospital for further management.

LoE:III[271]

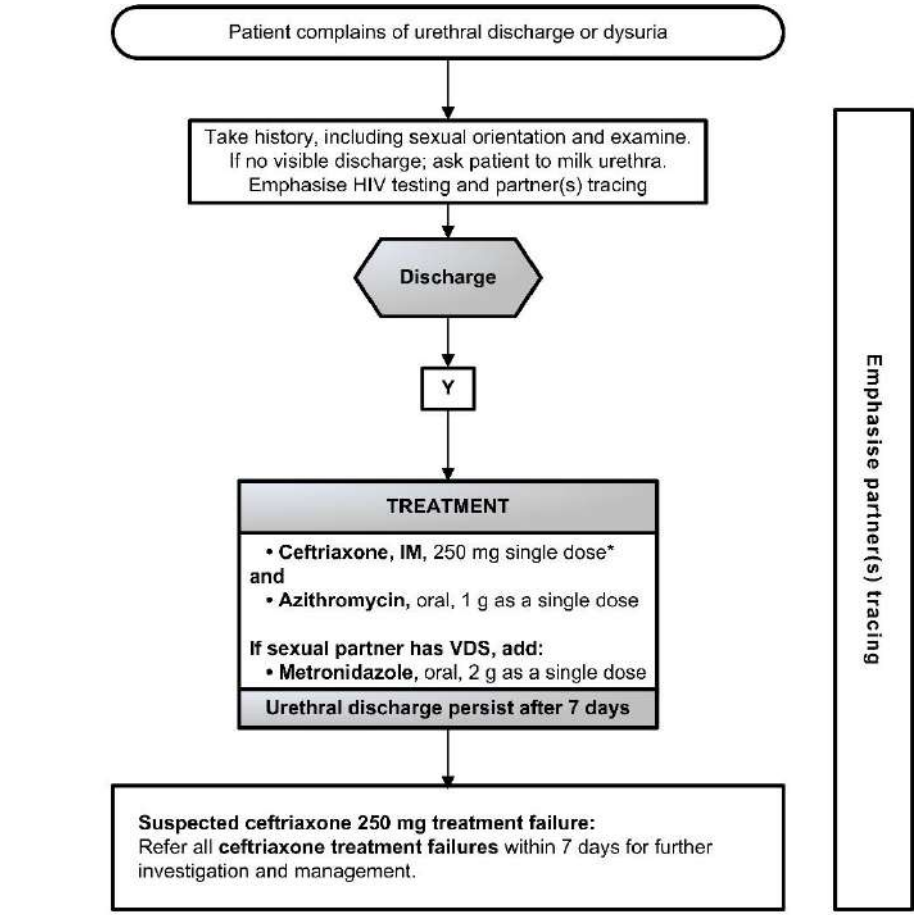
12.2 LOWER ABDOMINAL PAIN (LAP)

N73.9



12.3 MALE URETHRITIS SYNDROME (MUS)

A64 + N34.1



***If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:**

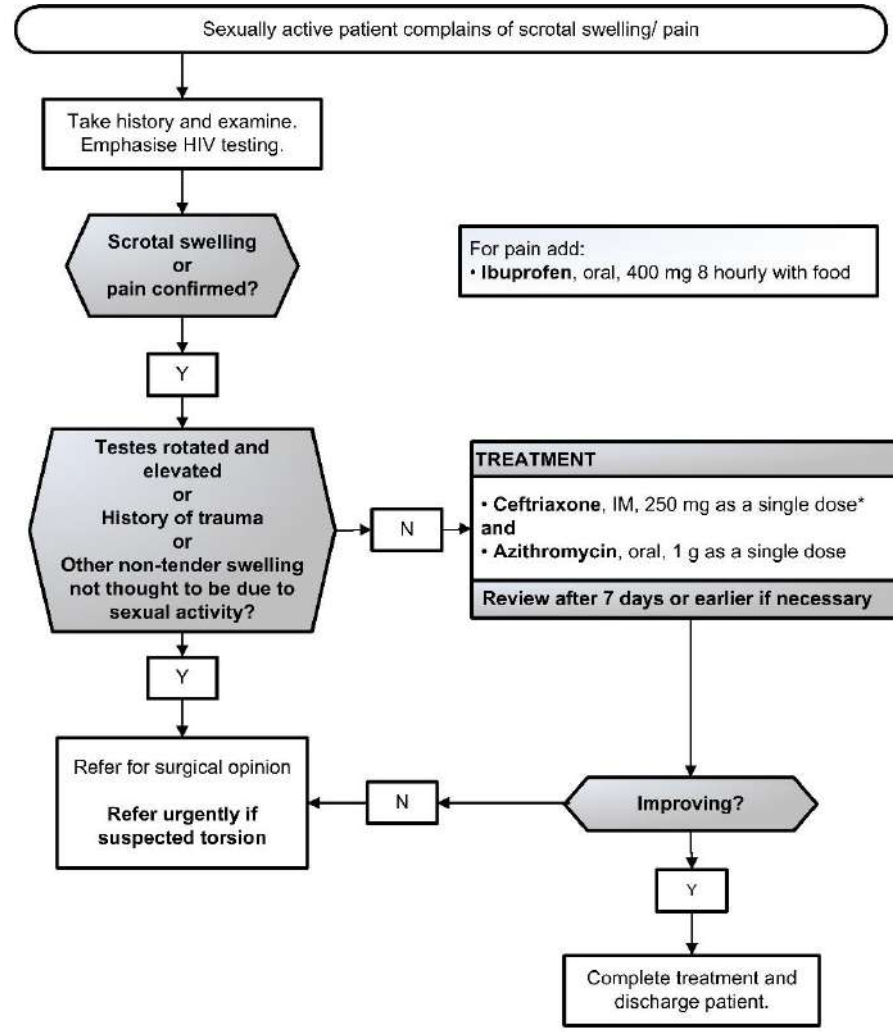
- **Azithromycin,** oral, 2 g as a single dose.

For **ceftriaxone IM injection:**

- Dissolve ceftriaxone **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

12.4 SCROTAL SWELLING (SSW)

N45.1



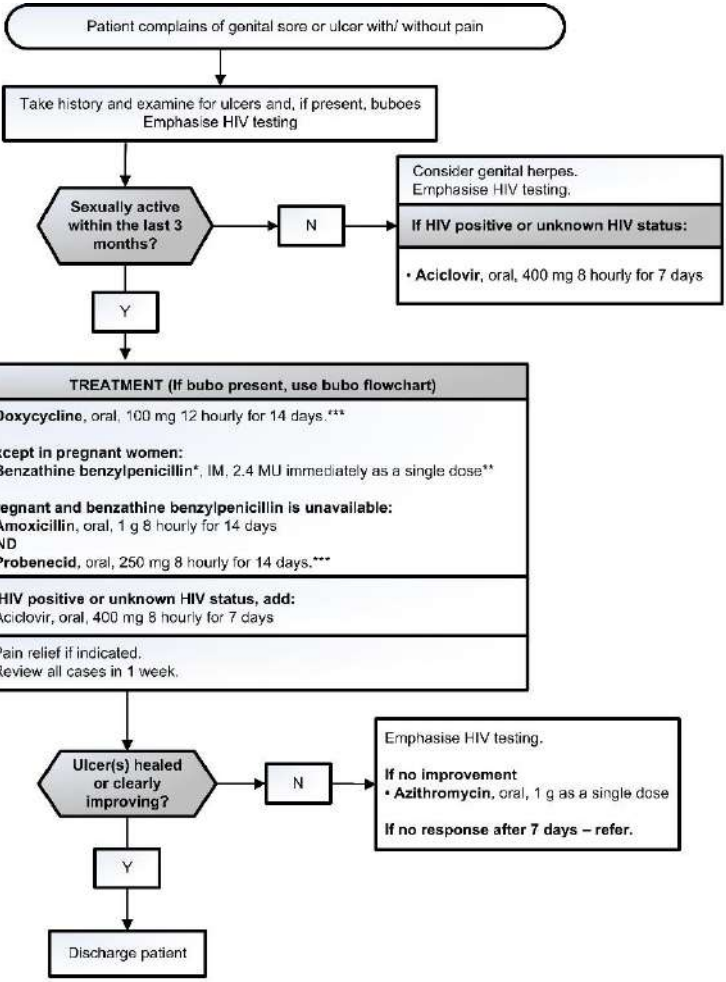
***If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:**
• **Azithromycin,** oral, 2 g as a single dose.

For **ceftriaxone IM injection:** dissolve **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

12.5 GENITAL ULCER SYNDROME (GUS)

A60.9/A51.0

LoE:III[272]



*Penicillin allergic pregnant women: refer for confirmation of new syphilis infection and possible penicillin desensitisation.

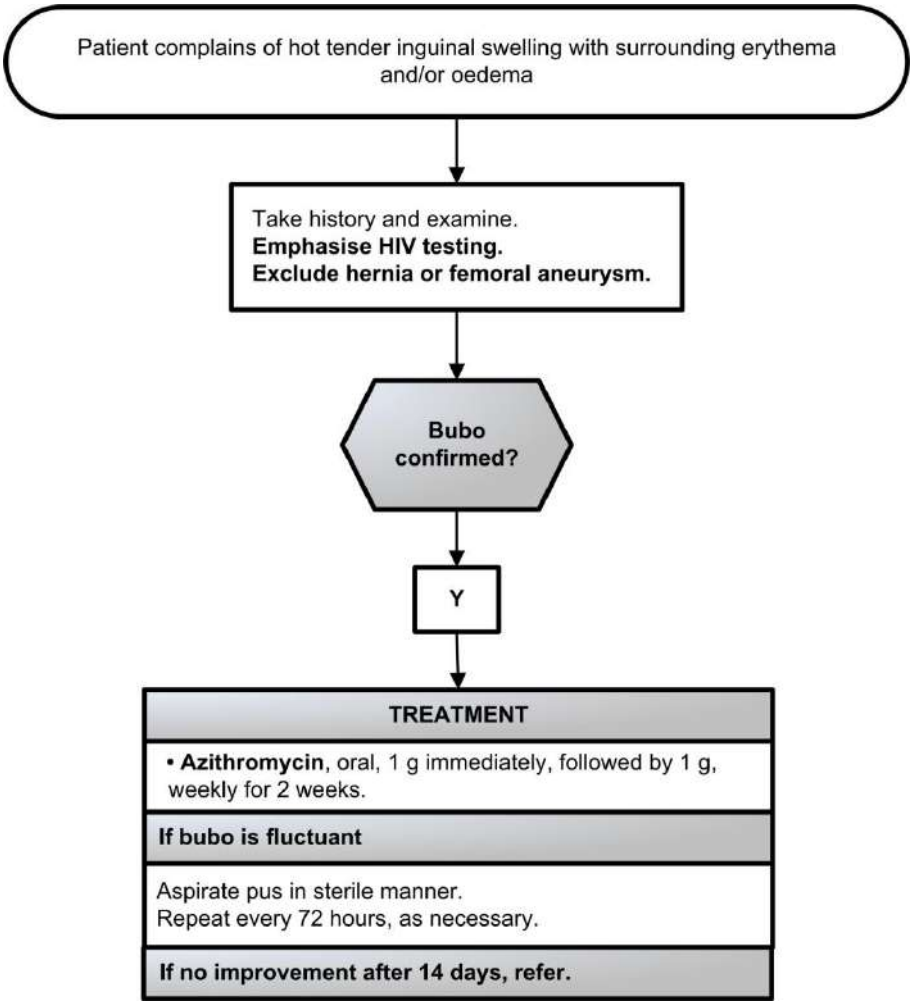
For **benzathine benzylpenicillin, IM, 2.4 MU: Dissolve benzathine benzylpenicillin **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline).

Note: Pregnant women presenting with genital ulcer(s) in the third trimester should be referred (risk of neonatal herpes).

LoE:II[273]

12.6 BUBO

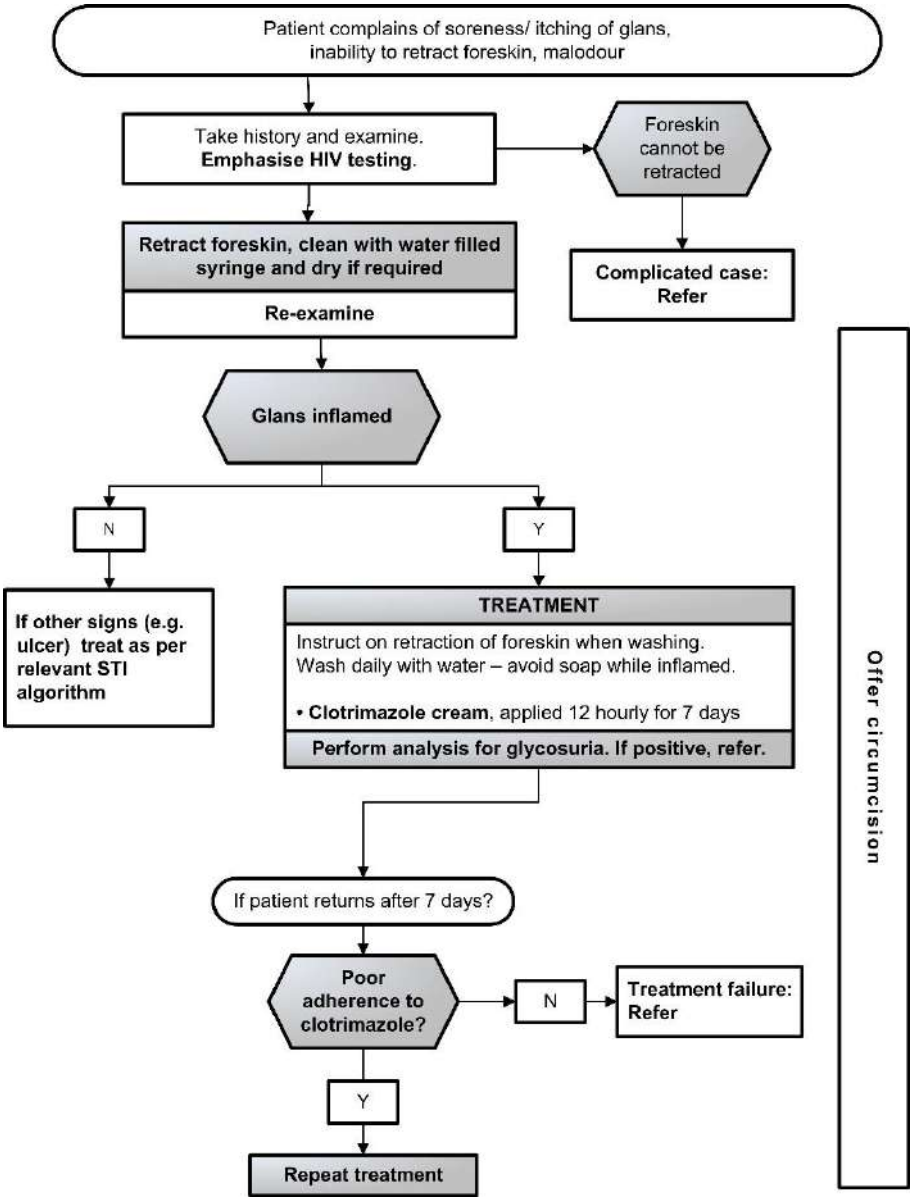
A58



LoE:III[274]

12.7 BALANITIS/BALANOPOSTHITIS (BAL)

N48.1



12.8 SYPHILIS SEROLOGY AND TREATMENT

A53.9

Syphilis serology

The Rapid Plasmin Reagin (RPR) measures disease activity, but is not specific for syphilis. False RPR-positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre <1:8). For this reason, positive RPR results should be confirmed due to syphilis by further testing of the serum with a specific treponemal test, e.g.:

» *Treponema pallidum* haemagglutination (TPHA) assay.
» *Treponema pallidum* particle agglutination (TPPA) assay.
» Fluorescent Treponemal Antibody (FTA) assay.
» *Treponema pallidum* ELISA.
» Rapid treponemal antibody test (TPAb)

Screening can also be done the other way around starting with a specific treponemal test followed by a RPR in patients who have a positive specific treponemal test. This is sometimes referred to as the "reverse algorithm".

- Once positive, specific treponemal tests generally remain positive for life and therefore the presence of specific treponemal antibodies cannot differentiate between current and past infections
- A person with previously successfully treated syphilis will retain lifelong positive specific treponemal test results.

The RPR can be used:

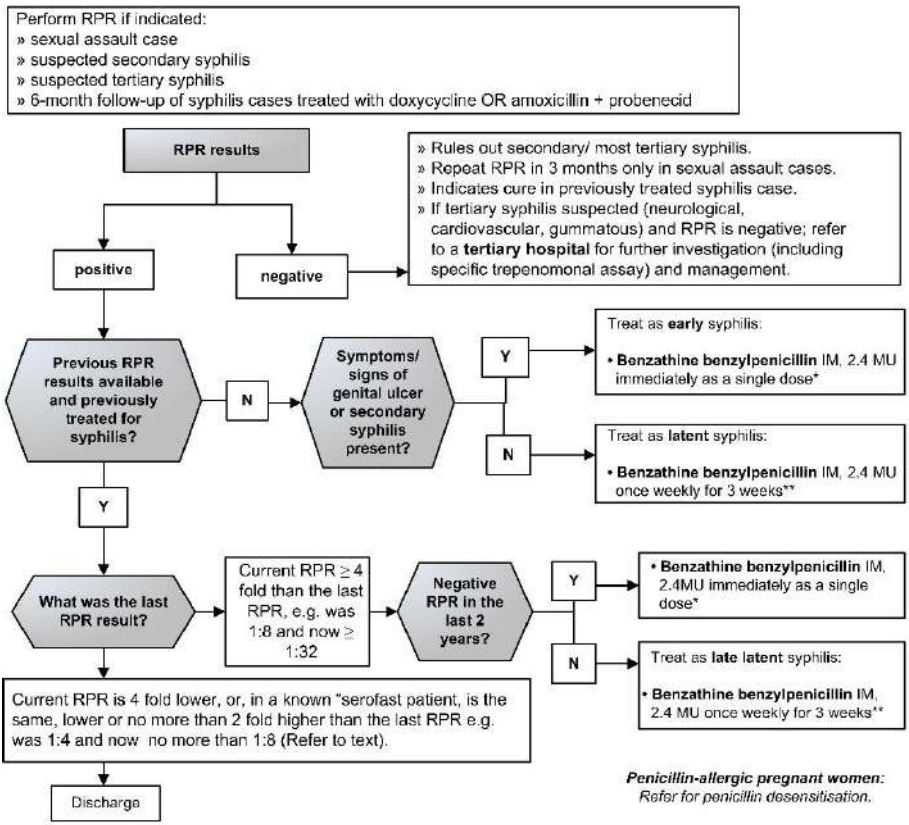
» To determine if the patient's syphilis disease is active or not,
» To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» To determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤1:8), which do not change by more than one dilution difference (up or down) over time (so-called serofast patients).

Note:

» Up to 30% of early primary syphilis cases, i.e. those with genital ulcers may have a negative RPR.
» The RPR is always positive in the secondary syphilis stage and remains high during the first two (infectious) years of syphilis. *LoE:II*[275]

For syphilis treatment in pregnancy, see Section 6.4.4: Syphilis in pregnancy.



*Early syphilis treatment:

Severe penicillin allergy or benzathine benzylpenicillin is unavailable:

- **Doxycycline,** oral, 100 mg 12 hourly for 14 days.

Pregnant or benzathine benzylpenicillin is unavailable:

- **Amoxicillin**, oral, 1 g 8 hourly for 14 days

AND

- **Probenecid**, oral 250 mg 8 hourly for 14 days.

**Latent/ late latent syphilis treatment:

Severe penicillin allergy or benzathine benzylpenicillin is unavailable:

- **Doxycycline**, oral, 100 mg 12 hourly for 30 days.

Pregnant or benzathine benzylpenicillin is unavailable:

- **Amoxicillin**, oral, 1 g 8 hourly for 28 days

AND

- **Probenecid,** oral 250 mg 8 hourly for 28 days.

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline).

MEDICINE TREATMENT

Early syphilis treatment

Check if treated at initial visit.

- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without adrenaline (epinephrine).

In penicillin-allergic patients or if benzathine benzylpenicillin is unavailable:

Z88.0

- Doxycycline, oral, 100 mg 12 hourly for 14 days. *LoE:III*[276]

If pregnant and benzathine benzylpenicillin is unavailable:

- Amoxicillin, oral 1 g 8 hourly for 14 days (Doctor initiated).

AND

- Probenecid, oral 250 mg, 8 hourly for 14 days (Doctor initiated). *LoE:III*[277]

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

Late/ late latent syphilis treatment

Check if treatment was commenced at initial visit.

- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without adrenaline (epinephrine).

In penicillin-allergic patients or if benzathine benzylpenicillin is unavailable:

Z88.0

- Doxycycline, oral, 100 mg 12 hourly for 30 days. *LoE:III*[278]

If pregnant and benzathine benzylpenicillin is unavailable:

- Amoxicillin, oral 1 g 8 hourly for 28 days (Doctor initiated).

AND

- Probenecid, oral 250 mg, 8 hourly for 28 days (Doctor initiated). *LoE:III*[279]

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

REFERRAL

» Tertiary syphilis: neurosyphilis, cardiovascular syphilis; gummatous syphilis.
» Clinical congenital syphilis.

12.9 TREATMENT OF MORE THAN ONE STI SYNDROME

STI SYNDROMES	TREATMENT (NEW EPISODE)
MUS + SSW	Treat according to SSW flow chart.
MUS + BAL	Treat according to MUS flow chart. **AND** • Clotrimazole cream, 12 hourly for 7 days.
MUS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*.

VDS + LAP	Treat according to LAP flow chart. **AND** Treat for candidiasis, if required (see VDS flow chart).
VDS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** Treat for candidiasis, if required (see VDS flow chart).
LAP+ GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 400 mg 12 hourly for 7days. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** • Azithromycin, oral, 1 g as a single dose.
SSW+ GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** • Azithromycin, oral, 1 g as a single dose.
***Treat with aciclovir only if HIV status is positive or unknown.** ****Penicillin allergic men and non-pregnant women avoid ceftriaxone and refer to relevant algorithms.** **Penicillin allergic pregnant/breastfeeding women, refer for penicillin desensitisation.**	

12.10 TREATMENT OF PARTNERS

Syndrome	Asymptomatic partner	Symptomatic partner
VDS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
LAP	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND**	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND**

	• Azithromycin, oral, 1 g as a single dose.	• Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
MUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above (see VDS flow chart).
Scrotal swelling	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
GUS	• Doxycycline, oral, 100 mg 12 hourly for 14 days. Except pregnant women: • Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose. o Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline). (If pregnant and benzathine benzylpenicillin is unavailable, see syphilis flow chart).	• Doxycycline, oral, 100 mg 12 hourly for 14 days. Except pregnant women: • Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose. o Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline). PLUS treatment for syndrome present if not included in the above. (If pregnant and benzathine benzylpenicillin is unavailable, see syphilis flow chart).
Bubo	• Azithromycin, oral, 1 g as a single dose.	• Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.

LoE:III[280]

12.11 GENITAL MOLLUSCUM CONTAGIOSUM (MC)

B08.1

DESCRIPTION

This is a viral infection which can be transmitted sexually and non-sexually. It is usually self-limiting but can be progressive in an advanced stage of immunodeficiency.
Clinical signs include papules at the genitals or other parts of the body.
The papules usually have a central dent (umbilicated papules).

MEDICINE TREATMENT

- Tincture of iodine BP, topical.
  - Apply with an applicator to the core of the lesions.

12.12 GENITAL WARTS (GW): CONDYLOMATA ACCUMINATA

A63.0

DESCRIPTION

The clinical signs include:

» Warts on the ano-genital areas, vagina, cervix, meatus or urethra.
» Warts can be soft or hard.

In most cases, warts resolve without treatment after 2 years in non-immunosuppressed patients.

GENERAL MEASURES

» If warts do not look typical or are fleshy or wet, perform a RPR test to exclude secondary syphilis, which may present with similar lesions.
» Emphasise HIV testing.

REFERRAL

» All patients with:
  - warts > 10 mm
  - inaccessible warts, e.g. intra-vaginal or cervical warts
  - numerous warts

12.13 PUBIC LICE (PL)

B85.3

DESCRIPTION

Infestation of lice mostly confined to pubic and peri-anal areas, and occasionally involves eyelashes.

The bites cause intense itching, which often results in scratching with bacterial super-infection.

GENERAL MEASURES

Thoroughly wash clothing and bed linen that may have been contaminated by the patient in the 2 days prior to the start of treatment in hot water and then iron.

MEDICINE TREATMENT

- Benzyl benzoate 25%
  - Apply to affected area.
  - Leave on for 24 hours, then wash thoroughly.
  - Repeat in 7 days.

Pediculosis of the eyelashes or eyebrows

- Yellow petroleum jelly (Note: Do not use white petroleum jelly near the eyes).
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes. *LoE:III*

REFERRAL

All children with lice on pubic, perianal area and eyelashes to exclude sexual abuse.

PHC Chapter 13: Immunisation

The contents of this chapter are based on the current National Vaccinators Manual and recommendations from the National Advisory Group on Immunisation (NAGI).

13.1 IMMUNISATION SCHEDULE

Any medical incident that takes place after immunisation and may be potentially related to immunisation should be reported.

» Every clinic day is an immunisation day.
» Never miss a chance to immunise – never turn a child away if an immunisation is needed, even if it means opening a multi-dose vial for just one child.
» Check the Road to Health Booklet every time the child visits the clinic, and give missed immunisations. These should be given according to the catch-up schedule which is shown in the Catch-up doses table on page 13.4.
» Mild illnesses are not a contra-indication to immunisation – most children who are well enough to be sent home, are well enough to be immunised. Do not immunise a sick child if the mother seriously objects, but encourage her to bring the child for immunisation on recovery.
» Give an extra dose if in doubt whether a child has had a certain dose or not, as extra doses are not harmful.
» The currently used measles vaccine must not be given with other childhood vaccines. All other vaccine listed in the table below can be given safely at the same time, but should not be given in the same syringe.
» Serious adverse events following immunisation are uncommon. All adverse events other than mild systemic symptoms (irritability, fever < 38°C) and minor local reactions (redness/swelling at infection site) should be reported.

There are very few contra-indications, but many missed opportunities.

Adverse events requiring reporting

Local reactions

» Pain, redness and / or swelling of more than 3 days' duration.
» Swelling more than 5cm from injection site.
» BCG lymphadenitis following immunisation.
» Injection site abscesses following immunisation.

Systemic reactions

» All cases of hospitalisation (thought to be related to immunisation).
» Encephalopathy within 7 days.
» Collapse or shock-like state within 48 hours.
» Fever of more than 38°C within 48 hours.
» Seizures within 3 days.
» All deaths (thought to be related to immunisation).

Conditions that are not contraindications to any of the standard EPI vaccines

» Family history of any adverse reactions following vaccination.
» Family history of convulsions.

» Previous convulsions.
» Previous measles, mumps, rubella or pertussis-like illness.
» Preterm birth.
» History of jaundice after birth.
» Stable neurological conditions such as cerebral palsy or trisomy 21.
» Contact with an infectious disease.
» Minor illness (without systemic illness and with a temperature below 38.5°C).
» Treatment with antibiotics.
» Asthma, eczema, hay fever or 'snuffles'.
» Treatment with locally acting (inhaled or low-dose topical) steroids.
» Child's mother is pregnant.
» Child being breastfed.
» Underweight, but otherwise healthy child.
» Over the age recommended in vaccination schedule but not above the allowable upper age limit per manufacturer's recommendations.
» Recent or imminent surgery.

13.2 CHILDHOOD IMMUNISATION SCHEDULE

Immunisation schedule

Age of child	Vaccine
At birth	OPV0 BCG
6 weeks	OPV1 RV1 Hexavalent (DTaP-IPV-HB-Hib)1 PCV1
10 weeks	Hexavalent (DTaP-IPV-HB-Hib)2
14 weeks	RV2 Hexavalent (DTaP-IPV-HB-Hib)3 PCV2
6 months	Measles1
9 months	PCV3
12 months	Measles2
18 months	Hexavalent (DTaP-IPV-HB-Hib)4
6 years	Td
12 years	Td

Note:

» Children with HIV should receive the full schedule of vaccines.
» Exception: patients with primary immune deficiency or known HIV-infection should not be given BCG vaccine. *LoE:III*

Catch-up doses

Any child who is unimmunised should be given a full schedule of immunisations.

Vaccine	Age of child	First dose	Interval for subsequent doses		
			Second	Third	Fourth
BCG	< 1 year	Give one dose			
	≥ 1 year	Do not give			
OPV	<6 months	Give first dose	4 weeks		
	≥6 months	Do not give			
Hexavalent (DTaP-IPV-HB-Hib)	Up to 5 years	Give first dose	4 weeks	4 weeks	12 months (do not give before child is 18 months old)
Rotavirus	< 20 weeks	Give first dose	4 weeks		
	20–24 weeks	Give one dose			
	> 24 weeks	Do not give			
PCV	< 6 months	Give first dose	4 weeks	Give at 9 months of age	
	6–9 months	Give first dose	4 weeks	8 weeks	
	>9–12 months	Give first dose	4 weeks	8 weeks	
	1–6 years	Give one dose			
Measles	< 11 months	Give first dose	At 12 months		
	≥ 11 months	Give first dose	4 weeks		
Td	> 6 years	Give first dose	At 12 years		

13.3 VACCINES FOR ROUTINE ADMINISTRATION

Vaccine	Form	Dose	Route	Recommended site	Age
BCG	Powder	0.05 mL	Intra-dermal	Right upper arm, at the deltoid muscle	Birth
OPV	Liquid	2 drops	Oral	Oral	Birth, 6 weeks
RV	Liquid	1.5 mL	Oral	Oral	6, 14 weeks
Hexavalent (DTaP-IPV-HB-Hib	Liquid and Powder	0.5 mL	IM	< 1 year: lateral aspect of the left thigh ≥ 1 year: left upper arm	6,10,14 weeks, 18 months
Measles	Powder	0.5 mL	SC	< 1 year: lateral aspect of the left thigh ≥ 1 year: right upper arm	6, 12 months
PCV	Liquid	0.5 mL	IM	Lateral aspect of the right thigh	6, 14 weeks, 9 months
Td	Liquid	0.5 mL	IM	Upper arm	5–7 years, ≥ 12 years.

BCG *(Bacillus calmette-guerin)*
Z23.2

Protects against TB meningitis and miliary TB in children < 2 years of age.

- BCG, 0.05 mL of reconstituted intradermal BCG vaccine.
  - Administered into the skin (intradermally) on the right upper arm, overlying insertion of the deltoid.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session, whichever comes first.
  - Adverse events:
    - Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar (visible in 40% of vaccinated infants).
    - In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a usual reaction and not a cause for alarm. Lymphadenopathy < 1.5 cm is not clinically significant.
    - Occasionally the papule becomes a pustule.
    - Complete AEFI notification and refer all cases with significant lymphadenopathy or a draining sinus.
  - Contraindications:
    - Children with known HIV infection should not get BCG vaccination. Do not delay BCG vaccination if HIV status is unknown. *LoE:III*
    - Children > 12 months old should not get BCG vaccination.

- Newborn infants: if the mother is on TB chemotherapy, the infant should be on chemoprophylaxis or treatment, and receive BCG once treatment is completed.

Hexavalent (DTaP-IPV-HB-Hib) vaccine
Z27.8

(Diphtheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and *Haemophilus influenzae* type b vaccine).

Protects against diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B infection and invasive infections caused by *Haemophilus influenzae* type b.

- Hexavalent (DTaP-IPV-HB-Hib), IM, 0.5 mL.
  - < 1 year of age: administer into outer side of left thigh.
  - > 1 year of age: administer into upper left arm.

Hexavalent (DTaP-IPV-HB-Hib) vaccine is a fully liquid combination of diphtheria toxoid, Tetanus toxoid, acelluar pertussis vaccine, inactivated polio vaccine, hepatitis B vaccine and Haemophilus influenzae type b vaccine.

- Storage:
  - Fridge: In a vaccine fridge at 2–8°C.
  - Hexavalent (DTaP-IPV-HB-Hib) vaccine should never be frozen.
- Adverse events:
  - Irritability.
  - Fever ≥ 38°C and acute illness.
  - Redness and induration at the site of the injection.
- Contra Indications:
  - Known hypersensitivity to any component of the vaccine or pertussis vaccine (acellular or whole cell pertussis) or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substance.

Td (Tetanus and diphtheria vaccine)
Z27.8

Protects against diphtheria and tetanus.

- Td, IM, 0.5 mL in upper arm.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Easily damaged by freezing.
    - Keep opened vials, record date of opening, for next session if kept at correct temperature and not contaminated.
    - Record date of reconstitution.
    - Discard after 30 days.
  - Adverse events:
    - Mild fever.
    - Pain.
    - Local swelling occasionally.
  - Contraindications:
    - Previous anaphylaxis.
    - Children < 6 years of age should not get Td.

bOPV (Oral polio vaccine)
Z24.0

Protects against polio.

- bOPV, oral, 2 drops given by mouth.
  - If spat out or vomited, repeat immediately.
  - Not affected by feeding (breast or other).
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C; or freezer (in pharmacy).
    - Not damaged by freezing.
    - Easily damaged by temperature > 8°C.
    - Record date of opening.
    - Discard after 30 days.
  - Adverse events:
    - May be associated with a flu-like illness and gastroenteritis.
    - Mild fever.
  - Contraindications:
    - Previous anaphylaxis.
    - bOPV is not contraindicated in HIV-infected children but should not be administered to children with primary immune deficiency.

RV (Rotavirus vaccine)
Z25.8

Protects against gastro-enteritis caused by rotavirus.

- RV, oral, 1.5 mL given by mouth.
  - Squeeze the entire contents of the tube in the inner cheek.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Easily damaged by freezing.
    - Protect the vaccine from light.
  - Adverse events:
    - Mild fever.
    - Irritability.
  - Contra-indications:
    - Previous anaphylaxis to rotavirus or any ingredients in the formulation.
    - Do not give Rotavirus vaccine if a child has a history of chronic gastro-intestinal disease or severe diarrhoea including children with any history of uncorrected congenital malformation of the gastrointestinal tract. Refer the child for medical opinion.
    - A history of intussusception (severe abdominal pain, persistent vomiting, bloody stools, abdominal bloating and/or high fever).
    - Rotavirus vaccine should not be given after 24 weeks of age (see table on page 13.4 for catch-up schedule).

PCV (Pneumococcal conjugated vaccine)
Z23.8

Protects against invasive pneumococcal disease (meningitis, septicaemia), pneumonia and otitis media.

- PCV, IM, 0.5 mL
  - < 1 year of age: administer into outer side of right thigh.
  - > 1 year of age: administer into upper arm in the deltoid muscle.
  - PCV and Hexavalent (DTaP-IPV-HB-Hib) can be administered at the same time, but at different sites.
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Do not freeze as the vaccine is easily damaged by freezing.
    - Do not mix PCV in the same syringe with other vaccines.
    - Shake the vaccine well before use.
  - Contra- indications:
    - Previous anaphylaxis.

Measles

Z24.4

- Measles vaccine, SC, 0.5 mL.
  - < 1 year of age: administer subcutaneously on lateral aspect of the left thigh.
  - ≥ 1 year of age: administer subcutaneously on right upper arm.
  - The new guideline is to administer the measles vaccine at 6 (range 7-11 months) and 12 months.
  - Do not give the currently available measles vaccine at the same time as other vaccines. If a child requires measles vaccine and other vaccines at the same time, give measles vaccine immediately and schedule visit to receive remaining vaccines 1 month later.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session (whichever comes first).
  - Adverse events:
    - Burning or stinging at the injection site, fever.
    - Transient morbilliform rash and mild pyrexia up to 30 days after vaccination.
  - Contra-indications:
    - Previous anaphylaxis.
    - Uncontrolled convulsions: consult a doctor.

13.4 THE COLD CHAIN

Maintaining the cold chain means keeping vaccines at the right temperature throughout distribution, storage and use. The cold chain can be maintained by:

» Never exposing vaccines to heat or freezing conditions, especially during transportation from one point to another.
» Always using a cold box to keep the vaccines cold during transport and immunisation.
» All vaccines should be kept in a refrigerator at a temperature of 2–8°C.
» Defrosted OPV should not be kept in the freezer or be allowed to freeze again.
» Use a metal dial thermometer or a fridge-tag for all vaccines (Min-max thermometer not recommended).

» Do not let Hexavalent (DTaP-IPV-HB-Hib), HPV, PCV, RV, Td and TT vaccines touch the evaporator at the back of the fridge as they may freeze. Do not freeze these vaccines. Do not use frozen vaccines. If unsure, do shake test to check whether vaccines have frozen.
» Monitor and record fridge temperature twice daily.
» Leave space between each tray to allow cold air to circulate.
» Do not keep food in the same fridge as the vaccines.
» If possible do not keep other medications e.g. Insulin etc. In the vaccine fridge.
» Do not keep blood and other specimens in the vaccine fridge.

Correct packing of the cold box

» **Fully** conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top.
» If there are not enough ice packs, place available ice packs at the sides and on top of the vaccines.
» Td, TT, HPV, PCV, RV and Hexavalent vaccines must not be allowed to freeze.
» Keep measles and polio vaccines very cold - place on bottom of the cold box, closest to the ice packs.
» BCGcan be placed anywhere in the box.
» Keep the lid firmly closed and the box out of the sun.
» Keep a thermometer and a freeze tag in the cold box with the vaccines and the temperature at 2–8°C.
» Live vaccines (BCG, OPV, measles) are very sensitive to heat, sunlight and skin antiseptics.

How to pack your fridge correctly

» Vaccines should be stored in a specific vaccine fridge. However, if unavailable store the vaccines in a domestic fridge, as follows:
» Top shelf: measles and polio vaccines in the coldest part.
  - Middle shelf: BCG, Td, Hexavalent (DTaP-IPV-HB-Hib), HPV,RV, PCV and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles for 2 days.
  - Do not let Td, Hexavalent (DTaP-IPV-HB-Hib) HPV, RV, PCV and TT vaccines touch the evaporator plate at the back of the fridge as they are destroyed by freezing.
  - Do not keep vaccines in the fridge door.
  - Store the same kind of vaccines together in one tray.
  - Leave about 2cm space between each tray to allow the cold air to move around.
  - Bottles filled with salt water stored in the bottom of the fridge will keep the fridge contents cold when the door is opened.
  - **Do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door.**
» There should be a contingency plan written and posted on every vaccine fridge of what to do in the event of a power failure.
» Monitor and record temperature twice daily.

CAUTION
Do not use vaccines that have expired, missed the cold chain or that VVM has reached discard point.
Keep the fridge temperature between 2–8°C.

Note: All vaccines with a "T" in the name are sensitive to freezing –TT, Td, HexavalenT, RoTavirus, HepaTiTis B and even diluents. All diluents (measles and BCG) should never be frozen.

13.5 OPEN MULTI-DOSE VIAL POLICY

Opened vials of TT, Td, HepB and OPV vaccines:

» May be used in subsequent immunisation sessions **for a maximum of one month**, provided that each of the following conditions have been met:
  - the expiry date has not passed
  - each vial must be dated when opened
  - the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording)
  - the vaccine vial septum has not been submerged in water
  - aseptic technique has been used to withdraw all doses

Opened vials of measles, BCG

Check the VVM and expiration date prior to reconstitution.
Reconstituted vials of measles and BCG vaccines must be discarded at the end of each immunisation session or at the end of 6 hours, whichever comes first.
Always label the vials with the date and time when opening or reconstituting.
All opened vials must be discarded immediately if:

» sterile procedures have not been fully observed,
» there is even a suspicion that the opened vial has been contaminated,
» there is visible evidence of contamination such as a change in appearance or floating particles, etc.

INJECTION SAFETY

» Always wash hands before and after giving the vaccine.
» Always keep a fully equipped emergency tray at the immunisation point.
» Use a sterile syringe and sterile needle for each immunisation.
» Clean the skin adequately with cotton wool and water, do not use alcohol swabs.
» Check all vaccines for safety.
» Return all unsafe vaccines back to the pharmacy.
» Use the same needle for drawing up and administering the vaccine. "One Needle, One Syringe".
» Diluents are not interchangeable. Different vaccines have different diluents.
» Always use the same diluent from the same manufacturer as the vaccine.
» Used needles and syringes must be disposed of safely.
» Discard all used empty vaccines in the sharps container.

13.6 ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFI)

Report all AEFIs to the local EPI Coordinator.
AEFI form may be accessed at: http://www.health.gov.za/index.php/2014-08-15-12-57-15/category/268-2016-frms

13.7 OTHER VACCINES

TT (Tetanus toxoid)
Z23.5

Protects against tetanus (neonatal and after wounds)

- TT, IM, 0.5 mL into arm
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing.
    - Keep opened vials for next session if kept at correct temperature and not contaminated.
    - Discard after 30 days.
    - Record date of reconstitution.
  - Contraindications:
    - Previous anaphylaxis.

Pregnant women
All pregnant women should routinely receive Tetanus toxoid.

	TT or Td	**TT or Td**	**TT or Td**	**TTor Td**	**TT or Td**
Pregnant women with no previous immunisation (or unreliable immunisation information)	As early as possible in 1st pregnancy	At least 4 weeks later	At least 6 months later, or in next pregnancy	At least 1 year later, or in next pregnancy	At least 1 year later, or in next pregnancy
Pregnant women with 3 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses	As early as possible in 1st pregnancy	At least 4 weeks later	At least 1 year later		
Pregnant women with 4 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses	As early as possible in 1st pregnancy	At least 1 year later			

Trauma

- Give booster dose of TT/Td after each trauma episode (unless given in previous 5 years).

Human Papilloma Virus (HPV) Vaccine
Z25.8
Protects against infection with HPV serotypes 16 and 18.
Persistent HPV infection is associated with the development of a number of reproductive tract cancers, especially cancer of the cervix.
Two dose schedule (6 months apart) currently offered as part of the **Integrated School Health programme** to Grade 4 girls (≥ 9 years of age) in public schools.

- HPV, IM, 0.5 mL
  - Administered into the deltoid of the non-dominant arm.
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing – do not freeze and discard any vaccine which has been frozen.
    - Store in original package and protect from light.
    - Use immediately once withdrawn into a syringe.
  - Contraindications:
    - Previous anaphylaxis.
    - Febrile illness (≥ 38.5°C).
    - Should not be administered to girls/women who are known to be pregnant.
  - Adverse events:
    - Injection site pain and swelling in the arm are common.
    - Itching, rash, redness and urticaria may also occur.
    - Nausea, diarrhoea, abdominal pain, headache, myalgia, fever (38oC) are not uncommon.
    - Syncope, dizziness, lymphadenopathy, and anaphylaxis have been reported.

Hepatitis B
Z24.6

All personnel working in a health care facility (including support staff)

- Hepatitis B vaccine, IM, 3 adult doses of 1 mL.
  - **first dose** administered immediately;
  - **second dose** 1 month after the first dose;
  - **third dose** 6 months after the first dose.

Perinatal transmission
Babies born to mothers with acute hepatitis B infection at the time of delivery or to mothers who are HBsAg-positive or HBeAg-positive, see Section 6.6.5: Perinatal transmission of hepatitis B.

Influenza vaccine
Z25.1

- Influenza vaccine, IM, 0.5 mL.
  - Contraindication: severe egg allergy, < 6 months of age.
  - All women who are pregnant at the time of the annual immunisation campaign should be immunised.
  - People with the following risk factors may be offered immunisation during the annual campaign:
    - HIV infection.

  - Chronic cardiac or pulmonary conditions.
  - Age > 65 years.
- Healthcare workers are not routinely offered immunisation during the annual campaign. Although it is recommended that healthcare workers are vaccinated against influenza, they will not be provided with publically funded vaccines unless they fall within any of the designated high risk groups.

NOTE: Prioritisation strategies may vary in a pandemic.

Recommended dosage of influenza vaccine for patients of different age groups:

Age group	Dose	Number of doses
Adults and children ≥ 9 years	0.5 mL, IM	Single dose.
Children: > 3 to < 9 years	0.5 mL, IM	2 doses ≥ 4 weeks apart during first year of immunisation, thereafter one dose per annum.
Children: > 6 months to < 3 years	0.25 mL, IM	2 doses ≥ 4 weeks apart during first year of immunisation, thereafter one dose per annum.

PHC Chapter 14: Musculoskeletal conditions

14.1 ARTHRALGIA

M25.50-59

DESCRIPTION

Joint pain without swelling, warmth, redness or systemic manifestations such as fever.
It is usually self-limiting. May be an early manifestation of degenerative joint conditions (osteoarthrosis) or local and systemic diseases. May follow injury to the joint, e.g. work, play and position during sleep.
Suspect rheumatic fever in children, especially if arthralgia affects several joints in succession.

GENERAL MEASURES

» Advise patient to:
  - apply heat locally to the affected joint, taking precautions not to burn themselves
  - exercise once their pain is relieved
  - reduce weight, if overweight, to decrease stress on the joint
» Exclude systemic causes.
» Reassure patient.

MEDICINE TREATMENT

Treat for 1 week (maximum 2 weeks) provided no new signs develop.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.
- Methyl salicylate ointment, topical, may provide some relief.

REFERRAL

» Pain for 1 week in children, and pain for > 2 weeks in adults.
» Recurrent pain.
» Severe pain.
» Fever.
» Involvement of several joints in succession
» Evidence of systemic illness e.g. e.g. sore throat in children, presence of jaundice, anaemia.

14.2 ARTHRITIS, RHEUMATOID

M06.90-99

DESCRIPTION

A chronic inflammatory systemic condition. May affect many organs, but the musculoskeletal system is predominantly affected with several joints becoming painful and swollen. There is usually symmetrical involvement of small joints from early on. The small joints of the fingers and hands with the exception of the distal interphalangeal joints, are usually involved, although any joint can be involved.

» Four 'S factors' are useful to screen for early joint disease:
  - Stiffness: Early morning stiffness lasting > 30 minutes.
  - Swelling: Persistent swelling of 1 or more joints, particularly hand joints.
  - Squeeze test hands: Tenderness on squeezing across all 4 metarcarpo-phalangeal joints.
  - Squeeze test feet: Tenderness on squeezing across all 4 metartarso-phalangeal joints.

Late disease may have destruction and deformity of affected joints especially of the fingers e.g. ulnar deviation, buttonhole and swan neck deformities. *LoE:III*[281]

GENERAL MEASURES

» Advise patient to:
  - reduce weight
  - stop smoking
» Manage co-morbidities.
» Educate on joint-care (refer for occupational therapy, if available).

MEDICINE TREATMENT

All newly diagnosed patients must be referred for specialist management with Disease Modifying Anti-rheumatic Drugs (DMARDs).

For control of acute symptoms whilst awaiting referral (Doctor initiated):

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.
  - Continue for no longer than 3–6 months.

For control of acute symptoms during disease flares and in severe extra-articular manifestations e.g. scleritis (Doctor prescribed):

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal for 2 weeks. *LoE:III*[282]

NSAIDsare used for symptomatic relief in patients with active inflammation and pain. They have no long-term disease modifying effects.
NSAIDs are relatively contra-indicated in patients with significantly impaired renal function, i.e. eGFR < 60 mL/minute.

CAUTION: NSAIDS
Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.

Chronic use of all NSAIDsis associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).
NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.
Do not use NSAID in pregnancy and breastfeeding.

LoE:III[283]

If NSAIDS are contraindicated for acute flares e.g. warfarin therapy, renal dysfunction (Doctor prescribed): *LoE:III*[284]

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 7.5 mg daily for a maximum of 2 weeks. *LoE:III*[285]

In high-risk patients: > 65 years of age; history of peptic ulcer disease; on concomitant warfarin, aspirin, or corticosteroids: *LoE:II*[286]

ADD

- Proton pump inhibitor, e.g.
- Lansoprazole, oral, 30 mg daily whilst on an NSAID.

For confirmed rheumatoid arthritis, NSAIDs and corticosteroids will be continued by a specialist as bridging therapy until DMARDs have taken effect.

REFERRAL

Urgent (to a specialist)

» Severe extra-articular articular manifestations.

Non-urgent

» Refer all patients early for confirmation of diagnosis and management.
» Known rheumatoid arthritis patients with acute disease flares.

14.3 ARTHRITIS, SEPTIC

M00.90-99

DESCRIPTION

An acute infective condition involving one or more joints.

The joint is hot, swollen, and very painful, and movement is restricted.

Signs of systemic infection, including fever, are usually present. The infection is usually blood borne, but may follow trauma to the joint. The course may be acute or protracted. A wide spectrum of organisms is involved, including staphylococci and *N. gonorrhoea*.

Note: Haemophiliacs may present with an acute arthritis similar to septic arthritis. This is due to bleeding into a joint and not due to infection.

MEDICINE TREATMENT

» Infants ≤ 2 months of age, who fulfil the IMCI criteria for "POSSIBLE SERIOUS BACTERIAL INFECTION" should receive a first dose of ceftriaxone and other IMCI urgent care while arranging transfer.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

Children with suspected septic arthritis should be assessed for evidence of septicaemia and septicaemic shock, which should be treated accordingly while awaiting transfer.

REFERRAL

Urgent

All patients for confirmation of diagnosis and surgical drainage.

14.4 GOUT

14.4.1 GOUT, ACUTE

M10.00-09/M10.90-99

DESCRIPTION

A metabolic disease in which uric acid crystals are deposited in joints and other tissues. Characterised by recurrent attacks of an acute arthritis that often affects one joint which is very painful, tender, swollen, red and hot to the touch. The inflammation may extend beyond the joint.

In many patients the 1st metatarso-phalangeal joint is initially involved. The instep, ankle, heel, and knee are also commonly involved. Bursae (such as the olecranon) may be involved.

Gout commonly occurs in men > 40 years of age and in postmenopausal women.

INVESTIGATIONS

Increased serum uric acid level.

However, the serum uric acid level may be normal during acute attacks, and therefore best estimated after the acute symptoms have subsided.

GENERAL MEASURES

» Immobilise the affected joint during the acute painful attack.

» Increase (high) fluid intake.

» Avoid alcohol.
» Avoid aspirin.

MEDICINE TREATMENT

Initiate treatment as early as possible in an acute attack.

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg,8 hourly with or after a meal for the duration of the attack.

CAUTION: NSAIDS

Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.

Chronic use of all NSAIDs is associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).

NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.

Do not use NSAID in pregnancy and breastfeeding.

LoE:III[287]

If NSAIDS are contraindicated, e.g. peptic ulceration, warfarin therapy and renal dysfunction, or heart failure:

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[288]
- Prednisone, oral, 40 mg daily for 5 days (Doctor prescribed). *LoE:II*[289]

REFERRAL

» No response to treatment.
» For confirmation of diagnosis, if in doubt.
» Patients with chronic kidney disease.
» Patients with suspected secondary gout (e.g. haematological malignancies).

Note:

» Gout may be secondary to other medical conditions, e.g. haematological malignancies.
» Gout may co-exist with hypertension, diabetes mellitus (as a risk factor for degenerative vascular disease) and chronic kidney disease. The pharmacological treatment of these conditions could precipitate gout.

14.4.2 GOUT, CHRONIC

M10.00-09/M10.90-99

DESCRIPTION

Gout with one or more of the following:

» uric acid deposits in and around the joints and cartilages of the extremities (tophi)
» tophi are most commonly found as hard nodules around the fingers and toes, at
» the tips of the elbows (olecranon bursae) or at the pinnae of the ears
» serum uric acid >0.5 mmol/L
» bone and cartilage destruction of the fingers and toes with joint swelling and deformity
» prolongation of attacks, often with reduction in pain severity
» incomplete resolution between attacks

GENERAL MEASURES

» If possible, avoid known precipitants and medicines that may increase uric acid, e.g. low dose aspirin, ethambutol, pyrazinamide and diuretics, especially hydrochlorothiazide. *LoE:III*
» Encourage weight loss, if overweight.
» Avoid alcohol.

MEDICINE TREATMENT

Uric acid lowering therapy is required in all of the following:

» ≥ 2 acute attacks per year
» urate renal stones
» chronic tophaceous gout
» urate nephropathy

When the acute attack has settled completely, i.e. usually after 3 weeks:

- Allopurinol, oral, 100 mg daily (Doctor initiated).
  - Increase monthly by 100 mg according to serum urate levels.
  - Titrate dose to reduce serum urate to <0.35 mmol/L.
  - Allopurinol dosage is dependent on severity of disease and serum urate concentration. Doses in excess of 300 mg should be administered in divided doses. *LoE:III*[290]
  - Average dose: 300 mg per day.
  - The elderly and patients with renal impairment require lower doses, start with 50 mg daily, or refer.

REFERRAL

» Suspected secondary gout.
» No response to treatment.
» Non-resolving tophaceous gout.
» Renal impairment.

14.5 OSTEOARTHROSIS (OSTEOARTHRITIS)

M13.00-19/M13.80-99/M15.0/M15.3/M15.8-9/M16.0-9/M18.0-5/M18.9/M19.00-09/M19.80-99

DESCRIPTION

A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:

» pain usually with movement
» post-rest stiffness
» limited range of movement often with crepitus
» joint may be swollen

GENERAL MEASURES

Non-pharmacological/general measures are as important as pharmacological management.
Educate patient and family on:

» weight reduction
» exercise
» rest during acute painful episodes.

Recommend use of a walking stick or crutch to alleviate stress on weight bearing joint.
Physiotherapy and/or occupational therapy.

MEDICINE TREATMENT

Pain:

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.
- Methyl salicylate ointment, topical, may provide some relief.

If patient responds to paracetamol reduce the dose to:

- Paracetamol, oral, 500 mg, 6–8 hourly when required.

If no response and inflammation is present:

ADD

- NSAID, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal, as needed for 7 days.

As many of these patients, particularly the elderly, have concomitant medical conditions such as cardiovascular, gastrointestinal disease or renal function impairment, NSAIDs must be used with caution.

Patients on aspirin for cardiovascular risk reduction should take aspirin 30 minutes before the 1st dose of ibuprofen in the morning, as taking aspirin and ibuprofen at the same time may reduce aspirin's efficacy. *LoE:III*[291]

In high-risk patients: > 65 years of age; history of peptic ulcer disease; or on concomitant warfarin, aspirin, or corticosteroids:

ADD

- Proton pump inhibitor, e.g.:
- Lansoprazole, oral, 30 mg daily. *LoE:II*[292]

CAUTION: NSAIDS

Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.

Chronic use of all NSAIDs is associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).

NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.

Do not use NSAID in pregnancy and breastfeeding.

LoE:III[293]

REFERRAL

» All cases with:
  - uncertain diagnosis
  - intractable pain
  - recurrent episodes of pain with inflammation
  - suspected infection

» Consideration of joint replacement.

PHC Chapter 15: Central nervous system conditions

15.1 STROKE

G45.9/I63.0-6/I63.8-9/I64

DESCRIPTION

Stroke consists of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting >24 hours or leading to death.

Most strokes are ischaemic (embolism or thrombosis) whilst others may be caused by cerebral haemorrhage.

A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.

The diagnosis of stroke depends on the presentation of sudden onset of neurological loss, including:

» Weakness, numbness or paralysis of the face or limb/s.
» Sudden onset of blurred or decreased vision in one or both eyes; or double vision.
» Difficulty speaking or understanding.
» Dizziness, loss of balance or any unexplained fall or unsteady gait.
» Headache (severe, abrupt).

GENERAL MEASURES

Acute management

» Assess airway, breathing, circulation and disability.
» Measure blood glucose and treat hypoglycaemia if present. See Section 21.2.6: Hypoglycaemia and hypoglycaemic coma.
» BP is often elevated in acute stroke. Do not treat elevated BP at PHC, but refer patient urgently.
» Patients should be given nil by mouth until swallowing is formally assessed.

Long term management

» Optimise treatment for existing medical conditions such as hypertension, diabetes mellitus, dyslipidaemia and cardiac conditions.
» Increase regular physical activity, aim for 30 minutes 5 times a week.
» Advise patient regarding appropriate weight loss, if weight exceeds ideal weight.
» Advise patient regarding smoking cessation.
» Refer for physiotherapy, if indicated.

MEDICINE TREATMENT

Acute treatment

- Aspirin, oral, 300 mg, as a pre-referral dose. *LoE:I*[294]

Note: Except if the patient:

» is unconscious
» cannot swallow
» is on long-term anticoagulation therapy
» has signs of a subarachnoid bleed: i.e. neck stiffness, headache
» will be transferred and treated with a thrombolytic within 3 hours *LoE:I*[295]

Secondary prevention for adults (i.e. continuation of aftercare treatment initiated at higher level of care).

Antiplatelet therapy

All patients, if not contraindicated (e.g. haemorrhagic stroke, peptic ulcer, patients on anticoagulation therapy, etc.):

- Aspirin, oral, 150 mg daily. *LoE:I*[296]

Lipid-lowering medicine therapy, see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Hypertensive therapy

For blood pressure management, see Section 4.7: Hypertension.

Diabetes mellitus and dietary management information

See Chapter 9: Endocrine system.

REFERRAL

Urgent

Refer all acute stroke cases for further management (preferably within 3 hours).

15.2 DEMENTIA

F03/E52/E03.2-3/8-9/A52.3/B23.8 + (F02.8)

DESCRIPTION

Progressive loss of cognitive function, usually of insidious onset. Initial presentation may be with mild personality or memory changes, before more pronounced deficits become evident.

Common reversible causes of dementia include:

» Metabolic
  - Hypothyroidism
  - Vitamin B12 deficiency
  - Pellagra
» Medications and drugs
  - Long-term alcohol abuse
  - Many medications have CNS side effects
» Infections
  - Neurosyphilis
  - HIV dementia
» Surgical
  - Normal pressure hydrocephalus
» Severe depression (pseudo-dementia)

GENERAL MEASURES

All patients must be seen by a doctor to confirm the diagnosis.

People with dementia are vulnerable to delirium and worsening confusion.

Manage conditions that may worsen symptoms, including:

» Electrolyte disturbances and dehydration.
» Infections, usually originating from the respiratory or urinary tract.
» Medication toxicity.

» For confirmed diagnosis of mild to moderate dementia the following supportive measure may be taken:
  - Disclose the diagnosis to family members /primary care giver.
  - Explain that the condition is evolving and future planning is necessary
  - Advise driving cessation for the patient, if relevant.
  - Discuss home safety risks – e.g. potential for patient to leave stove on while cooking or wander if not watched.
  - Ensure that the patient has a caregiver that can supervise medication taking when the patient is unable to do so themselves.
  - Monitor functional problems and manage as they arise e.g. urinary incontinence.
  - Monitor nutritional status and intervene if necessary.
  - Provide ongoing medical care.

REFERRAL

» Adults < 60 years of age, adolescents and children, where common reversible causes of dementia could not be identified.
» When behavioural and/or psychological symptoms pose a risk to patient or carer.

15.3 SEIZURES (CONVULSIONS/FITS)

R56.8

DESCRIPTION

A seizure is a change in movement, attention or level of awareness that is sustained or repetitive, and occurs because of abnormal and excessive neuronal discharge within the brain. Seizures may be secondary (where there is an underlying cause) or idiopathic (where no underlying cause is evident). When seizures are recurrent or typical of a specific syndrome, then the term epilepsy is used.

Seizures should be differentiated from:
» syncope
» hyperventilation
» transient ischaemic attack (TIA)
» non-epileptic seizure
» rigors
» febrile convulsions

Important conditions that should be excluded include:
» meningitis
» encephalitis or encephalopathy (including hypertensive encephalopathy)
» metabolic conditions, e.g. hypoglycaemia
» brain lesions
» seizure due to alcohol withdrawal

GENERAL MEASURES

If convulsing:

Measure blood glucose and treat hypoglycaemia, if present.
Ensure an open airway and administer oxygen.
» Position to prevent aspiration of vomitus, i.e. recovery position.
» Check glucose during the seizure and blood pressure after the seizure.

» Obtain intravenous access if seizure duration > 5 minutes.
» Avoid putting anything in the mouth.

MEDICINE TREATMENT

See Section 21.2.11: Seizures and status epilepticus.

Always check blood glucose concentrations to exclude hypoglycaemia.

For management of eclamptic convulsions in pregnancy, see Section 6.4.2.5: Eclampsia.

After seizure

» All patients presenting with a first seizure must be investigated to exclude underlying causes, including meningitis.
» A patient who presents with a first seizure should not automatically be labelled as an epileptic, or started on treatment.
» When indicated, long term therapy should be initiated by a doctor.

REFERRAL

Urgent:

» All patients with status epilepticus or suspected meningitis, see Section 15.4: Meningitis.
» All patients following a 1st seizure should be examined by a doctor to exclude underlying causes.

Note: Persons known to have epilepsy who recover fully following a seizure do not usually require referral. See criteria for referral under epilepsy.

15.3.1 STATUS EPILEPTICUS

See Section 21.2.11: Seizures and status epilepticus.

15.3.2 EPILEPSY

G40.0-9

DESCRIPTION

Epilepsy is defined as recurrent seizures. Epilepsy is associated with many psychological, social and legal problems, and cultural misperceptions.

DIAGNOSIS

» Is usually made clinically.
» Requires an accurate witness description of the seizure.

Some types of seizures

Generalised onset	Generalised motor seizure	Generalised tonic-clonic	Loss of consciousness preceded by: » a brief stiff phase, followed by » jerking of all the limbs
		Tonic	One or more limbs become stiff without any jerking.
		Myoclonic	Brief, involuntary, usually generalised jerks, with retained awareness.
	Generalised non-motor seizure	Absence	» Occurs in childhood. » Sudden cessation of activity followed by a blank stare. » Usually no muscle twitching. » Some children will smack their lips.
Focal (Partial)	Focal aware (Simple partial)		Seizure occurs on one side of the body, without loss of consciousness. Symptoms may include sensory, autonomic or psychic effects.
	Focal impaired awareness (Complex partial)		Complex partial seizures are often preceded by a simple partial seizure but is associated with altered awareness or loss of consciousness.

GENERAL MEASURES

» Educate patient.
» Advise patient to:
  - Record the dates and, if possible, the times of the seizures, in a seizure diary.
  - Present the seizure diary at each consultation for assessment of therapy.
  - Carry a disease identification bracelet, necklace or card.
» Monitor patients for psychiatric disturbances, intellectual disability (limitations in reasoning, learning and problem solving), anxiety and/or depression, and manage.
» Counsel and advise patient on:
  - the adverse effect of alcohol on seizures
  - the effect of missing a dose of medication
  - the risks of discontinuing medicine treatment without advice of the doctor
  - the need for family planning

Counsel the patient about driving, working at heights, swimming and operating machinery. The patient should sign in the notes that they have received this advice.

MEDICINE TREATMENT

Note:

» General rule: a single medicine is best.
» Combination therapy should be initiated only by a specialist.
  - Recommended doses are general guides and will be effective in most patients.
  - Some patients may need much higher or lower doses. Doses should be increased at 2-weekly intervals only.
  - In patients receiving any anticonvulsants, therapeutic drug monitoring may be useful to confirm suspected non-adherence, or diagnose toxicity in a symptomatic patient.

- Therapeutic drug monitoring should be done in patients receiving higher than usual doses of phenytoin.

Medicine interactions
Phenytoin, phenobarbitone and carbamazepine are potent enzyme inducing agents and should be used with caution with other medicines metabolised by the liver, especially warfarin, antiretrovirals, progestin subdermal implants and oral contraceptives.

» Progestin-only injectable contraceptives or IUCDs are the preferred contraceptive methods for women of child-bearing potential on anti-epileptic medication. See Chapter 7: Family planning. *LoE:III*[297]

Generalised tonic-clonic seizures

Adults

The aim is to use monotherapy, i.e. a single anticonvulsant, progressively increasing the dose until the seizures are controlled or clinically important side effects occur.

- Lamotrigine, oral (Doctor initiated).
  - Usual maintenance dose: 100–200 mg daily as a single dose or divided doses.
  - Dose-titrate as per table below:

Dose titration of lamotrigine	
Weeks	**Dose**
1, 2	25 mg daily
3, 4	25 mg 12 hourly
5	25 mg in the morning; 50 mg at night
6	50 mg 12 hourly
7 onwards	Increase by 50 mg every 1–2 weeks, according to response

Adapted from the Western Cape Department of Health, Lamotrigine dose titration protocol, 2019. *LoE:III*[298]

If therapy is interrupted for more than a week, restart the titration protocol. *LoE:III*[299]

Note: Carbamazepine and lamotrigine are the preferred anticonvulsants in women of child-bearing potential. Avoid valproic acid in women of child-bearing potential. *LoE:I*[300]

CAUTION
Children born to women taking valproic acid are at significant risk of birth defects (10%) and persistent developmental disorders (40%).
Valproic acid is contra-indicated and should be avoided in pregnancy and women of child-bearing potential. *LoE:III*[301]

OR

- Carbamazepine, oral (Doctor initiated).
  - 100 mg 12 hourly for one week then, 200 mg 12 hourly.
  - Titrate upwards by 100–200 mg daily, every week according to response to a maximum dose of 600 mg 12 hourly.

If the initial medicine fails to achieve satisfactory control with optimal dosages, or causes unacceptable adverse effects, then a 2nd medicine may be started. The 1st medicine should be continued for 2 weeks and then gradually reduced over 6–8 weeks until stopped.

Only if already well controlled on phenytoin, continue with:

- Phenytoin, oral, 4.5–5 mg/kg daily on lean body mass, at night (Doctor initiated).
  - Phenytoin is a useful and effective agent. However, doses > 300 mg/day are potentially toxic and could lead to permanent cerebellar damage. Increased dosages should be monitored carefully, both clinically and by medicine concentrations.

Children

The decision to initiate long-term therapy is generally made if the child has experienced ≥ 2 unprovoked convulsions (except febrile convulsions).

» Phenobarbital and carbamazepine are both effective in generalised tonic-clonic seizures.

» Monitor the behaviour profile and academic performance of children on phenobarbital. Change treatment if any problems are identified.

- Phenobarbital, oral, 3.5–5 mg/kg at night (< 6 months of age) (Doctor prescribed). *LoE:I*[302]

OR

- Carbamazepine, oral (Doctor prescribed)

  Children ≤12 years of age:
  - Initial dose:
    - Syrup (100 mg/5mL): 5 mg/kg/day, given in divided doses, 8 hourly.
    - Tablets (200 mg): 5 mg/kg/day, given in divided doses,12 hourly.
  - Depending on response to treatment, increase slowly by 5 mg/kg/day, if necessary, at 2 weekly intervals to a maximum of 20 mg/kg/day or 1 g/day.
  - Maintenance dose:
    - Maintenance total daily dose: 10–20 mg/kg/day.

Note:

» All children not controlled on carbamazepine 20 mg/kg/day should be referred.

» Carbamazepine may exacerbate myoclonic seizures and absence seizures. *LoE:III*[303]

HIV-infected individuals on ART

Children

For HIV-infected children on ART, valproic acid is preferred because of fewer medicine interactions. When switching to valproic acid, commence valproic acid with maintenance dose of the medicine as below and discontinue the other anticonvulsant gradually after 7 days. Exclude liver dysfunction prior to initiating therapy (at least ALT), in children < 2 years or if clinical suspicion of liver dysfunction. *LoE:III*[304]

- Valproic acid, oral, 5 mg/kg 12 hourly (Doctor prescribed).
  - Titrate according to response over 4 weeks up to 15 mg/kg 12 hourly.
  - If poorly tolerated divide total daily dose into 3 equal doses.
  - Maximum daily dose 40 mg/kg/day.
  - Switch to an alternate anticonvulsant when girls reach child-bearing age.

Adults

For HIV-infected adults on ART, lamotrigine is preferred because of fewer medicine interactions. When switching to lamotrigine, commence treatment as below and discontinue the other anticonvulsant after 28 days.

- Lamotrigine, oral (Doctor initiated).
  - 25 mg daily for 2 weeks.
  - Then 50 mg daily for 2 weeks.
  - Thereafter, increase by 50 mg every 2 weeks according to response.
  - Usual maintenance dose: 100–200 mg/day as a single or divided dose.

Note: Lamotrigine does not have interactions with dolutegravir. However, the dose of lamotrigine will need to be doubled when patients are switched from efavirenz- or nevirapine-based ART to lopinavir/ritonavir-based ART because the metabolism of lamotrigine is induced by lopinavir/ritonavir. *LoE:III*[305]

Poorly controlled epilepsy

Ask the patient, and if possible a family member or primary care giver, about the following, as these factors can influence decisions regarding medicine therapy:

» Has the patient been adherent in taking the medication regularly for at least 2 weeks or more before the seizure? Ask about medicine dosage and frequency.
» If non-adherence has been established, ask for reasons contributing to non-adherence and offer guidance.
» Has the patient recently used some other medicine (i.e. look for drug interactions, substance abuse or traditional medicine use).
» Is there a chance that alcohol is involved?

If ≥ 1 of the above are present, address the problem/s but leave anticonvulsant therapy unchanged (unless dose adjustment is necessary because of a drug interaction). Reassess the patient within 2 weeks.

REFERRAL

» All patients with new onset epilepsy for further investigations such as CT scans.
» Patients with seizures other than generalised tonic-clonic seizures, including absence seizures.
» Increased number of seizures despite attempts to address adherence issues, or changes in the seizure type.
» Patients who have been seizure free on therapy for ≥ 2 years to review therapy and consideration for stopping treatment.
» Pregnancy.
» Women of child-bearing potential who are on valproic acid for a switch to a less teratogenic medicine.
» Development of neurological signs and symptoms.
» Adverse medicine reactions or suspected toxicity in children.
» If uncontrolled on monotherapy, once patient has been shown to be adherent on monotherapy at the optimal dose.

Information on the seizures that should accompany each referral case.

» Number and frequency of seizures per month (or year).
» Date and time of most recent seizures.
» Detailed description of the seizures, including:
  - aura or warning sign
  - what happens during the seizure? (give a step-by-step account)
  - is the person conscious during the seizure?
  - how long do the seizures last on average?

- what does the patient experience after the seizure?
- how long does this experience last?

» Is there a family history of seizures?
» What is the initial date of diagnosis?
» Is there evidence of alcohol use?
» Is there another medical condition, e.g. diabetes, HIV and what medication is used?
» What is the name and dosage of the anti-epileptic medicines used to date?
» Does the person return regularly for repeat of medication?

15.3.3 FEBRILE CONVULSIONS

R56.0

DESCRIPTION

A febrile convulsion is a seizure occurring in a child between the ages of 3 months and 6 years of age in association with a significant fever in the absence of an intracranial infection. These are the most common type of seizures in children of this age. However, the diagnosis requires the exclusion of other causes of seizures. *LoE:III*[306]

Febrile convulsions can be simple or complex.

Simple febrile convulsions:
» are generalised
» occur once per illness
» always last for < 15 minutes (typically lasting 1–2 minutes)
» are not associated with any neurological deficit
» are self-limiting

Complex febrile seizures:
» last > 15 minutes; or
» are recurrent within the same febrile illness; or
» have a focal onset.

Children with febrile convulsions have a good prognosis, and very rarely develop epilepsy.

If convulsing:

Children

- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 23.7.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note:** Buccal midazolam should not be used in infants < 6 months of age.

OR

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 23.4.
  - Use diazepam for injection 10mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.

- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after two doses of midazolam or diazepam, manage as Status epilepticus. See Section 21.2.11: Seizures and status epilepticus.

Note:

» Look for a cause of the fever.
» **Always exclude meningitis**. See Section 15.4: Meningitis.

GENERAL MEASURES

Reassure parents and caregivers.

MEDICINE TREATMENT

Treat the underlying cause.

For symptomatic relief:

- Paracetamol, oral, 15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.
  - Paracetamol has no effect on seizure prevention.

REFERRAL

» All febrile convulsions except where:
  - the diagnosis of recurrent simple febrile seizures has been well established
  AND
  - the child regains full consciousness and function immediately after the seizure
  AND
  - meningitis has been excluded (See Section 15.4: Meningitis)
» Complex convulsions.

15.4 MENINGITIS

15.4.1 ACUTE MENINGITIS

G00.0-3/G00.8-9/G03.0-2/G03.8-9/A39.0++(G01*)

DESCRIPTION

Infection of the membranes of the brain.

Clinical signs and symptoms include:

» headache
» neck stiffness
» vomiting
» fever
» impaired level of consciousness
» photophobia
» bulging fontanelle in infants

Note:

» During the early phase of TB meningitis, malaise, low-grade fever, headache and personality change rather than the above-mentioned symptoms may be present.
» Duration of treatment for TB meningitis is 9 months.

Neck stiffness is rare in young children, and especially neonates, and may be absent in adults, especially debilitated patients and the elderly.

Young children with fever, vomiting and convulsions or an impaired level of consciousness must be assumed to have meningitis. Signs may be even more subtle in newborns.

EMERGENCY MEASURES

» Stabilise before referral.
» Treat for shock, if present.
» If patient's level of consciousness is depressed:
  - maintain airway
  - give oxygen
» Ensure hydration.

MEDICINE TREATMENT

Initiate medicine treatment before transfer.

Children

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose before referral. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Adults

- Ceftriaxone, IM, 2 g immediately before referral.
  - Do not inject more than 1 g at one injection site.

During a listeria outbreak, ADD as a pre-referral dose:
A32.0-1/A32.7-9

Children

- Ampicillin, IM/IV 75 mg/kg/dose immediately before referral.
  - If referral delayed by 6 hours, administer second dose.

Weight kg	**Dose** mg	**Injection** 500 mg/mL (500 mg diluted in 0.9 mL water for injection (WFI))	**Age** months/years
>3.5–5.5 kg	300 mg	0.6 mL	>1–3 months
>5–7 kg	450 mg	0.9 mL	>3–6 months
>7–9 kg	600 mg	1.2 mL	>6–12 months
>9–11 kg	750 mg	1.5 mL	>12–18 months
>11–17.5 kg	1000 mg	2 mL	>18 months–5 years
>17.5–25 kg	1500 mg	3 mL	>5–7 years
>25–35 kg	2000 mg	4 mL	>7–11 years
>35 kg	3000 mg	6 mL	>11 years

Adults
- Ampicillin, IM/IV, 3 g immediately before referral.
  - If referral delayed by 6 hours, administer second dose.

Severe penicillin allergy:
Z88.0

Adults
- Cotrimoxazole, oral, 80/400 immediately before referral.
  - If referral delayed by 12 hours, administer second dose. *LoE:III*[307]

Children
- Cotrimoxazole, oral, immediately before referral. See dosing table, pg 23.4.
  - If referral delayed by 12 hours, administer second dose.

If convulsing, see Section 21.2.11: Seizures and status epilepticus.

REFERRAL
All patients with meningitis, or suspected meningitis or suspected listeria meningitis.

15.4.2 MENINGOCOCCAL MENINGITIS, PROPHYLAXIS
Z29.2

In cases of meningococcal infection, the following close contacts should receive prophylaxis. Close contacts include:
» household members,
» child-care centre contacts, and
» anyone directly exposed to the patient's oral secretions, e.g. kissing, mouth-to-mouth resuscitation, endotracheal intubation, or endotracheal tube management.

Chemoprophylaxis is only effective for the current exposure.

MEDICINE TREATMENT

Prophylaxis

Children < 6 years of age
- Ceftriaxone, IM, 125 mg, as a single dose.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN
» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Children 6–12 years of age
- Ciprofloxacin, oral, 250 mg, as a single dose.

Children > 12 years of age and adults
- Ciprofloxacin, oral, 500 mg, as a single dose.

Pregnant women
- Ceftriaxone, IM, 250 mg, as a single dose.

15.4.3 CRYPTOCOCCAL MENINGITIS

See Section 11.3.4.2: Cryptococcal Meningitis.

15.5 HEADACHE, MILD, NON-SPECIFIC

R51

DESCRIPTION

Headache can be benign or serious.

Headache can have serious underlying causes including:

» encephalitis
» meningitis
» mastoiditis
» benign intracranial hypertension
» hypertensive emergencies
» venous sinus thrombosis
» stroke
» brain tumour

Headache due to a serious disease will often be associated with neurological symptoms and signs including:

» vomiting
» fever
» mood change
» cranial nerve fall-out
» convulsions
» confusion
» impaired consciousness
» pupillary changes and difference in size
» focal paralysis
» visual disturbances
» neck stiffness

Tension headache due to muscle spasm:

» May be worse in the afternoon, but often present all day.
» Is normally felt in the neck and the back of the head, but may be felt over the entire head.
» Is often associated with dizziness and/or blurring of vision.
» Is often described as a tight band around the head or pressure on the top of the head.
» Does not progress through stages like a migraine (no nausea, no visual symptoms).

GENERAL MEASURES

» Teach relaxation techniques where appropriate.
» Reassurance, where applicable.
» Exclude analgesia overuse headache.

MEDICINE TREATMENT

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» Refer patients with suspected meningitis immediately after initial treatment. See Section 15.4: Meningitis.
» Headache in children lasting for 3 days.
» Recent headache of increasing severity.
» Headache with neurological manifestations.
» Analgesia overuse headache.
» Newly developed headache persisting for >1 week in an adult.
» Chronic recurrent headaches in an otherwise healthy patient: refer if no improvement after 1 month of treatment.
» Tension headache due to muscle spasm: refer if no improvement after 1 month of treatment.

15.6 NEUROPATHY

DESCRIPTION

Defective functioning of nerves, which may involve peripheral nerves (peripheral neuropathy) and/or cranial nerves.
Clinical features may be predominantly of a sensory, sensorimotor or motor nature.

15.6.1 POST-HERPES ZOSTER NEUROPATHY (POST HERPETIC NEURALGIA)

See Section 10.13: Shingles (Herpes zoster).

15.6.2 BELL'S PALSY

G51.0

DESCRIPTION

Unilateral paralysis of all the muscles of facial expression (the corner of the mouth drops, the forehead is unfurrowed, and the eyelids will not close).
Taste sensation may be lost unilaterally and hyperacusis (painful sensitivity to loud sounds) may be present.
Most patients recover within a few weeks or months.

GENERAL MEASURES

» HIV testing.
» Referral for facial muscle massage and exercises
» Eye patch for protection of the eye during sleep.

MEDICINE TREATMENT

Adults — *LoE:III*[308]

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 60 mg daily for 7 days started within 72 hours, preferably within 48 hours of onset (Doctor prescribed). — *LoE:I*[309]

Children

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[310]
- Prednisone, oral, 2 mg/kg daily for 7 days within 3 days of onset (Doctor prescribed).

Weight Kg	Dose Mg	Tablet 5 mg	Age Months/years
>17.5–25 kg	40 mg	8 tablets	>5–7 years
>25–40 kg	55 mg	11 tablets	>7–12 years

REFERRAL

» If diagnosis uncertain.
» All cases for physiotherapy, if available.
» Eye irritation requiring lubrication.

15.6.3 PERIPHERAL NEUROPATHY

G60.9/G62.9/G62.0-1/E10.6/E11.6

DESCRIPTION

Initially sensory symptoms consisting of tingling, prickling, burning in the balls of the feet or tips of the toes or in a general distribution over the soles. The symptoms are symmetrical and with progression spread proximally.
Later sensory loss over both feet and weakness of dorsiflexion of the toes may be present. Patients may experience difficulty in walking on their heels and foot drop becomes apparent.
Common causes include HIV, Diabetes Mellitus, isoniazid, antiretrovirals (stavudine and didanosine), vitamin B12 deficiency and alcohol.

GENERAL MEASURES

» HIV testing.
» Screen for diabetes mellitus, syphilis and vitamin B12 deficiency
» Avoid alcohol.
» A balanced diet to prevent nutritional deficiency.

MEDICINE TREATMENT

» Stop the offending medicine or give suitable substitute e.g. substitute stavudine or didanosine with tenofovir or lamivudine.
» Patients on isoniazid (TB treatment or prophylaxis): increase pyridoxine to 25–50 mg 8 hourly for 3 weeks, followed by 25–50 mg daily.

- Amitriptyline, oral, 25 mg at night (Doctor prescribed).
  - Titrate at two weekly intervals to a maximum of 75 mg at night.

REFERRAL

» All children.
» Difficulty in walking or foot drop.
» Any limb weakness present.
» Unsteady/ataxic gait.
» Severe sensory loss.

PHC Chapter 16: Mental Health Conditions

Nurses with authorisation as provided by Section 56(6) of the Nursing Act 33 of 2005 may initiate and/or maintain treatment with medicines as per the STGs and in accordance with their scope of practice.

Precepts of the Mental Health Care Act (MHCA) No. 17 of 2002 include:
» All mentally ill and intellectually disabled must be managed under the Act and its regulations as either Voluntary, Assisted or Involuntary Mental Health Care Users.
» All registered medical practitioners, professional nurses, psychologists, occupational therapists (OTs) and social workers whose training includes mental health are designated Mental Health Care Practitioners.
» At PHC level, familiarity with MHCA Forms 01, 02, 04, 05, 07, 11, 13A, 22 and 48. Understanding of the related processes is required by all mental health practitioners.
» Specific obligations of the South African Police Service to protect, apprehend, and assist with transfer people with mental illness.

Children presenting with mental health conditions at a primary care setting:
» Manage underlying medical conditions.
» Consider developmental delay and refer for educational interventions.
» Ask about family/psychosocial stressors including abuse and refer to social worker.

16.1 AGGRESSIVE DISRUPTIVE BEHAVIOUR

16.1.1 ACUTE CONFUSION - DELIRIUM

See Section 21.2.4: Delirium with acute confusion and aggression in adults.

16.1.2 AGGRESSIVE DISRUPTIVE BEHAVIOUR IN ADULTS

R45.1/R45.4-6

DESCRIPTION

Agitation may escalate to overt aggression and often manifests with restlessness, pacing and loud or demanding speech. Aggressive behaviour includes verbally abusive language, specific verbal threats, intimidating physical behaviour and/or actual physical violence to self, others or property. All agitation and aggression must be considered an emergency and violence prevented wherever possible.

Multiple causes for aggressive, disruptive behaviour include:
» **Physical:** acute medical illness, delirium and its causes (see Section 21.2.4: Delirium with acute confusion and aggression in adults), epilepsy (pre-, intra-, and post-ictal), intracerebral lesions, traumatic brain injury.
» **Psychiatric:** psychosis, mania, agitated depression, neurocognitive disorders (e.g. dementias, traumatic brain injury), developmental disorders (e.g. intellectual disability and autistic spectrum disorder – See Section 16.8.1 Special considerations: Intellectual disability), severe anxiety.
» **Substance misuse:** alcohol, cannabis, methaqualone (mandrax) intoxication or withdrawal; stimulant (cocaine, methamphetamine (tik), methcaninone (cat) intoxication; benzodiazepine withdrawal.

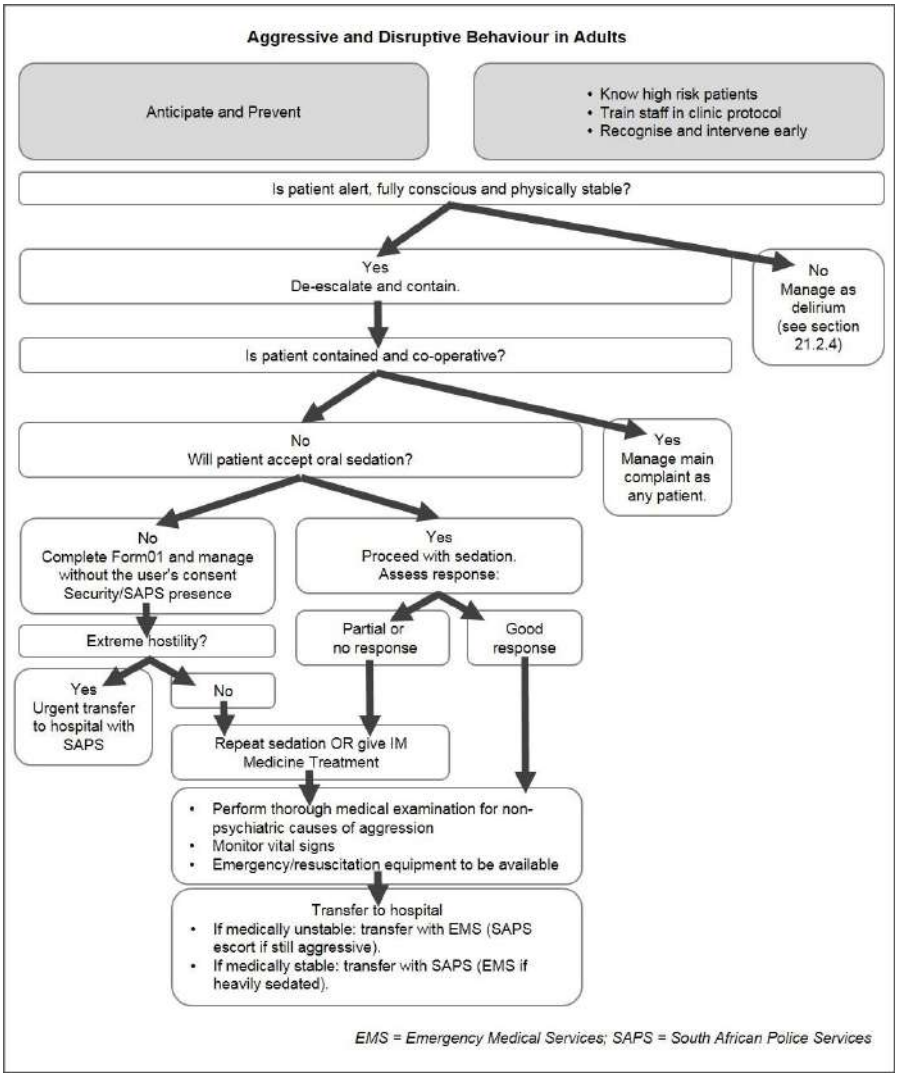
» **Psychological factors:** high levels of impulsivity and antagonism, hypersensitivity to rejection or insult, poor frustration tolerance and maladaptive coping skills all contribute to aggression and rage.

CAUTION

» Psychiatric and intellectually disabled patients often have medical conditions, trauma and substance misuse.
» **Do not assume that the aggression is due to the mental illness**.

GENERAL MEASURES

» Be prepared:
  - Be aware of high risk patients e.g. those known with previous violence, substance misuse, State patients.
  - Step-wise protocol to ensure safety of the patient and all in the clinic.
  - Clear roles for all staff members.
  - Triage plan for early signs of aggression.
  - Available backup – security, SAPS and EMS.
  - A designated calming area – suitable for regular monitoring.
» De-escalate and contain:
  - Be calm, confident, kind and reassuring.
  - Maintain a submissive posture with open hands; do NOT turn your back.
  - Do NOT argue, confront delusions or attempt to touch the patient.
» Be vigilant for delirium, medical and other causes while calming the patient.
» Mechanical restraint:
  - Only use when absolutely necessary to protect the patient and others in an acute setting for as short a period of time as possible.
  - Type, sites and duration of any restraints used must be documented, with 15-minute monitoring of vital signs, the mental state, restraint sites and reasons for use. Complete MHCA Form 48 and submit to Mental Health Review Board if mechanical restraint was used.



MEDICINE TREATMENT

Oral treatment:

- Benzodiazepines, e.g.:
- Diazepam, oral, 5 mg, immediately.
  OR
- Midazolam, buccal, 7.5–15 mg, immediately, using the parenteral formulation.

If alcohol use is suspected:

ADD

- Thiamine, oral, 300 mg immediately and daily for 14 days.

If oral treatment fails after 30–60 minutes,

OR

The patient is placing themselves and others at significant risk:

IM treatment (rapid tranquillisation):

- Short-acting benzodiazepines, e.g.:
- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR

- Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND

- Promethazine, IM, 25–50 mg.
  - In the elderly 25 mg.

CAUTION

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome and acute dystonic reactions.

» The elderly, children, intellectually disabled and those with comorbid medical conditions and substance users are at highest risk.

» **An emergency trolley, airway, bag, oxygen and intravenous line must be available**.

Always monitor vital signs of sedated patient:

» Vital signs: pulse, respiratory rate, blood pressure, temperature, level of consciousness and hydration.

» Monitor particularly for respiratory depression: if respiratory rate drops to < 12 breaths/minute, call doctor urgently and ventilate with bag-valve mask (1 breath/3-5 seconds) attached to oxygen at 15 L/minute.

REFERRAL

Urgent: All cases.

16.1.3 AGGRESSIVE DISRUPTIVE BEHAVIOUR IN CHILDREN AND ADOLESCENTS

R45.1/R45.4-6

MEDICINE TREATMENT

Exclude medical causes, e.g. encephalopathy or other intracranial pathology, infection, seizures, metabolic disease, medication adverse effects and intoxication.

For children < 6 years of age

Sedation with psychotropic agents should only be considered in extreme cases and only after consultation with a specialist.

For children > 6 years of age

- Benzodiazepines, e.g.:

- Midazolam, IM, 0.1–0.15 mg/kg/dose as a single dose (Doctor initiated).
  - Onset of action: within 5 minutes.

CAUTION

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome (see Section 16.2.2: Neuroleptic malignant syndrome) and acute dystonic reactions (see Section: 16.2.1: Extra-pyramidal side effects).
» The elderly, children, intellectually disabled and those with comorbid medical conditions and substance users are at highest risk.
» **An emergency trolley, airway, bag, oxygen and intravenous line must be available**.

If sedation is inadequate:

- Haloperidol, IM, 0.025–0.05 mg/kg/day in 2–3 divided doses (Doctor initiated).
  - Maximum daily dose: 0.15 mg/kg/day.

For management of acute dystonic reaction: See Section 16.2.1: Extra-pyramidal side effects.

CAUTION

Always consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to children and adolescents.

16.2 ANTIPSYCHOTIC ADVERSE DRUG REACTIONS

16.2.1 EXTRA-PYRAMIDAL SIDE EFFECTS

G21.1/G24.0/G25.8-9 + (T43.0-6/T43.8-9/Y40.0-9/Y59.0-3/Y59.8-9)

DESCRIPTION

Extra-pyramidal side effects (EPSE) may occur with any antipsychotic but are most commonly due to haloperidol, risperidone and flupenthixol and zuclopenthixol injections.

» At risk groups include those with underlying medical conditions such as epilepsy, intellectual disability, dementia and late onset psychosis (more often associated with a medical condition than psychosis in youth).
» People with Bipolar Disorder are more susceptible to EPSE than those with schizophrenia.

EPSEs may present as a variety of clinical syndromes:

Early appearing:

» Acute dystonic reaction (sustained muscle contraction that causes twisting and repetitive movements, abnormal posture or abnormal eye position, or laryngospasm within a few minutes to days after receiving an antipsychotic tablet or injection.
» Parkinsonism (slow, shuffling gait, delayed responses, masked facies and a pill rolling tremor).
» Akathisia (a subjective and observed motor restlessness e.g.: pacing, rocking, marching, crossing and uncrossing legs).

Late appearing:

» Tardive dyskinesia (choreoathetoid involuntary movements that particularly involve the face, lips and tongue (e.g.: lip smacking or chewing, tongue protrusion (“catching

flies"), but occasionally also arms, legs or trunk. More common in older women, depression, bipolar disorder, people with cognitive impairment. Only about 50% of cases are reversible.

MEDICINE TREATMENT

Acute dystonic reaction

Children

- Anticholinergic, e.g.:
- Biperiden, IM/slow IV, 0.05–0.1 mg/kg, to a maximum of:
  - 1–6 years: 1–2 mg
  - 7–10 years: 3 mg
  - > 10 years: 5 mg

LoE:III[311]

OR

- Promethazine, IM, 0.125–0.5 mg/kg to a maximum of:
  - 5–10 years: 12.5 mg
  - 10–16 years: 25 mg

LoE:III[312]

Adults

- Anticholinergic, e.g.:
- Biperiden, IM, 2.5 mg.
  - May be repeated every 30 minutes.
  - Maximum of 3 doses within 24 hours.

LoE:III[313]

OR

- Promethazine, IM, 50 mg.

Drug-induced parkinsonism

- Anticholinergic, e.g.:
- Orphenadrine, oral, 50 mg 8 hourly, whilst awaiting review.

LoE:III[314]

REFERRAL

» Refer all children urgently.
» All patients for review of psychotropic medication.

16.2.2 NEUROLEPTIC MALIGNANT SYNDROME

G21.0 + (T43.0-8/ Y40.0-9/Y59.0-3/Y59.8-9)

DESCRIPTION

» Neuroleptic malignant syndrome (NMS) is a rare but potentially fatal syndrome characterised by a tetrad of fever, muscle rigidity, altered mental state and autonomic dysfunction.
» An altered mental state with confusion, delirium or stupor may precede other clinical signs of NMS.
» Suspect if exposure to an antipsychotic, fever and sweating, muscle rigidity, elevated or fluctuating blood pressure.
» Most common after initiation or increase in dose of haloperidol, risperidone or injectable antipsychotic, but may occur with any antipsychotic at any dose.
» Combinations of antipsychotics with SSRIs or lithium may increase the risk.

» Agitation, dehydration, exhaustion and iron deficiency increase the risk of NMS.
» Other causes of fever must be investigated and treated.

LoE:III[315]

GENERAL MEASURES
Stop all antipsychotics.
Cool patient and hydrate adequately.

REFERRAL
All patients for urgent medical admission and psychiatric review

16.3 ANXIETY DISORDERS
F40.0-2/F40.8-9/F41.0-3/F41.8-9/F42.0-2 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION
Anxiety is an emotional response to an apparent stress. It is diagnosed as a disorder when it is excessive or persistent and impacts daily functioning.
Anxiety disorders are associated with an increase in cigarette smoking, alcohol use and various medical illnesses.
Anxiety may present in various forms:
» **Physical symptoms – anxiety may present with medically unexplained symptoms like**: muscle tension, headache, abdominal cramps, nausea, palpitations, sweating, a choking feeling, shortness of breath, chest pain (non-cardiac), dizziness, numbness and tingling of the hands and feet.
  - *Panic attacks* are abrupt surges of intense anxiety with prominent physical symptoms. They may occur in anxiety, mood, psychotic and substance use disorders and are a marker of increased severity.
» **Psychological symptoms**: panicky feelings, excessive worry, mood changes, irritability, tearfulness, distress, and difficulty concentrating.
  - *Phobias* are diagnosed when the anxiety is caused by a specific situation or object. e.g.: social phobia is the fear of social interactions. Thoughts are of negative evaluation by others and usually start in adolescence. Self-medication with alcohol or other substances before and during a social event is common: substance misuse may be the presenting feature.
  - *Obsessive thoughts and/or compulsive behaviours* are a core feature of Obsessive Compulsive Disorder but may also occur in other anxiety, mood, developmental and psychotic disorders.
  - *In people with intellectual disability*, anxiety may present with aggression, agitation and demanding behaviour.

GENERAL MEASURES
» Assess severity of the condition.
» Maintain an empathic and concerned attitude.
» Educate the patient and family regarding the nature of the anxiety.
» Exclude underlying medical conditions and optimise treatment for comorbid medical conditions (e.g. heart disease, hypertension, COPD, asthma, GORD, inflammatory bowel disease, thyroid disease, epilepsy).
» Screen for and manage underlying or co-morbid substance use, e.g. nicotine, alcohol, over the counter analgesics, benzodiazepines.

» Explore and address psychosocial stressors:
  - Stress management/coping skills – refer to counselling services.
  - Relationship and family issues – refer to counselling services. Refer to a social worker if abuse is evident.
  - Accommodation and vocational issues – refer to labour/social development.
» Assess social support and refer to a social worker if needed.
» Refer to local support groups and provide self-help literature.

MEDICINE TREATMENT

» Offer a choice of psychotherapy (if available) or medication.
» Review every 2–4 weeks for 3 months, then 3–6 monthly.
» If response only partial, may combine medication with psychotherapy (if available).
» If medication is effective, continue for at least 12 months to prevent relapse.
» Patients with severe conditions should be assessed by a doctor.

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2–4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur.

LoE:I[316]

OR

<u>If fluoxetine is poorly tolerated:</u>

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for the 1st week.
  - Then increase to 20 mg daily.

LoE:I[317]

CAUTION

SSRIs (e.g. fluoxetine, citalopram) may cause agitation initially. This typically resolves within 2-4 weeks. LoE:III[318]

Ask about suicidal ideation in all patients, particularly adolescents and young adults. (See Section 16.7: Suicide risk assessment).
If suicidal ideation present, refer before initiating SSRI.
Once started, monitor closely for clinical worsening, suicidality, or unusual changes in behaviour. Advise families and caregivers of the need for close observation and refer as required.

Note: Continue treatment for a minimum of 12 months. Consider stopping only if patient has had no/minimal symptoms and has been able to carry out routine daily activities. Prolong treatment if:

» Previous episode/s of anxiety (extend treatment to at least 3 years).
» Any of: severe anxiety, suicidal attempt, sudden onset of symptoms, family history of bipolar disorder (extend treatment to at least 3 years).
» If ≥ 3 episodes of anxiety (advise lifelong treatment).

LoE:III[319]

<u>For severe panic attacks:</u>

- Benzodiazepines, e.g.:
- Diazepam, oral.
  - 2.5–5 mg, immediately.

LoE:II[320]

- Continue with 2.5–5 mg at night, for a maximum of 10 days for severe anxious distress.
- Start definitive treatment with psychotherapy/SSRI. LoE:I[321]

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Long-term use is associated with irreversible cognitive decline.
» Avoid use in people at high risk of addiction: e.g. personality disorders and those with previous or other substance misuse. LoE:III[322]

REFERRAL

» High suicide risk.
» Any risk of harm to self or others.
» Comorbid severe mental or physical conditions.
» Poor response to treatment.
» Repeated panic attacks.
» Children and adolescents.

16.4 MOOD DISORDERS

DESCRIPTION

The person's thoughts and behaviour are driven by their mood, which may be depressed, sad, angry, happy, elated, manic or any of these in combination.
Mood disorders may be:

» Due to another medical condition, e.g. HIV, TB, anaemia of any cause, malignancy, hypothyroidism, and chronic pain conditions.
» Comorbid with other medical conditions e.g. epilepsy, diabetes, and cardiovascular disease.
» Due to substance use, e.g. alcohol, cannabis, benzodiazepine.
» Comorbid with substance use.

16.4.1 DEPRESSIVE DISORDERS

F32.0-3/F32.8-9/F33.0-4/F33.8-9/F34.1 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION

» Depressive disorders cause significant impairment in social and occupational functioning, and may result in unemployment, poor self-care, neglect of dependent children, and suicide.
» Depression impacts negatively on other medical conditions, with increased pain, disability and poorer treatment outcomes.
» Depression is characterised by a low mood and/or a reduced capacity to enjoy life. Depressive episodes may also occur as part of Bipolar Disorder, which requires a different treatment strategy to the other depressive disorders.

» Depression is often not recognised by the sufferer or clinicians. It may be regarded as a normal emotional state or it may be unacceptable to the sufferer due to stigma. Thus, associated symptoms may be the presenting complaint rather than the low mood. In general, insomnia and loss of energy are the most common presenting complaints. In African cultures, somatic symptoms (bodily aches and pains) may predominate. Symptoms may also be masked in the interview setting. It is important to have a high degree of suspicion and to elicit symptoms, degree of impaired function, and suicide risk with care.

Depression may present with:

» **Mood symptoms:** may manifest as depressed, sad, hopeless, discouraged, feeling empty, having no feelings, irritability, increased anger or frustration, bodily aches and pains
» **Loss of interest or pleasure (anhedonia):** 'not caring any more', boredom, social withdrawal, apathy, reduced sexual interest or desire
» **Neuro-vegetative symptoms:** loss of appetite or an increase in appetite, sometimes with food cravings; weight loss or gain if appetite changes are severe; increased or decreased sleep (usually mid- or terminal-insomnia, i.e. waking during the night or early hours of the morning); psychomotor agitation (pacing, hand-wringing, rubbing of skin or clothing) or psychomotor retardation (slowed thoughts, speech and/or movements); tiredness and fatigue – daily living tasks, e.g. getting dressed, are exhausting
» **Psychological symptoms:** feelings of worthlessness, unrealistic negative self-evaluation, self-blame and guilt – may be over minor failings or may be of delusional proportions
» **Cognitive symptoms:** diminished ability to think, concentrate or make minor decisions; may appear to be easily distracted; memory may be impaired (as in pseudodementia); preoccupation with thoughts of death of loved ones, others or self (from vague wishes to suicidal ideation or plans)

The presence of mood, psychological and cognitive symptoms help to differentiate between depression and normal sadness following a loss, or the loss of appetite and energy associated with a medical condition.

GENERAL MEASURES

» Assess severity of the condition.
» Maintain an empathic and concerned attitude.
» Exclude underlying medical conditions and optimise treatment for comorbid conditions (e.g. hypothyroidism, anaemia, HIV/AIDS, TB, cancers, diabetes).
» Screen for and manage underlying or co-morbid substance use, e.g. nicotine, alcohol, over the counter analgesics, benzodiazepines.
» Explore and address psychosocial stressors:
  - Stress management/coping skills – refer to counselling services.
  - Relationship and family issues – refer to counselling services. Refer to a social worker if abuse is evident.
  - Accommodation and vocational issues; refer to labour/social development.
  - Assess social support and refer to a social worker if financial difficulty.

MEDICINE TREATMENT

Offer choice of psychotherapy (if available) or medication.

Adults

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2–4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur.
  - Reassess response after 4 weeks on daily fluoxetine. Symptoms may take up to 2-4 weeks to resolve. If only a partial or no response after 8 weeks of treatment refer to doctor.
  - See note below for treatment duration.

OR *LoE:I*[323]

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for the 1st week.
  - Then increase to 20 mg daily. *LoE:I*[324]

CAUTION

SSRIs (e.g. fluoxetine, citalopram) may cause agitation during the first 2–4 weeks. Ask about suicidal ideation in all patients, particularly adolescents and young adults. (See Section 16.7: Suicide risk assessment).
If suicidal ideation present, refer before initiating SSRI.
Once started, monitor closely for clinical worsening, suicidality, or unusual changes in behaviour. Advise families and caregivers of the need for close observation and refer as required.

If a sedating antidepressant is required:

- Tricyclic antidepressants, e.g.: (Doctor initiated)
- Amitriptyline, oral, at bedtime.
  - Initial dose: 25 mg per day.
  - Increase by 25 mg per day at 3–5 day intervals.
  - Maximum dose: 150 mg per day.

CAUTION

» Tricyclic antidepressants can be fatal in overdose.
» Prescription requires a risk assessment of the patient and others in their household, especially adolescents.
» Avoid tricyclic antidepressants in the elderly and patients with heart disease, urinary retention, glaucoma and epilepsy.

Note:

Continue treatment for a minimum of 9 months. Consider stopping only if patient has had no/minimal symptoms and has been able to carry out routine daily activities. Prolong treatment if:

» Concomitant generalised anxiety disorder (extend treatment to at least 1 year).
» Previous episode/s of depression (extend treatment to at least 3 years).
» Any of: severe depression, suicidal attempt, sudden onset of symptoms, family history of bipolar disorder (extend treatment to at least 3 years).
» If ≥ 3 episodes of depression (advise lifelong treatment). *LoE:III*[325]

CAUTION

» Do not prescribe antidepressants to a patient with bipolar disorder without consultation, as antidepressants may precipitate a manic episode.
» Be careful of interactions between antidepressants and any other agents that the patient might be taking (e.g. St John's Wort or traditional African medicine).

REFERRAL

» Suicidal ideation.
» Major depression with psychotic features.
» Bipolar disorder.
» Failure to respond to antidepressants.
» Pregnancy and lactation.
» Children and adolescents.

16.4.2 BIPOLAR DISORDER

F31.0-9 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION

A lifelong illness which may have an episodic, variable course with the presenting episode being manic, hypomanic, mixed or depressive (according to accepted diagnostic criteria). An episode of mania is typically characterised by an elevated mood where a patient may experience extreme happiness, lasting days to weeks, which might also be associated with an underlying irritability. Such mood is associated with increased energy/activity, talkativeness and a reduction in the need for sleep, and features may be accompanied by grandiose and/or religious delusions.

The diagnosis of Bipolar Disorder should be confirmed by a specialist. It may present with any mood state, e.g. with treatment resistant depression. The diagnosis requires either a current or previous episode of mania (Bipolar I Disorder) or hypomania (Bipolar II Disorder), but this history is not always clear, in which case a trial of treatment may be indicated. In stable patients with good insight and support, PHC may continue treatment and management of comorbid medical conditions.

Comorbid substance use is common. It may confuse the clinical presentation and may cause poor adherence to medication. The 'dual diagnosis' of bipolar disorder and an addiction requires referral to a specialist and ongoing monitoring after discharge.

GENERAL MEASURES

Reassurance and support of the patient and family.

MEDICINE TREATMENT

For manic, agitated and acutely disturbed patients:

» Stop antidepressants if prescribed.
» Manage as for the aggressive or disruptive patient. See Section 16.1.2: Aggressive disruptive behaviour in adults.

REFERRAL

All patients.

16.5 PSYCHOSIS

DESCRIPTION

The patient may experience perceptual disturbances, e.g. hallucinations that are generally auditory, as well as disturbances of thought content, i.e. delusional thought process. Patients generally have no insight into their symptoms and may be resistant to intervention. The presentation may be acute (acute psychosis) or chronic (schizophrenia).

16.5.1 ACUTE PSYCHOSIS

F23.0-3/F23.8-9 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION

Acute psychosis is a clinical state characterised by recent onset of psychotic symptoms such as: hallucinations, delusions, disorganised or illogical speech, agitation or bizarre behaviour and extreme and labile emotional states.

These symptoms may be preceded by a period of deteriorating social, occupational and academic functioning.

GENERAL MEASURES

» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT

For agitated and acutely disturbed patients, manage as for the aggressive or disruptive patient. See Section 16.1.2: Aggressive disruptive behaviour in adults.

REFERRAL

All patients.

16.5.2 CHRONIC PSYCHOSIS (SCHIZOPHRENIA)

F20.0-6/F20.8-9 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Schizophrenia is the most common chronic psychotic disorder and is characterised by a loss of contact with reality. It is further characterised by:

» positive symptoms, delusions, hallucinations and thought process disorder
» negative symptoms, blunting of affect, social withdrawal
» mood symptoms such as depression may be present

Clinical features include:

» delusions: fixed, unshakeable false beliefs (not shared by society)
» hallucinations: perceptions without adequate corresponding external stimuli, e.g. hearing voices
» disorganised thoughts and speech: e.g. derailment or incoherence
» grossly disorganised or catatonic behaviour
» negative symptoms: affective flattening, social withdrawal

» social and/or occupational dysfunction

The diagnosis of schizophrenia should be confirmed by a specialist. In stable patients with good insight and support, primary care facilities may continue treatment.

GENERAL MEASURES

» Supportive intervention includes:
  - Family counselling and psycho-education for patient and family.
  - Supportive group therapy for patients with schizophrenia.
» Rehabilitation may be enhanced by:
  - Assertive community programs.
  - Occupational therapy.
  - Work assessment, and bridging programmes.
  - Appropriate placement and supported employment.
» Assessment of risk to self and others and early signs of relapse should be performed at every review.

MEDICINE TREATMENT

Schizophrenia where a less sedating agent is required:

Adults

- Haloperidol, oral. (Doctor prescribed)
  - Initial dose: 1 mg daily, increasing to 5 mg daily.
  - Once stabilised, administer as a single dose at bedtime.

Elderly

- Haloperidol, oral. (Doctor prescribed) *LoE:III*
  - Initial dose: 0.75 mg twice daily.
  - Increase dose more gradually until symptoms are controlled or until a maximum of 5 mg daily, if tolerated, is reached.
  - Once stabilised, administer as a single dose at bedtime.

See Section 16.8.2: Special considerations: Older patients (≥ 45 years).

If extrapyramidal side effects: switch to risperidone rather than adding an anticholinergic medicine:

- Risperidone, oral (Doctor prescribed).
  - Initial dose: 2 mg daily.
  - Increase to 4 mg daily, if poor response after 4weeks.

Note: Anticholinergic medicines (e.g. orphenadrine) should not routinely be added prophylactically to antipsychotics to prevent extrapyramidal side effects.

Patients already stabilised on chlorpromazine:

- Chlorpromazine, oral (Doctor initiated).
  - Maintenance dose: 75–300 mg at night, but may be as high as 800 mg.

Only for health care workers with advanced psychiatric training:

Long-term depot therapy where adherence problem, or patient preference:

- Flupenthixol decanoate, IM, 20–80 mg every 4 weeks.
  - Initial dose: 20 mg.

OR

- Zuclopenthixol decanoate, IM, 200–600 mg every 4 weeks.

- Initial dose: 100 mg.

Note: Initially, patients should be stabilised on an oral antipsychotic agent before changing to a depot preparation. Administer an initial test dose and observe the patient for 1 week before administering higher doses. Reduce the oral antipsychotic formulation, stopping once patient is stabilised on the long-term depot therapy.

For breakthrough episodes, consider short-term therapy of:

- Risperidone, oral 2 mg daily (Doctor prescribed).

» Long-acting antipsychotics are particularly useful in patients unable to adhere to their oral medication regimens but need to be accompanied by a track and trace programme to be effective for adherence

» Long-term therapy should always be in consultation with a doctor or, if available, with a psychiatrist. Patients should be re-assessed every 6 months.

For management of extra-pyramidal adverse drug reactions and acute dystonic reactions: See Section 16.2.1: Extra-pyramidal side effects.

REFERRAL

» Poor social support.
» High suicidal risk or risk of harm to others.
» Children and adolescents.
» The elderly.
» Pregnant and lactating women.
» No response or intolerance to medicine treatment.
» Concurrent medical or other psychiatric illness.
» Epilepsy with psychosis.
» Early sign of relapse.

16.6 PSYCHIATRIC PATIENTS - GENERAL MONITORING AND CARE

DESCRIPTION

Nursing staff are required to monitor users with serious mental illness between medical or psychiatric doctor visits.

Regular monitoring with documented nursing notes in the file should occur monthly to 6-monthly depending on the severity of the illness and the risk of relapse, aggression, absconding or poor adherence, with referral as required.

Monitoring includes:

» A mental state enquiry and examination.
» A brief psychosocial assessment.
» A risk assessment for harm to self or others with referral if deemed high risk
» Adherence support.
» In women: family planning and pregnancy counselling.
» General health: screen at baseline and annually - weight and BMI, blood pressure (see Section 4.7: Hypertension), finger-prick blood glucose test for diabetes (See Section: 9.2.2: Type 2 Diabetes mellitus, adults), HIV (See chapter 11: HIV and AIDS) and tuberculosis (see Section 17.4: Pulmonary tuberculosis (TB)).

» Lifestyle advice for obesity, smoking, alcohol, other substances and high- risk sexual behaviour or victim of abuse. LoE:III[326]

Recommendations for specific medicines include:

» Antipsychotic medicines e.g.: haloperidol, risperidone, flupenthixol decanoate, zuclopenthixol deconate: If metabolic effects (weight gain/ hyperglycaemia) occur, refer to a dietician and encourage regular exercise. If needed, manage lipids - See Section: 4.1: Prevention of ischaemic heart disease and atherosclerosis. LoE:III[327]

» Valproic acid and carbamazepine: Avoid in women of childbearing potential.
  - If alternate treatment cannot be recommended and these agents are required, give:

- Folic acid, oral, 5 mg daily; and ensure reliable contraception. LoE:III[328]

CAUTION

Children born to women taking valproic acid are at significant risk of birth defects (10%) and persistent developmental disorders (40%).
Valproic acid is contra-indicated and should be avoided in pregnancy and women of child-bearing potential. LoE:III[329]

16.7 SUICIDE RISK ASSESSMENT

R45.8

DESCRIPTION

Suicide is the act of deliberately killing oneself. Self-harm refers to intentionally self-inflicting injury or poisoning, which may or may not have a fatal intent or outcome. Suicide risk assessment is a process of estimating probability for a person to commit suicide.
There are 5 important components when assessing suicide: ideation (thoughts), intent, plan, access to lethal means, and history of past suicide attempts.
Key risk factors for suicide include previous suicide attempt, current suicidal plan or ideation, and history of mental illness (most commonly major depressive disorder and substance abuse), access to lethal means, history of childhood sexual/physical abuse, family history of suicide and suicidality in males, adolescents, elderly patients and lesbian, gay, bisexual, and transgender (LGBT) patients (See Section 16.8.3: Special considerations: Sexual health and sexuality).

WARNING

Suicide risk assessment tools and guidelines do not replace clinical judgment.

GENERAL MEASURES

» Screen for self-harm/suicide risk if any of the following present:
» Extreme hopelessness and despair.
» Current thoughts/plan/act of self-harm/suicide.
» History of self-harm/suicide.
» Mental health condition: depression, mood disorder, substance use disorders, psychoses, dementia.
» Chronic condition: chronic pain, disability.
» Extreme emotional distress.

» Key population groups (LGBT) and adolescents.

10. **Reduce immediate risk**
» Manage the patient who has attempted a medically serious act of self-harm: see Section 21.3: Trauma and injuries.
» If medically stable, assess for imminent risk of self-harm/suicide: imminent risk of suicide is likely in a patient who is extremely agitated, violent, distressed or lacks communication with any the following:
  - Current thoughts or plan of self-harm/suicide or
  - History of thoughts or plan of self-harm in the past month or
  - Act of self-harm.

11. **Manage underlying factors:**
» Ensure optimal treatment and support of other conditions like chronic pain and mental health conditions (depression, mood disorders, substance use disorders, psychosis, dementia)
» Identify psychosocial stressors like bereavement, intimate partner violence, bereavement, financial or relationship problems, bullying, divorce, separation.

12. **Monitoring and follow-up:**
» For all cases of medically serious acts of self-harm/suicide or where there is an imminent risk of self-harm/suicide:
  - Do not leave person alone. Place in a secure, supportive environment in health facility while awaiting referral.
  - Remove access to means of self-harm/suicide (bleach, pesticides, firearms, medications) known to be toxic in overdose including paracetamol, amitriptyline, theophylline).
» Maintain regular contact if possible – suggested weekly contact for the first 2 months. Follow-up for as long as the risk of self-harm/suicide persists. At every contact, re-assess for suicidal thoughts and plans.
» Educate patient/carer:
  - If one has thoughts of self-harm/suicide, seek help from a trusted family member, friend or health worker.
  - Talking about suicide does not trigger the act of suicide, and may lower the risk of following through on suicidal plans.
» Refer to mental health services, if available or community resources like religious centres, crisis centres or support groups.
» Try to locate family/friends to care for and support patient during this phase. Encourage carers to find support for themselves as well.

REFERRAL

» All patients who have attempted a medically serious act of self-harm/suicide.
» All patients where there is an imminent risk of self-harm/suicide.
» All patients with a high index of suspicion.

16.8 SPECIAL CONSIDERATIONS

16.8.1 INTELLECTUAL DISABILITY

F70.0-9/ F71.0-9F72.-9/F73-9/F78.0-9/F79.0-9

» Difficulty with verbal communication in the patient may result in over diagnosis of psychiatric conditions.
» More time is needed in the consultation and adequate history from family members.
» High risk of being victims of sexual and physical violence, by the family, neighbours or strangers.
» Emotional distress, fear, anxiety or depression may present as aggression or odd behaviour.
» A supportive, caring, secure environment is essential for well-being and contained behaviour.
» Manage together with social workers, occupational therapists, counsellors and non-health departments e.g. social development and education.
» Lowest doses of medication should be used; consider anxiety, depression and epilepsy before psychosis.
» Placement in a residential facility may be necessary. Requires referral to a social worker and may require completion of a MHCA Form04 and two Form 05s depending on the mental health status of the user.

16.8.2 OLDER PATIENTS (≥ 45 YEARS)

» New psychiatric diagnoses are rare in the older patient.
» Actively exclude medical causes, e.g. anaemia, pain, dementia, chronic kidney disease, COPD, malignancy.
» Older patients are very sensitive to the side effects of psychiatric medications and these are common presentations. Use lowest possible dose.
» Consult with family/carers: educate about the condition and provide support by explaining how to manage behaviour at home.
» Refer family/carers to social worker/counsellor for further support.

16.8.3 SEXUAL HEALTH AND SEXUALITY

F52.0-9

Sexual problems may be more frequent amongst people with mental illness or neuropsychiatric conditions:

» Low sex drive, anorgasmia (unable to achieve an orgasm), impotence may occur as part of the mental illness, as a result of medication side effects (e.g. fluoxetine), and/or substance use.
» Hyper-sexuality may occur in people with intellectual disability, in manic or psychotic states, emotional dysregulation, substance use disorders
» Specific sexual disorders, e.g. vaginismus (spasm of vagina) or other sexual dysfunction, require specialist treatment.
» Refer for assessment and appropriate treatment.

Mental illness is more common amongst people with alternative sexual orientations or who are transgender.
» Stigma, discrimination and victimisation increase the prevalence of mental illness amongst this group of people.
» Response to treatment will be poor if underlying issues are not expressed and managed.
» Disclosure to a staff depends on a non-judgemental, accepting environment.
» Refer to counsellor/social worker.
» Counsel family members/caregivers.
» Refer to psychiatrist depending on clinical presentation/need.

16.8.4 MATERNAL MENTAL HEALTH

See Section 6.9: Maternal mental health.

16.9 SUBSTANCE MISUSE

16.9.1 SUBSTANCE USE DISORDERS

F10.0-F19.9 + (R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

Consult National Policy guidelines on detoxification of psychoactive substances.

DESCRIPTION

Substance use disorder is mental and physical symptoms caused by the use of one or more substance despite significant substance-related problems (including abuse and dependence). Substance-induced disorders include intoxication, withdrawal and other substance/medication-induced mental disorder.

Alcohol withdrawal

See Section 16.9.4: Alcohol withdrawal (uncomplicated).

Methamphetamines (tik), cocaine (crack), methaqualone (mandrax), cannabis

These patients usually do not require hospitalisation.

GENERAL MEASURES

Reassurance and support of the patient and family.

MEDICINE TREATMENT

For severe anxiety, irritability and insomnia:

- Benzodiazepine, e.g.:
- Diazepam, oral, 5–10 mg as a single dose or 12 hourly for 5–7 days.

For seizure control and /or sedation:

- Diazepam, slow IV, 10 mg

LoE:III[330]

REFERRAL

» Severe alcohol dependence.
» Past history of withdrawal seizures or a history of epilepsy.

» Past history of Delirium Tremens.
» Younger (< 12 years of age) or older age (> 60 years of age).
» Pregnancy.
» Significant polydrug use.
» Cognitive impairment.
» Lack of support at home or homelessness.
» Previous failed community detoxification attempts.
» Opioid substance use disorder.

16.9.2 SUBSTANCE-INDUCED MOOD DISORDERS

F10.0-F19.9 + (R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Mood disorder secondary to substance use or withdrawal such as abuse of alcohol, drugs e.g. cannabis.

GENERAL MEASURES

» Generally treated by removal of the causative substance.
» Requires acute detoxification followed by maintenance treatment.
» If symptoms of mood disorder persist after 2 weeks, consider treating the mood disorder. See Section 16.4: Mood disorders.

16.9.3 SUBSTANCE-INDUCED PSYCHOSIS

F10.0-F19.9 + (R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Psychosis secondary to a substance use or withdrawal such as abuse of alcohol, drugs e.g. cannabis.

GENERAL MEASURES

» Most patients with substance-induced psychosis can be managed without medication.
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT

See section 16.1.2: Aggressive disruptive behaviour in adults.

Always use non-pharmacological de-escalation techniques first.
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment:

- Benzodiazepines, e.g.: *LoE:III*[331]
- Diazepam, oral, 5 mg, immediately. *LoE:II*[332]

OR

- Midazolam, buccal, 7.5–15 mg, immediately. LoE:III[333]

If oral treatment fails after 30–60 minutes,

OR

The patient is placing themselves and others at significant risk: LoE:III[334]

Consider IM treatment:

- Benzodiazepines, e.g.:
- Midazolam, IM, 7.5–15 mg, immediately.
  - Repeat after 30–60 minutes if needed.

OR

- Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND

- Promethazine, IM, 25–50 mg.
  - In the elderly 25 mg. LoE:III[335]

Always monitor vital signs of sedated patient:

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the 1st hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL

All patients.

16.9.4 ALCOHOL WITHDRAWAL (UNCOMPLICATED)

F10.3

DESCRIPTION

A syndrome characterised by central nervous system hyperactivity that occurs when an alcohol dependent individual abruptly stops or significantly reduces alcohol consumption. The symptoms of an uncomplicated Alcohol Withdrawal Syndrome include:

» Autonomic (sweating, tachycardia, hypertension, tremors, tonic-clonic seizures and low grade fever).
» Gastrointestinal (anorexia, nausea, vomiting, dyspepsia and diarrhoea).
» Cognitive and perceptual disturbances (poor concentration, anxiety, psychomotor agitation, disturbed sleep with vivid dreams, visual hallucinations and disorientation).

Typical delirium occurs 2–3 days following cessation of prolonged alcohol intake, but some withdrawal symptoms such as the typical tremor, may start within 12 hours.

GENERAL MEASURES

Assess for comorbid infections.

MEDICINE TREATMENT

- Thiamine, oral, 300 mg daily for 14 days.

AND LoE:III[336]

- Diazepam, oral, 10 mg immediately.
  - Then 5 mg 6 hourly for 3 days.
  - Then 5 mg 12 hourly for 2 days.
  - Then 5 mg daily for 2 days.

- Then stop.

LoE:III[337]

REFERRAL

See referral criteria of Section 16.9.1: Substance use disorders.

PHC Chapter 17: Respiratory conditions

17.1 CONDITIONS WITH PREDOMINANT WHEEZE

17.1.1 ACUTE ASTHMA & ACUTE EXACERBATION OF COPD

J46/J45.0-1/J45.8/J45.9

DESCRIPTION

This is an emergency situation recognised by various combinations of:

- » wheeze
- » tightness of the chest
- » chest indrawing in children
- » use of accessory muscles of respiration
- » breathlessness
- » respiratory distress
- » cough

In adults, bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).

The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. If patients >50 years of age present with asthma for the first time, consider pulmonary oedema due to left ventricular heart failure.

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Consider foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation, especially if the wheeze is unilateral.

All PHC facilities must have peak expiratory flow rate (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

Recognition and assessment of severity of attacks in children

	Moderate	Severe
Respiratory rate	>40 breaths/minute	>40 breaths/minute
Chest indrawing/recession	present	present
PEF (if > 5 years of age)	50–70% of predicted	<50% of predicted
Speech	normal or difficult	unable to speak
Feeding	difficulty with feeding	unable to feed
Wheeze	present	absent
Consciousness	normal	impaired

Recognition and assessment of severity of attacks in adults

	Moderate	Severe
Talks in	phrases	words
Alertness	usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 breaths/minute	often >30 breaths/minute
Wheeze	loud	loud or absent
Heart rate	100–120 beats/minute	>120 beats/minute
PEFR after initial nebulisation	±50–75%	<50%; may be too short of breath to blow in PEF meter

Note: PEFR is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment.

MEDICINE TREATMENT

Adults with mild and moderate attacks

- Salbutamol, inhalation using a metered-dose inhaler (MDI), 400–800 mcg (4–8 puffs), using a spacer.
  - Inhale one puff at a time. Allow for 4 breaths through the spacer between puffs.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed.

Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser. *LoE:II*[338]

OR

- Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 8 L/min with oxygen.
  - 1 mL (5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed. *LoE:III*[339]

AND

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[340]
- Prednisone, oral, 40 mg immediately if patient known to have asthma/COPD.
  - Follow with prednisone, oral, 40 mg daily for 7 days.

Adults with severe attacks (while awaiting referral)

- Oxygen, 40% or higher, using highest concentration facemask.
  Note: In COPD:
  Give oxygen with care (preferably by 24% or 28% facemask, if available). Observe patients closely, as a small number of patients' condition may deteriorate.

AND

- Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 8 L/min with oxygen.
  - 1 mL (5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes until PEF > 60% of predicted.
  - Once PEF > 60% of predicted, repeat every 2–4 hours if needed. *LoE:III*[341]

OR

- Salbutamol, inhalation using a MDI, 400–800 mcg (4–8 puffs), up to 20 puffs, using a spacer.
  - Inhale 1 puff at a time. Allow for 4 breaths through the spacer between puffs.
  - If no relief, repeat every 20–30 minutes until PEF > 60% of predicted.
  - Once PEF > 60% of predicted, repeat every 2–4 hours if needed. *LoE:III*[342]

AND

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[343]
- Prednisone, oral, 40 mg immediately.
  - Follow with prednisone, oral, 40 mg daily for 7 days.

OR

If oral prednisone cannot be taken:

- Hydrocortisone IM/slow IV, 100 mg as a single dose.

Follow with:

- Corticosteroids (intermediate-acting) e.g.: LoE:III[344]
- Prednisone, oral, 40 mg daily for 7 days.

ADD

If poor response after first salbutamol nebulisation/inhalation:

- Ipratropium bromide solution, 0.5 mg nebulised, 2 mL (0.5 mg) added to salbutamol solution every 20–30 minutes for 3 doses depending on clinical response. LoE:III[345]

OR

- , using MDI, 80–160 mcg (2–4 puffs), using a spacer every 20–30 minutes as needed for up to 3 hours. LoE:III[346]

Children with mild and moderate attacks

- Salbutamol, inhalation, using a MDI, 200–400 mcg (2–4 puffs), using a spacer.
  - Inhale 1 puff at a time. Allow for 6 breaths through the spacer between puffs.
  - If child < 3 years of age, use a mask attached to the spacer. Apply the mask to the face to create a seal so that the child breathes through the spacer.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed.

Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser. LoE:II[347]

OR

- Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 5 L/min with oxygen.
  - 0.5–1 mL (2.5–5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed. LoE:III[348]

<u>If reversal of bronchospasm is incomplete after the first nebulisation/inhalation:</u>

ADD LoE:III[349]

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 1–2 mg/kg immediately and follow with same dose for 7 days:

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years
>17.5 kg	40 mg	8 tablets	>5 years and adult

Children with severe attacks (while awaiting referral)

- Oxygen, 100%, at least 4-6 L/minute by facemask or 1-2 L/minute by nasal cannula.

AND

- Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 5 L/min with oxygen.
  - 0.5–1 mL (2.5–5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes depending on clinical response. LoE:III[350]

OR

- Salbutamol, inhalation using a metered-dose inhaler (MDI), 400–600 mcg (4–6 puffs) up to 10 puffs, using a spacer.
  - Inhale 1 puff at a time. Allow for 6 breaths through the spacer between puffs.
  - If child < 3 years of age, use a mask attached to the spacer. Apply the mask to the face to create a seal so that the child breathes through the spacer.
  - If no relief, repeat every 20–30 minutes depending on clinical response.

Note: Administering salbutamol via a spacer is as effective as and cheaper than using a nebuliser. *LoE:III*[351]

AND

- Ipratropium bromide, 0.25 mg solution, nebulised with salbutamol and sodium chloride.
  - 0.25 mg (2 mL) every 20–30 minutes depending on clinical response for 4
  - doses over 2 hours. *LoE:III*[352]

AND

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[353]
- Prednisone oral, 1–2 mg/kg immediately and follow with same dose for 7 days:

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years
>17.5 kg	40 mg	8 tablets	>5 years and adult

OR if oral prednisone cannot be taken:

- Hydrocortisone IM/slow IV, 4–6 mg/kg immediately. See dosing table, pg 23.5.

CAUTION
Avoid sedation of any kind.

Note: If poor response to treatment, consider alternate diagnosis and refer urgently.

Assessment of response in children

	Response	**No response**
PEFR (if possible)	improvement by >20%	improvement by <20%
Respiratory rate	<40 breaths/ minute	>40 breaths/ minute
Chest indrawing or recession	absent	present
Speech	normal	impaired
Feeding	normal	impaired

Assessment of response in adults

	Response	**No response**
PEFR (if possible)	improvement by >20%	improvement by <20%
Respiratory rate	<20 breaths/ minute	>20 breaths/ minute
Speech	normal	impaired

Patients responding to treatment:

» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.

» Advise patient/caregiver on further care at home, danger signs and that follow up is required.
» Caution patient on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.
» Ask about smoking: if yes, urge patient to stop.

Note: Patients needing repeated courses of oral corticosteroids (more than twice over 6 months) should be assessed by a doctor for maintenance therapy. (See Section 17.1.2: Chronic asthma).

REFERRAL

Urgent (after commencing treatment):

» All patients with severe attack.
» Poor response to initial treatment.
» PEFR < 75% of the predicted normal or of personal best value 15–30 minutes after nebulisation.
» A lower threshold to admission is appropriate in patients when:
  - seen in the afternoon or evening, rather than earlier in the day
  - recent onset of nocturnal symptoms or aggravation of symptoms
  - previous severe attacks, especially if the onset was rapid

17.1.2 CHRONIC ASTHMA

J45.0-1/J45.8-9

DESCRIPTION

A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections results in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and, if not controlled, eventual bronchial muscle hypertrophy of the airways' smooth muscle. All these factors contribute to airways obstruction.

Asthma varies in intensity and is characterised by recurrent attacks of:

» wheezing,
» dyspnoea or shortness of breath,
» cough, especially nocturnal, and
» periods of no airways obstruction between attacks.

Acute attacks may be caused by:

» exposure to allergens,
» respiratory viral infections,
» non-specific irritating substances, and
» exercise.

Asthma must be distinguished from COPD, which is often mistaken for asthma. (See Section 17.1.4: COPD). The history is a reliable diagnostic guideline and may be of value in assessing treatment response.

Asthma	COPD
» Young age onset, usually < 20 years. » History of hay fever, eczema and/or allergies. » Family history of asthma. » Symptoms are intermittent with periods of normal breathing in between. » Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes, or when upset. » Marked improvement with beta2 agonist.	» Older age onset, usually > 40 years. » Symptoms slowly worsen over a long period of time. » Long history of daily or frequent cough before the onset of shortness of breath. » Symptoms are persistent rather than only at night or during the early morning. » History of heavy smoking (> 20 cigarettes/day for ≥15 years), heavy cannabis use, or previous TB. » Little improvement with beta2 agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.

If symptoms suggest TB (e.g. weight loss, night sweats, etc.), investigate and manage accordingly.

Note: The diagnosis of asthma can be difficult in children < 6 years of age.
If the diagnosis of asthma is uncertain, refer the patient.

ASTHMA DIAGNOSIS AND SEVERITY

Peak Expiratory Flow Rate (PEFR)

See PEF charts on pg lxx.

The PEFR may provide additional information for diagnosis and assessing response to therapy.

» PEFR is best assessed in the morning and evening.
  - Instruct the patient to blow forcibly into the device after a deep inspiratory effort.
  - The patient must perform three blows at each testing point.
  - Take the highest value as the true value.
» The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
  - An improvement of 60L/min or ≥20% of the pre-bronchodilator PEFR, 10–20 minutes after inhalation of a beta2 agonist e.g. salbutamol, inhalation, 200 mcg, confirms a diagnosis of asthma.
  - A normal PEFR excludes the possibility of moderate and severe COPD.
» PEFR may be useful in assessing response to therapy.
  - Any value >80% of the personal best before the use of a bronchodilator is regarded as adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

Note: Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma should always be done with the use of a peak flow meter to assess severity and treatment response of asthma.

Place patient in a severity category based on frequency of daytime symptoms, frequency of night-time symptoms, PEFR, and history of admission for asthma exacerbation. Note that an admission in the 12 months' prior means that the patient requires treatment for persistent asthma, including inhaled corticosteroids.

	Mild intermittent asthma	Mild persistent asthma	Moderate persistent asthma	Severe persistent asthma
Daytime symptoms	≤2 episodes of daytime cough and/or wheeze per week	2-4 episodes of day time wheeze, tightness or cough per week	>4 episodes of day time wheeze, tightness or cough per week	continuous day time wheeze, tightness or cough
Night-time symptoms	≤1 night-time cough and/or wheeze per month	2–4 episodes of night time wheeze or cough per month	>4 episodes of night time wheeze or cough per month	frequent night time awakenings
PEFR	PEFR ≥80% predicted between attacks	PEFR ≥80% predicted between attacks	PEFR 60-80% predicted between attacks	PEFR < 60% predicted
Admissions for exacerbation	no admission to hospital for asthma within last 12 months	-	-	-

GENERAL MEASURES

» No smoking by an asthmatic or in the living area of an asthmatic.
» Avoid contact with household pets.
» Avoid exposure to known allergens and stimulants or irritants.
» Education on early recognition and management of acute attacks.
» Patient and caregiver education:
  - emphasise the diagnosis and explain the nature and natural course of the condition;
  - teach and monitor inhaler technique; and
  - reassure parents and patients of the safety and efficacy of continuous regular controller therapy.

MEDICINE TREATMENT

Medicine treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

Reliever medicines in asthma:

- Short acting beta$_2$ agonists (SABAs), e.g.:
- Salbutamol (short-acting)
  - Indicated for the immediate relief of the symptoms of acute attacks, i.e. cough, wheeze and shortness of breath.
  - Can be used as needed.
  - Increasing need for reliever medicine indicates poor asthma control.

Controller medicines in asthma:

- Inhaled corticosteroids, e.g.:
- Beclomethasone.

- Must be used twice daily every day, even when the patient feels well.

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled corticosteroids for further management. *LoE:III*[354]

Inhalation therapy:
Inhaled therapy is preferable to oral therapy.

Spacer devices
» Spacers are vital for an adequate therapeutic effect of inhaled therapy.
» Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of medicine delivery and limit adverse effects.
» Use the spacer appropriate for the age of the patient.

	Spacer volume	Face mask
Infants	150–250 mL	mandatory
Children	500 mL	highly recommended
Adolescents and adults	750 mL	

» Inhalation spacer devices enable parents to administer inhaled therapy even to small children.
» Children < 3 years of age should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly.
» Demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure (see below).

Patient and caregiver education on inhaler and spacer techniques:
» A mask attachment must be used with the spacer for children < 3 years of age.

Inhalation therapy without a spacer in adults:
13. remove the cap from the mouthpiece
14. shake the inhaler well
15. while standing or sitting upright, breathe out as much air as possible
16. place the mouth piece of the inhaler between the lips and gently close the lips around it
17. while beginning to inhale, press down the canister of the metered dose inhaler once to release one puff while breathing in as deeply as possible
18. hold breath for 5–10 seconds, if possible
19. breathe out slowly and rest for a few breaths (30–60 seconds)
20. repeat steps 2–6 for each puff prescribed
21. rinse mouth after inhalation of corticosteroids

Inhalation therapy with a spacer in adults and older children:
22. remove the caps from the inhaler and the spacer
23. shake the inhaler well
24. insert the mouthpiece of the metered dose inhaler into the back of the spacer
25. insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece. Avoid covering any small exhalation holes
26. press down the canister of the metered dose inhaler once to release one puff into the spacer
27. immediately take 3–4 slow deep breaths
28. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

29. rinse mouth after inhalation of corticosteroids

Inhalation therapy with the spacer alone in younger children:

30. allow to breathe slowly in and out of the spacer continuously for 30 seconds
31. while still breathing, release one puff from the inhaler into the spacer
32. continue breathing for 3–4 breaths
33. if breathing through the nose as well as the mouth, pinch the nose gently while breathing from the spacer

Inhalation therapy with a spacer and mask for infants and small children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. infants may be placed on the caregiver's lap or laid on a bed while administering the medication
4. apply the mask to the face, ensuring that the mouth and nose are well covered
5. with the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer
6. keep the mask in place for at least six breaths, then remove
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

MILD INTERMITTENT ASTHMA

Adults and children

- SABA, e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 6–8 hourly as needed (until symptoms are controlled).

PERSISTENT ASTHMA

Children

- Inhaled corticosteroids e.g.:
- Beclomethasone, inhalation, 100 mcg 12 hourly.

AND

- Short acting beta$_2$ agonist e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 6–8 hourly as needed (until symptoms are controlled)

Adults

- Inhaled corticosteroids e.g.:
- Beclomethasone, inhalation, 200 mcg 12 hourly.

AND

- SABA e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 6–8 hourly as needed (until symptoms are controlled).

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled corticosteroids for further management. *LoE:III*[355]

Review treatment every 3 months. Adequate control is defined as:

» ≤ 2 episodes of daytime cough and/or wheeze per week.
» No night-time cough and/or wheeze.

» No recent (within the last year) admission to hospital for asthma.
» PEFR≥ 80% predicted between attacks.

If control is inadequate:
» check adherence and inhaler technique, and
» exclude on-going exposure to allergens.

After excluding those causes, refer to a doctor to confirm the diagnosis of asthma, and to exclude TB and heart failure.
Once the diagnosis is confirmed, step-up treatment as follows:

Children
- Inhaled corticosteroids, e.g.:
- Beclomethasone, inhalation, 200 mcg 12 hourly.

Adults
- Inhaled corticosteroids, e.g.:
- Beclomethasone, inhalation, 400 mcg 12 hourly.

If control is still inadequate in adults, treat with combination of corticosteroid and long-acting beta agonist (LABA)

Stop inhaled corticosteroid (e.g. beclomethasone) and replace with:
- Inhaled long-acting beta agonist (LABA)/corticosteroid combination, e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly (Doctor initiated). *LoE:III*[356]

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled corticosteroids for further management. *LoE:III*[357]

Stepping down treatment:
Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months, and day-time and night-time symptoms are well controlled.
Gradually reduce the dose of inhaled corticosteroid therapy.
If the symptoms are seasonal, corticosteroids may be stopped until the next season.
If symptoms re-appear, increase the therapy to the level on which the patient was previously controlled.

REFERRAL TO DOCTOR
» All children < 6 years of age for assessment and confirmation of diagnosis.
» Any patient who has received > 2 courses of oral prednisone within 6 months.
» Brittle asthma (very sudden, very severe attacks).
» All patients without adequate control of their symptoms.
» Patients on protease inhibitors, requiring inhaled corticosteroids.

REFERRAL TO HOSPITAL
Uncontrolled asthma.
Note: In patients with new onset of exercise-related symptoms, consider other diagnoses, particularly if no response to pre-treatment with SABA.

17.1.3 ACUTE BRONCHIOLITIS IN CHILDREN

J21.0-1/J21.8-9

DESCRIPTION

Acute bronchiolitis is a common cause of wheezing and cough in the first two years of life. It is caused by viral infections and presents with lower airways obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.

It can be difficult to distinguish between bronchiolitis and asthma. Bronchiolitis does not respond to salbutamol. If there is a good response to a single dose of salbutamol, asthma is the likely diagnosis. See Section 17.1.1: Acute asthma and acute exacerbation of chronic obstructive pulmonary disease (COPD).

Bronchiolitis is extremely rare in children > 2 years of age. Consider other causes of wheeze in children > 2 years of age. See Section 17.1.1: Acute asthma and acute exacerbation of chronic obstructive pulmonary disease (COPD) and Section 17.3.4.1: Pneumonia in children.

Child presents with:

- » rapid breathing
- » chest indrawing
- » decreased breath sounds
- » an audible wheeze

Risk factors for severe bronchiolitis:

- » Infants < 3 months of age.
- » Chronic lung disease.
- » Ex-premature babies.
- » Congenital heart disease.

Signs of severe disease:

- » Increased respiratory effort: tachypnoea, nasal flaring, severe lower chest wall indrawing, accessory muscle use, grunting.
- » Central cyanosis or hypoxia (oxygen saturation < 90% in room air)
- » Apnoea.
- » Inability to feed.
- » Lethargy or decreased level of consciousness.

DIAGNOSTIC CRITERIA

- » Prodrome of viral infection: irritability and rhinorrhoea.
- » A wheeze that is slowly responsive or non-responsive to bronchodilators.
- » Tachypnoea: age dependent:

Age	Respiratory rate
Birth – 2 months	≥ 60 breaths/minute
2–12 months	≥ 50 breaths/minute
1–5 years	≥ 40 breaths/minute

GENERAL MEASURES

- » Minimise contact with other children.
- » Avoid routine use of antibiotics and corticosteroids.
- » Do not sedate child.

MEDICINE TREATMENT

Mild cases, without risk factors may be managed as an outpatient.

Refer severe bronchiolitis or those with risk factors:

- Oxygen, humidified, using nasal prongs or nasal cannula, at 1–2 L/minute.

REFERRAL

» Signs of severe bronchiolitis (respiratory distress, hypoxia, apnoea, inability to feed, lethargy/decreased level of consciousness).
» Bronchiolitis with risk factors for severe disease.
» Previous admission for same problem.

17.1.4 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

J44.0-1/J44.8-9/J43.0-2/J43.8-9

DESCRIPTION

Also referred to as chronic obstructive airways disease (COAD), and comprises chronic bronchitis and emphysema which are characterised by:

» chronic cough with/without sputum production on most days of ≥3 months for ≥2 consecutive years;
» dyspnoea or shortness of breath; and
» wheezing.

The onset is very gradual with progressively worsening symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. In addition to the symptoms listed above, patients may present with symptoms or signs of right heart failure. The airways obstruction is not fully reversible (in contrast to asthma).

The main causes of COPD are chronic irritation of the airways caused by smoking, air pollution, previous TB, and previous cannabis (dagga) smoking, although there are many other causes.

If symptoms suggest TB (e.g. weight loss, night sweats, etc.), investigate and manage accordingly.

GENERAL MEASURES

» Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
» Chest physiotherapy where available.
» Exercise.

MEDICINE TREATMENT

Acute lower airways obstruction: Treat as for acute asthma.

Chronic management:

» In a stable patient, check PEFR.
» Then give a test dose of salbutamol, i.e. 2 puffs.
» Repeat PEFR 15 minutes later.
» If there is ≥ 20% improvement in peak flow, diagnose asthma and manage patient accordingly. See Section 17.1.2: Chronic asthma.
» Perform spirometry if available. Diagnose COPD if FEV1/FVC < 70%.

- SABA e.g.:

- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 3–4 times daily as needed for relief of wheeze.

If not controlled on SABA alone and diagnosis was confirmed by spirometry (with < 2 exacerbations per year):
- Long-acting β_2-agonist (LABA), e.g.:
- Formoterol, inhaled 12 mcg (1 puff) 12 hourly (Doctor initiated). *LoE:III*[358]

If not controlled on SABA alone and spirometry not available:
- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly (Doctor initiated).

If not controlled on a LABA alone or frequent exacerbations (≥ 2 per year):
Replace with:
- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly (Doctor initiated). *LoE:III*[359]

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled corticosteroids for further management. *LoE:III*[360]

Acute infective exacerbation of chronic bronchitis:
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Severe penicillin allergy:
Z88.0
- Doxycycline, oral, 100 mg 12 hourly for 5 days.

Note: Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long-term if benefit has been proven by lung function testing.

Prophylaxis against respiratory tract infections:
Z25.1
- Influenza vaccination, annually.

REFERRAL
» Poor response to above therapy, for further investigations and adjustment of treatment.
» Patients on protease inhibitors, requiring inhaled corticosteroids.

17.2 STRIDOR (UPPER AIRWAYS OBSTRUCTION)

17.2.1 CROUP (LARYNGOTRACHEO BRONCHITIS) IN CHILDREN

J05.0-1

DESCRIPTION

Croup is a common cause of potentially life-threatening airway obstruction in childhood. It is characterised by inflammation of the larynx, trachea and bronchi. Most common causative pathogens are viruses, including measles.

A clinical diagnosis of viral croup can be made if a previously healthy child develops progressive inspiratory airway obstruction with stridor and a barking cough, 1–2 days after the onset of an upper respiratory tract infection. A mild fever may be present.

Suspect foreign body aspiration if there is a sudden onset of stridor in an otherwise healthy child.

Suspect epiglottitis if the following are present in addition to stridor:

» very ill child
» high fever
» sitting upright with head held erect
» drooling saliva
» unable to swallow

Assessment of the severity of airway obstruction and management in croup

Grade 1 Inspiratory stridor only	▪ Corticosteroids (intermediate-acting) e.g.: • Prednisone, oral, 1–2mg/kg, single dose. o Do not give if measles or herpes infection present. » Refer. *LoE:III*[361]
Grade 2 Inspiratory and expiratory stridor	▪ Corticosteroids (intermediate-acting) e.g.: • Prednisone, oral, 1–2 mg/kg, immediately as a single dose. *LoE:III*[362] • Adrenaline (epinephrine), 1:1 000 diluted in sodium chloride 0.9%, nebulised, immediately. o Dilute 1 mL of 1:1 000 epinephrine with 1 mL sodium chloride 0.9%. o Repeat every 15–30 minutes until expiratory stridor disappears. » Refer.
Grade 3 Inspiratory and expiratory stridor with active expiration, using abdominal muscles	» Treat as above. » If no improvement within one hour, refer **urgently** (intubate before referral if possible).
Grade 4 Cyanosis, apathy, marked retractions, impending apnoea	» Intubate (if not possible give treatment as above). » Refer **urgently**.

GENERAL MEASURES

» Keep child comfortable.
» Continue oral fluids.
» Encourage parent or caregiver to remain with the child.

MEDICINE TREATMENT

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Children grade 2 or more stridor- while awaiting transfer:

- Adrenaline (epinephrine), 1:1000, nebulised, immediately using a nebuliser.
  - If there is no improvement, repeat every 15 minutes, until the child is transferred.
  - Dilute 1 mL of 1:1000 epinephrine (adrenaline) with 1 mL sodium chloride 0.9%.
  - Nebulise the entire volume with oxygen at a flow rate of 6–8 L/minute.
- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[363]
- Prednisone, oral, 1–2 mg/kg immediately as a single dose.

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years

If epiglottitis suspected

- Ceftriaxone, IM,80 mg/kg/dose immediately as a single dose and refer. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Management during transfer:

» Give the child oxygen.
» Continue nebulisations with epinephrine (adrenaline).
» If grade 3, contact ambulance or nearest doctor.
» If grade 4, intubate and transfer.

REFERRAL

Urgent

» Children with:
  - chest indrawing
  - rapid breathing
  - altered consciousness
  - inability to drink or feed
» For confirmation of diagnosis.
» Suspected foreign body.
» Suspected epiglottitis.

Non Urgent

» All children grade1 or 2 stridor.

17.3 RESPIRATORY INFECTIONS

17.3.1 INFLUENZA

J09/J10.0-1/J10.8/J11.0-1/J11.8

DESCRIPTION

Influenza is a self-limiting viral condition that may last up to 14 days. It presents with headache, muscular pain and fever, and begins to clear within 7 days.
Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION
Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» otitis media
» sinusitis

GENERAL MEASURES

» Bed rest, if feverish.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and/or cough or fever persists for longer than a week.

MEDICINE TREATMENT

Note: Antibiotics are of no value for the treatment of influenza.

Infants
- Sodium chloride 0.9%, instilled into each nostril.

Pain and fever with distress:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 4–6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

Severe complications.

17.3.2 ACUTE BRONCHITIS IN ADULTS OR ADOLESCENTS

J20.9

DESCRIPTION

Acute airways infections, mostly of viral origin, accompanied by cough, sputum production, and sometimes a burning retrosternal chest pain in patients with otherwise healthy lungs.

Clinical features:

» initially: non-productive cough
» later: productive cough with yellow or greenish sputum

Viral bronchitis is usually part of an upper respiratory viral infection. It may be accompanied by other manifestations of viral infections. It is important to exclude underlying bronchiectasis or an acute exacerbation of chronic bronchitis in adults.

Antibiotics are not indicated in acute bronchitis in the absence of underlying COPD.

17.3.3 ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

See Sections 17.1.1: Acute asthma and acute exacerbation of COPD and 17.1.4: Chronic COPD.

17.3.4 PNEUMONIA

DESCRIPTION

Acute infection of the lung parenchyma, usually caused by bacteria, especially *Streptococcus pneumonia* (pneumococcus).

Management is guided by:

» age
» co-morbidity
» severity of the pneumonia

Manifestations include:

» malaise
» fever, often with sudden onset and with rigors
» cough, which becomes productive of rusty brown or yellow-green sputum
» pleuritic type chest pain
» shortness of breath
» in severe cases, shock and respiratory failure

On examination there is:

» fever
» tachypnoea
» crackles or crepitations
» bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.

Predisposing conditions include:

» very young or old age
» malnutrition
» other concomitant diseases
» HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults.

Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4.1 PNEUMONIA IN CHILDREN

J18.0-2/J18-9

DESCRIPTION

Pneumonia should be distinguished from viral upper respiratory infections. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia

Classify children according to the severity of the illness:

» Pneumonia: fever, cough and rapid breathing, but no chest indrawing (of the lower chest wall) and no flaring of nostrils.
» Severe pneumonia: fever, cough, rapid breathing, chest indrawing and flaring nostrils, or grunting.

Note: Children < 2 months of age with rapid breathing should be classified as having severe pneumonia.

Rapid breathing is defined according to age:

Age	Respiratory rate
Birth – 2 months	≥ 60 breaths/minute
2–12 months	≥ 50 breaths/minute
1–5 years	≥ 40 breaths/minute

Danger signs indicating urgent and immediate referral include:

» oxygen saturation of < 90% in room air
» inability to drink
» impaired consciousness
» cyanosis
» < 2 months of age
» grunting

GENERAL MEASURES

» Ensure adequate hydration.
» Continue feeding.

MEDICINE TREATMENT

Pneumonia (non-severe):

- Amoxicillin, oral, 45 mg/kg/dose, 12 hourly for 5 days. *LoE:III*[364]

Weight kg	Dose mg	Use one of the following: Syrup mg/ 5mL		Capsule mg		Age Months/years
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

*capsule/tablet preferred

Severe penicillin allergy:
Z88.0

Children
- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. See dosing table, pg 23.2.

Severe pneumonia:
- Oxygen, using nasal cannula at 1–2 L/minute before and during transfer.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, page 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN
» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL
Urgent
» All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis.
» All children < 2 months of age.

Non urgent
» Inadequate response to treatment.
» Children coughing for > 3 weeks to exclude other causes such as TB, foreign body aspiration or pertussis.

17.3.4.2 PNEUMONIA IN ADULTS

17.3.4.2.1 UNCOMPLICATED PNEUMONIA
J18.0-2/J18-9

DIAGNOSIS
A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

MEDICINE TREATMENT

If not severely ill (see referral criteria below):
- Amoxicillin, oral, 1 g 8 hourly for 5 days.

Severe Penicillin allergy:
Z88.0
- Moxifloxacin, oral, 400 mg daily for 5 days.

A follow-up chest X-ray should ideally be taken to ensure resolution of the pneumonia, in patients > 50 years of age. LoE:III[365]

REFERRAL

Any of the following:

» Confusion or decreased level of consciousness.
» Cyanosis.
» Respiratory rate of ≥ 30 breaths/minute.
» Systolic BP < 90 mmHg.
» Diastolic BP < 60 mmHg.
» Deterioration at any point.
» No response to treatment after 48 hours.
» Patients with pneumonia:
  - from a poor socio-economic background
  - who are unlikely to comply with treatment
  - who live a considerable distance from health centres
  - who have no access to immediate transport

17.3.4.2.2 PNEUMONIA IN ADULTS WITH UNDERLYING MEDICAL CONDITIONS OR > 65 YEARS OF AGE

J18.0-2/J18-9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

Common underlying conditions include:

» Diabetes mellitus.
» HIV infection.
» Cardiac failure.
» COPD.
» Alcoholism.
» Chronic liver disease.
» Chronic kidney disease.

Most of these patients will require referral to a doctor.

MEDICINE TREATMENT

Mild pneumonia:

- Amoxicillin/clavulanic acid 875/125 mg, oral, 12 hourly for 5 days.

Severe Penicillin allergy:

Z88.0

- Moxifloxacin, oral, 400 mg daily for 5 days.

A follow-up chest X-ray should ideally be taken to ensure resolution of the pneumonia, in patients > 50 years of age. LoE:III[366]

17.3.4.2.3 SEVERE PNEUMONIA

J18.0-2/J18.8-9

DESCRIPTION

Severe pneumonia is defined as ≥2 of the following:

» confusion/ decreased level of consciousness
» respiratory rate of ≥30 breaths/ minute
» > 65 years of age
» systolic BP < 90 mmHg
» diastolic BP < 60 mmHg

MEDICINE TREATMENT

While awaiting transfer:

- Oxygen, to achieve a saturation of 92%.
- Ceftriaxone, IV/IM, 1 g, as a single dose before referral.

CAUTION
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

REFERRAL

Urgent
All patients.

17.3.4.2.4 PNEUMOCYSTIS PNEUMONIA

B20.6

DESCRIPTION

Interstitial pneumonia occurring with advanced HIV infection due to *Pneumocystis jiroveci* (formerly *carinii*). Patients usually present with shortness of breath or dry cough. Chest X-ray may be normal in the early stages, but typically shows bilateral interstitial or ground glass pattern.

GENERAL MEASURES

Ensure adequate hydration.

MEDICINE TREATMENT

Adults

- , 6 hourly for 3 weeks.

Approx. weight	**Use one of the following tablets**	
kg	80/400 mg	160/800 mg
<40 kg	2 tablets	1 tablet
>40–56 kg	3 tablets	1½ tablets
>56 kg	4 tablets	2 tablets

For secondary prophylaxis

- Cotrimoxazole, oral, daily.

Use one of the following tablets	
80/400 mg	160/800 mg
2 tablets	1 tablet

Discontinue cotrimoxazole prophylaxis if the CD4 count increases on ART to > 200 cells/mm3 for at least 6 months.

REFERRAL
» All children.
» Breathing rate > 24 breaths/minute.
» Shortness of breath with mild effort.
» Cyanosed patients.

17.4 PULMONARY TUBERCULOSIS (TB)
Note: TB is a notifiable disease.

TB guidelines are updated regularly.
Consult the most recent National Tuberculosis Control Programme Guidelines.

DESCRIPTION
Tuberculosis is an infection caused by Mycobacterium tuberculosis. It is exacerbated and complicated by HIV, AIDS, and multi drug-resistant mycobacteria.

17.4.1 PULMONARY TUBERCULOSIS (TB) IN ADULTS
B20.0

DIAGNOSIS
Pulmonary TB is diagnosed on Xpert MTB/RIF testing, sputum smear or culture.
» Send 1 sputum specimen for Xpert MTB/RIF.
  - If Xpert MTB/RIF is positive: treat for TB and send a sputum specimen for smear microscopy. (The smear is used for reporting, not for diagnosis).
  - If Xpert MTB/RIF is positive and susceptible to RIF: treat for TB.
  - If Xpert MTB/RIF is positive and resistant to RIF: commence MDR treatment and send sputum for drug susceptibility testing to confirm MDR TB.
  - If Xpert MTB/RIF is negative and patient is HIV-infected: send sputum for culture and chest X-ray, if available.
  - If Xpert MTB/RIF is negative and patient is HIV negative: treat with antibiotics and consider further investigation only if symptoms persist.

Note: If the patient was recently treated for TB, the Xpert MTB/RIF test could be falsely positive. Send sputum for smear microscopy and culture instead.

» If Xpert MTB/RIF is not available, send 2 sputum specimens for smear microscopy.
  - If both smears are negative, send another sputum specimen for culture.
  - In all patients who have had TB previously, send a sputum specimen for culture and sensitivity.
» Urine lipoarabinomannan (LAM) is a good “rule-in” diagnostic test for HIV-infected patients with signs and symptoms of pulmonary and/or extrapulmonary TB and CD4 ≤100 cells/microL. *LoE:I*[367]

GENERAL MEASURES

» Counsel patients about the disease. Explain the importance of completing treatment.
» Avoid the use of tobacco.
» Avoid excessive alcohol.
» If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have.

MEDICINE TREATMENT

Administer total daily amount of each medicine in one dose and not as divided doses.

Important medicine interactions

Rifampicin may reduce the efficacy of low dose combined oral contraceptives, resulting in possible unplanned pregnancies (See Chapter 7: Family planning).

» Alter the oral contraceptive to a high dose preparation for the duration of TB treatment or use an injectable contraception or IUD.
» Use additional contraception in patients using a progestin-only subdermal implant for the duration of TB therapy. See Section: 11.1 Antiretroviral therapy, adults.

CAUTION
Antiretroviral medicines frequently interact with TB medicines.
Consult the National Department of Health antiretroviral treatment guidelines.

Dose adjustment

Ethambutol should be given on alternative days in patients with impaired renal function (eGFR < 10 mL/min).

Adverse effects of TB medicines include:

» Nausea.
  - Taking medicines with meals can minimise nausea.
» Hepatitis must be excluded, if there is new onset nausea. Request serum alanine aminotransferase test urgently in these patients.
» Hepatitis (drug induced liver injury)
  - Rifampicin, isoniazid and pyrazinamide may cause hepatitis. Cotrimoxazole and antiretrovirals (efavirenz, nevirapine, lopinavir + ritonavir) can also cause hepatitis.
  - Patient may present with jaundice and/or complaining of hepatitis symptoms (e.g. nausea, malaise, abdominal pain).
  - Refer to hospital for urgent (same day) ALT and further management
  - If jaundiced, stop TB treatment and medicines known to cause hepatitis before referring. See Section: 11.1 Antiretroviral therapy, adults.
» New onset skin rash.
  - Refer if suspected drug rash.
» Neuropathy.
  - Can be prevented by taking pyridoxine.
» Arthralgia.
  - Exclude gout, and treat symptomatically.

17.4.1.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN ADULTS

See Section 11.2.2: Isoniazid preventive therapy.

17.4.1.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0

Treatment should be given once daily **seven days per week** in both the intensive and continuation phases.

R – Rifampicin
H – Isoniazid
Z or PZA– Pyrazinamide
E or EMB – Ethambutol

Pre-treatment body weight kg	**Two months initial phase**	**Four months continuation phase**	
	RHZE (150/75/400/275)	RH	RH (300/150)
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
≥71kg	5 tablets		2 tablets

» Keep strictly to the correct dose and the duration of treatment.
» Weigh patient frequently and adjust the dose according to current weight.

17.4.2 PULMONARY TUBERCULOSIS (TB) IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0

Most children acquire tuberculosis from infected adults by inhalation. Malnourished, immunosuppressed (HIV and AIDS) children and children < 5 years of age are at increased risk for pulmonary tuberculosis.

DIAGNOSIS

Any child presenting with symptoms and signs suggestive of pulmonary TB is regarded as a case of TB if there is:

» A chest X-ray suggestive of TB,

AND/OR

» History of exposure to an infectious TB case and/or positive tuberculin skin test (TST) e.g. Mantoux.

A positive Xpert MTB/RIF and/or smear microscopy and/or culture, on early morning gastric aspirate or induced sputum, confirms TB disease.

Signs and symptoms include:

» unexplained weight loss or failure to thrive,
» unexplained fever for ≥2 weeks,
» chronic unremitting cough for >14 days,
» lymphadenopathy (especially cervical, often matted),
» hepatosplenomegaly,

» consolidation and pleural effusion.

Tuberculin skin test (TST), e.g. Mantoux.
» A positive test: TST induration ≥10 mm.
» A TST may be falsely negative in the presence of:
  - malnutrition
  - immunodeficiency, e.g. HIV and AIDS
  - immunosuppression, e.g. steroid therapy, cancer chemotherapy
  - following overwhelming viral infection, e.g. measles or post vaccination

  In these circumstances a TST induration ≥5 mm may be regarded as positive. Frequently, the TST will be non-reactive in these cases. TB treatment should be considered, despite a negative TST.

The following may be evident on chest X-ray:
» Direct or indirect evidence of hilar or mediastinal adenopathy with or without parenchymal opacification and/or bronchopneumonia.

GENERAL MEASURES
» Identify and treat the source case.
» Screen all contacts for TB infection.
» Monitor the nutritional status of the child to assess response to treatment.

17.4.2.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN CHILDREN

Z20.1 + Z29.2

Consider TB chemoprophylaxis/isoniazid preventive therapy (IPT) in all children exposed to a pulmonary TB contact.

Exclude active TB (i.e. no signs or symptoms suggestive of TB):
» Refer to Section 17.4.2: Pulmonary tuberculosis in children.
» If any signs or symptoms of pulmonary TB are present, refer for chest X-ray.
» Never give IPT to children with active TB.

TB chemoprophylaxis/ IPT is only used in:
» Children < 5 years of age.

OR

» Children of any age, who are HIV-infected.

WITH EITHER

- Close contact with an infectious pulmonary TB case. If child is re-exposed to a close contact, TB chemoprophylaxis must be repeated (Previous IPT does not protect the child against subsequent TB exposure/ infection).
- Positive TST (only applicable on the first occasion of a positive TST).

MEDICINE TREATMENT

Preventive therapy in case of drug-sensitive TB contact:

- Isoniazid, oral, 10 mg/kg daily for 6 months.
  - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
>2–3.4 kg	¼ tablet
>3.5–6.9 kg	½ tablet
>7–9.9 kg	1 tablet
>10–14.9 kg	1½ tablets
>15–19.9 kg	2 tablets
>20–24.9 kg	2½ tablets
>25 kg	3 tablets

Preventive therapy in case of drug-resistant TB contact:

Isoniazid mono-resistant contact:

- Rifampicin, oral, 15 mg/kg daily for 4 months.
  - If child unable to swallow tablets. *LoE:III*[368]

Rifampicin mono-resistant contact:

- Isoniazid, oral, 10 mg/kg daily for 6 months (see table above). *LoE:III*[369]

Children with HIV or malnutrition or existing neuropathy taking isoniazid:
ADD

- Pyridoxine, oral, daily for duration of prophylaxis:
  - Child < 5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25 mg. *LoE:III*[370]

REFERRAL

Children with MDR and XDR TB contacts for expert advice.

17.4.2.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0

Directly observed therapy (DOT), short-course and using fixed medicine combinations are recommended. Treatment should be given daily in both the intensive (initial) and the continuation phases.

Recommended dose ranges in mg/kg		
	Daily(mg/kg)	**Maximum daily dose**
H	10–15	300 mg
R	10–20	600 mg
Z/ PZA	30–40	2 g
E/EMB	15–25	1200 mg

UNCOMPLICATED PULMONARY TB

Includes smear negative pulmonary TB with no more than mild to moderate lymph node enlargement and/or lung field opacification, or simple pleural effusion on chest x-ray.

Children ≤ 8 years of age

	2 months intensive phase given daily			4 months continuation phase given daily
Weight kg	**RH**	**PZA**		**RH**
	60/60mg	150 mg* **OR** 150mg/3 mL	500mg	60/60mg
2–2.9 kg	½ tablet	1.5 mL	expert advice on dose	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	1 tablet
6–7.9 kg	1½ tablets		½ tablet	1½ tablets
8–11.9 kg	2 tablets		½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	5 tablets

* For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3 mL)
Note: Give PZA 150 mg **or** 500 mg, and not both.

Dosing recommendations for dispersible fixed dose combinations tablets:

Weight kg	**2 months intensive phase given daily**	**4 months continuation phase given daily**
	RHZ (75/50/150 mg)	**RH** (75/50 mg)
4–7.9 kg	1 tablet	1 tablet
8–11.9 kg	2 tablets	2 tablets
12–15.9 kg	3 tablets	3 tablets
16–24.9 kg	4 tablets	4 tablets
≥25 kg	Adult dosages recommended	

LoE:III[371]

ADD

- Pyridoxine, oral, daily for 6 months if HIV-infected, malnourished, or have existing neuropathy:
  - Child < 5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25 mg.

LoE:III[372]

Children ≥ 8 years and adolescents

Pre-treatment body weight kg	**2 months intensive phase given daily**	**4 months continuation phase given daily**	
	RHZE (150,75,400,275)	**RH (150,75)**	**RH (300,150)**
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
>71 kg	5 tablets		2 tablets

AND

If HIV-infected, malnourished or have existing neuropathy:

- Pyridoxine, oral, daily for 6 months.
  - Child < 5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25mg.

» Adjust treatment dosages to current body weight. *LoE:III*[373]

» If calculating dosages, rather give ½ tablet more than ½ tablet less.

COMPLICATED PULMONARY TB

» Includes all other forms of pulmonary TB, such as smear positive TB, cavitating pulmonary TB, bronchopneumonic TB, large lesion pulmonary TB, tuberculous empyema.

» Refer all cases of miliary TB for exclusion of TB meningitis.

Children ≤ 8 years of age

» Intensive phase: Standard dose 4-drug therapy daily (RHZE) for 2 months.

THEN

» Continuation phase: Standard dose 2-drug therapy daily (INH+rifampicin) for 4–7 months.

	Intensive phase: 2 months				**Continuation phase:4–7 months*** **
Weight kg	**RH**	**PZA**		**EMB**	**RH**
	60/60	150 mg** **OR** 150 mg/3 mL	500mg	400 mg tablet **OR** 400 mg/8 mL* solution	60/60
2–2.9 kg	½ tablet	1.5 mL	Expert advice on dose	1 mL	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	1.5 mL	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	2 mL	1 tablet
6–7.9 kg	1½ tablet		½ tablet	3 mL	1½ tablets
8–11.9 kg	2 tablets		½ tablet	½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	¾ tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	1 tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	1½ tablets	5 tablets

* EMB For each dose, crush 400 mg (1 tablet) to a fine powder and dissolve in 8 mL of water to prepare a concentration of 400mg/8mL. Discard unused solution.

** PZA: For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3mL)

Note: Give PZA 150 mg or 500 mg, and not both.

*** Continuation phase may be prolonged to 7 months in slow responders and children with HIV.

AND

If HIV-infected, malnourished or have existing neuropathy:

- Pyridoxine, oral, daily for 6–9 months.
  - Child < 5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25 mg.

LoE:III[374]

Children ≥ 8 years and adolescents

	2 months intensive phase given daily	4 months continuation phase given daily	
Weight kg	**RHZE (150/75/400/275)** mg	**RH (150/75)** mg	**RH (300/150)** mg
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
>71 kg	5 tablets		2 tablets

AND

If HIV-infected, malnourished, or have existing neuropathy:

- Pyridoxine, oral, daily for 6–9 months. *LoE:III*[375]
  - Child < 5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25 mg.

» Weigh at each visit and adjust treatment dosages to body weight. If calculating dosages, rather give ½ tablet more than ½ tablet less.

» Keep strictly to the correct dose and the duration of treatment.

» The patient should be weighed regularly and the dose adjusted according to the current weight.

REFERRAL

Disseminated forms of TB.
All patients who cannot be managed on an ambulatory basis.
Children < 12 years of age for a chest X-ray for diagnostic purposes.
Retreatment cases of children.
Children who are contacts of patients with open MDR or XDR TB.

17.4.3 TB, HIV AND AIDS

B20.0

HIV and AIDS patients with suspected TB should have one negative sputum TB DNA PCR test (Xpert MTB/RIF) or two negative sputum smears, before sputum is sent for culture.

Advise HIV and AIDS patients to present to a clinic if they develop common TB symptoms:

» active cough (any duration)
» fever
» night sweats
» loss of weight

HIV-infected patients with TB should be treated according to the standard TB treatment protocol.

Medicine interactions may occur with ART (See Sections 11.1: Antiretroviral therapy, adults; 11.7: Opportunistic infections, treatment in children and 11.8.7: Tuberculosis).

17.4.4 DRUG-RESISTANT TUBERCULOSIS (MDR TB)

MDR TB guidelines are updated regularly.
Consult the most recent National MDR TB Programme Guidelines.

DESCRIPTION

Isoniazid mono-resistant TB is diagnosed when there is resistance to isoniazid only.
MDR TB is diagnosed when there is resistance to rifampicin **and** isoniazid.
XDR TB is diagnosed when there is resistance to rifampicin and isoniazid **plus** resistance to fluoroquinolones and an injectable medicine e.g. kanamycin.

17.4.4.1 ISONIAZID MONO-RESISTANT TUBERCULOSIS IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.3-4/A16.7-9/B20.0 + (U50.00-01/U50.10-11)

MEDICINE TREATMENT

Confirmed INH mono-resistant TB:

- Rifampicin, oral, 10 mg/kg daily.

AND

- Ethambutol, oral, 15 mg/kg daily.

AND

- Pyrazinamide, oral, 25 mg/kg daily.

AND

- Levofloxacin, oral, daily.
  - 30–50 kg: 750 mg
  - >50 kg:1000 mg

LoE:III[376]

Where single medicines are not available or the pill burden is too high a FDC of RHZE dosed as per weight may be used, and levofloxacin added to this.

Treatment should be given for at least 6 months.

17.4.4.2 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB), IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0 + (U50.00-01)

Never treat for MDR TB without laboratory confirmation, either by molecular or phenotypic (culture and sensitivity) results.
All cases should be discussed with a designated specialist centre and MDR TB medicines accessed from the designated centres.

GENERAL MEASURES

Counsel and educate patients about the disease and its treatment, including treatment duration.
Screen all close contacts for signs and symptoms of MDR TB and by sputum sampling to detect early disease.
Infection control and cough etiquette is important to limit spread.

REFERRAL
» All MDR patients.
» All XDR patients.

17.4.4.3 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB), IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/A16.7-8/B20.0 + (U50.00-01)

Never treat for MDR TB without laboratory confirmation, either by molecular or phenotypic (culture and sensitivity) results.
All cases should be discussed with a designated specialist centre and MDR TB medicines accessed from the designated centres.

GENERAL MEASURES
Suspect DR-TB when any of the features listed below is present:
» A known source case (or contact) with drug resistant TB or high-risk source case, e.g. on TB therapy who was recently released from prison.
» A smear positive case after 2 months of TB treatment who failed (or deteriorated on) 1st line antituberculosis treatment to which they were adherent (treatment failure or relapse within 6 months of treatment).
» Any severely ill child with TB who failed or got worse on TB treatment.
» Patients who defaulted TB treatment (> 2 months).
» Treatment interruptions (< 1 month) or who relapsed while on TB treatment or at the end of treatment.
» With recurrent TB disease after completion of TB treatment (retreatment case).

Manage confirmed DR-TB in a dedicated MDR-TB centre with appropriate infection control measures to prevent nosocomial transmission. Initiate treatment in consultation with a designated expert while awaiting referral to the designated MDR-TB centre. An uninterrupted medicine supply, direct supervision with proper education and counselling is necessary.

REFERRAL
All children.

PHC Chapter 18: Eye conditions

18.1 CONJUNCTIVITIS

An inflammatory condition of the conjunctiva, possibly caused by:

» allergies
» bacterial or viral (pink eye) infections

18.1.1 CONJUNCTIVITIS, ALLERGIC

H10.1

DESCRIPTION

An inflammatory condition of the conjunctivae caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. Often associated with allergic rhinitis or hay fever. Common features include:

» itching, watery eyes and photophobia
» slightly red or normal conjunctiva
» conjunctival swelling in severe cases
» normal cornea, iris and pupil
» normal visual acuity

In chronic cases, there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae (vernal conjunctivitis).

GENERAL MEASURES

Relieve symptoms with cold compresses, i.e. a clean moistened cloth over the eyes for 10 minutes.

MEDICINE TREATMENT

Adults and children > 6 years of age

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

<u>If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:</u>

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1–3 months) or long-term. *LoE:II*[377]

<u>If symptoms not controlled, add cetirizine/chlorphenamine:</u>

- Cetirizine, oral, 10 mg once daily.
  - Use may be seasonal (1–3 months) or long-term.

Children: 2–6 years of age

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

<u>If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:</u>

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1–3 months) or long-term. *LoE:II*[378]

<u>If symptoms not controlled, add cetirizine:</u>

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

- Use may be seasonal (1–3 months) or long-term.

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL
» No response to treatment.
» Persons wearing contact lenses.
» Children < 2 years of age.

18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)
H10.0

DESCRIPTION
An inflammatory purulent condition of the conjunctivae caused by bacterial infection and characterised by:
» sore, gritty or scratchy eyes and swollen lids
» mucopurulent discharge from one or both eyes
» redness especially of conjunctival angles (fornices)

GENERAL MEASURES
» Educate patient on personal hygiene to avoid spread e.g. do not use the same face-cloth or towels as others.
» Do not use contaminated cosmetics.
» Practise good contact lens hygiene.
» Avoid chronic use topical medications.
» Educate patient on correct application of ophthalmic ointment.
» Advise patient:
  - to wash hands thoroughly before and after applying ophthalmic ointment
  - not to share ophthalmic ointments or drops
  - not to rub eyes
  - never to use urine or milk to wash the eyes

MEDICINE TREATMENT
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Pain:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» No response after 5 days.
» All cases of unilateral conjunctivitis, as this may be caused by a foreign body.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

P39.1

DESCRIPTION

Inflammation of the conjunctivae in the neonatal period, presenting with a picture that may range from mildly sticky eyes to an abundant purulent discharge and eyelid oedema.

Common infectious agents include *N. gonorrhoeae*, *S. aureus*, and *Chlamydia*.

Generally, conjunctivitis of the newborn is either mild (small amount of sticky exudates) or severe (profuse pus and swollen eyelids).
The latter is often *N. gonorrhoeae* and threatens damage to the cornea, while the former is often *S. aureus* or undefined.

CAUTION
Treat conjunctivitis with abundant pus immediately to prevent damage to the cornea that may lead to blindness.
This is often caused by gonorrhoeae.
Treat parents of a neonate with purulent discharge, appropriately.

GENERAL MEASURES

» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab, taking care not to touch or injure the eye.

MEDICINE TREATMENT

Prevention
Routine administration for every newborn baby:

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth.

Treatment
Sticky eye(s) without purulent discharge:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Purulent discharge:
i.e. mild discharge without swollen eyelids and no corneal haziness

- Sodium chloride 0.9%, eye washes, immediately then 2–3 hourly, until discharge clears.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose.

Weight kg	Dose mg	Use one of the following injections mixed with water for injection (WFI):		Age Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

Review daily.

Abundant purulent discharge and/or swollen eyelids and/or corneal haziness:

- Sodium chloride 0.9%, eye washes, immediately then hourly until referral.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose, and refer.

Weight kg	Dose mg	Use one of the following injections mixed with water for injection (WFI):		Age Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include dose and route of administration of ceftriaxone in the referral letter.

Treat both parents of newborn babies who develop purulent conjunctivitis after 24 hours of birth for N. gonorrhoeae and Chlamydia.

Parents:

- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g as a single dose.

REFERRAL

Urgent

» All neonates with abundant purulent discharge and/ or swollen eyelids and/or corneal haziness.

» Neonate unresponsive to treatment within 2 days.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)

B30.1/B30.9 + (H13.1)

DESCRIPTION

A highly contagious, viral infection, which is spread by contact with:

» hands
» face cloths
» towels

It may start in one eye, spreading to the other. More commonly both eyes are infected.
Common symptoms include:

» sore eyes, feeling of itching or burning, often described as being painful
» photophobia
» watery discharge (a yellow discharge indicates a secondary bacterial infection)
» diffuse pink or red conjunctivae, which may become haemorrhagic
» enlarged pre-auricular lymph node

The cornea, iris and pupil are completely normal with normal visual acuity.

GENERAL MEASURES

» Advise on correct cleansing or rinsing of eyes with clean water.
» Cold compresses for symptomatic relief.

MEDICINE TREATMENT

Children >6 years of age and adults

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» No response after 5 days.
» A unilateral red eye for more than one day.
» Suspected herpes conjunctivitis.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.2 CORNEAL ULCER

H16.0

DESCRIPTION

Corneal ulcers may be caused by an infection, a foreign body, abrasions on the eye surface, severely dry eye or wearing contact lenses that are left in overnight.

Presents with:

» Blurring of vision.
» Photophobia.
» Very painful and watery eye.
» White patch/es on the cornea.
» Inflamed conjunctiva.

Herpes virus causes a branching (dendritic) ulcer which can recur and relapse over the lifetime of an individual.

GENERAL MEASURES

» Establish the cause, to determine likelihood of a foreign body.
» Remove any foreign body if visible on sclera or conjunctivae with cotton bud.
» Stain with fluorescein to reveal corneal foreign body or conditions such as abrasion or dendritic ulcer.
» Cover injured eye with eye pad, provided there is no pressure on the eye.

MEDICINE TREATMENT

If referral is deferred and a culture cannot be done within 12 hours:

- Chloramphenicol 1%, ophthalmic ointment applied 6 hourly. *LoE:III*[379]

REFERRAL

Urgent within 12 hours

All patients.

18.3 EYE INJURIES

18.3.1 EYE INJURY, CHEMICAL BURN

T26.9 + (X49.99)

This is a medical emergency.

DESCRIPTION

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid.

Presents with:

» pain
» inability to open eye
» blurred vision
» excessive teary and watery eye

GENERAL MEASURES

» Irrigate or wash the eye immediately and continuously with clean water or sodium chloride 0.9% for at least 20 minutes.
» In severe alkaline burn cases, irrigation should be prolonged further.

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1drop in the affected eye(s).
  - Repeat irrigation of the eye.
  - Evert upper eyelid and remove debris with cotton bud.
  - Never give anaesthetic drops to the patient to take home as they can cause blindness if used too often.
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

All cases within 12 hours.

18.3.2 EYE INJURY/FOREIGN BODIES

S05.9+(Y34.99)

Many foreign objects that enter the conjunctiva are the result of mishaps that occur during everyday activities e.g. eyelashes, dust, dirt, sand.

Foreign objects that enter the eye at high rate of speed pose the highest risk of injury and may embed in the eye especially the cornea, or may penetrate into the eyeball. This often follows welding, grinding or hammering metal without wearing a protective eye visor or spectacles.

DESCRIPTION

» Disturbance of vision.
» Complaints of foreign body in the eye that may not be visible.
» Pain and lacrimation.
» Metallic foreign body embedded in the cornea appears as a cloudy spot with a dark speck (the metal splinter) in the centre.

GENERAL MEASURES

» If the foreign body is not embedded, irrigate eye with clean water or sodium chloride 0.9%.
» Remove any foreign body if visible on sclera or conjunctivae with moist cotton bud.
» Stain with fluorescein to reveal corneal foreign body if it is not obvious.
» Consider X-ray of orbit to exclude intra-ocular metallic foreign body.

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s), before removal of the foreign body.
  - Apply an eye shield until the anaesthetic effect wears off.
  - Never give anaesthetic drops to the patient to take home.

LoE:III

REFERRAL

» Any embedded or penetrating foreign body.
» Failure to remove a visible foreign body.
» Suspected intraocular foreign body.

18.3.3 EYE INJURY, BLUNT OR PENETRATING

S05.9+(Y34.99)

DESCRIPTION

Eye injuries can be caused by high speed flying objects e.g. pieces of wood, glass, stone and other materials or by blunt trauma e.g. sporting balls, blow from a fist, facial trauma in a MVA. Injuries include conjunctival/corneal lacerations, haematoma, orbital fracture and penetrating open-globe injuries with prolapse of eye contents.
Check for:

» visual loss, hyphema, lacerations
» perforation e.g. teardrop-shaped pupil indicating uveal prolapse
» muscular entrapment associated with a fracture of the orbital bones limiting vision in one direction

GENERAL MEASURES

» Apply an eye shield only. Avoid using pressure patching which increases the risk of intraocular infection.

MEDICINE TREATMENT

Deep corneal or scleral injuries:
Cover with an eye shield and refer immediately.
If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately.
- Chloramphenicol 1%, ophthalmic ointment applied immediately.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

CAUTION
Review the problem daily.
Do not use an eye pad if there is ecchymosis, lid oedema or bleeding.

REFERRAL
Immediately:
» If the foreign body cannot be removed or an intraocular foreign body is suspected.
» Laceration, perforation or diffuse damage to the cornea or sclera.
» Damage to other structures of the eye, including the eyelid edge.
» Visual abnormalities or limitation of movement of the eye.

18.4 GLAUCOMA, ACUTE AND CLOSED ANGLE
H40.0-6/H40.8-9

DESCRIPTION
Acute closed angle glaucoma is damage to the optic nerve caused by raised intra-ocular pressure. This may result in loss of vision usually in one eye.
Clinical features:
» pupil is moderately dilated and may be oval in shape
» corneal haziness
» pericorneal conjunctival inflammation
» sudden onset of extremely severe, bursting pain and eye redness
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. in a cinema
» coloured haloes around lights (bright rings)
» eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
» severe pain in eye (acute)
» nausea and vomiting in severe cases
Note: The more common chronic open angle glaucoma is usually without symptoms.

Emergency medicine treatment before referral (Doctor prescribed)
- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly until referred.

REFERRAL
Urgent
All patients to an ophthalmologist within 12 hours.

18.5 PAINFUL RED EYE
H57.1

DESCRIPTION
Pain and redness in one eye only, indicates inflammation of the anterior structures of the eye.
Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain).

Consider acute closed angle glaucoma and manage appropriately. See Section 18.4: Glaucoma, acute and closed angle.

REFERRAL

Urgent within 12–24 hours:

» All patients (excluding those with conjunctivitis):
- Single painful red eye.
- Corneal ulceration including herpes infection.
- Sudden loss or change in vision, including blurred or reduced vision.
- Sudden onset of visual problems, associated with dizziness, weakness on either one or both sides, difficulty speaking or swallowing (possible stroke; see Section 15.1: Stroke).
- Foreign body associated with welding or grinding.
- Chemical burn (see Section 18.3.1: Eye injury, chemical burn).
- Whole eyelid swollen, red and painful (consider orbital cellulitis).
- Coloured haloes around light, dilated oval pupil, headache, nausea, vomiting (possible glaucoma; see Section 18.4: Glaucoma, acute and closed angle).

18.6 STRUCTURAL ABNORMALITIES OF THE EYE

H02.0-1/H02.4/Q10.0-2

These include:

» eyelashes rubbing on the cornea (trichiasis)
» eyelids bent into the eye (entropion)
» eyelids bent out too much (ectropion)
» ptosis (drooping eyelid)

REFERRAL

All patients.

18.7 VISUAL PROBLEMS

H53.0-H53.6/H53.8-9/H54.0-H54.7/H54.9

DESCRIPTION

Visual problems may be due to refractive errors, damage to the eye or optic nerve. This may be an indication of underlying disease such as diabetes or hypertension.

Assessment

Look for abnormalities of the eye.
Determine visual acuity accurately in both eyes by using the Snellen chart.
If vision is diminished (less than 6/12) perform the following tests:

» Pin hole test
- Make a hole of about 1 mm wide in a piece of dark/black paper– you can push a hole in paper or card with a pen tip.
- Ask the patient to look through this hole at the Snellen chart.
- If vision improves, this means that the patient has a refractive error.

» Red reflex test
The patient looks past the examiner's head focussing on a distant target.

- With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
- The examiner stands about 60 cm away from the patient.
- In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex.
If there is a history of trauma or diabetes the absence of a red reflex is probably due to:
» retinal detachment
» a vitreous or internal haemorrhage
» mature cataract
If there are cataracts one usually sees:
» black shadows against the red reflex in immature cataracts, or
» absence of red reflex in mature cataracts.
In a patient > 50 years of age with no history of trauma, diabetes or previous eye disease, an absent red reflex is often due to cataract formation, especially with decreased visual acuity.
Note: Associated diabetes or hypertension should be adequately managed with referral, as surgery can only be considered with appropriately managed disease.

REFERRAL

Urgent: within 12–24 hours
» Sudden visual loss in one or both eyes.
» Pain or redness in one eye only especially with visual and pupil abnormalities.
» Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos/glaucoma) in children.
» Hazy cornea in children.
» Unilateral watery eye.

Within days
» Squint of recent onset.
» Suspected or previously diagnosed glaucoma.
» Double vision following recent injury might indicate orbital fracture.
» Leucokoria (white reflex from the pupil).
» Squint at any age if not previously investigated by ophthalmologist.
» Visual loss in patients with systemic disease such as diabetes.

Non-urgent referral
» Cataracts.
» Refractive errors.
» Long-standing blindness – first visit to health facility.

PHC Chapter 19: Ear, nose and throat conditions

19.1 ALLERGIC RHINITIS

J30.0-4

DESCRIPTION

Inflammation of the mucous membranes of the nose and paranasal sinuses in response to an allergen e.g. pollen, house dust, grasses, and animal hair.

Allergic rhinitis is characterised by recurrent episodes of:

» blocked stuffy nose
» watery nasal discharge
» frequent sneezing, often accompanied by nasal itching and irritation
» conjunctival itching and watering
» oedematous pale nasal mucosa
» mouth breathing
» snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, and side effects of antihypertensives and antidepressants.

GENERAL MEASURES

Avoid allergens and irritants.

MEDICINE TREATMENT

Adults and children > 6 years of age

- Corticosteroid, e.g.: *LoE:III*[380]
- Fluticasone, aqueous nasal solution, 1 spray of 100 mcg in each nostril 12 hourly.
  - Aim the nozzle laterally and upwards (aim for the eye) and not to the back of the throat.
  - Do not sniff vigorously.
  - Review 3 monthly. *LoE:I*[381]

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring corticosteroids for further management. *LoE:III*[382]

For short term symptomatic use:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For relief of nocturnal nasal blockage:

Topical nasal decongestant e.g.:

- Oxymetazoline 0.05%, intranasal, administered at night for a maximum of 5 days.

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy, if necessary.

For long-term use in adults and school going children:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.

Children > 6 years of age and adults
- Non-sedating antihistamine, oral e.g.:
- Cetirizine, oral, 10 mg daily. *LoE:I*[383]

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL
» Chronic persistent symptoms.
» Severe symptoms.
» Patients on protease inhibitors, requiring nasal corticosteroids.

19.2 COMMON COLD (VIRAL RHINITIS)
J00

DESCRIPTION
Colds are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days. Colds present with nasal stuffiness and throat irritation.
Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

Complications
Secondary bacterial infections, including:
» pneumonia
» otitis media
» sinusitis

GENERAL MEASURES
» Limit strenuous activity.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops or symptoms persist for > 14 days.

MEDICINE TREATMENT
Antibiotics are of no value for the treatment of the common cold.

Infants
- Sodium chloride 0.9%, 1–3 drops, instilled into each nostril as required. *LoE:III*[384]

Symptomatic relief of pain and fever with discomfort:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8. *LoE:III*[385]

REFERRAL
Severe complications.

19.3 EPISTAXIS
See Section 21.2.7: Nose bleeds (epistaxis).

19.4 OTITIS

19.4.1 OTITIS EXTERNA

H60.0/H60.5/H60.9

DESCRIPTION

Inflammation of the external ear may be one of the following:

» Diffuse: An infection of the ear canal, often due to Gram negative bacilli (especially P. aeruginosa). Pain is increased when chewing and the lining of the canal may be either inflamed or swollen with dry or moist debris or even a white or clear discharge.
» Furuncular: Usually caused by Staphylococcus aureus. A painful localised swelling present at the entrance to the ear canal. May be precipitated by trauma caused by scratching, e.g. matchsticks, earbuds.

GENERAL MEASURES

» Exclude any underlying suppurative otitis media. If suppurative otitis media is
» diagnosed, see Section: 19.4.3 Otitis media, chronic, suppurative.
» Most cases recover after thorough cleansing and drying of the ear.
» Keep the ear clean and dry (dry mopping).
» Do not leave pieces of cotton wool, etc. in the ear.
» Do not instil anything into the ear unless prescribed.

MEDICINE TREATMENT

Diffuse

» Does not usually require an antibiotic
» Make a wick where possible, using ribbon gauze or other suitable absorbent cloth, e.g. paper towel to clean and dry the ear.
- Acetic acid 2% in alcohol, topical, instilled into the ear every 6 hours for 5 days.
  - Instil 3–4 drops after cleaning and drying the ear.

Furuncular

Children

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 23.3.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg23.5.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table pg 23.2.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

REFERRAL
No response to treatment.

19.4.2 OTITIS MEDIA, ACUTE
H66.9

DESCRIPTION
Inflammation of the middle ear characterised by:
» pain
» loss of hearing
» red bulging eardrum
» drum perforation
» fever in about half of the cases
» loss of the normal light reflex of the eardrum

Mild redness of the eardrum and rubbing the ear are not reliable signs.

GENERAL MEASURES
» Do not instil anything into the ear.
» Avoid getting the inside of the ear wet.
» Dry mop ear if discharge is present.
» Do not plug the ear with cotton wool, etc.
» Exclude HIV infection as a contributing factor for recurrent ear infection.

MEDICINE TREATMENT
Children
- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:** **Syrup** mg/ 5mL		**Capsule** mg		**Age** Months/years
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

  - Review response after 5 days. *LoE:III*[386]
  - If pain or discharge persists, consider alternative diagnosis and continue antibiotics for a further 5 days. *LoE:III*[387]

Adults
- Amoxicillin, oral, 1500 mg 12 hourly for 5 days. *LoE:III*[388]

Antibiotic treatment for those who have taken amoxicillin in the previous 30 days; or poor response to 10-day course of amoxicillin:

Children

- Amoxicillin/clavulanic acid, oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5-10 days.

Weight kg	**Dose** mg (amoxicillin component)	**Use one of the following**			**Age** months/years
		Susp 125/31.5 mg/5 mL	**Susp** 250/62.5 mg/5 mL	**Tablet** 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Children > 35 kg and adults

Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 to 10 days. *LoE:III*[389]

LoE:III[390]

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table, pg 23.2.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8. *LoE:II*[391]

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

For patients with upper respiratory tract congestion, secondary to allergy: (T78.4)

- Non-sedating antihistamine, oral, e.g.:
- Cetirizine, oral, 10 mg daily for 10 days. *LoE:II*[392]

For management of allergic rhinitis, see section 19.1: Allergic rhinitis.

REFERRAL

» Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
» Recurrent otitis media.

» Painful swelling behind the ear or tenderness on percussion of the mastoid.
» Suspected meningitis.

19.4.3 OTITIS MEDIA, CHRONIC, SUPPURATIVE

H66.1-3

DESCRIPTION

A purulent discharge from the ear with perforation for > 2 weeks. If the eardrum has been ruptured for ≥ 2 weeks, a secondary infection with multiple organisms usually occurs. Oral antibiotic treatment is generally ineffective.

TB may present with a chronically discharging ear. Consider the diagnosis of TB if other clinical features suggestive of TB are present (e.g. cough, weight loss, failure to thrive, etc.). See Section 17.4: Pulmonary tuberculosis (TB). *LoE:III*[393]

GENERAL MEASURES

» Do not send pus swabs collected from the external ear canal for routine bacterial and fungal MC+S (microscopy, culture and sensitivity) or for microscopy and culture for tuberculosis.
» Explain to patients and caregivers that a chronically draining ear can only heal if it is dry.
» Dry mopping is the most important part of the treatment. It should be demonstrated to the child's caregiver or patient if old enough. Roll a piece of clean absorbent cloth into a wick.
  - Carefully insert the wick into the ear with twisting action.
  - Remove the wick and replace with a clean dry wick.
  - Repeat this until the wick is dry when removed.
» Do not leave anything in the ear.
» Do not instil anything else in the ear.
» Avoid getting the inside of the ear wet while swimming and bathing.
» Check HIV status if unknown.

REFERRAL

» All sick children, vomiting, drowsy, etc.
» Painful swelling behind the ear.
» Ear discharge still present for ≥ 4 weeks, despite dry mopping.
  Note: These referrals do not all require referral to an ENT. They may be referred to a hospital outpatient department for consideration of a topical antibiotic eardrops.
» Any attic perforation.
» Any perforation not progressively improving after 3 months or closed by 6 months, even if dry.
» Moderate or severe hearing loss.

19.5 SINUSITIS, ACUTE, BACTERIAL

J01.0-4/J01.8-9

DESCRIPTION

Bacterial infection of one or more paranasal sinuses that occurs most often after a viral nasal infection or allergic rhinitis.

Bacterial sinusitis is characterised by:

» Deterioration of a common cold after 5–7 days.
» Headache.
» Purulent nasal discharge, especially if unilateral.
» Pain and tenderness over one or more sinuses.
» Nasal obstruction.
» Fever.

Note: Sinusitis is uncommon in children < 5 years of age, as sinuses are not fully developed.

GENERAL MEASURES

Consider HIV in recurrent sinusitis.

MEDICINE TREATMENT

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule** mg		
		125	250	250	500	
>2–2.5 kg	100	4 mL	2 mL	–	–	34–36 weeks
>2.5–3.5 kg	125	5 mL	2.5 mL	–	–	Birth–1 month
>3.5–5 kg	175	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500	–	10 mL	2	1	>18 months–3 years

Children > 3 years of age

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table, pg 23.2.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

AND

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously.

- Children > 5 years of age: 0.025%
- Adults: 0.05%

LoE:III[394]

AND/OR

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» Fever lasting > 48 hours.
» Poor response > 5 days.
» Complications, e.g. periorbital cellulitis with periorbital swelling.
» Oedema over a sinus.
» Recurrent sinusitis.
» Meningeal irritation.

19.6 TONSILLITIS AND PHARYNGITIS

J03.0/J03.8-9/J35.0/J02.0/J02.8-9/J31.1-2

DESCRIPTION

A painful red throat and/or enlarged inflamed tonsils. White pus exudates, either spots or patches, may be present. Tender anterior cervical lymphadenopathy may be present.
Viruses cause the majority of cases. Group A beta haemolytic streptococcus causes 20% of pharyngitis/tonsillitis, and may result in rheumatic fever (which can cause serious heart disease) as well as local suppurative complications.
Other clinical features that might suggest streptococcal infection may include palatal petechiae, inflamed tongue mucosal papillae (strawberry tongue), a scarlitiniform (i.e.: rough, diffuse, fine papular) rash.

GENERAL MEASURES

» Homemade salt mouthwash, gargle for 1 minute twice daily:
  - 2.5 mL (½ medicine measure) of table salt in 200 mL lukewarm water.
  - Do not give to children unable to gargle.
» Advise adequate hydration.
» Avoid irritants e.g. vaporubs inserted into nostrils.
» For children < 6 years of age: Soothe the throat with, breastmilk. If not exclusively breastfed, give warm water or weak tea: add sugar or honey and lemon if available.

MEDICINE TREATMENT

Antibiotics are not required for all patients with a sore throat.

Antibiotics to eradicate streptococci must be given to patients presenting with a sore throat who are at risk for rheumatic fever (3–21 years of age) if they have:

» Enlarged tonsils;
PLUS at least one of the following criteria:
- Exudates on their tonsils
- No cough
- No runny nose

LoE:I[395]

- Benzathine benzylpenicillin, IM, single dose.
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine) or 3 mL water for injection.

OR

Children

- Amoxicillin, oral, 50 mg/kg daily for 10 days.

Weight kg	Dose mg	Use one of the following				Age Months/years
		Susp		Capsule		
		125 mg/5mL	250 mg/5mL	250 mg	500 mg	
>2–2.5 kg	100 mg	4 mL	2 mL	–	–	>34–36 weeks
>2.5–3.5 kg	150 mg	6 mL	3 mL	–	–	>36 weeks–1 month
>3.5–5 kg	200 mg	8 mL	4 mL	–	–	>1–3 months
>5–7 kg	275 mg	11 mL	5.5 mL	–	–	>3–6 months
>7–11 kg	400 mg	–	8 mL	–	–	>6–18 months
>11–17.5 kg	575 mg	–	11.5 mL	–	–	>18 months–5 years
>17.5–25 kg	750 mg	–	15 mL	3	–	>5–7 years
>25–35 kg	1000 mg	–	20 mL	4	2	>7–11 years
>35kg	2000 mg	–	–		4	>11 years

LoE:I[396]

Adults

- Amoxicillin, oral, 1 000 mg 12 hourly for 10 days.

LoE:III[397]

OR

Children: 18 months–11 years of age

- Phenoxymethylpenicillin, oral, 250 mg 12 hourly for 10 days.

Children > 11 years of age and adults

- Phenoxymethylpenicillin, oral, 500 mg 12 hourly for 10 days.

Severe Penicillin allergy:
Z88.0

Children > 3 years of age
- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table, pg 23.2.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults
- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

REFERRAL

» Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
» Tonsillitis accompanied by difficulty in opening the mouth (trismus).
» Recurrent tonsillitis (≥ 6 documented episodes/year) for possible tonsillectomy.
» Suspected acute rheumatic fever.
» Suspected acute glomerulonephritis.
» Heart murmurs not previously diagnosed.

PHC Chapter 20: Pain

20.1 PAIN CONTROL

R52.0/R52.9

DESCRIPTION

Pain is an unpleasant sensation experience associated with actual or potential tissue injury. It is always subjective. It is affected by the patient's mood, morale and the meaning the pain has for the patient.

Active pain assessment and self-report is the key to effective pain management.

Different pain assessment scales should be used for different ages and intellectual categories of patients.

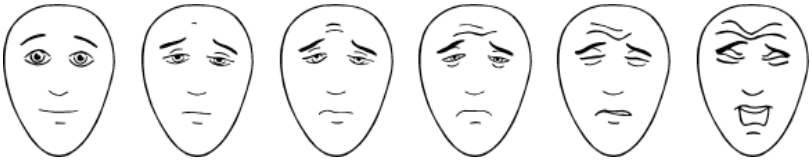
FLACC SCALE:

For babies and intellectually impaired children and critically ill adults who are unable to self-report pain the FLACC (face, legs, activity, cry, consolability) scale is used. Evaluate each item and arrive at a total score ranging from 0 to10.A score of ≥4 needs active pain management.

Item	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed, no need to console	Reassured by occasional touching, hugging or "talking to", distractible	Difficult to console or comfort

REVISED FACES PAIN SCALE:

» Use in children > 4 years of age.
» Ask them to point to the face that best depicts their level of pain.



0 2 4 6 8 10

VISUAL ANALOGUE SCALE:

» Use in children over 7 and adults who can communicate
» Ask: "on a scale of 0 -10, '0' being no pain and to '10'being the worst pain, what number are you feeling right now?"

Pain should be assessed by:

» duration

» severity, e.g. does the patient wake up because of the pain?
» site
» character, e.g. stabbing, throbbing, crushing, cramp like
» persistent or intermittent
» relieving or aggravating factors
» accompanying symptoms e.g. nausea and vomiting, visual disturbances
» distribution of pain
» referred pain

20.2 ACUTE PAIN

R52.0/R52.9

DESCRIPTION

Pain that has been present for less than 4 weeks and usually occurs in response to tissue damage.

GENERAL MEASURES

» Patient counselling.
» Lifestyle adjustment.

MEDICINE TREATMENT

Mild pain:
Non-opioid treatment.

Non-inflammatory or post trauma:

Children

- Paracetamol, oral, 15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Pain associated with inflammation:

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.

If no relief after 2 or 3 doses, combine paracetamol and ibuprofen at the above dosages. *LoE:III*[398]

Moderate pain:
If no relief to paracetamol:
ADD

Children

- NSAIDs, e.g.:
- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with or after a meal. See dosing table, pg 23.6.

- Discontinue if not effective after 2–3 days. *LoE:III*[399]

If no response to paracetamol and ibuprofen, refer.

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.
  - Discontinue if not effective after 2–3 days. *LoE:III*[400]

If still no relief to paracetamol and ibuprofen:

ADD

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor prescribed).
  - May be increased to a maximum of 400 mg daily.

Acute severe pain:

Children

Refer.

Adults

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor prescribed).
  - May be increased to a maximum of 400 mg daily.

AND

- Paracetamol, oral, 1 g 4- 6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

OR

- Morphine solution, oral (Doctor prescribed).
  - Starting dose: 10–15 mg (maximum 0.2 mg/kg) 4 hourly.
  - Elderly or frail patients: 2.5–5 mg (maximum 0.1 mg/kg) 4 hourly.

OR

- Morphine, IM, 10 mg, 4–6 hourly when required (Doctor prescribed). *LoE:III*[401]

OR

- Morphine, IV, to a total maximum dose of 10 mg (Doctor prescribed).
  - Dilute 10 mg up to 10 mL with sodium chloride 0.9%.
  - Morphine, IV, 3–5 mg as a single dose then further boluses of 1–2 mg/minute and monitor closely.
  - Total maximum dose: 10 mg.
  - Repeat after 4 hours if necessary.
  - Monitor response to pain and effects on respiration and BP. *LoE:III*[402]

Patients requiring morphine for acute pain of unknown cause or pain not responding with 1 dose must be referred for definitive treatment.

Precautions and special comments on the use of morphine

» Morphine may cause respiratory depression. This can be reversed with naloxone. See Section 21.3.3: Exposure to poisonous substances.
  Do not administer morphine in:
  - severe head injury
  - acute asthma– uncontrolled hypothyroidism

» Morphine can be used for acute abdominal pain without leading to surgical misdiagnosis.

» **Use** morphine **with extreme care** if there is:
  - recent or concurrent alcohol intake or other CNS depressants
  - advanced chronic obstructive pulmonary disease, or other respiratory disease with imminent respiratory failure
  - hypovolaemia or shock
  - advanced liver disease
  - in the elderly

In these circumstances use:

Adults

- Morphine, IV, to a total maximum dose of 10 mg (Doctor prescribed).
  - Dilute 10 mg up to 10 mL with sodium chloride 0.9%.
  - Morphine , IV, 3–5 mg as a single dose then further boluses of 1–2 mg/minute and monitor closely.
  - Total maximum dose: 10 mg.
  - Repeat after 4 hours if necessary.
  - Monitor response to pain and effects on respiration and BP. *LoE:III*[403]

If morphine has been administered, the time and dose should be clearly documented on the referral letter as this may alter some of the clinical features of acute abdomen or head injury.

REFERRAL

» All children with acute severe pain.
» No response to oral pain control and unable to initiate opioid therapy.
» Uncertain diagnosis.
» Management of serious underlying conditions.

20.3 CHRONIC NON-CANCER PAIN

DESCRIPTION

Pain that is present for more than 4 weeks.

It can arise from:

» tissue damage (nociceptive pain), e.g. arthritis, lower back pain, pleurisy; or
» injury to nerves (neuropathic pain) e.g. post herpetic neuralgia (pain following shingles), trigeminal neuralgia, diabetic neuropathy, HIV related peripheral neuropathy, drug induced peripheral neuropathy or phantom limb; or
» Pain experienced in the absence of tissue damage, inflammation nor nerve damage (central pain) e.g. fibromyalgia, irritable bowel syndrome.

Assess pain severity, functional status, medication use including self-medication, co-morbid illnesses, etc.

Actively look for concomitant depression and anxiety/somatoform pain disorders.

GENERAL MEASURES

» Lifestyle adjustments.
» Occupational therapy and physiotherapy as appropriate.
» Address psycho-social problems e.g. stress, anxiety, sleep disturbances.

MEDICINE TREATMENT

The principles are the same as with cancer pain relief. Analgesics should be given by mouth, regularly, in a stepwise manner to ensure adequate relief. Neuropathic and central pain are best treated with analgesics in addition to tricyclic antidepressants.
It is useful to combine different classes of analgesics for the additive effects, depending on pain severity.

Mild pain:

Children
Chronic non-cancer conditions such as genetic conditions, nerve damage pain, chronic musculoskeletal pain, and chronic abdominal pain:

- Paracetamol, oral, 15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8. *LoE:III*[404]

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Pain associated with inflammation:

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal. *LoE:III*[405]

OR
Combine paracetamol and ibuprofen at the above dosages.

Moderate pain:

Adults
If still no relief to simple analgesics (paracetamol and/or ibuprofen), as above
ADD

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor prescribed).
  - May be increased to a maximum of 400 mg daily.

Adjuvant therapy:

Adults
In addition to analgesia as above:

- Amitriptyline, oral, 25 mg at night (Doctor initiated).
  - Titrate up to a maximum of 75 mg at night.

Under-recognition of pain and under-dosing of analgesics is common in chronic pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

REFERRAL

» Pain requiring strong opioids.
» Pain requiring definitive treatment for the underlying disease.
» All children.

20.4 CHRONIC CANCER PAIN

R52.9

DESCRIPTION

Cancer pain is usually persistent and progressive. Pain assessment requires training in:

» psycho-social assessment
» assessment of need of type and dose of analgesics
» pain severity assessment

Pain severity and not the presence of pain determine the need for treatment.
Medicinal treatment for pain should never be withheld.
Pain is what the patient says it is.

Under-recognition of pain and under-dosing with analgesics is common in chronic cancer pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

GENERAL MEASURES

» Counselling/hospice care.
» Occupational therapy may be required.
» Management of psycho-social factors.

Note:

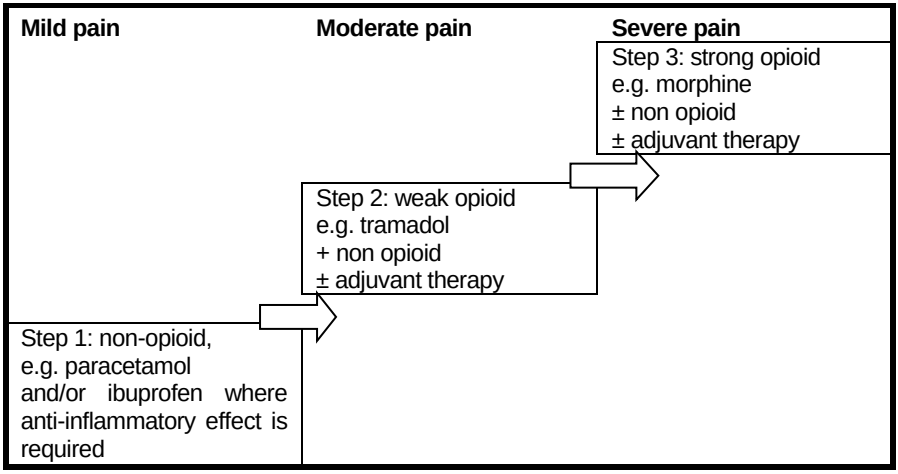
» Appropriate care is provided from the time of diagnosis.
» Home palliative care is provided by the family or caregiver with the support of health care professionals. See Chapter 22: Medicines used in palliative care.

MEDICINE TREATMENT

Pain should be controlled as rapidly as possible. If pain is not adequately controlled within 2 days, proceed to the next step. Cancer pain in children is managed by the same principles but using lower doses of morphine than adults.

RECOMMENDED STEPS IN MANAGEMENT OF CANCER PAIN

Adults



Step 1

Non-opioid

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

LoE:II[406]

AND/OR

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.

LoE:II[407]

Step 2

Add weak opioid to Step 1

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor prescribed).
  - May be increased to a maximum of 400 mg daily.

CAUTION
Use with caution when administered with antidepressants e.g. amitryptyline to avoid over sedation.

LoE:II[408]

Step 3

Paracetamol and/or ibuprofen can be used with morphine in step 3

- Morphine, oral, 4 hourly (Doctor prescribed).
  - Start with 5–10 mg.
  - Titrate the dose and dose frequency against the effect on pain.

If dosage is established and patient is able to swallow:

- Morphine, long-acting, oral, 8–12 hourly (Doctor prescribed).
  - Start with 10–20 mg/dose.
  - Titrate the dose and dose frequency against the effect on pain. *LoE:III*[409]

Elderly adults or severe liver impairment:

- Morphine solution, oral, 4 hourly (Doctor prescribed).
  - Start with 2.5–5 mg.
  - Titrate the dose and dose frequency against the effect on pain.

Titrate the dose and dose frequency against the effect on pain.

Note:

» There is no maximum dose for morphine – dose is titrated upward against the effect on pain.

» For the management of morphine overdose, see Section 21.3.3: Exposure to poisonous substances.

Children

Stepwise approach to pain management is recommended:

Mild pain	**Moderate to Severe pain** Step 2: strong opioid e.g. morphine ± non opioid ± adjuvant therapy
Step 1: non-opioid, e.g. paracetamol and/or ibuprofen where anti-inflammatory effect is required	

LoE:III[410]

Non-opioid

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.
- NSAIDs, e.g.:
- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with or after a meal. See dosing table, pg 23.6.
  - Where anti-inflammatory effect is required.
  - Can be used in combination with paracetamol or opioids.
  - Discontinue if not effective after 2–3 days. *LoE:III*[411]

Opioid

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly according to severity of the pain. See dosing table, pg 23.8 (Doctor prescribed). *LoE:III*[412]

Adjuvant therapy:

Adults

In addition to analgesia as above:

- Amitriptyline, oral, 25 mg at night. (Doctor initiated).

- Titrate up to a maximum of 75 mg at night.

Significant nausea and vomiting:

Adults

- Metoclopramide, oral, 10 mg, 8 hourly as needed.

Children

For treatment of nausea and vomiting in the palliative care setting, see Section: 22.1.3 Nausea and vomiting.

Constipation:

A common problem due to long-term use of opioids, which can be prevented and should always be treated.

Children

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing table, pg 23.6.
  - If poor response, increase frequency to 12 hourly.

Adult

- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.

(See Section: 22.1.1 Constipation for further management of palliative constipation).

For pruritus:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

CAUTION
Do not give an antihistamine to children < 2 years of age.

For anxiety:

Children

- Diazepam, oral, 0.04 mg/kg/dose 8–12 hourly (Doctor prescribed).

Weight kg	**Dose** mg	**Tablet** 2 mg	**Age** months/years
>9–17.5 kg	0.5 mg	¼ tablet	>12 months–3 years
>17.5–25 kg	1 mg	½ tablet	>5–7 years
>25–35 kg	1.5 mg	¾ tablet	>7–11 years
>35 kg	2mg	1 tablet	>11 years

  - May be increased to 0.2 mg/kg/dose 8–12 hourly.
  - Beware of respiratory depression if given with morphine.

- Diazepam, oral, 0.2 mg/kg/dose 8–12 hourly (Doctor prescribed).
  - Beware of respiratory depression if given with morphine.

Weight kg	**Dose** mg	**Use one of the following tablets:**		**Age** months/years
		2 mg	5 mg	
>9–11 kg	2 mg	1 tablet	–	>12–18 months
>11–14 kg	2.5 mg	–	½ tablet	>18 months–3 years
>14–17.5 kg	3 mg	1½tablets	–	>5–7 years
>17.5–25 kg	4 mg	2 tablets	–	>5–7 years
>25 kg	5 mg	–	1 tablet	>7 years

Adults

- Diazepam, oral, 2–5 mg every 12 hours for a maximum of two weeks (Doctor prescribed).

Breakthrough pain:
Breakthrough pain is pain that occurs before the next regular dose of analgesics. This is due to an inadequate regular dose.

It is recommended that an additional dose of morphine (up to the same dose as the regular 4-hourly dose) be administered for breakthrough pain. The next regular dose of morphine must still be given at the prescribed time, and not be delayed because of the additional dose.

The regular 4-hourly dosage should be titrated upward against the effect on pain in the following way:
» Add up the amount of "breakthrough morphine" needed in 24 hours.
» Divide this amount by 6 (the number of 4 hourly doses in 24 hours).
» The next day increase each dose by that amount.

Example:
Patient gets 10 mg morphine every four hours.
The patient has 3 episodes of breakthrough pain:
3 x 10 mg = 30 mg
30 mg ÷ 6 = 5 mg
The regular 4 hourly dose of 10 mg will be increased by 5 mg
i.e. 10 mg + 5 mg = 15 mg.
The increased morphine dose will be 15 mg 4 hourly.

REFERRAL
» Uncontrolled pain.
» Pain uncontrolled by step 1 if no doctor available.
» Severe emotional or other distress which may aggravate the perception of pain.
» Nausea and vomiting associated with pain in children.

PHC Chapter 21: Emergencies and injuries

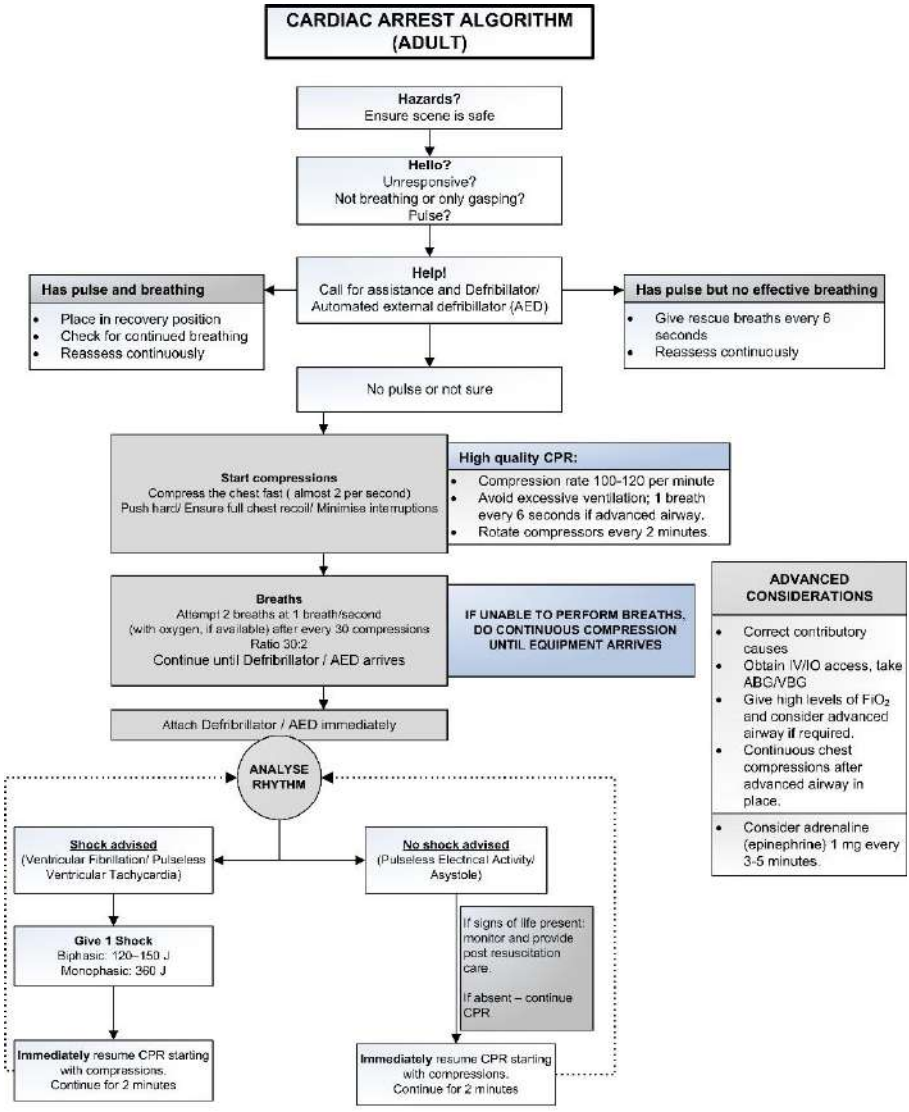
The following conditions are emergencies and must be treated as such. Medicines used for treatment must be properly secured and recorded (time, dosage, route of administration) on the patient's notes and on the referral letter.

Determine the priority of patients' treatments based on the severity of their condition, using a triage system appropriate to your level of care, available resources and staff at your facility.

21.1 CARDIOPULMONARY ARREST– CARDIOPULMONARY RESUSCITATION

21.1.1 CARDIAC ARREST, ADULTS

I46.0/I46.9



Adapted with permission from the Resuscitation Council of Southern Africa. www.resuscitationcouncil.co.za

DESCRIPTION

Described as the loss of a heart beat and a palpable pulse, irrespective of the electrical activity captured on ECG tracing.
Irreversible brain damage can occur within 2-4 minutes.
Clinical features include:

» sudden loss of consciousness
» absent carotid pulse
» loss of spontaneous respiration

EMERGENCY TREATMENT

» Diagnose rapidly.
» Make a note of the time of starting resuscitation.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Document medication given and progress after the resuscitation.
» Follow instructions as per algorithm.

HAZARDS, HELLO, HELP

» Assess for any hazards and remove. Make use of personal protective equipment i.e. gloves, masks.
» Speak to the patient. If they respond, turn into recovery position and continue management as directed by findings.
» If no response, check for carotid pulse and breathing. Take no longer than 10 seconds.
» Call for skilled help and an automated external defibrillator (AED) or defibrillator.

CARDIOPULMONARY RESUSCITATION (CPR)

» Initiate CAB (Circulation Airway Breathing) sequence of CPR.

Circulation

» If there is no pulse or you are not sure, start with 30 chest compressions at a rate of 100-120 compressions per minute, and a depth of 5-6 cm.
» Allow full chest recoil between compressions.
» Minimise interruptions during compressions.

Airway and **B**reathing

» To open the airway, lift the chin forward with the fingers of the one hand and tilt the head backwards with other hand on the forehead. Do not do this where a neck injury is suspected.
» If there is no normal breathing, give 2 breaths with bag-valve-mask resuscitator and face mask.
» The administered breaths must cause visible chest rise.
» If not able to perform breaths, continue compressions (Reposition head and insert correctly sized oropharyngeal airway and try again after 30 compressions).

Where neck injury is suspected:

» To open the airway, use a jaw thrust:
  - place your fingers behind the jaw on each side
  - lift the jaw upwards while opening the mouth with your thumbs “Jaw thrust”
» ideally use a 3rd person to provide in-line manual stabilisation of the neck

Repeat the cycle of 30 compressions followed by 2 breaths (30:2) until the AED or defibrillator arrives.

AED/Defibrillator

Attach leads and analyse rhythm:

» If shock advised: (ventricular fibrillation or pulseless ventricular tachycardia)
  - deliver 1 shock
  - immediately resume CPR
  - continue cycles of 30:2 for 2 minutes, then re-assess for a pulse

» If no shock advised: (asystole or pulseless electrical activity)
  - if no pulse or respirations
  - immediately resume CPR
  - continue cycles of 30:2 for 2 minutes, then re-assess for a pulse

IMMEDIATE EMERGENCY MEDICINE TREATMENT:

Adrenaline (epinephrine) is the mainstay of treatment. Give immediately, IV or endotracheal, when there is no response to initial resuscitation or defibrillation.

- Adrenaline (epinephrine), 1:1 000, 1 mL, IV immediately as a single dose.
  - Flush with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

OR

- Adrenaline (epinephrine), intra-osseous (IO), 1:1000, 1 mL, via IO line. *LoE: III*[413]

ADDITIONAL GUIDANCE

Connect bag-valve-mask resuscitator to 100% oxygen at 10-15L/min flow.
Check glucose and treat hypoglycaemia.
Continue CPR until spontaneous breathing and/or heart beat returns.
Assess continuously (every 2 minutes) until the patient shows signs of recovery.
Consider stopping resuscitation attempts and pronouncing death if:

» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease, or
» no success after all the above procedures have been carried out for ≥30 minutes and no reversible cause detected, or
» no success after all of above procedures have been carried out for ≥30 minutes and the rhythm is asystole or pulseless electrical activity.

Consider carrying on for longer especially when:

» hypothermia and drowning
» poisoning or medicine overdose or carbon monoxide poisoning
» neurotoxic envenomation (e.g. mamba or Cape cobra snakebite)

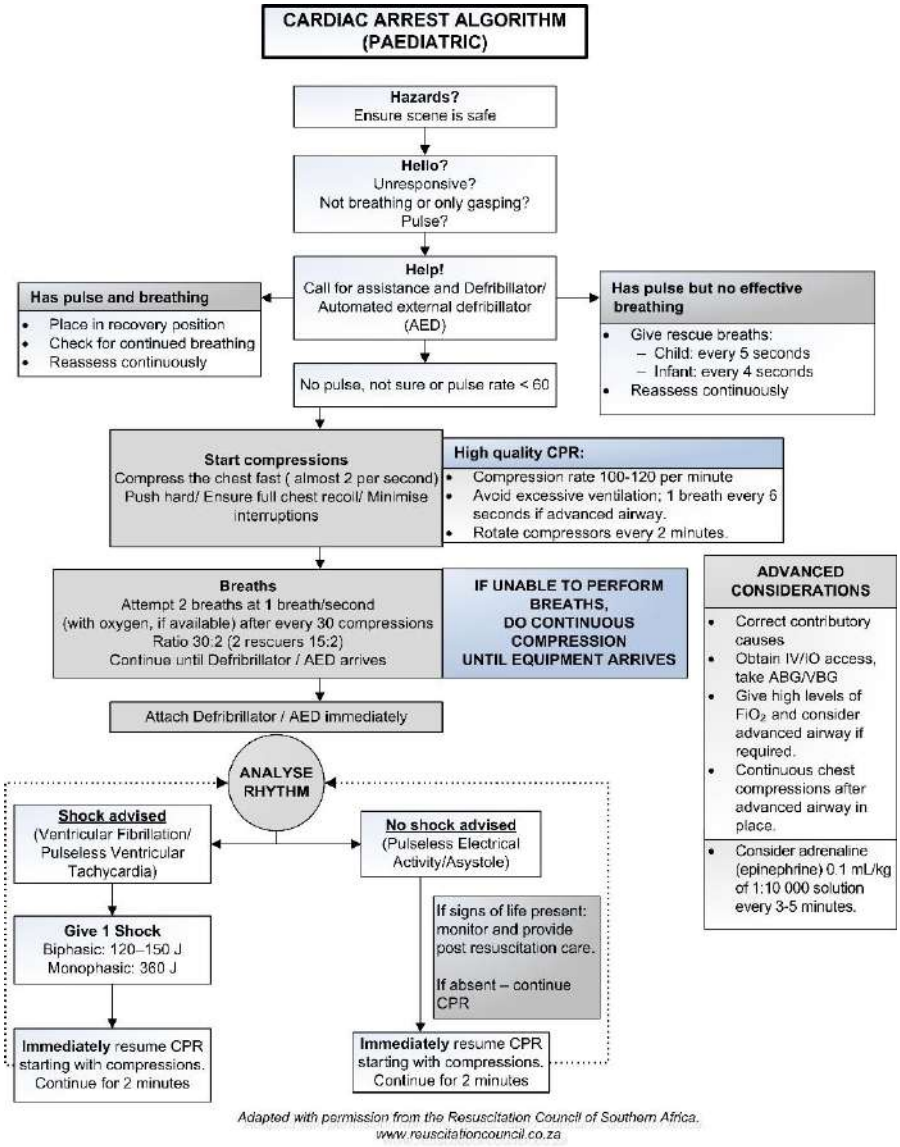
REFERRAL

All patients: transfer with supportive care and accompanying skilled worker until taken over by doctor at receiving institution.

21.1.2 CARDIOPULMONARY ARREST, CHILDREN

I46.0/I46.9

The most experienced clinician present should take control of the resuscitation.



Adapted with permission from the Resuscitation Council of Southern Africa. www.resuscitationcouncil.co.za

DESCRIPTION

Cardiopulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a critical illness.

The effective treatment of cardiorespiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease. Bradycardia in children is a pre-terminal event and needs to be treated with resuscitation.

Cardiorespiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (e.g. prolonged seizures, poisoning, neuromuscular weakness etc.).

The following table outlines signs of serious disease/impending cardiorespiratory failure in a child. These are an indication that urgent effective management is needed.

	Neurological	Respiratory	Circulatory
Signs of impending cardio-respiratory failure/ severe disease	Decreased level of consciousness or extreme weakness	Increased respiratory rate: > 60 breaths/minute	Increased heart rate: > 160 beats/min in infants > 120 beats/min in children
	Abnormal posture	Marked chest indrawing	Decreased pulse volume
	Pupils – unequal or abnormal size	Grunting	Capillary refill time > 3 seconds
	Presence of convulsions	Flaring nostrils, gasping, shallow/irregular breathing	Poor colour: bluish, grey or marked pallor

EMERGENCY TREATMENT

» Diagnose the need for resuscitation rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Document timings of interventions, medication and any response to these. (Ideally, during resuscitation, one staff member should act as a 'scribe').
» Collect all ampoules used and total them at the end.

HAZARDS, HELLO, HELP

» Assess for any hazards and remove. Make use of personal protective equipment i.e. gloves, masks.
» Call for skilled help and an automated external defibrillator (AED) or defibrillator.

CARDIOPULMONARY RESUSCITATION (CPR)

Circulation

» Check for signs of life and presence of central pulse for 5–10 seconds. In younger children (infants) check brachial or femoral pulse, in older children use femoral or carotid pulse).
» If there is no pulse (or pulse < 60 beats/minute) with no signs of life, give 30 chest compressions at a rate of 100-120 compressions/minute.
» Compress over lower half of sternum and compress chest by approximately 1/3 of the anteroposterior diameter of the chest.
» Allow chest to fully recoil before next compression.
» Minimise interruptions in compressions.

Airway

» Manually remove obvious visible obstruction from the mouth.

CAUTION

Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants: position the head in neutral position. In children: position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.

Breathing

» If there is no breathing, give breaths:
  - preferably with bag-valve-mask resuscitator

  or

  - mouth-to-nose (covering child's mouth AND nose with your mouth)

  or

  - mouth-to-mouth (occluding nose by pinching child's nostrils)
» Give 2 effective breaths at one breath/second.
» Breaths must produce visible chest rise.

Then

» If 2 rescuers are present, carry out cycles of 15 chest compressions followed by 2 breaths (15:2).
» If only 1 rescuer present, carry out cycles of 30 compressions to 2 breaths (30:2).
» Review after 2 minutes or 5 cycles - if pulse is not palpable continue CPR sequence until help arrives.
• Oxygenate with 100% oxygen, if available.
» Keep patient covered and warm while resuscitating (although the patient should be fully exposed for short periods during examination).

IMMEDIATE EMERGENCY MEDICINE TREATMENT:

» If still no pulse or signs of life after cardiac compressions and ventilations:
• Adrenaline (epinephrine), IV, 0.1 mL/kg of 1:10 000 solution.
  - To make an 1:10 000 adrenaline (epinephrine) solution, dilute 1 mL ampoule of adrenaline (epinephrine) (1:1000) with 9 mL of sodium chloride 0.9% to give 10 mL of 1:10 000 solution.
  - Administer dose according to table below.
  - If no IV line is available, the same dose may be given IO.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
>2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
>7–11 kg	0.1 mg	1 mL	>6–18 months
>11–17.5 kg	0.15 mg	1.5 mL	>18 months–5 years
>17.5–25 kg	0.2 mg	2 mL	>5–7 years
>25–35 kg	0.3 mg	3 mL	>7–11 years
>35–55 kg	0.5 mg	5 mL	>11–15 years

Treat hypoglycaemia

- Dextrose 10%, solution, IV, 2–5 mL/kg.
  - To make 20 mL of 10% dextrose solution: draw 4 mL of 50% dextrose using 20 mL syringe and add 16 mL of sodium chloride 0.9% or water for injection.
  - After dextrose bolus, commence dextrose 5–10% infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.
  - Re-check the blood glucose after 15 minutes: if blood sugar is still low: give further bolus of dextrose 10%, IV, 2 mL/kg and continue dextrose infusion.
  - Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:

» No signs of life are present after 30 minutes of active resuscitation. A doctor must be called before resuscitation is stopped. If no doctor on site, telephonic consultation should take place.

Always **carry on** for longer in cases of:

» hypothermia and drowning
» suspected poisoning or medicine overdose or carbon monoxide poisoning
» neurotoxic envenomation (e.g. mamba or Cape cobra snakebite)

REFERRAL

All patients: transfer with supportive care and accompanying skilled worker until taken over by doctor at receiving institution.

For guidance on neonatal resuscitation, see Section 6.6.2: Neonatal resuscitation.

21.1.3 BRADYCARDIA

R00.1

Refer to Adult Hospital Level and Paediatric Hospital Level STGs and EML for relevant guidance.

DESCRIPTION

In adults, bradycardia refers to a pulse rate < 50 beats/ minute.

In children, bradycardia refers to a pulse rate < 60 beats/ minute despite effective oxygenation and ventilation.

EMERGENCY TREATMENT

» Assess ABC:
  - Airway: ensure airway is open and clear.
  - Breathing: give oxygen to target pulse oximeter saturation of 94–98%.
  - Circulation: assess peripheral perfusion, measure pulse and blood pressure.
» Attach ECG monitor, pulse oximeter and blood pressure cuff.
» Establish IV access.
» Print rhythm strip to confirm bradycardia; if possible, do 12 lead ECG.
» Assess for signs of instability:
  - Hypotension
  - Chest pain
  - Signs of shock: cold clammy peripheries and weak pulses
  - Altered mental status
  - Acute heart failure

Adults

If unstable:

- Atropine, IV, 0.5 mg as a bolus.
  - Repeat every 3–5 minutes, if no response.
  - Maximum dose: 3 mg.

» Look for and treat contributory causes for bradycardia (see table below).
» If no response to atropine, discuss with referral centre or refer to Adult Hospital Level STGs and EML for guidance.

If stable:

Look for and treat contributory causes for bradycardia (see table below):

Contributory causes for bradycardia and treatment	
Hypoxia	Give supplemental oxygen or ventilate.
Hypothermia	Warm the patient.
Head injury	Give oxygen, elevate head of bed.
Heart block	Look for cause of heart block.
Hydrogen ion (acidosis)	Look for cause of acidosis.
Hypotension	If no signs of heart failure: • Sodium chloride 0.9%, IV, 200 mL.
Toxins and therapeutic agents	Treat as for specific overdose.

Children

If unstable:

» Start CPR:
  - 30 compressions: 2 breaths (1 rescuer), or
  - 15 compressions: 2 breaths (2 rescuers)

- Adrenaline (epinephrine), IV, 0.1 mL/kg of 1:10 000 solution (Doctor prescribed).
  - To make 1:10 000 adrenaline (epinephrine) solution: dilute 1 mL ampoule of adrenaline (epinephrine) (1:1000) with 9 mL of sodium chloride 0.9% to give 10 mL of 1:10000 solution.
  - Administer dose every 3–5 minutes, according to table below.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
>2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
>7–11 kg	0.1 mg	1 mL	>6–18 months
>11–17.5 kg	0.15 mg	1.5 mL	>18 months–5 years
>17.5–25 kg	0.2 mg	2 mL	>5–7 years
>25–35 kg	0.3 mg	3 mL	>7–11 years
>35–55 kg	0.5 mg	5 mL	>11–15 years

If heart block or increased vagal tone suspected: *LoE: III*[414]

- Atropine, IV, 0.02 mg/kg/dose as a single dose (Doctor prescribed).
  - Maximum single dose: 0.5 mg.
  - Repeat dose, if no response.

If stable: *LoE: III*[415]

» Look for and treat contributory causes for bradycardia (see table above).
» Close monitoring required.
» Ensure adequate oxygenation and ventilation if necessary.

REFERRAL

Urgent

All patients: transfer with supportive care and accompanying skilled worker until taken over by doctor at receiving institution.

21.1.4 TACHYDYSRHYTHMIAS

R00.0

Refer to Adult and Paediatric Hospital Level STGs and EML for relevant guidance.

DESCRIPTION

Adults: tachydysrhythmias refer to a pulse rate > 150 beats/minute.
Children: tachydysrhythmias refers to a pulse rate > normal range for age (see table).

EMERGENCY TREATMENT

Assess ABC:

» Airway: ensure airway is open and clear
» Breathing: give oxygen to target pulse oximeter saturation of 94-98%
» Circulation: assess peripheral perfusion, measure pulse and blood pressure.

Child heart rate ranges for age	
Age	**Normal heart rate range (beats/minute)**
Newborn to 3 months	85–205
3 months to 2 years	100–190
2 years to 10 years	60–140
> 10 years	60–100

» Supraventricular tachycardia is suspected in a child when the pulse rate > 180 beats/minute in a child and > 220 beats/minute in an infant.
» Attach ECG monitor, pulse oximeter and blood pressure cuff.
» Establish IV access.
» Print rhythm strip to confirm tachycardia, if possible do 12 lead ECG.
» Assess for signs of instability:
- Hypotension
- Chest pain
- Altered mental status
- Acute heart failure
- Signs of shock: cold clammy peripheries and weak pulses

Adult

<u>If unstable:</u>

» Synchronised cardioversion at 100 J.
» Consider analgesia and sedation if time permits.

<u>If stable:</u>

Assess QRS length on rhythm strip or 12 lead ECG:

» If QRS < 0.12 = Narrow complex tachycardia (supraventricular tachycardia):
- Attempt vagal stimulation: Vasalva manoeuvre.
  Ice water applied to face.
  Cough, breath holding.
  Carotid sinus massage (not in elderly or cardiac disease).

» If QRS > 0.12 = Wide complex tachycardia (ventricular tachycardia):
  - Correct electrolyte disturbances.
  - Consider toxins, overdoses.

Child

If unstable:
» Synchronised cardioversion at 0.5-1 J/kg initially (max 4 J/kg).
» Consider analgesia and sedation if time permits.

If stable:
Assess QRS length on rhythm strip or 12 lead ECG:
» If QRS < 0.08 = Narrow complex tachycardia (supraventricular tachycardia):
  - Attempt vagal stimulation: Ice water applied to face.
» If QRS > 0.08 = Wide complex tachycardia (ventricular tachycardia):
  - Correct electrolyte disturbances.
  - Consider toxins, overdoses.

REFERRAL

Urgent

All patients: transfer with supportive care and accompanying skilled worker until taken over by doctor at receiving institution.

21.1.5 MANAGEMENT OF SUSPECTED CHOKING/FOREIGN BODY ASPIRATION IN CHILDREN

T17.2-5/T17.8-9/ T18.0-1

If the child is **able to talk and breathe**	Encourage the child to cough repeatedly while arranging transfer to hospital urgently with supervision.
If the child is **conscious but with no effective cough or breathing**	Give 5 back blows, followed by 5 chest/ abdominal thrusts, followed by re-assessment of breathing. and then repeated as a cycle until recovery or child becomes unconscious. See differences below for infants and children.
If the child is **unconscious with no effective breathing**	Call for assistance. Open airway and check for any visible foreign body and remove. Start CPR: compressions and breaths (30:2) (check airway for foreign body each time before giving breaths).

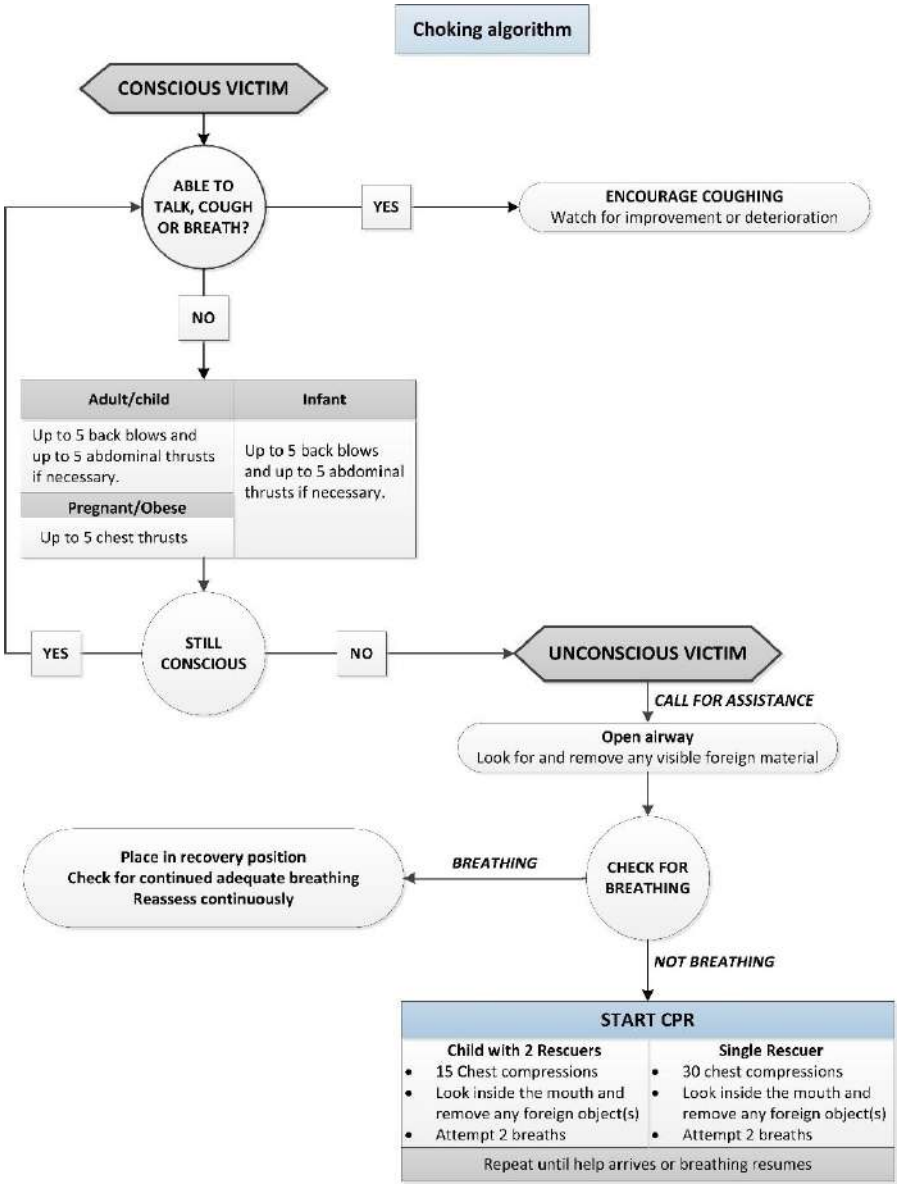
(Infant: < 1 year of age; Child: > 1 year of age until puberty).

Techniques for back blows and chest/abdominal thrusts:

Infants
» Place the baby along one of the rescuer's arms in a head down position with baby face down.
» Rescuer to rest his/her arm along own thigh and deliver 5 back blows to the child.
» If this is ineffective turn the baby over (face up) and lay on the rescuer's thigh in the head down position.
» Apply 5 chest thrusts – use the lower ½ of the sternum – compress at least 1/3 of the anteroposterior diameter of the chest. If baby too large to carry out on the thigh this can be done across the lap.

Children

» In older children, rather lie child across rescuer's lap to deliver back blows. Use abdominal thrusts (Heimlich manoeuvre) in place of chest thrust.
» For abdominal thrust in the standing, sitting or kneeling position, rescuer to move behind the child and pass his/her arms around the child's body. Then, form a fist with one hand, and place against the child's abdomen above the umbilicus and below the xiphisternum. Then place the other hand over the fist and the thrust both hands sharply upwards into the abdomen towards the chest.
» In the lying (supine) position, the rescuer to kneel astride the victim and do the same manoeuvre except use the heel of one hand rather than a fist.



Adapted with permission from the Resuscitation Council of Southern Africa. http://resus.co.za/

LoE: III[416]

21.2 MEDICAL EMERGENCIES

21.2.1 PAEDIATRIC EMERGENCIES

Certain emergencies of the airway, breathing, circulation and neurological system are dealt with in the respiratory, cardiac and nervous system chapters. All doctors should ensure that they have received appropriate training in at least providing basic (and preferably advanced) life support to children.

21.2.1.1 RAPID TRIAGE OF CHILDREN PRESENTING WITH ACUTE CONDITIONS IN CLINICS AND CHCS

Triage is the process of rapidly examining all sick children when they first arrive at clinics in order to place them in one of three categories (Emergency, Priority, Non-urgent):

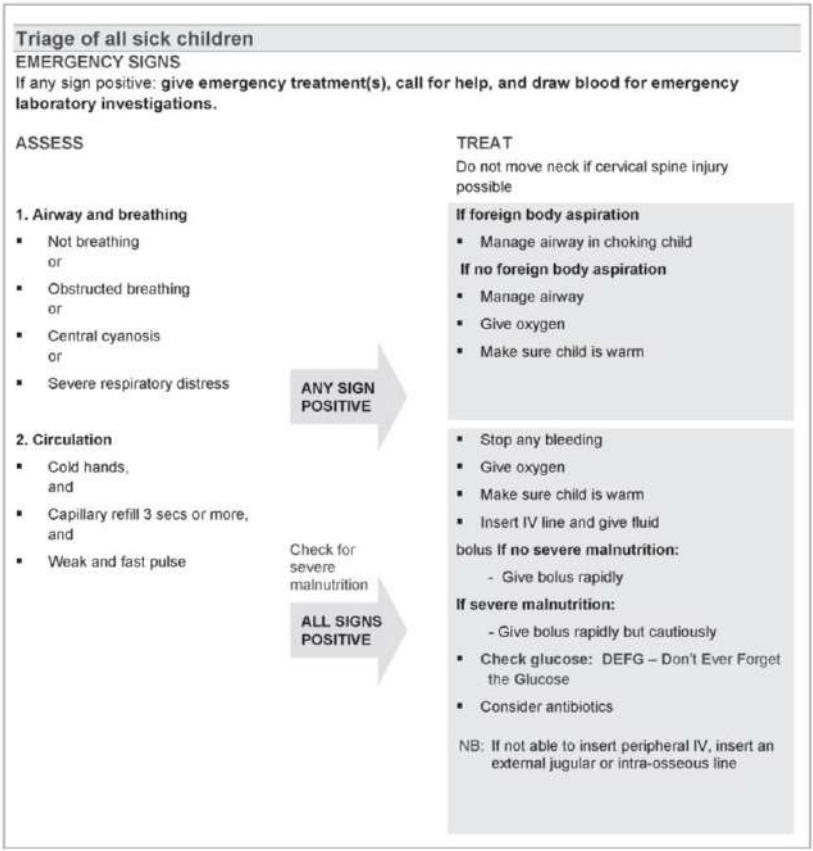


CHART 2. Triage of all sick children (continued)

EMERGENCY SIGNS

If any sign positive: give treatment(s), call for help, draw blood for emergency laboratory investigations (glucose, Hb, blood culture, malaria smear)

ASSESS		TREAT
3. Coma/convulsing ▪ Coma or ▪ Convulsing (now)	**IF COMA OR CONVULSING**	Do not move neck if cervical spine injury possible ▪ Manage airway ▪ Give oxygen ▪ Position the unconscious child (if head or neck trauma is suspected, stabilise the neck first) ▪ Give IV glucose, if indicated ▪ If convulsing, give Midazolam bucally or diazpam PR
4. Severe dehydration (only in child with diarrhoea) Diarrhoea plus any two of these: ▪ Lethargy ▪ Sunken eyes ▪ Very slow skin pinch	**DIARRHOEA plus TWO SIGNS POSITIVE** Check for severe malnutrition	▪ Attempt oral rehydration for 4 hours giving ORS 5ml/kg every 15 minutes ▪ If not improving, insert IV and give IV ½ DD: ◆ 20ml/kg/hr for 4hrs **if no severe malnutrition** ◆ 10ml/kg/hr for 8hrs **if severe malnutrition** ▪ Make sure child is warm ▪ Review 2 hourly ▪ Check glucose (especially if severe malnutrition or altered level of consciousness)

PRIORITY SIGNS (3TPR MOB)

These children need prompt assessment and treatment

- **T**iny baby (< 3 months)
- **T**emperature very high
- **T**rauma or other urgent surgical condition
- **P**allor (severe)
- **P**oisoning (history of)
- **P**ain (severe)
- **R**espiratory distress
- **R**estless, continuously irritable, or lethargic
- **R**eferral (urgent)
- **M**alnutrition: Visible severe wasting
- **O**edema of both feet
- **B**urns (major)

Note: If a child has trauma or other surgical problems, get surgical help or follow surgical guidelines

NON-URGENT

Proceed with assessment and further treatment according to the child's priority

Adapted from Pocketbook of Hospital Care for Children. Management of Common Childhood Illnesses. National Department of Health, South Africa, 2016. www.health.gov.za/

If any emergency sign is present, give emergency treatment(s), call for help, and draw blood for emergency laboratory investigations.

(A&B) Airway and Breathing

» Not breathing
or
» Obstructed breathing
or
» Central cyanosis
or
» Severe respiratory distress

(C) Circulation

» Cold hands
and
» Capillary refill ≥3 seconds
and
» Weak and fast pulse

(C) Coma/convulsing

» Coma
or
» Convulsing (now)

(D) Severe dehydration (e.g. in child with diarrhoea)

» Diarrhoea
plus
» Any two of:
- Lethargy
- Sunken eyes
- Very slow skin pinch

PRIORITY

Priority signs

These children need prompt assessment and treatment

» Tiny baby (< 3 months of age)
» High Temperature
» Trauma or other urgent surgical condition
» Pallor (severe)
» Poisoning (history of)
» Pain (severe)
» Respiratory distress
» Restless, continuously irritable, or lethargic
» Referred for urgent attention
» Malnutrition: visible severe wasting
» Oedema of both feet
» Burns (major)

NON-URGENT (queue)

Proceed with assessment and further treatment according to the child's priority.

The Emergency Triage Assessment and Treatment (ETAT) tool, presented above, should be a minimum standard of triage in community health centres.

(Alternative tool P-SATS is available, see the Paediatric Hospital level STGs and EML).

21.2.2 ANGINA PECTORIS, UNSTABLE

See Section 4.3: Angina pectoris, unstable/ Non ST elevation myocardial infarction (NSTEMI).

21.2.3 MYOCARDIAL INFARCTION, ACUTE (AMI)

See Section 4.4: Myocardial infarction, Acute (AMI)/ ST Elevation Myocardial Infarction (STEMI).

21.2.4 DELIRIUM

F05.0-1/F05.8-9/F44.8/R45.1/R45.4-6

DESCRIPTION

Delirium is a medical emergency.

Delirium is a disturbance in attention, awareness (reduced orientation to the environment), and cognition (e.g. memory deficit, language, visuospatial ability, or perception). It is acute, developing within hours to days, and fluctuates during the day, worsening in the evenings. It may be hyperactive, with increased mood lability, agitation, and/or uncooperative behaviour, or hypoactive, with poor responsiveness and stupor.

Delirium should not be mistaken for psychiatric disorders like schizophrenia or a manic phase of a bipolar disorder. It is a physiological consequence of another medical condition, substance intoxication or withdrawal (including prescription or over the counter medications and recreational substances), exposure to a toxin, or multiple aetiologies.

There are many possible causes including extracranial causes. Organic or physical illness should also be considered as possible causes.

The elderly are particularly prone to delirium caused by medication, infections, electrolyte and other metabolic disturbances.

Main clinical features are:

- acute onset (usually hours to days)
- impaired awareness
- confusion
- disorientation

Other symptoms may also be present:

- restlessness and agitation
- hallucinations
- autonomic symptoms such as sweating, tachycardia and flushing
- patients may be hypo-active, with reduced responsiveness to the environment
- a fluctuating course and disturbances of the sleep-wake cycle are characteristic
- aggressiveness
- violent behaviour alone occurs in exceptional cases only

Risk factors for delirium include:

» > 65 years of age
» history of stroke, neurological disorder, falls, previous delirium
» HIV infection
» polypharmacy
» psychoactive substance intoxication and withdrawal
» dementia
» medicines such as anticholinergics and hypnotics
» multiple comorbidities
» severe illness

GENERAL MEASURES

» Investigations need to be done to exclude or diagnose an underlying medical problem, the treatment of which is the primary management (e.g. hypoglycaemia, hypoxia, pain etc).

Checklist for diagnosis:

D Drugs (Intoxication and withdrawal. Consider Wernicke's encephalopathy).
I Infections, e.g. sepsis, pneumonia, urinary tract infections, peritonitis, meningitis.
M Metabolic, e.g. hypoglycaemia, electrolyte abnormalities (e.g. hyponatraemia); organ failure (e.g. liver failure, renal dysfunction), CO_2 narcosis.
T Trauma, e.g. chronic subdural haematoma.
O Oxygen deficit (including hypoxia, carbon monoxide poisoning).
P Psychiatric or physical conditions, e.g. severe stressor pain.

» Nurse in a calm, predictable and safe environment, avoid changes of staff or rooms/ wards.
» Maintain circadian rhythm: in the day mobilise, provide sensory stimulation/ spectacles/ hearing aids; at night avoid noise, light and procedures
» Ensure effective communication: introduce self with each patient contact, be aware of patient's non-verbal cues, listen attentively, reassure frequently.
» Re-orientate verbally, with a clock, and signage
» Assess for and address dehydration, constipation, hypoxia, infections, pain, and discomfort.
» Avoid abrupt substance withdrawal (see Section 16.9: Substance misuse).
» Note: Physical restraint worsens the outcomes of delirious patients: this is a last resort when all else has failed and is a short-term measure until chemical restraint has been achieved.

EMERGENCY TREATMENT

Treat the underlying medical condition.

Acute management

For the management of severe aggression and disruptive behaviour, see Section 15.1: Aggressive, disruptive behaviour in adults.

If the delirium is caused by seizures or substance withdrawal, or if communication is difficult

- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR

- Diazepam, IV, 10 mg for immediate sedative or hypnotic action.
  - If no response, give a 2nd dose.
  - Do not administer at a rate over 5 mg/minute.

Switch to oral administration, once containment is achieved.
» Secure airway.
» Exclude hypoglycaemia.
» Monitor for respiratory depression.

CAUTION - Benzodiazepines

» Benzodiazepines, especially diazepam IV, can cause respiratory depression.
» Monitor vital signs closely during and after administration.In the frail and elderly patient or where respiratory depression is a concern, reduce the dose by half.
» The safest route of administration is oral followed by IM with the IV route having the highest risk of respiratory depression and arrest. Use the safest route wherever possible.
» Use haloperidol instead of benzodiazepines in patients with respiratory insufficiency.
» In the short-term, benzodiazepines can aggravate delirium.
» Allow at least 15–30 minutes for the medication to take effect. Repeated IM doses of benzodiazepines may result in toxicity owing to accumulation.

LoE: III[417]

If the most likely cause of delirium is a medical disorder and if very restless:
- Haloperidol, IM, 5 mg, immediately.
  - In elderly: 2.5 mg, immediately.
  - If no response give a second dose.

If alcohol withdrawal/ Wernicke's encephalopathy suspected:
- Thiamine, IV/IM, 100 mg immediately.

See Section 16.9.4: Alcohol withdrawal (uncomplicated).

REFERRAL
Urgent
All cases.

21.2.5 HYPERGLYCAEMIA AND KETOACIDOSIS
See Section 9.3.2: Severe hyperglycaemia (Diabetic ketoacidosis (DKA) & hyperosmolar hyperglycaemic state (HHS)).

21.2.6 HYPOGLYCAEMIA AND HYPOGLYCAEMIC COMA
E10.0/E10.6/E11.0/E11.6/E12.0/E12.6/E13.0/E13.6/E14.0/E14.6

DESCRIPTION
Hypoglycaemia is a blood sugar < 3 mmol/L (< 2.6 mmol/L in neonate) and may rapidly cause irreversible brain damage and/or death.
Clinical features include:

» tremor
» sweating
» tachycardia
» dizziness
» hunger
» headache
» confusion
» delirium
» coma
» convulsions
» transient aphasia or speech disorders
» irritability

» impaired concentration

There may be few or no symptoms in the following situations:

» chronically low blood sugar
» patients with impaired autonomic nervous system response, e.g.
  - the elderly
  - very ill
  - those with long-standing diabetes mellitus
  - malnourished
  - treatment with beta-blockers

People at risk of hypoglycaemia:

» neonates with low birth weight or ill or not feeding well
» malnourished or sick children
» shocked, unconscious or convulsing patients
» alcohol binge
» liver disease
» diabetics on treatment

Hypoglycaemia may be a marker of deteriorating renal function.

EMERGENCY TREATMENT

» Obtain blood for glucose determination immediately.
» Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to feed

Adult

- Sweets, sugar, glucose or milk by mouth.
  or
- Oral sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water.

Breastfeeding child

- Administer breast milk.

Older children

- A formula feed of 5 mL/kg.
  or
- Oral sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water; administer 5 mL/kg.
  or
- Sweets, sugar, glucose by mouth.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5mL/kg.
  (add 1 part 50% dextrose water to 4 parts water to make 10% solution)
  or
- Milk.
  or
- Sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water – administer 5 mL/kg.

Unconscious patient

Children

- Dextrose 10%, IV, 2–5 mL/kg.
  - 10% solution, e.g.: 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.
  - Take a blood sample for emergency investigations and blood glucose.
  - After dextrose bolus, commence dextrose 5–10% infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.
  - Re-check blood glucose after 15 minutes: if blood sugar is still low: give further bolus of dextrose 10%, IV, 2 mL/kg and continue dextrose infusion.
  - Feed the child as soon as conscious.
  - Investigate underlying cause e.g. infection.

Adults

- Dextrose 10%, IV, 5 mL/kg immediately and reassess.
  - 10% solution, e.g.: 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.
  - Generally, an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution until blood glucose is stabilised.
  - Investigate underlying cause e.g. infection.

Note: The volume of dextrose has been changed in the above-mentioned protocol. *LoE:III*[418]

Alcoholics/ Malnourished (adults)

- Thiamine, IV/IM, 100 mg immediately.

CAUTION

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children who have had documented hypoglycaemia (unless the cause is clearly identified and safe management instituted to prevent recurrence).

21.2.7 NOSE BLEED (EPISTAXIS)

R04.0

DESCRIPTION

Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking and occurs from an area anterior and inferior to the nasal septum. Consider other conditions associated with nosebleeds, especially if recurrent, e.g. hypertension and bleeding tendency.

MANAGEMENT

Acute episode

Control bleeding by pinching the nasal wings (alae) together for 5–10 minutes.
If this fails, insert nasal tampons or BIPP stripping into bleeding nostril(s), if available.
Identify underlying cause.

REFERRAL

» Recurrent nose bleeds.
» Failure to stop the bleeding.

21.2.8 PULMONARY OEDEMA, ACUTE

J81

DESCRIPTION

A life-threatening condition with abnormal accumulation of fluid in the lungs.
Common causes include acute heart failure and acute renal failure (e.g. acute nephritis).
Persons with pulmonary oedema may present similarly to acute bronchospasm.
It is important to distinguish this condition from an acute attack of asthma.

EMERGENCY TREATMENT

Place the patient in a sitting or Semi-Fowlers position.

Children

- Oxygen, using a 40% face mask or nasal cannula at 2–3 L/minute.
- Furosemide, IV, 1 mg/kg immediately administered slowly over 5 minutes. See dosing table, pg 23.5.
  - Do not put up a drip or run in any IV fluids.

Adults

- Oxygen, using face mask to deliver 40% oxygen at a rate of 6–8 L/minute.

AND

- Furosemide, slow IV, 40 mg.
  If response is adequate follow with:
  - Furosemide, IV, 40 mg in 2–4 hours.

  If no response within 20–30 minutes:
  - Furosemide, IV, 80 mg.

AND

- Isosorbide dinitrate, sublingual, 5 mg immediately.
  - If needed, repeat every 5–10 minutes. *LoE:III*
  - Do not administer if hypotensive. Monitor BP.

If patient very anxious or restless, doctor to consider adding morphine:

- Morphine, IV, to a total maximum dose of 10 mg (Doctor prescribed).
  - Dilute 10 mg up to 10 mL with sodium chloride 0.9%.
  - Morphine, IV, 3–5 mg as a single dose then further boluses of 1–2 mg/minute and monitor closely.
  - Total maximum dose: 10 mg.
  - Repeat after 4 hours if necessary.

- Monitor response to pain and effects on respiration and BP. *LoE:III*[419]

Pulmonary oedema due to a hypertensive crisis:
ADD

To treat hypertension:
I10
- ACE-inhibitor, e.g.
- Enalapril 10 mg, oral, as a single dose and refer.

REFERRAL
Urgent
All cases.
(Continue oxygen during transfer).

21.2.9 SHOCK
R57.0-2/R57.8-9/T09.3/T79.4/T78.2 + (Y34.99/Y57.9/Y14.99)

DESCRIPTION
Shock is a life-threatening condition characterised by any evidence of inadequate organ perfusion.

Signs and symptoms of shock in adults
» Low blood pressure (systolic BP < 80 mmHg) is the key sign of shock.
» Weak and rapid pulse
» Rapid shallow breathing.
» Low urine output
» Restlessness and altered mental state
» Weakness

Signs and symptoms of shock in children
Shock must be recognised while still in the compensated state to avoid irreversible deterioration. Therefore, the following are primarily assessed in children:
» Prolonged capillary filling (> 3 seconds).
» Decreased pulse volume (weak thready pulse).
» Increased heart rate (>160 beats/minute in infants, > 120 beats/minute in children).
» Decreased level of consciousness (poor eye contact).
» Rapid breathing.
» The signs mentioned above are more sensitive in detecting shock, before irreversible. Decreased blood pressure and decreased urine output are late signs of shock and can be monitored.

Normotensive BP values in children:

	Age of child (years)				
	<1	**1-2**	**2-5**	**5-12**	**>12**
Respiratory rate (breaths/min)	30–40	25–35	25–30	20–25	15–20
Heart rate (beats/min)	110–160	100–150	95–140	80–120	60–100
Systolic BP (mmHg)	80–90	85–95	85–100	90–110	100–120

Source: The Hands-on Guide to Practical Paediatrics, First Edition. Rebecca Hewitson and Caroline Fertleman. © 2014 John Wiley & Sons, Ltd. Published 2014 by John Wiley & Sons, Ltd. Companion Website: www.wileyhandsonguides.com/paediatrics

Types of shock:
» *Hypovolaemic shock:* Most common type of shock. Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, etc.
» *Cardiogenic shock:* Caused by the failure of heart to pump effectively e.g. in myocardial infarction, cardiac failure, etc.
» *Septic shock:* Caused by an overwhelming infection, leading to vasodilation.
» Anaphylactic shock: Caused by severe allergic reaction to an allergen, or medicine.

EMERGENCY TREATMENT

LoE:I[420]

» Maintain open airway.
• Administer face mask oxygen, if saturation < 94%.
» Consider the need for intubation and seek advice from referral centre.
» Check for and manage hypoglycaemia.
» If anaphylactic shock suspected, see Section 21.2.10: Anaphylaxis.

Intravenous fluid therapy is important in the treatment of all types of shock, except for cardiogenic shock and septic shock (as fluid-overloaded patients do not need fluid replacement) – these patients should receive a fluid challenge as detailed below. Prompt diagnosis of the underlying cause is essential to ensure optimal treatment.

Fluid replacement (avoid in cardiogenic and septic shock):

Adults
- Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  - Repeat bolus until haemodynamic status is improved.
  - Once stable, maintain IV fluids with careful monitoring of haemodynamic status; adjust infusion rate as needed to maintain stability pending transfer.

Children
- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus until haemodynamic status is improved.
  - Once stable, maintain IV fluids with careful monitoring of haemodynamic status; adjust infusion rate as needed to maintain stability pending transfer.

Note: If patient develops respiratory distress, recheck airway and breathing and discontinue fluids.

In adults with suspected cardiogenic or septic shock: give a fluid challenge:
- Sodium chloride 0.9%, IV, 500 mL over 30 minutes.
  - Assess blood pressure and pulse rate response. Response is defined by improvements in blood pressure, pulse rate and mental status (adequate cerebral perfusion) in addition to a good urine output, rather than an absolute blood pressure value.
  - If response is positive, then continue with intravenous fluid. Monitor the patient and stop fluids if patient is breathless. Avoid over hydrating as this could exacerbate hypoxia associated with adult respiratory distress syndrome.
  - If no adequate response to fluid challenge (as described above), suspect septic shock and repeat fluid challenge.

Septicaemia in children:
All children with shock, which is not obviously due to trauma or simple watery diarrhoea, should in addition to fluid resuscitation, receive antibiotic cover for probable septicaemia.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL

Urgent
All patients, after resuscitation.

21.2.10 ANAPHYLAXIS

T78.2 + (Y34.99/Y57.9/Y14.99)

DESCRIPTION

A very severe allergic reaction that usually occurs within seconds or minutes after exposure to an allergen, but may be delayed for up to 1 hour. The reaction can be short-lived, protracted or biphasic, i.e. acute with recurrence several hours later. Immediate reactions are usually the most severe and/or life-threatening.
Clinical features include:

» Acute onset of signs and symptoms.
» Urticaria (hives) or angioedema.
» Bronchospasm, wheezing, dyspnoea, chest tightness.
» Laryngeal oedema with upper airway obstruction or stridor.
» Gastrointestinal symptoms such as nausea, vomiting, diarrhoea.
» Hypotension and/or shock.
» Dizziness, paraesthesia, syncope, sweating, flushing, dysrhythmias.

EMERGENCY TREATMENT

» Resuscitate (CAB) immediately (See Section 21.1: Cardiopulmonary arrest–cardiopulmonary resuscitation).
» Place hypotensive or shocked patient in horizontal position. Do NOT sit the patient up.
» Severe anaphylaxis: administer oxygen by facemask at high flow rate of 15 L/min.
» Remove the trigger if possible.

MEDICINE TREATMENT

First line priority:

Adrenaline (epinephrine) is the mainstay of treatment and should be given immediately.

- Adrenaline (epinephrine), 1:1000, IM, 0.01 mL/kg as a single dose.
  - Children: 1:1000, IM, 0.01 mL/kg as a single dose. See dosing table, pg 23.5.
  - Adults: 1:1000, IM, 0.5 mg (0.5 mL) as a single dose, into the lateral thigh.
  - Repeat in 5 minutes if no improvement.

Second line priority:

- Oxygen, 8-10 L/minute via facemask or up to 100% oxygen, as needed.

AND *LoE: III*[421]

If hypotension not responding promptly to adrenaline (epinephrine), also give:

- Sodium chloride 0.9%, IV:
  - Children: 20 mL/kg, over 5 to 10 minutes. Repeat as needed.
  - Adults: 1000–2000 mL, at the most rapid flow rate possible in the first minutes of treatment. Repeat as needed.

CAUTION
Monitor continuously for clinical response and fluid overload.

AND *LoE: III*[422]

If wheeze:

- Salbutamol 0.5%, solution, nebulised, with high flow oxygen.
  - 0.5–1 mL (2.5–5 mg) salbutamol 0.5% solution, in 4 mL of sodium chloride 0.9%.

AND *LoE: III*[423]

- Ipratropium bromide, solution, added to salbutamol solution.
  - Children: 0.5–1 mL (0.125–0.25 mg)
  - Adults: 2 mL (0.5 mg) *LoE: III*[424]

AND

- Hydrocortisone, IM/slow IV, immediately.
  - Children: 5 mg/kg immediately. See dosing table, pg 23.5. *LoE:III*[425]
  - Adults: 200 mg immediately. *LoEIII*[426]

AND

- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg. See dosing table, pg 23.8. *LoE: III*[427]
  - Adults: 25–50 mg.

REFERRAL

All patients.

Note: Adrenaline (epinephrine) administration may have to be repeated due to its short duration of action. Observe closely during transport.

21.2.11 SEIZURES AND STATUS EPILEPTICUS

G41.0-2/G41.8-9

For description and general measures of seizures, see Section 15.3: Seizures.

DESCRIPTION

This is a medical emergency and has the potential for causing high mortality.

Status epilepticus is a series of seizures follow one another lasting > 30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.

Do not wait for established status epilepticus to terminate convulsions. Convulsions lasting > 5 minutes should be terminated.

GENERAL MEASURES

» Place the patient in a lateral (recovery) position.
» **Do not** place anything (spoon or spatula, etc.) in the patient's mouth.
» Do not try to open the patient's mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen
» Prepare for intubation if sufficiently skilled in the procedure and relevant rescue devices are available.
» Check blood glucose (exclude hypoglycaemia).
» Monitor vital signs every 15 minutes.
» Establish an IV line.

MEDICINE TREATMENT

Children < 12 years of age

- Midazolam, buccal, 0.5 mg/kg/dose. See dosing table, pg 23.7.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - If seizures persist for > 5 minutes, repeat the dose and refer urgently.
  - Note: Buccal midazolam should not be used in infants < 6 months of age.

OR *LoE:II*[428]

- Midazolam, IM:
  - Child > 13 kg: midazolam, IM, 5 mg, repeat once after 5–10 minutes if still fitting.

OR *LoE:II*[429]

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 23.4.
  - Use diazepam for injection 10 mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1–5 minutes.

CAUTION
Benzodiazepines, can cause respiratory depression.
Monitor closely for respiratory depression. If this occurs, assist ventilation with bag-valve mask (1 breath every 3–5 seconds) and refer urgently.

If no response after two consecutive doses of either midazolam or diazepam, and if the convulsion has lasted more than 20 minutes:

ADD

- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose. See dosing table, pg 23.8. *LoE: III*[430]

Adults

- Midazolam, IM, 10 mg, immediately.
  - Repeat once after 5–10 minutes if still fitting. *LoE: I*[431]

OR

- Midazolam, buccal, 10 mg using the parenteral formulation.
  - Repeat once after 5–10 minutes if still fitting. *LoE: III*

OR

- Diazepam, slow IV, 10 mg.
  - Administer at a rate not exceeding 5mg/minute.
  - Repeat within 5 minutes if needed.
  - Maximum dose: 20 mg within 1 hour.
  - Expect a response within 1–5 minutes. *LoE: III*[432]

CAUTION
Benzodiazepines can cause respiratory depression.
Monitor closely for respiratory depression. If this occurs, assist ventilation with bag-valve mask (1 breath every 3-5 seconds) and refer urgently.
Avoid diazepam IM since absorption is slow and erratic.
Do not mix diazepam with other medicines in same syringe.

REFERRAL

Urgent
Seizures that cannot be controlled.
Non-urgent
All patients once stabilised.
Note: Clinical notes describing medication administered and route of administration should accompany patients.

21.3 TRAUMA AND INJURIES

21.3.1 BITES AND STINGS

21.3.1.1 ANIMAL BITES

S01.0-9/S11.0-2/S11.7-9/S21.0-2/S21.7-9/S31.0-5/S31.7-8/S41.0-1/S41.7-8/S51.0/S51.7-9/S61.0-1/S61.7-9/S71.0-1/S71.7-8/S81.0/S81.7-9/S91.0-3/S91.7/T01.0-3/T01.6/T01.8-9/T09.1/T11.1/T13.1/T14.0-1/A82.0-1/A82.9/Z24.2/Z20.3 + External Cause Code (W,X,Y,Z)

Note: Rabies and tetanus are notifiable medical conditions.

DESCRIPTION

Animal bites may be caused by:

» Domestic animals e.g. horses, cows, dogs, cats.
» Wild animals e.g. jackals, mongooses (meerkats), bats.

Animal bites may result in:

» Wound infection, often due to mixed aerobic and anaerobic infection.
» Puncture wounds.
» Tissue necrosis.
» Transmission of diseases, e.g. tetanus, rabies.

NICD hotline for rabies advice: 0828839920

Suspected rabid bite

Any mammal bite can transmit rabies. Rabies incubation period is at least 9–90 days, but could be much longer. In suspected rabies exposure of a person by a domestic animal, attempt to trace source animal to determine likelihood of rabies. Observe the suspected rabid animal for abnormal behaviour for 10 days. If the animal remains healthy for 10 days, rabies is unlikely.

Note: If the animal has to be put down, care should be taken to preserve the brain, as the brain is required by the state veterinarian for confirmation of diagnosis. The animal must not be killed by shooting it in the head, as this will damage the brain.

Category	Type of exposure	Management
1	» Touching/feeding of animal. » Licking of intact skin.	» No treatment if history is reliable. » If history not reliable, treat as category 2.
2	» Nibbling of uncovered skin. » Superficial scratch without bleeding.	» Wound management. » Administer full course vaccine. Only stop if animal tested negative for rabies or is still healthy after 10 days' observation. » Don't give immunoglobulin, except in immunocompromised patients.
3	» Bites/scratches that penetrate the skin and with any visible blood. » Licking of broken skin or mucous membranes e.g. eyes and mouth. » Bat bites: – Any close contact with a bat: single or multiple bites or scratches and bruising (even	» Wound management. » Administer full course vaccine. » Only stop if animal tested negative for rabies or is still healthy after 10 days' observation. » Administer rabies immunoglobulin. » Administer tetanus vaccine. » Prescribe antibiotics.

	with minor bites or unapparent skin penetration). – Direct physical contact with bat saliva or neural tissue; contact of mucous membranes with bat saliva, droppings or urine.	

MEDICINE TREATMENT

Emergency management

Wound management:

Wash wound thoroughly with soap under running water for 5–10 minutes.

- Chlorhexidine 0.05%, aqueous solution.

Apply disinfectant if available:

- Povidone iodine 10%, solution.

CAUTION

Do not suture bite wounds unless on the head/face.
Clean thoroughly, dress (avoid compressive dressings) and review after 48 hours for secondary closure at that time.

The following treatment may be commenced in facilities designated by Provincial/Regional Pharmaceutical Therapeutics Committees. If access to rabies vaccine and immunoglobulin is not immediately available refer urgently.

Note: Rabies PEP (post-exposure prophylaxis) schedule varies for immunocompromised patients. The degree to which a patient is immunocompromised should preferably be verified by a physician and includes congenital immunodeficiency, HIV infection, leukaemia, lymphoma, generalised malignancy, radiation, immunosuppressant medicines, e.g. long-term therapy of corticosteroids, etc.

Rabies immunoglobulin:

» Only indicated for:
  - Category 3, immunocompetent patients.
  - Category 2 and 3 immunocompromised patients.
  - All bat exposures.

» Available from the nearest district hospital.

» If not immediately available, source and give as soon as possible.

- Rabies immunoglobulin 20 IU/kg.
  - Infiltrate as much as possible in and around the wound and inject the rest IM (not buttock, unless the wound is on the buttock).
  - Follow with a complete course of vaccine.

Rabies vaccination:

Only indicated for category 2 and 3 exposure.
Available from the nearest district hospital.

Children

- Rabies vaccine, 1 amp, IM anterolateral thigh.
  Day 0 – single dose
  Day 3 – single dose

Day 7 – single dose
Day 14 – single dose
Day 28 – single dose(only if immunocompromised).

Adults

- Rabies vaccine, 1 amp, IM deltoid.

Day 0 – single dose
Day 3 – single dose
Day 7 – single dose
Day 14 – single dose

Day 28 – single dose(only if immunocompromised).

CAUTION
Do not administer rabies vaccine into buttocks (gluteus maximus).

Tetanus prophylaxis if not previously immunised within the last 5 years:
Z23.5

- Tetanus toxoid vaccine (TT), IM, 0.5 mL.

Note: In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin may produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Antibiotic treatment (only for category 3 exposure, hand wounds):

Children

- Amoxicillin/clavulanic acid, oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days.

Weight kg	**Dose mg** (amoxicillin component)	**Use one of the following**			**Age** months/years
		Susp 125/31.5 mg/5 mL	**Susp** 250/62.5 mg/5 mL	**Tablet** 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Children > 35 kg and adults

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table pg 23.2.

Children > 35 kg and adults

- Macrolide, e.g.:

- Azithromycin, oral, 500 mg daily for 3 days.

AND

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 23.7.

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

PREVENTION

» Regular vaccination of domestic cats and dogs.
» Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

REFERRAL

» Deep and large wounds requiring suturing.
» Shock and bleeding.
» Possible rabies exposure (for immunoglobulin and vaccination).
» Severe infected wounds or infected wounds not responding to oral antibiotics.
» Hand bites.

21.3.1.2 HUMAN BITES

S01.0-9/S11.0-2/S11.7-9/S21.0-2/S21.7-9/S31.0-5/S31.7-8/S41.0-1/S41.7-8/S51.0/S51.7-9/S61.0-1/S61.7-9/S71.0-1/S71.7-8/S81.0/S81.7-9/S91.0-3/S91.7/T01.0-3/T01.6/T01.8-9/T09.1/T11.1/T13.1/T14.0-1 + External Cause Code (W,X,Y,Z)

DESCRIPTION

Human bites may be accidental or intentional (form of assault).
Human bites may result in:

» Wound infection, often due to mixed aerobic and anaerobic infection.
» Puncture wounds.
» Tissue necrosis.
» Transmission of diseases, e.g. HIV, hepatitis.

MEDICINE TREATMENT

Wound management:

Wash wound thoroughly with soap under running water for 5–10 minutes.

- Chlorhexidine 0.05%, aqueous solution.

Apply disinfectant if available:

- Povidone iodine 10%, solution.

CAUTION

Do not suture bite wounds unless on the head/face. Clean thoroughly, dress (avoid compressive dressings). Review after 48 hours for secondary closure at that time.

Tetanus prophylaxis:

Z23.5

If not previously immunised within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL. *LoE: III[433]*

Antibiotic treatment:

Children

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days.

Weight kg	Dose mg (amoxicillin component)	Use one of the following			Age months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Children > 35 kg and adults

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table pg 23.2.

AND

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 23.7.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

AND

- Metronidazole, oral, 400 mg, 8 hourly for 5 days.

Hepatitis B prophylaxis (if bite is severe enough to cause bleeding):
Z29.8
See section 21.3.6.3: Post exposure prophylaxis, inadvertent (non-occupational).

HIV prophylaxis
The risk of HIV transmission through biting is negligible. Post-exposure prophylaxis is not indicated after a bite. *LoE: II*[434]

REFERRAL

» Deep and large wounds requiring suturing.
» Shock and bleeding.
» Severe infected wounds or infected wounds not responding to oral antibiotics.
» Hand bites.

21.3.1.3 INSECT STINGS, SCORPION STINGS AND SPIDER BITES

T63.2/3/4 + External Cause Code (V,W,X,Y)

Poisons Information Helpline:0861555777
See Section 21.3.3: Exposure to poisonous substances.

DESCRIPTION

Injury from spider bites and stings by bees, wasps, scorpions and other insects.
Symptoms are usually local such as pain, redness, swelling and itching.

Bees and wasps

» Venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylaxis (see Section 21.2.10: Anaphylaxis).

Spiders and scorpions

» Most are non-venomous or mildly venomous, but some may be extremely venomous and constitute a medical emergency.

MEDICINE TREATMENT

Emergency treatment:
Treat anaphylaxis (bee/wasp stings). See Section 21.2.10: Anaphylaxis.

Severe local symptoms:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

CAUTION
Do not give an antihistamine to children < 2 years of age.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

AND

- Calamine lotion, applied when needed.

If hypersensitivity response to insect bite with inflamed lesion, see Section 5.10.4: Papular urticaria.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Cytotoxic lesions:
Avoid giving prophylactic antibiotics for bites and stings.

If secondary skin infection (site red, swollen, hot, tender, pus may be present), manage as cellulitis. See Section 5.4.3: Cellulitis.

Very painful scorpion stings:

- Lidocaine 2%, 2 mL injected around the bite as a local anaesthetic.

Local application of ice, if tolerated.

For spider bites and scorpion stings: Tetanus prophylaxis:

Z23.5

If not immunised within the last 5 years:

- Tetanus toxoid vaccine (TT), IM, 0.5 mL. *LoE:III*[435]

REFERRAL

» For possible antivenom (neurotoxic spider bites or scorpion stings), if applicable, and intensive care, if necessary.

» Presence of systemic manifestations:

- weakness
- drooping eyelids
- hypersalivation
- sweating
- difficulty in swallowing and speaking
- double vision
- muscle cramps
- paraesthesia
- difficulty in breathing
- agitation/restlessness in children

Note: Send the spider or scorpion with the patient, if available.

» If secondary infection of bite/sting present, that is not responding to 1st line antibiotics.

21.3.1.4 SNAKEBITES

T63.0 + (X20.99/W59.99)

DESCRIPTION

Of all the snake species found in South Africa, about 12% are considered to be potentially dangerous to humans. However, all snakebites should be considered dangerous until proven otherwise. In the majority of snakebite incidents, the offending snake is not identified.

South African poisonous snakes can be broadly divided into 3 groups according to the action of their venom although there is significant overlap of toxic effects in some snake venoms.

8. **Cytotoxic venoms:**

» Venom causes local tissue damage and destruction around the area of bite, including swelling, discolouration of the skin and blister formation.

» Bite is painful and symptoms usually start within 10–30 minutes after the bite.

» Examples include: Puff adder, Gaboon adder, Mozambique spitting cobras, other smaller adders and spitting cobra, stiletto snake, Rinkhals (cytotoxic as well as neurotoxic).

9. **Neurotoxic venoms:**

» Neurotoxic venom causes weakness, ptosis, drooling and dysphagia, pins and needles, sweating, blurred vision, hypotension, paralysis of skeletal muscles and respiratory compromise.

» Bite is not as painful as cytotoxic venom bites.

» Symptoms usually start in 15–30 minutes.
» Examples include: Black and green mamba, non-spitting cobras (Cape, forest, snouted), Berg adder (neurotoxic as well as cytotoxic), Rinkhals (cytotoxic as well as neurotoxic)

10. **Haemotoxic venoms:**

» Venom affects the clotting of blood causing bleeding tendency that may present within hours or up to a few days after the bite.
  - Boomslang
  - Vine snake

Symptoms and signs of snakebite envenomation include:

Local

» Fang marks with or without pain.
» Swelling around the bite, which may be severe with discolouration of skin and/or blister formation.
» Bleeding or oozing from bite site.

Note: the absence of fang marks does not exclude envenomation.

Systemic

» Nausea, vomiting.
» Sweating, hypersalivation and hypotension.
» Pins and needles.
» Skeletal muscle weakness (descending paralysis), which may cause:
  - drooping eyelids
  - double vision
  - difficulty in swallowing
  - difficulty in breathing
» Shock.
» Rarely bleeding (epistaxis, haematuria, haematemesis or haemoptysis).

CAUTION
Do not apply a tourniquet.
Do not apply a restrictive bandage to the head, neck or trunk.
Do not squeeze or incise the wound.
Do not attempt to suck the venom out.

GENERAL MEASURES

Emergency treatment

» Remove clothing from site of the bite and rings if an extremity bite.
» Clean the wound thoroughly with chlorhexidine 0.05%, aqueous solution.
» Be prepared to support ventilation in neurotoxic bites as this can be life-saving.
» To prevent spread to vital organs, immediately apply a wide crepe bandage firmly from just above the bite site up to 10–15 cm proximal to the bite site. Apply no tighter than for a sprained ankle.
» Immobilise the affected limb with a splint or sling.
» Obtain an accurate history e.g. time of the bite, type of snake.
» If the snake is unidentified, observe for 24 hours with repeated examinations. Absence of symptoms and signs for 6–8 hours usually indicates a harmless bite.
» For neurotoxic bites only:
  - As this may be life-saving, support ventilation as required.

- To prevent spread to vital organs: immediately apply a wide crepe bandage firmly from distal to the bite site up to 10–15 cm proximal to the bite site. Apply no tighter than for a sprained ankle.

MEDICINE TREATMENT

Venom in the eyes: S05.9 + (X20.99)

Irrigate the eye thoroughly for 15–20 minutes with water or sodium chloride, 0.9%.

- Tetracaine 1%, drops (if available), instil 1 drop into the affected eye(s) before irrigation. *LoE:III*

Refer the patient.

Pain:

- Non-opioid analgesics according to severity. See Section 20.3: Chronic non-cancer pain.

Note: The use of NSAIDs is not recommended due to the antiplatelet effect and the potential danger of renal failure in a hypotensive patient. *LoE:III*[436]

Shock:

Treat if present. See Section 21.2.9: Shock.

Tetanus prophylaxis:

Z23.5

If not previously immunised within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL.

Note:

» **The majority of patients do not need and should not be given antivenom.**
» Adverse reactions to antivenom (including anaphylaxis) are common and may be severe.
» The dose of antivenom is the same for adults and children.
» Polyvalent antivenom does NOT include antivenom for Berg adders or Stiletto snakes. Management for these snakebites is symptomatic and supportive only.
» Antibiotics are seldom needed, except for secondary infection. *LoE:III*[437]

Criteria for antivenom administration

All patients with systemic signs and symptoms or severe spreading local tissue damage should receive antivenom.

» Signs of neurotoxicity.
» Positively identified puff adder, Gaboon adder, Mozambique spitting cobra or rinkhals bites AND evidence of severe progressive cytotoxicity.
» Unidentified snakebites and evidence of severe progressive cytotoxicity envenomation, i.e.:
  - swelling of whole hand or foot within 1 hour
  - swelling to the knee or elbow in < 6 hours
  - swelling of the whole limb in < 12 hours
  - swelling progression > 2.5cm per hour
  - a threatened airway due to swelling
  - evidence of complication, e.g. compartment syndrome *LoE:III*[438]

REFERRAL

» All patients with bites or likely bites even if puncture marks are not seen. If possible, take the dead snake to the referral centre for identification. Referral centre will determine if antivenom is indicated.
» If patient presents at the clinic with their own antivenom, contact the secondary level hospital for advice (antivenom should be given as soon as possible, however administration may be considered even as late as 48-72 hours after the bite, if there is continued clinical deterioration indicating ongoing venom activity).

South African Vaccine Producers (SAVP):
Office hours: (011) 386 6062/6063/6078
After hours: (011) 386 6000 or 071 680 9897

21.3.2 BURNS

T30.0-3/T31.0-9 + (Y34.99)

DESCRIPTION

Burns lead to skin and soft tissue injury and may be caused by:
» heat, e.g. open flame, hot liquids, hot steam,
» chemical compounds,
» physical agents, e.g. electrical/lightning) or
» radiation.

The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues.
Initially, burns are usually sterile.

Assessment of burns

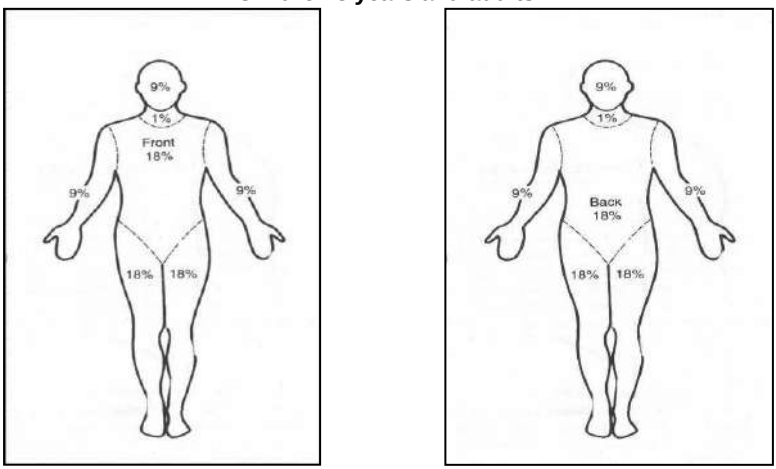
Depth of burn wound	Surface /colour	Pain sensation/healing
Superficial or epidermal	Dry, minor blisters, erythema	» Painful » Heals within 7 days
Partial thickness superficial or superficial dermal	Blisters, moist	» Painful » Heals within 10–14 days
Partial thickness deep or deep dermal	Moist white or yellow slough, red mottled	» Less painful » Heals within a month or more Generally needs surgical debridement and skin graft
Full thickness (complete loss of skin)	Dry, charred whitish, brown or black	» Painless, firm to touch » Healing by contraction of the margins (generally needs surgical debridement and skin graft)

The figures below are used to calculate body surface area %*.

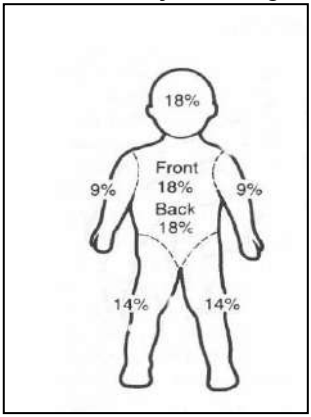
These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not just the front or back.

In children the palm of the hand, including the fingers, is 1%.

Children 8 years and adults



Children < 8 years of age



* Source: Karpelowsky JS, Wallis L, Madaree A, Rode H; South African Burn Society..South African Burn Society burn stabilisation protocol. S Afr Med J. 2007. Aug;97(8):574-7. https://www.ncbi.nlm.nih.gov/pubmed/17966146

Child and adult percentages					
Age years	**Head + neck Front + back**	**Torso Front**	**Torso Back**	**Leg + foot Front + back**	**Arm+ hand Front+ back**
<1	18%	18%	18%	14%	9%
1-<2	17%	18%	18%	14.5%	9%
2-<3	16%	18%	18%	15%	9%
3-<4	15%	18%	18%	15.5%	9%
4-<5	14%	18%	18%	16%	9%
5-<6	13%	18%	18%	16.5%	9%
6-<7	12%	18%	18%	17%	9%
7-<8	11%	18%	18%	17.5%	9%
≥ 8	10%	18%	18%	18%	9%

EMERGENCY TREATMENT

Follow the 7C's:

» Clothing: remove non-sticking clothing especially if hot or smouldering or constrictive (e.g. rings).
» Cool: with tap water for 30 minutes.
» Clean: with chlorhexidine.
» Cover: with a non-adherent dressing.
» Comfort: provide pain relief.
» Carbon dioxide poisoning: consider if enclosed fire, decreased LOC, disorientation.
» Consider inhalation injury if: carbonaceous (black-coloured) sputum, shortness of breath, perioral burns, hoarse voice stridor. Discuss with referral centre as early intubation may be needed.

MEDICINE TREATMENT

Fluid replacement

Burns ≤ 10% Total Body Surface Area (TBSA):
Oral fluids.

Burns > 10% of TBSA:

- IV fluid for resuscitation, replacement and maintenance.

Calculation of fluid replacement
Fluids in adults:
If shocked, see Section 21.2.9: Shock.

Replacement fluids for burns
First 24 hours:

- Sodium chloride 0.9%, IV.
  - Calculate total fluid requirement in 24 hours:
    Total % burn x weight (kg) x 4 mL.
  - Give half this volume in the first 8 hours.
  - Administer remaining fluid volume in next 16 hours.

Note: If urine output is not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Fluids in children:

Replacement fluids for burns

» First 8 hours:

Note: Avoid circumferential taping when securing infusion lines, as oedema under the eschar may decrease the venous return.

Weight kg	**Fluid volume (mL per hour) for the 1st 8 hours in burns of > 10% seen in PHC clinics while awaiting transfer:** • 0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10mL of 50% dextrose added to each 100mL.			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	15	19	23	28
>2.5–3.5 kg	20	25	31	36
>3.5–5 kg	28	36	44	51
>5–7 kg	40	50	62	73
>7–9 kg	53	70	84	100
>9–11 kg	67	85	105	120
>11–14 kg	82	105	125	150
>14–17.5 kg	95	125	155	185
>17.5–25 kg	115	155	190	235
>25–35 kg	147	200	250	310

» Next 16 hours:

Weight kg	**Fluid volume (mL per hour) for the 2nd (next) 16 hours in burns of > 10% seen in PHC clinics if transfer has not been accomplished in the 1st 8 hours:** • 0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	12	14	17	19
>2.5–3.5 kg	16	19	22	25
>3.5–5 kg	23	27	31	35
>5–7 kg	33	38	44	49
>7–9 kg	43	50	58	65
>9–11 kg	54	64	72	82
>11–14 kg	64	76	86	97
>14–17.5 kg	75	91	104	118
>17.5–25 kg	91	110	129	148
>25–35 kg	110	138	165	190

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

Severe pain:
See Section 20.3: Chronic non-cancer pain.

Wound cleansing:
Clean the burn wound gently.
Sodium chloride 0.9% or clean water.

Burn dressing:
Keep the wound clean and dress with sterile dressings.

For patients requiring referral
» If within 12 hours, transfer patient wrapped in clean dry sheet and blankets.
» If delayed by > 12 hours, paraffin gauze dressing and dry gauze on top.
» For full thickness and extensive burns cover with a paraffin gauze occlusive dressing. Cover the dressing with plastic wrap (e.g. cling film). *LoE:III*

For patients not requiring transfer (burns that can be treated at home)
» Paraffin gauze dressing.

If infected burn
- Povidone iodine 5%, cream, applied daily.

Tetanus prophylaxis:
Z23.5

If not vaccinated within the last 5 years
- Tetanus toxoid (TT), IM, 0.5 mL.

See Section 21.3.1.1: Animal bites or 21.3.1.2: Human bites, for detailed indications and management principles.

REFERRAL

» All children < 1 year of age.
» All burns > 5% in children1–2 years of age.
» Full thickness burns of any size in any age group.
» Partial thickness burns > 10% TBSA.
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints.
» Electrical burns, including lightning injury.
» Chemical burns.
» Inhalation injury – fire or scald injury.
» Circumferential burns of the limbs or chest.
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality.
» Any patient with burns and concomitant trauma.
» Suspected child abuse.
» Burns exceeding the capabilities of the referring centre.
» Septic burn wounds.

Note: IV fluid replacement is very important in large burns. However, if unable to obtain IV access, give fluids orally or via NGT and transfer urgently.

21.3.3 EXPOSURE TO POISONOUS SUBSTANCES

T36.0-9/T37.0-5/T37.8-9/T38.0-9/T39.0-4/T39.8-9/T40.0-9/T41-0-5/T42.0-8/T43.0-6/T43.8-9/ T44.0-9/T45.0-9/T46.0-9/T47.0-9/T48-0-7/T49.0-9/T50.0-9/T51.0-3/T51.8-9/T52.0-4/T52.8-9/T53.0-9/T54.0-3/T54.9/T55/T56.0-9/T57.0-3/T57.8-9/T58/T59.0-9/T60.0-4/T60.8-9/T65.0-6/T65.8-9+ (X44.99/X49.99/X64.99/X69.99/Y14.99/Y19.99)

Note: Poisoning from agricultural stock remedies is notifiable.

POISON INFORMATION CENTRES		
Poisons Information Helpline (national service)	24 hours/day	0861 555 777
Red Cross War Memorial Children's Hospital Poisons Information Centre Email: poisonsinformation@uct.ac.za http://www.paediatrics.uct.ac.za/poisons-information-centre		
Tygerberg Poison Information Centre Email: toxicology@sun.ac.za www.sun.ac.za/poisoncentre		
University of the Free State Poison Control and Medicine Information Centre	24 hours/day	082 491 0160
Telephone numbers tested September 2019		

The Afritox database is available free of charge to public hospitals in South Africa: see www.afritox.co.za for information on how to access the database.
If the above centres cannot be contacted, enquire at the nearest trauma and emergency unit.

DESCRIPTION

Acute poisoning is a common medical emergency. Poisoning may occur by ingestion, inhalation or absorption through skin or mucus membranes. Frequently encountered poisons include:

- analgesics
- anti-epileptic agents
- antidepressants and sedatives
- anti-infectives
- pesticides
- volatile hydrocarbons, e.g. paraffin
- household cleaning agents
- antihypertensive and anti-diabetic agents
- vitamins and minerals, especially iron in children

Signs and symptoms vary according to the nature of poisoning.

GENERAL MEASURES

Emergency Management

- Establish and maintain the airway.
- Ensure adequate ventilation and oxygenation.
- Treat shock. See Section 21.1: Cardiopulmonary arrest.
- Take an accurate history.
- Obtain collateral information, especially in patients with impaired consciousness.
- A special effort should be made to obtain tablets, packets, containers, etc. of the suspected agent used to identify poisons involved.
- Document, and respond to, abnormalities of:
  - pulse rate
  - blood pressure
  - respiratory rate
  - level of consciousness
  - pupillary size and reaction
  - oxygenation

Remove the patient from the source of poison:
» *Topical exposure*:
  - If skin contact has occurred, especially pesticides, wash the skin with soap and water, ensuring carer has protective measures, e.g., gloves, gowns, masks, etc.
  - Remove contaminated clothes in organophosphate poisoning
  - Remove eye contaminants, especially alkalis, acids and other irritants, by continuous irrigation of the eye with sterile water or normal saline for 15–20 minutes. Analgesic eye drops may be required to perform this adequately.
» *Inhalation of poisonous gases*: move the patient to fresh air.
» *Ingested poisons*: decontaminate the gut using activated charcoal.

MEDICINE TREATMENT

» Assess patient urgently and perform resuscitation as required. Wear personal protective equipment. See Section 21.1: Cardiopulmonary arrest.
» Take a history and identify the nature and route of poisoning.
» Remove contaminated clothes in organophosphate poisoning and thoroughly wash off any poison from the skin with soap and water.

Ingested poisons

- Activated charcoal.
  - Administer only when the airway is protected (i.e. patient is fully awake and cooperative or intubated with a depressed level of consciousness).
  - Administer within 1 hour of ingestion of toxin, unless poison is a substance that delays gastric emptying.
  - Children: 1 g/kg mixed as a slurry with water. See dosing table, pg 23.1.
  - Adults: 50 g (36 level medicine measures) diluted in 100 mL water.
  - When mixing, add a small amount of water to charcoal in a container.
  - Cap and shake container to make a slurry and then dilute further.

Charcoal may be useful if these poisons are taken in toxic dose	Poisons where charcoal is ineffective and should not be given
» carbamazepine, barbiturates, phenytoin	» ethanol, methanol, ethylene glycol
» dapsone, quinine	» brake fluid
» theophylline	» petroleum products (e.g. petrol or paraffin)
» salicylates	» iron salts
» mushroom poisoning (Amanita phalloides)	» lead, mercury, arsenic
» slow release preparations	» lithium
» digoxin	» strong acids or alkalis
» beta-blockers	» other corrosive agents (e.g. household detergents)
» NSAIDs	

LoE:III[439]

Protect the airway:
» Place in lateral position if decreased level of consciousness.
» Identify the poison and keep a sample of the poison or container.
» Contact the nearest hospital or Poisons Information Helpline or nearest hospital for advice.

Specific poisons and antidotes:

Carbon monoxide poisoning

T58 + (X49.99/X69.99/Y19.99)

For hypoxia:

- Oxygen, 100% by non-rebreather mask.

Organophosphate and carbamate poisoning

T60.0 + (X48.99/X68.99/Y18.99)

» Note: Healthcare workers should wear personal protective equipment and all caregivers should avoid having skin contact with the poison or the patient's bodily fluids e.g. vomitus, faeces. If staff come into contact with body fluids, wash off immediately.

» Decontamination procedures for the patient should only be done once the patient is fully resuscitated. Remove patient's clothes and wash the body with soap and water. Place clothes in closed bags.

» Signs and symptoms of poisoning include:
  - Diarrhoea and vomiting
  - hypotension
  - bradycardia
  - muscle twitching
  - coma
  - hypersecretions (hypersalivation, sweating, lacrimation, rhinorrhoea)
  - bronchospasm and bronchorrhoea
  - weakness
  - pinpoint pupils
  - confusion
  - convulsions

» Protect airway if GCS < 8.

» Suction secretions frequently.

» Intubate and ventilate if hypoxia, hypercarbia or decreased respiratory effort.

» Start atropine antidote immediately.

For bronchorrhoea, bronchospasm or bradycardia:

- Atropine bolus, IV. *LoE:III*[440]
  - Children: 0.05 mg/kg/dose. See dosing table, pg 23.2.
  - Adults: 2 mg *LoE:II*[441]
  - In both adults and children:
  - Reassess after 3–5 minutes for evidence of atropinisation as indicated by reduced bronchial secretions, dry skin, increasing heart rate and blood pressure, and dilating pupils (note: pupil dilatation may be delayed).
  - Give repeated atropine boluses incrementally doubling the dose until adequate clinical response achieved, e.g. 2 mg, 4 mg, 8 mg, 16 mg etc.
    - If no clinical response, give double the dose.
    - If some response, give the same or reduced dose.
  - Continue to reassess frequently as additional doses may be required.

Note: Refer all patients urgently but only when stable.

Opioid overdose

T40.0-9 + (X42.99/X62.99/Y12.99)

» Respiratory support is the mainstay of treatment. Give naloxone for severe poisoning only (i.e. patients requiring ventilatory support) or as a single test dose for uncertain diagnosis.

- If respiration adequate, observe the patient in a monitored setting and reassess frequently.
- If patient is apnoeic or has slow/shallow respirations, assist ventilation with bag-valve mask attached to supplemental oxygen, whilst administering naloxone as prescribed below. If GCS < 8, protect airway and consider intubation if persistent respiratory depression.

- Naloxone, IV (preferable) or IM

Age and weight	Initial dose (IV/IM)	**Repeat dose:** Reassess every 2 minutes. If breathing still inadequate, give further naloxone every 2–3 minutes.
Children:		*LoE:III*[442]
< 5 years or ≤ 20 kg	• 0.1 mg/kg immediately (maximum 2 mg/dose)	Repeat 0.1mg/kg (maximum 2 mg/dose), up to total dose of 10 mg.
≥ 5 years or > 20 kg	• 0.4–2mg immediately	Repeat 0.1mg/kg (maximum 2mg/dose), up to total dose of 10 mg
Adults:		*LoE:III*
Adults	• 0.4–2 mg immediately	Double the dose each time (e.g.: 0.8mg, 2mg, 4 mg), up to total dose of 10 mg.

  - Naloxone has a short duration of action (45 minutes) - continue to monitor closely as further doses of naloxone may be needed while awaiting and during transport.
  - In patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
  - Refer all patients.

Paracetamol poisoning

T39.1 + (X40.99/X60.99/Y10.99)

All symptomatic patients or those with a history of significant single ingestion (≥ 200 mg/kg or 10 g, whichever is less) should be referred urgently for paracetamol blood level (taken at least 4 hours post-ingestion) and consideration of acetylcysteine.

Where referral is delayed:

- N-acetylcysteine, oral, 140 mg/kg immediately.
  - Followed by 70 mg/kg 4 hourly, for seventeen doses.

Note: Avoid giving together with activated charcoal, as systemic absorption and effect of N-acetylcysteine is reduced. *LoE:III*[443]

REFERRAL

» All intentional overdoses.
» All symptomatic patients.
» All children in whom toxicity can be expected, e.g. ingestion with: *LoE:III*[444]
- paracetamol ≥ 200 mg/kg or 10 g (whichever is less)
- anti-epileptics
- warfarin
- anticholinergics
- antihypertensives
- tricyclic antidepressants
- sulphonylureas

- paraffin (unless patient has a normal respiratory rate after 6 hours)
- iron tablets

If in doubt, consult the referral hospital or Poisons Information Helpline.

Note: Send the following to hospital with the patient:

» written information
» a sample of the poison or the empty poison container

21.3.4 EYE, CHEMICAL BURNS

(See Chapter 18: Eye conditions).

21.3.5 EYE INJURY, FOREIGN BODY

(See Chapter 18: Eye conditions).

21.3.6 POST EXPOSURE PROPHYLAXIS

21.3.6.1 POST EXPOSURE PROPHYLAXIS, OCCUPATIONAL

Z20.6 + Z20.5 + (Z57.8+X58.92+Z29.8)

DESCRIPTION

Post exposure prophylaxis may prevent the risk of acquiring HIV and hepatitis B following a significant occupational exposure to infectious material from a patient (includes blood, CSF, semen, vaginal secretions and synovial/pleural/ pericardial/ peritoneal/amniotic fluid).

The risk of acquiring HIV following occupational exposure is estimated at 0.3%.

There is a higher risk when:

» the injury is deep or
» involves a hollow needle or
» if the source patient is more infectious, e.g.: WHO stage 4 defining illness or known to have a high HIV viral load, i.e. >100 000 copies/mL, seroconversion illness.

GENERAL MEASURES

» Where the source patient is on ARVs or has been on ARVs, initiate prophylaxis and seek expert opinion. An extra blood sample (unclotted, EDTA) of the source patient should be stored in case of need for further viral testing.
» Other blood borne infections that can be transmitted include hepatitis B, hepatitis C and syphilis. Test all source patients (see monitoring table).
» Offer comprehensive and confidential pre-test HIV counselling.
» Advise HCW about the need to take precautions, e.g. condom use (for 4 months), to prevent HIV and HBV transmission to sexual partners.
» Document occupational exposures adequately for possible subsequent compensation.

INVESTIGATIONS

Test	Source patient	Exposed person *Only if source patient was positive			
	Baseline	Baseline	2 weeks	6 weeks	4 months
HIV	Rapid test **PLUS** HIV ELISA (NHLS test)	Rapid test **PLUS** HIV ELISA (NHLS test)		HIV ELISA (NHLS test)	HIV ELISA (NHLS test)
Hepatitis B	Surface antigen	Surface antibody			Surface antigen
Hepatitis C**	HCV antibody	HCV antibody*		HCV PCR*	
Syphilis***	RPR/ TP antibody	RPR/TP antibody*			RPR/TP antibody*
Serum creatinine		If TDF part of PEP	If TDF part of PEP		
FBC		If AZT part of PEP	If AZT part of PEP		

** If occupational exposure
*** If sexual exposure

LoE:III[445]

MEDICINE TREATMENT

1. Prevent HIV:

Z20.6 + (Z57.8+X58.92+Z29.8)

» Initiate HIV PEP immediately after the injury - within 72 hours. Do not wait for the confirmatory test results on the source patient and health care worker.

» If higher risk exposure (defined above) consider initiation of treatment beyond 72 hours, as the risks of prophylaxis in this setting may outweigh the benefits. Avoid initiating PEP beyond 7 days after exposure.

Note: HIV PEP is **not** indicated if:

» HCW exposed to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva.

» HCW is HIV-infected. Stop PEP if HIV test of the health care worker is positive at the time of the injury.

» The source is HIV sero-negative unless there are features suggesting sero-conversion illness.
- Continue prophylaxis until the results of additional tests are available.
- These cases should be discussed with virologists.

PEP for healthcare worker following occupational HIV exposure:

Exposure	HIV Status of source patient	
	Negative	Unknown or Positive
Intact skin	no PEP	no PEP
Mucosal splash or non-intact skin or percutaneous injury	no PEP	PEP • TDF+3TC+DTG OR (in WOCP/ DTG not tolerated) • 3-drug regimen (PI-based)

When PEP is indicated, the following regimen is recommended:

- Tenofovir (TDF), oral, 300 mg daily for 4 weeks (provided baseline eGFR is >50 mL/minute).

and

- Lamivudine (3TC), oral, 200 mg daily for 4 weeks.

and

- Dolutegravir (DTG), oral 50 mg once daily for 4 weeks. *LoE:III*[446]

Note: Administer a FDC wherever possible.

In WOCP, pregnant women <6 weeks gestation, or where DTG is not tolerated:

- Tenofovir (TDF), oral, 300 mg daily for 4 weeks (provided baseline eGFR is >50 mL/minute).

and

- Emtricitabine (FTC), oral, 200 mg daily for 4 weeks. *LoE:III*[447]

and

- Atazanavir/ritonavir (ATV/r), oral 300/100 mg daily for 4 weeks.

OR

- Lopinavir/ritonavir (LPV/r), oral 200/50 mg, 2 tablets 12 hourly for 4 weeks.

Note: Administer a FDC wherever possible.

If tenofovir is contraindicated or if source patient is known to be failing a tenofovir based regimen, replace tenofovir and emtricitabine with:

- Zidovudine (AZT), oral, 300 mg 12 hourly for 4 weeks.

and

- Lamivudine (3TC), oral, 150 mg 12 hourly for 4 weeks.

» PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Efavirenz (EFZ) is not recommended as it is very poorly tolerated in PEP.

» AZT often causes nausea and headache. If AZT is not tolerated, switch to TDF (check baseline eGFR as above).

» LPV/r often causes diarrhoea. If LPV/r is not tolerated switch to ATV/r. ATV/r often causes unconjugated jaundice, which is benign but may not be tolerated, in which case switch to lopinavir/ritonavir.

» When the source patient is known to be failing ART, modify the PEP regimen:
  - If the patient is on AZT , use TDF.
  - If the patient is on TDF then use AZT

» Patients failing 2nd line ART usually have no resistance to protease inhibitors, so lopinavir/ritonavir should still be effective, but consultation with a virologist or infectious diseases physician is recommended for advice on which ARVs to use for PEP in this setting.

Note: Adverse effects of PEP:

» PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third.

» TDF is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines, e.g. aminoglycosides (check baseline creatinine clearance). Where TDF is contraindicated, switch to AZT. If AZT is not tolerated, consult or refer for further management.

» Give ATV/r as first choice as LPV/r frequently causes gastrointestinal side effects. ATV/r may commonly cause jaundice (i.e. unconjugated hyperbilirubinaemia without hepatitis) which is harmless.

When the source patient is known to be failing ART, modify the PEP regimen and seek expert opinion:

» If the patient is on AZT or stavudine then TDF should be used.
» If the patient is on TDF then AZT should be used.
» If the patient is on efavirenz or nevirapine then ATV/r or LPV/r should be used.

Patients failing second line ART almost always have no resistance to protease inhibitors, so ATV/r or LPV/r should still be effective.

Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP.

2. Prevent hepatitis B

Decide on what treatment to give the exposed person according to the vaccination status (and antibody response) of the exposed person, as well as the HBsAg results of the source patient, if known.

PEP following hepatitis B exposure:

Z20.5 + (Z57.8+X58.92+Z29.8)

Vaccination status and antibody response of exposed person	Source patient		
	HBsAg positive	**HbsAg negative**	**HBsAg unknown**
Exposed person unvaccinated or vaccination incomplete	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)	• Initiate Hep B vaccination (month 0, 1 and 6)	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)
Exposed person vaccinated **AND** known to have HBsAbtitre≥ 10 units/mL#	No treatment	No treatment	No treatment
Exposed person vaccinated **AND** HBsAb< 10 units/mL **OR** level unknown	• HBIG, IM, 500 units * • Repeat Hep B vaccine (3 doses at monthly intervals)	No treatment	• HBIG, IM, 500 units* • Repeat Hep B vaccine (3 doses at monthly intervals)

* Refer to secondary level of care for HBIG, IM. HBIG to be given as soon as possible, preferably within 24-72 hours after exposure (or within 7 days).

If the delay in obtaining HBsAb results is more than 24 hours, initiate treatment as for vaccinated AND HBsAb< 10 units/mL.

Note: For health care workers: repeat HBsAb 1 – 2 months after the last vaccine dose, to ensure adequate immune response (i.e. HBsAb ≥ 10 units/mL).

LoE:III[448]

LoE:III[449]

REFERRAL

Note: Refer if there are inadequate resources with regard to:

» counselling
» laboratory for testing
» medico-legal examination
» medicine treatment

21.3.6.2 POST EXPOSURE PROPHYLAXIS, RAPE AND SEXUAL ASSAULT

Z29.8

DESCRIPTION

Sexual offences are of grave concern and in particular to the most vulnerable persons including women, children and disabled persons.

The definitions of sexual offences are within the Criminal Law (Sexual Offences and Related Matters) Amendment Act, No 32 of 2007. Sexual offences are physically and psychologically damaging to victims, and the ability to consent to a sexual act depends on the competence of the person to give consent and be knowledgeable of the consequences of that act - including the risk of contracting sexually transmitted diseases such as HIV.

GENERAL MEASURES

» Sexual offences victims must be regarded as emergencies but do not displace life-threatening management of other cases.
» Ensure appropriate management is in place for every case. So called “cold cases” (> 72 hours after the incident) may be managed medically and given an appointment for medico-legal investigation.
» If the victim wants to open a case, the Family Violence, Child Protection and Sexual Offences Unit (FCS) must be phoned and requested to come to the hospital.
» Cases must be opened in all cases of suspected or alleged rape/sexual abuse in children.

Offer 1st dose of antiretroviral PEP in all cases of suspected rape - the following matters can be resolved in due course:

HIV test

» Determine the patient’s HIV status before initiating PEP.
  - Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance. Provide counselling and manage accordingly.
» Obtain informed consent from the patient and written consent from the parent in case of minors before HIV testing and giving the full course of treatment.
» Consent for HIV testing in children can be given by:
  - Children who are competent to give consent and are:
    (i) ≥ 12 years of age; or
    (ii) < 12 years of age and of sufficient maturity to understand the benefits, risks and social implications of such a test.
  - Parents or caregivers of children who are not competent to sign consent (but the child should have this explained to them so they understand what is happening, appropriate to their age and development).
  - The clinical head of the institution, where a competent person is not available to give consent for HIV testing and PEP (alleged rape in children is a medical emergency).
» Opting for immediate HIV testing remains the patient’s choice.
  - If the patient declines, give a 3–day starter pack of PEP and encourage the patient to reconsider testing within those 3 days.

- **No further PEP should be given in the case of continued refusal of HIV testing in adults, in children where the parent unreasonably refuses PEP this may be taken further.**
- If in doubt about the indications for HIV PEP, give PEP.

» A patient presenting after 72 hours since the alleged incident should not be given PEP, but should be counselled about the possible risk of transmission.
- HIV testing should still be offered at the time of presentation and 4 months later.

» If the HIV Elisa/Rapid test is positive in sexually abused children <18 months of age, perform HIV PCR to confirm if HIV infection is truly present.

» If HIV-uninfected or if the child has no access to immediate HIV PCR results, they should receive prophylaxis (until the HIV PCR result is obtained).

Pregnancy test

» Perform a pregnancy test in adult and pubertal girls to exclude pregnancy before initiating post exposure contraception and STI prophylaxis.
- Pregnant rape patients should be referred.

Initial Counselling

Counsel all cases of sexual offences patients and caregivers in the case of children

» Explain the side effects of ARVs, e.g. tiredness, nausea and flu-like symptoms.

» Use condoms for 4 months.

» Avoid blood or tissue donation for 6 months.

» Emphasise the importance of compliance with ARV PEP.

» Provide psychosocial support pertaining to:
- Restoring control of the victim by avoiding secondary traumatisation, and give choices and participation in treatment decisions.
- Medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis-B and C.
- Risk of pregnancy.
- Psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity.

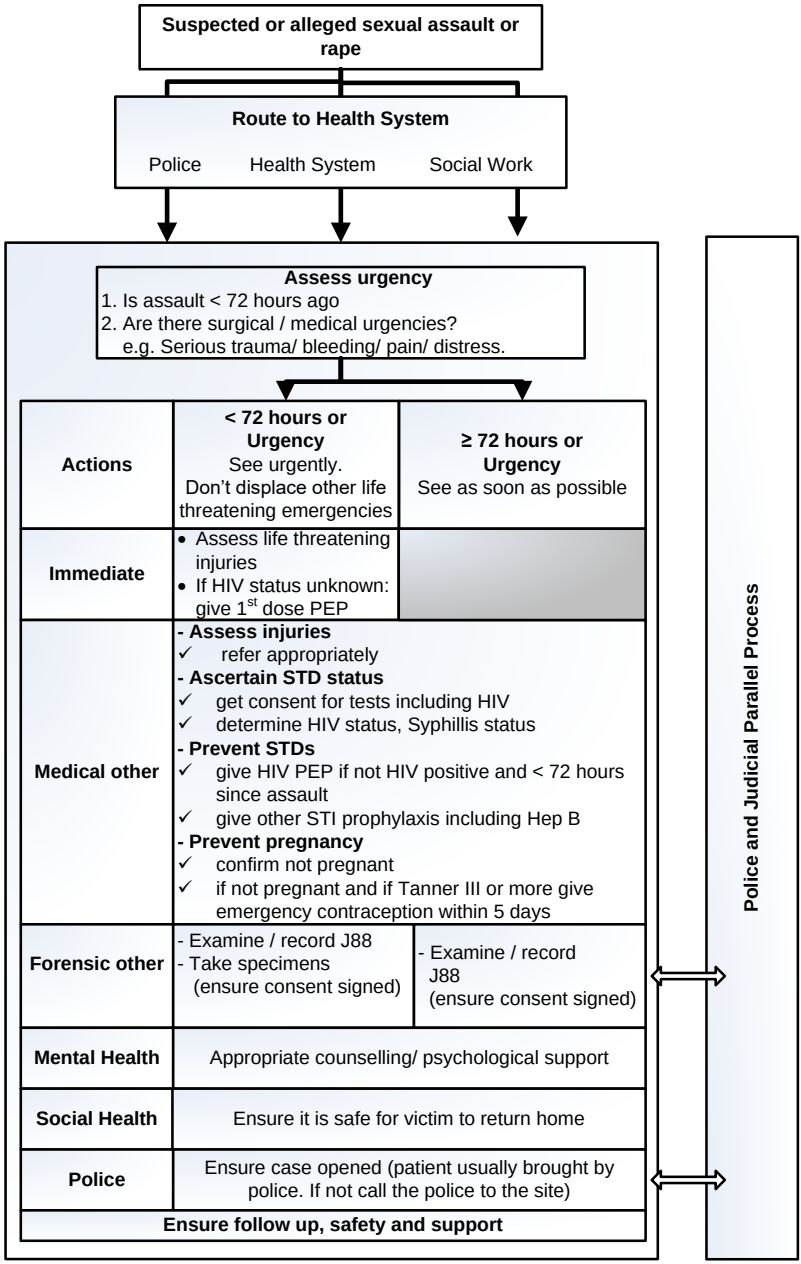
Follow-up support

» Discuss issues relating to stress management at subsequent visits.

» Inform the patient of the signs and symptoms of post-traumatic stress syndrome (PTSD), that may eventually cause exhaustion and illness. These include:
- general irritability
- trembling
- pain in neck and/or lower back
- change in appetite
- change in sleep pattern

Medico-legal assessment of injuries

» Complete appropriate required forms and registers.


Suspected or alleged sexual assault or rape
Route to Health System
Police
Health System
Social Work
Assess urgency
1. Is assault < 72 hours ago
2. Are there surgical / medical urgencies?
e.g. Serious trauma/ bleeding/ pain/ distress.
Actions
< 72 hours or Urgency
See urgently.
Don't displace other life threatening emergencies
≥ 72 hours or Urgency
See as soon as possible
Immediate
• Assess life threatening injuries
• If HIV status unknown: give 1st dose PEP
Medical other
- Assess injuries
✓ refer appropriately
- Ascertain STD status
✓ get consent for tests including HIV
✓ determine HIV status, Syphillis status
- Prevent STDs
✓ give HIV PEP if not HIV positive and < 72 hours since assault
✓ give other STI prophylaxis including Hep B
- Prevent pregnancy
✓ confirm not pregnant
✓ if not pregnant and if Tanner III or more give emergency contraception within 5 days
Forensic other
- Examine / record J88
- Take specimens (ensure consent signed)
- Examine / record J88 (ensure consent signed)
Mental Health
Appropriate counselling/ psychological support
Social Health
Ensure it is safe for victim to return home
Police
Ensure case opened (patient usually brought by police. If not call the police to the site)
Ensure follow up, safety and support
Police and Judicial Parallel Process

INVESTIGATIONS

» The patient/parent should sign a consent form for both HIV testing and PEP.
» Voluntary rapid HIV testing should be made available and should be done on all opting for PEP.
» Further baseline and follow-up investigations are the same as for occupational HIV exposure, with the addition of pregnancy testing in all women and female adolescents prior to post exposure contraception. See section 21.6.3.1 Post-exposure prophylaxis, occupational.

MEDICINE TREATMENT

Prevent the following:
11. HIV
12. Hepatitis B
13. Pregnancy
14. STIs

Note:
» Obtain consent for HIV testing from all patients before initiating PEP.
» Offer PEP if the patient presents within 72 hours of being raped and is HIV-uninfected or HIV status is unknown.
» Initiate therapy as early as possible after the exposure to maximize the chance of effective prophylaxis.
» It is important to manage the medical condition before medico-legal examination. Most of these will require referral.
» If, for practical reasons, a person cannot return for the 3-day follow up, a 28-day course of ART should be provided.

1. HIV PEP
» Therapy may be given up to 72 hours after exposure.
» In children < 18 months of age: initiate antiretroviral PEP while awaiting transfer and HIV PCR results.

Children
- Zidovudine (AZT), oral, 12 hourly for 28 days.
  - Paediatric dose: 180–240 mg/m2. See dosing table, pg 23.9.
  - Maximum: 300 mg/dose.

AND
- Lamivudine (3TC), oral, 4 mg/kg 12 hourly or 8mg/kg daily for 28 days.
  - Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See dosing table, pg 23.6.

AND
- Lopinavir/ritonavir (LPV/r), oral 12 hourly for 28 days.
  - Paediatric dose: 300/75mg/m2. See dosing table, pg 23.7.
  - Maximum: 400/100 mg/dose.

Dosages may vary by±1 mg/kg/dose, to allow a convenient volume of medication.
Use the adult dosage regimen if children require more than the maximum dose.
Follow-up visits should be at 2 weeks, 6 weeks, and 4 months after the rape.

Adults
Management for HIV prevention is the same as for occupational HIV exposure. See section 21.3.6.1 Post-exposure prophylaxis, occupational.

2. Hepatitis B prevention
Management for Hepatitis B prevention is the same as for occupational hepatitis B exposure. See section 21.3.6.1 Post-exposure prophylaxis, occupational. *LoE:III*

3. Emergency contraception (after pregnancy is excluded)
Do a pregnancy test in all women and female adolescents.
Children must be tested and given emergency contraception from Breast Tanner Stage III. If unsure of staging, give emergency contraception when you detect any breast development (DO NOT REGARD MENARCHE AS AN INDICATION). Refer all pregnant rape victims.

- Levonorgestrel oral, 1.5 mg as a single dose as soon as possible after unprotected intercourse.
  - Repeat the dose, if the patient vomits within 2 hours.

CAUTION
Emergency contraceptive tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse, and not later than 5 days.
Women on enzyme inducers (including efavirenz, carbamazepine) cause a significant reduction in levonorgestrel concentrations. Women on these medicines should preferably have copper IUCD inserted or alternatively double the dose of levonorgestrel, because of significant reduction of levonorgestrel.
See Section 7.4: Contraception, emergency. *LoE:III*[450]

An anti-emetic:

Adults
- Metoclopramide oral, 10 mg 8 hourly as needed.

4. STI prophylaxis

Adults
- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without adrenaline (epinephrine).

AND
- Azithromycin, oral, 1 g, as a single dose.

AND
- Metronidazole, oral, 2 g immediately as a single dose.

Children
Prior to hospital referral, administer:

Children < 45 kg
- Macrolide, e.g.:
- Azithromycin, oral, 20 mg/kg/dose, as a single dose, and refer.

Weight kg	Dose mg	Use one of the following:			Age Months/years
		Susp	Tablet		
		200 mg/5mL	250 mg	500 mg	
>7–9 kg	160 mg	4 mL			>6-12 months
>9–11 kg	200 mg	5 mL	–	–	>12–18 months
>11–14 kg	240 mg	6 mL	–	–	>18 months–3 years
>14–18 kg	320 mg	8 mL	–	–	>3–5 years
>18-25	400 mg	10 mL	–	–	>5-7 years
>25–35 kg	500 mg	–	2 tablets	1 tablet	>7–11 years
>35–45 kg	750mg	–	3 tablets	–	>11–13 years
> 45 kg	1000 mg	–	–	2 tablets	>13 years

Children ≥ 45 kg

- Macrolide, e.g.:
- Azithromycin, oral, 1g, as a single dose, and refer.

AND

- Metronidazole, oral, as a single dose, and refer.
  - 1–3 years: 500 mg
  - 3–7 years: 600–800 mg
  - 7–10 years 1 g
  - > 10 years 2 g

AND

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 23.3.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

LoE:III[451]

REFERRAL

» All patients with severe physical or psychological injuries.
- All Children for medico legal and general care assessment after initiation of PEP as outlined above at PHC.
- If uncertain, phone Childline 0800055555
- Pregnant rape victims.
- Adults with:
  i. Active bleeding ii. Multiple injuries
  iii. Abdominal pain iv. History of the use of a foreign object

Note: Refer if there are inadequate resources with regards to:
- counselling
- medico-legal examination
- laboratory for testing
- medicine treatment

21.3.6.3 POST EXPOSURE PROPHYLAXIS, INADVERTENT (NON-OCCUPATIONAL)

Z29.8

DESCRIPTION

Inadvertent (non-occupational) exposure to infectious material from HIV and hepatitis B sero-positive persons often requires clinical judgement and includes:

» human bites (requires hepatitis B, but not HIV prophylaxis)
» sharing of needles during recreational drug use
» consensual sexual exposure, burst condoms
» contact sports with blood exposure

Management of inadvertent (non-occupational) HIV and hepatitis B exposure is the same as for occupational exposure. See Section: 21.3.6.1 Post exposure prophylaxis, Occupational. *LoE:III*[452]

For exposures of a sexual nature (e.g. consensual sex with a burst condom), consider emergency contraception and STI prophylaxis on a case-by-case basis – see Section 21.3.6.2: Post exposure prophylaxis, rape and sexual assault.

21.3.7 SOFT TISSUE INJURIES

T14.0-1/T14.9

DESCRIPTION

Injuries may be minor, moderate or major:

Major injuries: it is important is to recognise potentially life-threatening injuries.
Indicators of such injuries are:

» Mechanism of injury: motor vehicle collision at speed exceeding 60 km/hour, ejection from the car, death of other occupant in the same car compartment, roll-over, pedestrian thrown out of his/her shoes, fall from height of more than 2 stories (more than thrice the patient's height in a child), multiple gunshot wounds.
» Physiological status: unable to maintain airway, tachycardia, hypoxia, hypotension on arrival (even if corrected with crystalloid infusion), tachycardia (especially in a child) or decreased level of consciousness.
» Anatomical distribution: (suspicion of) injuries to more than one body region (face, intracranial, chest, abdominal cavity, spine).
» Age: children < 2 years of age require admission.

Moderate injuries (list is not exhaustive):

» Head injuries: moderate head injuries (i.e. any GCS 11-14), facial fractures (airway maintained).
» Neck injuries: stable patient with a stabbed neck, tenderness over C-spine.
» Chest injuries: pneumothorax, haemothorax, rib fractures (2 or less).
» Abdominal injuries: any suspicion of an intra-abdominal injury in a haemodynamically stable patient: e.g. abdominal bruising (including seat belt sign in children), tenderness, distension, loss of bowel sounds, vomiting, haematemesis or haematuria.
» Extremity injuries: major open wounds, degloving injuries (boggy feel under intact skin), fractures, dislocations (in children: point tenderness around a major joint), crush injuries, multiple soft tissue injuries, enlarging or pulsating swelling.

» Suspicion of abuse (child abuse, intimate partner abuse, elderly abuse).

Minor injuries are injuries that can be managed as an outpatient and include bruises, small lacerations, sprains, concussions etc.

» Human bites (see Section 21.3.1.2: Human bites) and animal bites (see Section 21.3.1.1: Animal bites).
» Sprains or strains (see Section 21.3.8: Sprains and strains).
» Exclude fractures.

EMERGENCY MANAGEMENT

All trauma patients, except for those who only have minor injuries, should undergo these surveys:

Primary survey

A = **Airway:** check and maintain airway. If airway obstructed, first perform a jaw thrust manoeuver, then if able, insert an endotracheal tube. Patients with maxillofacial fractures may require a tracheostomy.

B = **Breathing:** assess respiratory rate, use of accessory muscles, symmetry, oxygen saturation. If needed, support breathing using a Bag-Valve-Mask device ('AMBU bag'). Look for signs of pneumothorax (affected site is hyperinflated, hypertympanic and has decreased breath sounds). If tension pneumothorax (distended neck veins, deviated trachea, hypoxia and hypotension): perform a needle thoracostomy.

C = **Circulation:** look for tachycardia and hypotension. Put up two large bore peripheral lines, a femoral line or an intraosseous line in the tibia (if no abdominal injury) or the proximal humerus. In adults: if SBP if < 90 mmHg, infuse 2 L of sodium chloride 0.9% until SBP ≥ 90 mmHg. If actively bleeding, it is permissible to maintain SBP≥ 80 mmHg (or a palpable radial pulse if you do not have access to a BP machine). In children the SBP should not fall below (70 + [2 x age]) mmHg.

D = **Disability:** perform a brief neurologic assessment and classify according to the Glasgow Coma Score:

Glasgow Coma Score: Add scores to give a single score out of 15:		
Best motor response:	Obeys commands	6
	Localises to pain	5
	Withdraws from pain	4
	Abnormal flexion to pain	3
	Extends to pain	2
	None	1
Best verbal response:	Orientated	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	None	1
Eye opening	Spontaneous	4
	To voice	3
	To pain	2
	None	1
Total		

E = **Exposure/environment:** expose the patient. If any suspicion of spinal cord injury (multi-trauma, decreased level of consciousness, neurological deficit, tenderness over the spine, severe mechanism of injury, anatomic deformity of the spine or any of the following:

intoxication, inability to communicate or a distracting injury) cut the patient's clothes off, so as to minimise movement of the spine, and immobilise neck using a long back board. Use a hard collar and strapping to the trolley in other patients Prevent hypothermia by covering the patient with warm blankets, and infusing warm fluids.

When major physiological derangements are identified and patient is stabilised using the ABCDEs of the primary survey, perform an AMPLE history and secondary survey:

AMPLE history:

A = allergies
M = the patient's regular medication (including contraceptives and OTC medication)
P = past medical history
L = time of last meal (important is the time between the last meal and the accident)
E = Events leading up to the incident

Secondary survey

The secondary survey is a head-to-toe examination of the patient to identify any injuries that may have been missed during the primary survey. The secondary survey is only performed in a stable patient.

First examine patient from the front, then log-roll the patient and examine the back (include a rectal examination).

All fracture sites must be immobilised by external splints.

Any additional investigations are ordered according to availability of resources:

» Bloods may include FBC, clotting profile, cross-match and U & E's.
» Consider whether the patient requires transfer for x-rays.

MANAGEMENT OF WOUNDS AND LACERATIONS

» Assess wound: if significant devitalised tissue, especially if due to a crush injury or a bite, dress with Povidone iodine and refer for surgical debridement.
» Assess surrounding tissues and test function: look for associated fractures, ligament/tendon damage and nerve or vascular injuries. Document.
» If needed, anaesthetise wound. Remove foreign bodies and irrigate the wound with sodium chloride 0.9%. If needed, remove any devitalised tissue with a knife
» Wounds may be glued with tissue adhesives if wound < 4 cm, clean and uncomplicated, especially in children and elderly patients. Avoid in the following cases: lacerations in areas under tension (hands, feet, joints), oral mucosa, wounds in moist or hairy areas (axillae/perineum), if needing high level of precision (hairline or vermilion border of lip), wounds at increased risk of infection (bite wounds, puncture wounds, wounds with contaminated tissue). Wounds on the scalp can be glued but surrounding hair needs to be trimmed.

Tissue adhesive (glue):

- Clean wound thoroughly with chlorhexidine 0.05% aqueous solution.
- Ensure good haemostasis before applying glue.
- Appose wound edges (bring wound edges together). Ensure patient positioned appropriately so that when applied, any excess glue does not run down into areas not meant to be glued. If this happens, quickly wipe away with dry gauze.
- Crush tissues adhesive vial and invert.
- Gently brush adhesive over laceration (avoid contact with gloves/ instruments and avoid pushing adhesive into wound).
- Apply three layers of adhesive (maximum bonding strength is achieved within 2.5 minutes of application).

- Do not put on any covering or dressings.
- Advise patients that they may shower but not soak in bath and to pat area dry.
- The bonded adhesives spontaneously slough off within 5 to 10 days.

MEDICINE TREATMENT

If fluid replacement needed, see Section 21.2.9: Shock.

Adults

- Sodium chloride 0.9%, IV, 1L as a rapid bolus.
  - Repeat bolus until blood pressure is improved.

Children

- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus if no adequate response.

Note: If patient develops respiratory distress, discontinue fluids.

Tetanus prophylaxis:

Z23.5

If not previously immunised within the last 5 years

- Tetanus toxoid (TT), IM, 0.5 mL.

If sutures needed:

- Lidocaine without adrenaline (epinephrine), injection.
  - Infiltrate around the wound as local anaesthetic. *LoE:III*[453]
  - Maximum dose: 3 mg/kg.

Weight kg	Maximum dose, mg	Vial 1%, 10 mg/mL	Vial 2%, 20 mg/mL	Age months/years
>2.5–3.5 kg	7 mg	0.7 mL	0.35 mL	Birth–1 month
>3.5–5 kg	10 mg	1 mL	0.5 mL	>1–3 months
>5–7 kg	15 mg	1.5 mL	0.75 mL	>3–6 months
>7–9 kg	20 mg	2 mL	1 mL	>6–12 months
>9–11 kg	25 mg	2.5 mL	1.25 mL	>12–18 months
>11–14 kg	30 mg	3 mL	1.5 mL	>18 months–3 years
>14–17.5 kg	40 mg	4 mL	2 mL	>3–5 years
>17.5–35 kg	50 mg	5 mL	2.5 mL	>5–11 years
>35–55 kg	100 mg	10 mL	5 mL	>11–15 years

For children > 55 kg and adults:

- Lidocaine without adrenaline (epinephrine), injection.
  - Infiltrate around the wound as local anaesthetic.
  - Maximum dose: 3 mg/kg.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

For more severe pain, give analgesia as appropriate. See Section 20.1: Pain control.

Infected wound management:
Manage as for cellulitis. See Section 5.4.3: Cellulitis.

REFERRAL

Urgent
» All major and moderate injuries once stabilised.
» Infected wounds.

Note:
» If uncertain how to stabilize patient, phone for guidance from referral hospital.
» Before transport leaves, ensure endotracheal tube is securely strapped, all lines are secured, all drips are running well and patient is well covered to prevent hypothermia.
» If transport delayed, ensure patient does not deteriorate while waiting: repeat ABCD survey at least hourly.

21.3.8 SPRAINS AND STRAINS

S03.4-5/S13.4-6/S23.3-5/S33.5-7/S43.4-7/S53.4/S63.5-7/S73.1/S83.4-6/S93.4-6/T11.2/T13.2/ T14.3

DESCRIPTION

Clinical features include:
» pain, especially on movement
» tenderness on touch
» limited movement
» history of trauma

May be caused by:
» sport injuries
» slips and twists
» overuse of muscles
» abnormal posture

Note: In children always bear non-accidental injuries (assault) in mind.

EMERGENCY TREATMENT

Immobilise with firm bandage and/or temporary splinting.

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.
  - Maximum dose: 4 g in 24 hours.

AND

Children >12 years of age and adults

- NSAID, e.g.:
- Ibuprofen, oral, 200–400 mg 8 hourly with or after a meal.

REFERRAL

» Severe progressive pain.
» Progressive swelling.
» Extensive bruising.
» Deformity.
» Joint tenderness on bone.

» No response to treatment.
» Severe limitation of movement.
» Suspected serious injury.
» Recurrence.
» Previous history of bleeding disorder.

PHC Chapter 22: Medicines used in palliative care

Palliative care improves the quality of life of patients facing life-threatening illnesses and their family members, regardless of whether or not they also receive life-prolonging treatment. It requires a multidisciplinary approach, and aims to address physical, psychological, spiritual and social problems.

General principles of palliative care include:

» Treat the underlying causes of symptoms;
» Minimise medicine side effects; and
» Ensure that the patient and caregivers are informed of the nature of the disease, treatment, side-effects, and likely outcomes.

Palliative care patients who are down-referred from higher levels of care with a care plan should be managed according to that plan. Palliative care patients should be assessed by community-based palliative care teams where available.

Always refer to the latest National Department of Health Guidelines on Palliative Care.

Note: The recommendations in this chapter are primarily directed at end-of-life care, which is a component of palliative care.

22.1 GASTROINTESTINAL CONDITIONS

22.1.1 CONSTIPATION

K59.0 + (Z51.5)
See section 2.8: Constipation.

DESCRIPTION

The underlying cause of constipation in palliative care patients may be functional, disease, or treatment related. Developmental disorders with or without cognitive deficits, mood and situational circumstances can impact bowel habits in chronically ill children.

GENERAL MEASURES

Ensure privacy and comfort to allow a patient to defecate normally.
Increase fluid intake within the patient's limits.
Encourage activity and increased mobility within the patient's limits.
Anticipate the constipating effects of pharmacological agents, such as opioids, and provide laxatives prophylactically.

MEDICINE TREATMENT

Adults and children > 15 years of age

- Sennosides A and B, oral, 13.5 mg, 1 tablet at night.
  - In resistant cases increase to 2 tablets. *LoE:III*[454]

AND/OR

- Lactulose, oral, 10–20 mL 12–24 hourly. *LoE:III*[455]

Children > 12 months of age

- Lactulose, oral, 0.5 mg/kg/dose once daily. See dosing tables, pg 23.6.
  - If poor response, increase frequency to 12 hourly. *LoE:III*[456]

Note: Manual removal should only be undertaken if the patient has received adequate pain relief and if need be sedation as well.

For management of opioid-induced constipation:
See adjuvant therapy in Section 20.4: Chronic cancer pain.

REFERRAL

» All patients with suspected bowel obstruction.
» Patients with severe constipation, not relieved with oral treatment, or who are unable to swallow.

22.1.2 DIARRHOEA

A09.0/A09.9/K52.2/K52.9 + (Z51.5)
See Section 2.9: Diarrhoea.

DESCRIPTION

The commonest cause of diarrhoea in palliative care is laxative use. Other causes include partial intestinal obstruction, HIV-associated diarrhoea, pancreatic insufficiency, Clostridium difficile infection, chemotherapeutics, and radiation enteritis.

Severe constipation and faecal impaction can also cause diarrhoea as backed-up, liquefied stool may be all that the patient can pass (“overflow diarrhoea").

GENERAL MEASURES
Refer to a dietician.
Consider faecal impaction and perform rectal examination if indicated.

MEDICINE TREATMENT
Rehydrate the patient as appropriate if necessary. See Section 2.9.1: Diarrhoea, acute in children and Section 2.9.3: Diarrhoea, acute, without blood, in adults.

Adults:

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool up to 6 hourly.
  - Not more than 12 mg daily
  - Contraindicated in antibiotic-induced diarrhoea and overflow diarrhoea.

REFERRAL
Persistent diarrhoea (> 2 weeks) in children.

22.1.3 NAUSEA AND VOMITING
R11 + (Z51.5)
See Section 2.4: Nausea and vomiting, non-specific.

DESCRIPTION
Nausea and vomiting may have many causes in palliative care patients e.g. medication, constipation, anxiety, infection and raised intracranial pressure.

GENERAL MEASURES
Refer to a dietician if available.

MEDICINE TREATMENT
Treat the underlying cause and rehydrate the patient if necessary.
Deliver medicines via an appropriate route and regularly.

Adults:

- Metoclopramide, oral, 10 mg, 8 hourly as needed.

Children:

- Metoclopramide, oral, 0.1 mg/kg/dose, 8–12 hourly.

Weight kg	**Dose** mg	**Syrup** 5 mg/5 mL	**Age** months/years
>9–11 kg	1 mg	1 mL	>12–18 months
>11–14 kg	1.2 mg	1.2 mL	>2–3 years
>14–17.5 kg	1.6 mg	1.6 mL	>3–5 years
>17.5–25 kg	2 mg	2 mL	>5–7 years
>25–35 kg	3 mg	3 mL	>7–11 years
>35–55 kg	4.5 mg	4.5 mL	>11–15 years

Use with caution as extrapyramidal side effects may occur (especially at higher doses).

LoE:III[457]

REFERRAL

» All patients with a diagnosed or suspected underlying cause that requires treatment at a higher level of care.
» Consult a palliative care trained doctor if nausea and vomiting persist despite treatment.

22.2 NEUROPSYCHIATRIC CONDITIONS

22.2.1 ANXIETY

F40.0-2/F40.8-9/F41.0-3/F41.89/F42.0-2/F42.8-9 + (Z51.5)
See Section 16.3: Anxiety disorders.

DESCRIPTION

Some symptoms of anxiety in palliative care patients may be expected, given the concerns of living with a serious illness. However, if the symptoms are debilitating, they require treatment.

GENERAL MEASURES

Address any contributing factors such as pain and dyspnoea.
Consider other underlying conditions that may mimic anxiety e.g. electrolyte imbalance, hyperthyroidism, hypoxia, arrhythmias and many adverse drug reactions.
Assess for depression.
Offer referral for psychotherapy if available.

MEDICINE TREATMENT

Adult:

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2–4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur.

LoE:II[458]

OR

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for 2 weeks.
  - Then increase to 20 mg daily.

LoE:I[459]

For acute anxiety reactions:

- Benzodiazepine, e.g.:
- Diazepam, oral, 2.5–5 mg.
  - For a maximum of 10 days.

LoE:III[460]

Note: Benzodiazepines might cause sedation and confusion. Use with caution.

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Avoid use in people at high risk of addiction – personality disorders and those with previous or other substance misuse. *LoE:III*[461]

REFERRAL
All children.

22.2.2 DELIRIUM
F05.0-1/F05.8-9/F44.8/R45.1/R45.4-6 + (Z51.5)
See Section 21.2.4: Delirium with acute confusion and aggression in adults.

DESCRIPTION
Delirium (confusion) is common in the terminal stages of advanced disease, but is rarely seen in children. Supportive measures such as frequent re-orientation may be useful.

GENERAL MEASURES
Assess for underlying causes e.g. infection, electrolyte imbalance.
Remove factors that can agitate patient (full bladders, thirst, pain, constipation).
Reduce polypharmacy.
Monitor for sensory deficits e.g. hearing impairment.

MEDICINE TREATMENT

CAUTION

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome and acute dystonic reactions.
» The elderly, children, intellectually disabled and those with comorbid medical conditions and substance users are at highest risk.
» An emergency trolley, airway, bag, oxygen and intravenous line must be available.

Adults:

For acute agitation
- Benzodiazepine, e.g.:
- Diazepam, IV, 10 mg *LoE:III*[462]
  - If no response, give a 2nd dose.
  - Do not administer at a rate over 5 mg/minute.

Elderly or frail patients, or those with liver impairment:
- Diazepam, IV, 5 mg
  - If no response, give a 2nd dose.

- Do not administer at a rate over 5 mg/minute. LoE:III[463]

OR

- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.
  - Lower doses are indicated for patients with liver failure. LoE:III[464]

Switch to oral benzodiazepine if possible.

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Avoid use in people at high risk of addiction – personality disorders and those with previous or other substance misuse. LoE:III[465]

REFERRAL

All children.

22.2.3 DEPRESSION

F32-3/F32.8-9/F33.0-4/F33.8-9/F34.1 + (Z51.5)
See section 16.4.1: Depressive disorders.

DESCRIPTION

Depression might be difficult to diagnose in palliative care patients as some symptoms of depression are similar to disease manifestations such as anorexia and insomnia. The key indicators of depression in palliative care patients are persistent feelings of hopelessness and worthlessness and/or suicidal ideation. Young children may present with somatic complaints e.g. abdominal pain or headaches, or may have restlessness.

GENERAL MEASURES

Refer to a social worker to assist with concerns of future care of patient, family, and finances.

MEDICINE TREATMENT

Adults

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2–4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur. LoE:I[466]

OR

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for 2 weeks.

- Then increase to 20 mg daily. LoE:I[467]

OR

If a sedating antidepressant is required:

- Tricyclic antidepressants, e.g.:
- Amitriptyline, oral, at bedtime.
  - Initial dose: 25 mg per day.
  - Increase by 25 mg per day at 3–5 day intervals.
  - Maximum dose: 150 mg per day.

Note: Tricyclic antidepressants may cause dry mouth, constipation, urinary retention, and confusion, which might be especially problematic in palliative care patients. Use the lowest dose possible, and titrate slowly. LoE:III[468]

REFERRAL

» All children and adolescents.
» All patients to a psychologist and social worker if available.

22.3 PAIN

See chapter 20: Pain.

22.3.1 CHRONIC CANCER PAIN

See Section 20.4: Chronic cancer pain.

22.4 RESPIRATORY CONDITIONS

22.4.1 DYSPNOEA

R06.0 + (Z51.5)

DESCRIPTION

Dyspnoea is the subjective, unpleasant sensation of being unable to breathe adequately (breathlessness). Dyspnoea is a complex symptom which can be caused or exacerbated by physical, psychological, and emotional factors. The intensity of dyspnoea is not related to the oxygen saturation.

The aim should always be to address the cause, however, in end stage disease symptomatic treatment is indicated.

In children dyspnoea is often evidenced by difficulty talking or feeding, or restlessness.

GENERAL MEASURES

If available refer to a physiotherapist and occupational therapist for pulmonary rehabilitation, and to teach patients pursed lip breathing, pacing of activities, relaxation techniques and positioning.

A fan might reduce the sensation of dyspnoea.

Where possible treat the underlying cause e.g. antibiotics for underlying respiratory infection.

MEDICINE TREATMENT

Adults

LoE:III[469]

- Morphine solution, oral (Doctor prescribed).
  - Starting dose: 2.5–5 mg as required, titrating up slowly.

Children

- Morphine solution, oral (Doctor prescribed).
  - Starting dose:
    - 0–1 month of age: 0.05 mg/kg 6 hourly.
    - ≥ 1–12 months of age: 0.1 mg/kg/dose 4 hourly.
    - ≥ 12 months of age: 0.2–0.4 mg/kg/dose 4 hourly.

LoE:III[470]

REFERRAL

Dyspnoea associated with hypoxia for consideration of home-based oxygen.

22.5 PRESSURE ULCERS/SORES

See Section 5.19: Pressure ulcers/sores.

22.6 END OF LIFE CARE

Z51.1

The management of a patient who is imminently terminal (death suspected to occur within a few days or weeks), should include:

» Communicating honest, direct, compassionate, and culturally sensitive information regarding the prognosis, and symptoms that might develop.
» Relieving physical, spiritual and emotional distress in the patient and family.
» Treating easily manageable complications that cause suffering.
» Stopping all unnecessary medicines.
» Limiting hospital admissions, if possible.
» Ensuring that parents/caregivers are adequately counselled.
» Decision making as to the preferred place of death (home, hospice, hospital) and referral to community-based services where available (hospice, palliative, and home-based care services).

Indications for referral for in-patient hospital or hospice care:

» Hypoxia and respiratory distress where oxygen therapy provides relief. IV/ nasogastric fluid requirements or medication administration needed to relieve suffering.
» Carer/s unable to cope at home.

Feeds and fluids at the end of life:

» Anorexia and refusal of feeds/fluids in dying patients is a normal phenomenon.
» Encourage the family to 'feed for comfort only" and reassure them that the dying patient is not hungry.

Investigations at the end of life:

» Investigations should be kept to a minimum and only done if it might contribute to the patient's comfort.

Antibiotics at the end of life:

» Oral antibiotic therapy might not be indicated. Refer to the patient's palliative care plan if available, or consult a palliative care trained doctor.

PHC Chapter 23: Standard paediatric dosing tables

Different conditions require different dosaging of medication. In children most conditions can use standardised doses. The weight-band dosing tables below are standardised doses of a medicine **for children** for specific conditions (indicated above each table). Where a specific condition is not indicated below, see the main text of the book for the dosing specific to that condition.

ABACAVIR

1.6 Management of HIV-infected children

- Abacavir, oral, 8 mg/kg 12 hourly or 16 mg/kg daily.

Weight kg	**Daily dose** mg	**Use one of the following**			**Age** Months/years
		Solution 20 mg/mL	**Tablet** 60 mg	**Tablet** 300 mg	
3–4.9 kg	40 mg	2 mL 12 hourly	-	-	>1–3 months
5–6.9 kg	60 mg	3 mL 12 hourly	–	–	>3–6 months
7–9.9 kg	80 mg	4 mL 12 hourly	–	–	>6 months –1 year
10–13.9 kg	240 mg	6 mL 12 hourly OR 12 mL daily	–	–	>1–3 years
14–19.9 kg	300 mg	7.5 mL 12 hourly OR 15 mL daily	2 ½ x 60 mg tablets 12 hourly	1 tablet daily	>3–4 years
20–22.9 kg	400 mg	10 mL 12 hourly OR 20 mL daily	3 x 60 mg tablets 12 hourly	–	>4–6 years
			OR 1x 60 mg and 1x 300 mg tablets daily		
23–24.9 kg	400 mg	10 mL 12 hourly OR 20 mL daily	2x 60 mg and 1x 300 mg tablets daily		>6–7 years
>25 kg	600 mg	–	–	2 tablets daily	>7 years

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2013. http://www.sahivsoc.org/Files/2013%20ARV%20dosing%20chart%20for%20children%20(Aug%202013).pdf

ACICLOVIR

1.4 Herpes simplex infections of the mouth and lips; 5.13 Herpes simplex.

- Aciclovir, oral, 250 mg/m2/dose, 8 hourly for 7–10 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5mL	**Tablet**		
			200 mg	400 mg	
>3.5–5 kg	50 mg	1.25 mL	–	–	>1–3 months
>5–7 kg	80 mg	2 mL	–	–	>3–6 months
>7–11 kg	100 mg	2.5 mL	½ tablet	–	>6–18 months
>11–14 kg	120 mg	3 mL	–	–	>18 months–3 years
>14–25 kg	160 mg	4 mL	–		>3–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35 kg–55 kg	300 mg	7.5 mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	1 tablet	>15 years

ACTIVATED CHARCOAL

21.3.3 Exposure to poisonous substances.

- Activated charcol, 1 g/kg mixed as a slurry with water.

Weight kg	**Dose** g	**Age** Months/years
>3.5–7 kg	5 g	>1–6 months
>7–11 kg	10 g	>6–18 months
>11–17.5 kg	15 g	>18 months–5 years
>17.5–35 kg	25 g	>5–11 years
>35–55 kg	50 g	>11–15 years
>55 kg	50–100 g	>15 years

ADRENALINE (EPINEPHRINE)

21.1.1 Cardiac arrest (adults); 21.1.2 Cardiopulmonary arrest, children; 21.1.3 Bradycardia; 21.2.10 Anaphylaxis.

- Adrenaline (epinephrine), 1:1000, IM, 0.01 mL/kg as a single dose.

Weight kg	**Dose** mg	**Injection** 1 mg/mL (1:1 000)	**Age** years
9–12 kg	0.1 mg	0.1 mL	1–2 years
>12–17.5 kg	0.2 mg	0.2 mL	>2–5 years
>17.5–40 kg	0.3 mg	0.3 mL	>5–12 years
>40 kg	0.5 mg	0.5 mL	>12 years

AMOXICILLIN

3.2.1.1 Complicated severe acute malnutrition (SAM); 10.8 Measles (initial dose for measles with pneumonia, then refer); 17.3.4.1: Pneumonia in children; 19.4.2: Otitis media, acute.

- Amoxicillin, oral, 45 mg/ kg/ dose, 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule** mg		
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

ATROPINE

21.1.3 Bradycardia; 21.3.3 Exposure to poisonous substances.

- Atropine, IV, 0.05 mg/kg/dose.

Weight kg	**Dose** mg	**Use one of the following injections** (intravenously)		**Age** months/years
		0.5 mg/mL	1 mg/mL	
>3.5–5kg	0.2 mg	0.4 mL	0.2 mL	>1–3 months
>5–7 kg	0.3 mg	0.6 mL	0.3 mL	>3–6 months
>7–9 kg	0.4 mg	0.8 mL	0.4 mL	>6–12 months
>9–11 kg	0.5 mg	1 mL	0.5 mL	>12–18 months
>11–14 kg	0.6 mg	1.2 mL	0.6 mL	>18 months–3 years
>14–17.5 kg	0.8 mg	1.6 mL	0.8 mL	>3–5 years
>17.5 kg	1 mg	2 mL	1 mL	>5 years

AZITHROMYCIN

1.1.1 Dental abscess; 4.9 Rheumatic fever, acute; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 10.8 Measles (children with otitis media); 10.14 Tick bite fever; 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Azithromycin, oral, 10 mg/kg/dose, daily for 3 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp	**Tablet**		
		200 mg/5mL	250 mg	500 mg	
>3.5–5 kg	40 mg	1 ml	–	–	>1–3 months
>5–7 kg	60 mg	1.5 ml	–	–	>3–6 months
>7–9 kg	80 mg	2 mL			>6-12 months
>9–11 kg	100 mg	2.5 mL	–	–	>12–18 months
>11–14 kg	120 mg	3 mL	–	–	>18 months–3 years
>14–18 kg	160 mg	4 mL	–	–	>3–5 years
>18-25 kg	200 mg	5 mL	–	–	>5-7 years
>25–35 kg	250 mg	–	1 tablet	–	>7–11 years
>35 kg	500 mg	–	–	1 tablet	>11 years

CEFTRIAXONE

2.9.1 Diarrhoea, acute in children; 2.10.1 Dysentery, bacillary; 3.2.1.1 Complicated severe acute malnutrition (SAM); 8.4 Urinary tract infection (UTI); 10.5 Fever; 10.18 Viral haemorrhagic fever; 14.3 Arthritis, septic; 15.4.1 Meningitis, acute; 17.2.1 Croup (laryngotracheobronchitis) in children;17.3.4.1 Pneumonia in children; 21.2.9 Shock (septicaemia); 21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose.

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**			**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	1 000 mg/3.5 mL (1 000 mg diluted in 3.5 mL WFI)	
>2–2.5 kg	190 mg	1.5 mL	0.75 mL	–	>34–36 weeks
>2.5–3.5 kg	225 mg	1.8 mL	0.9 mL	–	>36 weeks–1 month
>3.5–5.5 kg	310 mg	–	1.25 mL	–	>1–3 months
>5.5–7 kg	440 mg	–	1.75 mL	–	>3–6 months
>7–9 kg	625 mg	–	2.5 mL	–	>6–12 months
>9–11 kg	750 mg	–	3 mL	–	>12–18 months
>11–14 kg	810 mg	–	3.25 mL	–	>18 months–3 years
>14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	>3–5 years
>17.5 kg	1 500 mg		-	5.5 mL	>5 years

CEPHALEXIN

5.4.1 Boil, abscess; 5.4.2 Impetigo;5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa, (furuncular).

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days.

Weight kg	**Dose** mg	**Syrup** 125 mg/ 5mL	**Syrup** 250 mg/ 5mL	**Capsule** 250 mg	**Age** Months/years
>2.5–5 kg	62.5 mg	2.5 mL	–	–	Birth–3 months
>5–11 kg	125 mg	5 mL	2.5 mL	–	>3–18 months
>11–25 kg	250 mg	10 mL	5 mL	1capsule	>18 months–7 years
>25 kg	500 mg	–	–	2 capsules	>7 years

CETIRIZINE

5.2 Itching (pruritus); 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis.

- Cetirizine, oral, once daily

Weight kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 1 mg/ mL	**Tablet** 10 mg	
>12–21 kg	5 mg	5 mL	–	2–6 years
>21 kg	10 mg	10 mL	1 tablet	>6 years

CHLORPHENAMINE

5.2 Itching (pruritus); 5.7.3 Sandworm; 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.1 Urticaria; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 10.2 Chicken pox; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis; 20.4 Chronic cancer pain (pruritis); 21.3.1.3 Insect stings, scorpion stings and spider bites.

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly.

Weight Kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
>12–14 kg	1.2 mg	3 mL	–	>2–3 years
>14–17.5 kg	1.6 mg	4 mL	–	>3–5 years
>17.5–25 kg	2 mg	5 mL	–	>5–7 years
>25–35 kg	3 mg	7.5 mL	–	>7–11 years
>35 kg	4 mg	–	1 tablet	>11 years

CIPROFLOXACIN

2.10.1 Dysentery, bacillary.

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp	**Tablet**		
		250 mg/5 mL	250 mg	500 mg	
>9–11 kg	150mg	3 mL	–	–	>12–18 months
>11–14 kg	200 mg	4 mL	–	–	>18 months–3 years
>14–17.5 kg	250 mg	5 mL	1	–	>3–5 years
>17.5–25 kg	300 mg	6 mL	–	–	>5–7 years
>25 kg	500 mg	10 mL	2	1	>7 years

CLARITHROMYCIN.

1.1.1 Dental abscess; 4.9 Rheumatic fever, acute; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 10.8 Measles (children with otitis media); 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Clarithromycin, oral, 7.5 mg/kg/dose, 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp		**Tablet**	
		125mg/5mL	250mg/5mL	250 mg	
>3.5–5 kg	30 mg	1.2	–	–	>1–3 months
>5–7 kg	45 mg	1.8	–	–	>3–6 months
>7–9 kg	62.5 mg	2.5	–	–	>6–12 months
>9–11 kg	75 mg	3	–	–	>12–18 months
>11–14 kg	100 mg	4	–	–	>18 months–3 years
>14–17.5kg	125 mg	5	2.5	–	>3–5 years
>17.5-25kg	150 mg	6	3	–	>5–7 years
>25–35 kg	187.5 mg	7.5	3.75	–	>7–11 years
>35–55 kg	250 mg	–	5	1 tablet	>11–15 years

COTRIMOXAZOLE (PROPHYLAXIS)

11.5 The HIV-exposed infant; 11.6 Management of HIV infected children; 11.7 Opportunistic infections, prophylaxis in children; 15.4.1 Meningitis, acute – listeriosis outbreak (pre-referral dose only).

- Cotrimoxazole, oral, once daily (everyday).

Recommended daily by weight band	**Dose sulfamethoxazole /trimethoprim**	**Susp** 200/40 mg per 5 mL	**Single strength tablet** 400/80 mg	**Double strength tablet** 800/160 mg
3–4.9 kg	100/20 mg	2.5 mL	¼ tablet	–
5–13.9 kg	200/40 mg	5 mL	½ tablet	–
14–29.9kg	400/80 mg	10 mL	1 tablet	½ tablet
>30 kg	800/160 mg	–	2 tablets	1 tablet

DIAZEPAM

15.3.3 Febrile convulsions; 21.2.11 Seizures and status epilepticus.

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.

Weight kg	**Dose** mg	**Ampoule** 10 mg/2 mL	**Age** Months/years
>3–6 kg	2 mg	0.4 mL	<6 months
>6–10 kg	2.5 mg	0.5 mL	>6 months–1 year
>10–18 kg	5 mg	1 mL	>1–5 years
>18–25 kg	7.5 mg	1.5 mL	>5–7 years
>25–40 kg	10 mg	2 mL	>7–12 years

EFAVIRENZ

11.6 Management of HIV-infected children

- Efavirenz, oral, at night.

Weight kg	Dose mg	Use one of the following: Capsule/Tablet			Age Months/years
		50 mg	200 mg	600 mg	
10–13.9 kg	200 mg	–	1 cap/tab	–	3 years
14–24.9 kg	300 mg	2 caps/tabs (50 mg) PLUS 1 cap/tab (200 mg)		–	>3–7 years
25–39.9 kg	400 mg	–	2 caps/tabs	–	>7–12 years
>40 kg	600 mg	–	–	1 tablet	>12 years

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2013. http://www.sahivsoc.org/Files/2013%20ARV%20dosing%20chart%20for%20children%20(Aug%202013).pdf

FLUCLOXACILLIN

5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa (furuncular)

- Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days.

Weight Kg	Dose mg	Syrup 125 mg/ 5mL	Capsule 250 mg	Age Months/years
>2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
>5–11 kg	125 mg	5 mL	–	>3–18 months
>11–25 kg	250 mg	10 mL	1 capsule	>18 months–7 years
>25 kg	500 mg	–	2 capsules	>7 years

FLUCONAZOLE

5.5.2.3 Scalp infections – tinea capitis (for 28 days); 11.8.2 Candidiasis, oesophageal (for 21 days).

- Fluconazole, oral, 6 mg/kg once daily.

Weight Kg	Dose mg	Use one of the following: Susp 50 mg/5 mL	Capsule 50 mg	Capsule 200 mg	Age Months/years
>3.5–5 kg	25 mg	2.5 mL	–	–	>1–3 months
>5–7 kg	30 mg	3 mL	–	–	>3–6 months
>7–9 kg	50 mg	5 mL	1 capsule	–	>6–12 months
>9–11 kg	60 mg	6 mL			>12–18 months
>11–14 kg	70 mg	7mL	–	–	>18 months–3 years
>14–17.5 kg	100 mg	10 mL	2 capsules	–	>3–5 years
>17.5–25 kg	125 mg	12.5 mL	–	–	>5–7 years
>25–35 kg	150 mg	15 mL	3 capsules	–	>7–11 years
>35 kg	200 mg	–	–	1 capsule	>11 years

FUROSEMIDE

4.6.2 Cardiac failure, Congestive (CCF), children; 8.1 Chronic kidney disease (CKD); 8.2 Acute kidney injury; 21.2.8 Pulmonary oedema, acute.

- Furosemide, IV, 1 mg/kg, over 5 minutes.

Weight Kg	Dose mg	Injection 10 mg/mL	Age Months/years
>3.5–5 kg	4 mg	0.4 mL	>1–3 months
>5–7 kg	6 mg	0.6 mL	>3–6 months
>7–9 kg	8 mg	0.8 mL	>6–12 months
>9–11 kg	10 mg	1 mL	>12–18 months
>11–14 kg	12 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	15 mg	1.5 mL	>3–5 years
>17.5–25 kg	20 mg	2 mL	>5–7 years
>25–35 kg	30 mg	3 mL	>7–11 years
>35 kg	40 mg	4 mL	>11 years

HYDROCORTISONE

17.1.1 Acute asthma & acute exacerbation of COPD; 21.2.10 Anaphylaxis.

- Hydrocortisone slow IV, 4–6 mg/kg immediately.

Weight kg	Dose mg	Injection 100 mg/2 mL	Age Months/years
>11–14 kg	50 mg	1 mL	>2–3 years
>14–17.5 kg	75 mg	1.5 mL	>3–5 years
>17.5 kg	100 mg	2 mL	>5 years

IBUPROFEN

20.2 Acute pain; 20.3 Chronic non-cancer pain; 20.4 Chronic cancer pain.

- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with or after a meal.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 100 mg/5mL	**Tablet** 200 mg	
>9–11 kg	80 mg	4 mL	–	>12–18 months
>11–14 kg	100 mg	5 mL	–	>18 months–3 years
>14–17.5 kg	120 mg	6 mL	–	>3–5 years
>17.5–25 kg	150 mg	7.5 mL	–	>5–7 years
>25–40 kg	200 mg	10 mL	1 tablet	>7–12 years
>40 kg	400 mg	–	2 tablets	>12 years

LACTULOSE

2.5.1 Anal fissures; 2.8 Constipation; 20.4 Chronic cancer pain (constipation); 22.1.1 Constipation (medicines used in palliative care).

- Lactulose, oral, 0.5 mL/kg/dose once daily.
  - If poor response, increase frequency to 12 hourly.

Weight kg	**Syrup** 3.3 g/5 mL	**Age** Months/years
>5–7 kg	3 mL	>3–6 months
>7–9 kg	4 mL	>6–12 months
>9–11 kg	5 mL	>12–18 months
>11–14 kg	6 mL	>18 months–3 years
>14–17.5 kg	7.5 mL	>3–5 years
>17.5–35 kg	10 mL	>5–11 years
>35 kg	15 mL	>11 years

LAMIVUDINE

11.6 Management of HIV-infected children; 21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Lamivudine, oral, 4 mg/kg 12 hourly or 8 mg/kg daily.

Weight kg	**Dose** mg	**Use one of the following**			**Age** Months/years
		Solution 10 mg/mL	**Tablet** 150 mg	**Tablet** 300 mg	
3–4.9 kg	40 mg	2 mL 12 hourly	-	-	>1–3 months
5–6.9 kg	60 mg	3 mL 12 hourly	–	–	>3–6 months
7–9.9 kg	80 mg	4 mL 12 hourly	–	–	>6 months –1 year
10–13.9 kg	120 mg	6 mL 12 hourly OR 12 mL daily	–	–	>1–3 years
14–19.9 kg	150 mg	7.5 mL 12 hourly OR 15 mL daily	½ tablet 12 hourly OR 1 tablet daily	–	>3–4 years
20–24.9 kg	300 mg	15 mL 12 hourly OR 30 mL daily	1 tablet 12 hourly OR 2 tablets daily	1 tablet daily	>4–7 years
>25 kg	600 mg	–	–	1 tablet 12 hourly OR 2 tablets daily	>7 years

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2013. http://www.sahivsoc.org/Files/2013%20ARV%20dosing%20chart%20for%20children%20(Aug%202013).pdf

LOPINAVIR/RITONAVIR

11.6 Management of HIV-infected children; 21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Lopinavir/ritonavir, oral 300/75mg/m2 – administered 12 hourly.

Weight kg	**Dose** mg		**Use one of the following**			**Age** Months/years
		Pellets/cap 40/10 mg	**Solution** 80/20 mg/mL	**Tablet** 100/25 mg	**Tablet** 200/50 mg	
3–4.9 kg	80/20 mg	2 capsules	1 mL	–	–	>1–3 months
5–5.9 kg	150/15 mg		1.5 mL	–	–	>3 months–1 year
6–9.9 kg	120/30 mg	3 capsules				
10–13.9 kg	160/40 mg	4 capsules	2 mL	–	–	>1–3 years
14–19.9 kg	200/50 mg	5 capsules	2.5 mL	2 tablets	1 tablet	>3–4 years
20–24.9 kg	240/60 mg	6 capsules	3 mL	2 tablets	1 tablet	>4–7 years
25–29.9 kg	280/70 mg		3.5 mL	3 tablets	–	>7–9 years
				OR 1x100/25 mg tablet and 1x200/50mg tablet		
30–34.9 kg	320/80 mg	8 capsules	4 mL	3 tablets	–	>9–11 years
				OR 1x100/25 mg tablet and 1x200/50 mg tablet		
>35 kg	400/100 mg	10 capsules	5 mL	–	2 tablets	>11 years

Source: National Department of Health. 2019 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy, Adolescents, Children, Infants and Neonates. https://www.knowledgehub.org.za/elibrary/2019-art-clinical-guidelines-management-hiv-adults-pregnancy-adolescents-children-infants

METRONIDAZOLE

1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Suspension 200 mg/5mL	**Tabs** 200mg	**Tabs** 400mg	
> 9–11 kg	80 mg	2 mL	–	–	>12–18 months
>11–14 kg	100 mg	2.5 mL	½ tablet	–	>18 months–3 years
>14–17.5 kg	120 mg	3 mL	–	–	>3–5 years
>17.5–25 kg	160 mg	4 mL	–	–	>5–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35–55 kg	300 mg	7.5mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	2 tablets	>15 years

MIDAZOLAM

15.3.3 Febrile convulsions; 21.2.11 Seizures and status epilepticus.

- Midazolam, buccal, 0.5 mg/kg/dose.

Weight kg	**Dose** mg	**Injection formulation (buccal administration)** 5 mg/mL	**Age** Months/years
>7–9 kg	4 mg	0.8 mL	>6–12 months
>9–11 kg	5 mg	1 mL	>12–18 months
>11–14 kg	6 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	7.5 mg	1.5 mL	>3–5 years
>17.5 kg	10 mg	2 mL	>5 years

MORPHINE

20.3 Chronic cancer pain

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 1 mg/mL	**Tablet** 10 mg	
>7–9 kg	2 mg	2 mL	–	>6–12 months
>9–11 kg	2.5 mg	2.5 mL	–	>12–18 months
>11–14 kg	4 mg	4 mL	–	>18 months–3 years
>14–17.5 kg	5 mg	5 mL	–	>3–5 years
>17.5–25 kg	6 mg	6 mL	–	>5–7 years
>25 kg	10 mg	10 mL	1 tablet	>7 years

PARACETAMOL

1.1.1 Dental abscess; 1.3.3 Necrotising periodontitis; 1.4 Herpes simplex infections of the mouth and lips; 1.5 Apthous ulcer; 10.2 Chickenpox; 10.5 Fever; 10.7.1 Malaria, uncomplicated (fever in children < 5 years of age); 10.8 Measles; 10.10 Mumps; 10.11 Rubella (German measles); 10.14 Tick bite fever; 14.1 Arthralgia; 15.3.3 Febrile convulsions; 15.4.1 Meningitis, acute; 15.5 Headache, mild, non-specific; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.1 Influenza; 18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn); 18.1.4 Conjunctivitis, viral (pink eye); 18.3.1 Eye injury, chemical burn; 18.3.3 Eye injury (blunt or penetrating); 19.2 Viral rhinitis (common cold); 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 20.2 Acute pain; 20.3 Chronic non-cancer pain; 20.4 Chronic cancer pain; 21.3.1.3 Insect stings, scorpion stings and spider bites; 21.3.2 Burns; 21.14 Injuries; 21.3.8 Sprains; 21.3.7 Soft tissue injuries.

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
>3.5–5 kg	48 mg	2 mL	–	>1–3 months
>5–7 kg	72 mg	3 mL	–	>3–6 months
>7–9 kg	96 mg	4 mL	–	>6–12 months
>9–11 kg	120 mg	5 mL	–	>12–18 months
>11–14 kg	144 mg	6 mL		>18 months–3 years
>14–17.5 kg	180 mg	7.5 mL		>3–5 years
>17.5–25 kg	240 mg	10 mL	½ tablet	>5–7 years
>25–35 kg	360 mg	15 mL		>7–11 years
>35–55 kg	500 mg	–	1 tablet	>11–15 years
>55 kg	1 000 mg		2 tablets	>15 years

PHENOBARBITAL

21.2.11 Seizures and status epilepticus.

- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 30 mg	**Age** Months/ years
>2.5–3.5 kg	60 mg	2 tablets	Birth–1 month
>3.5–5 kg	75 mg	2½ tablets	>1–3 months
>5–7 kg	120 mg	4 tablets	>3–6 months
>7–11 kg	180 mg	6 tablets	>6–12 months
>11–14 kg	210 mg	7 tablets	>18 months–3 years
>14 kg	240 mg	8 tablets	>3 years

PRAZIQUANTEL

10.12 Schistosomiasis.

- Praziquantel, oral, 40 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 600 mg	**Age** years
>12–17.5 kg	600 mg	1tablet	>2–5 years
>17.5–25 kg	900 mg	1½ tablet	>5–7 years
>25–35 kg	1 200 mg	2 tablets	>7–11 years
>35 kg	1 800 mg	3 tablets	>11 years

PROMETHAZINE

21.2.10 Anaphylaxis.

- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg.

Weight kg	**Dose** mg	**Use one of the following injections:**		**Age** Months/years
		25 mg/mL	50 mg/2 mL	
>12–17.5 kg	2.5 mg	0.1 mL	0.1 mL	2–5 years
>17.5–25 kg	5 mg	0.2 mL	0.2 mL	>5–7 years
>25–35 kg	7.5 mg	0.3 mL	0.3 mL	>7–11 years
>35–55 kg	15 mg	0.6 mL	0.6 mL	>11–15 years
>55 kg	25 mg	1 mL	1 mL	>15 years

QUININE DIHYDROCHLORIDE

10.7.2 Malaria, severe.

- Quinine dihydrochloride, IV or IM, 15–20 mg/kg immediately as a single dose and refer urgently.

Weight kg	**Dose** mg	**Injection** 300 mg /mL	**Use one of the following:**		**Age** Months/years
			IM volume of Sodium chloride 0.9%	**IV** volume of Dextrose 5%	
>9–11 kg	180 mg	0.6 mL	2 mL	75 mL	>12–18 months
>11–14 kg	210 mg	0.7 mL	2.5 mL	100 mL	>18 months–3 years
>14–17.5 kg	300 mg	1 mL	3 mL	125 mL	>3–5 years
>17.5–25 kg	360 mg	1.2 mL	4.5 mL	175 mL	>5–7 years
>25–35 kg	510 mg	1.7 mL	7.5 mL	250 mL	>7–11 years
>35–55 kg	750 mg	2.5 mL	10 mL	350 mL	>11–15 years
>55 kg	900 mg	3 mL	10 mL	450 mL	>15 years

RITONAVIR

11.6 Management of HIV-infected children; 11.8.7 Tuberculosis (concomitant ARVs).

- Ritonavir, oral, 12 hourly (ONLY as booster for lopinavir/ritonavir, when on rifampicin).

Weight kg	**Dose** mg	**Solution** 80 mg/mL	**Age** years
3–4.9 kg	80 mg	1 mL	>1–3 months
5–13.9 kg	120 mg	1.5 mL	>3 months–3 years
14–19.9 kg	160 mg	2 mL	>3–4 years
20–24.9 kg	200 mg	2.5 mL	>4–7 years
25–34.9 kg	240 mg	3 mL	>7–11 years
>35 kg	320 mg	4 mL	>11 years

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2013. http://www.sahivsoc.org/Files/2013%20ARV%20dosing%20chart%20for%20children%20(Aug%202013).pdf

ZIDOVUDINE

21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Zidovudine, oral, 180-240 mg/m2 12 hourly.

Weight kg	**Dose** mg	**Use one of the following**			**Age** years
		Solution 10 mg/mL	**Capsule** 100 mg	**Tablet** 300 mg	
3–5.9 kg	60 mg	6 mL 12 hourly	–	–	>1–4 months
6–7.9 kg	90 mg	9 mL 12 hourly	–	–	>4–7 months
8–13.9 kg	120 mg	12 mL 12 hourly	1 cap 12 hourly	–	>7 months–3 years
14–19.9 kg	150 mg	15 mL 12 hourly	2 caps in the morning and 1 cap in the evening	–	>3–4 years
20–24.9 kg	200 mg	20 mL 12 hourly	2 caps 12 hourly	–	>4–7 years
>25 kg	300 mg	–	–	1 tab 12 hourly	>7 years

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2013. http://www.sahivsoc.org/Files/2013%20ARV%20dosing%20chart%20for%20children%20(Aug%202013).pdf

GUIDELINES FOR THE MOTIVATION OF A NEW MEDICINE ON THE NATIONAL ESSENTIAL MEDICINES LIST

Section 1: Medication details

» Generic name
A fundamental principle of the Essential Drug Programme is that of generic prescribing. Most clinical trails are conducted using the generic name.

» Proposed indication
There will usually be many registered indications for the medication. However, this section should be limited to the main indication which is supported by the evidence provided in section 2.

» Prevalence of the condition in South Africa
This information is not always readily available. However, it is an important consideration in the review of a proposed essential medicine.

» Prescriber level
Here the proposed prescriber level should be included. If more than one level is proposed each relevant box should be ticked.

Section 2: Evidence and motivation

» Estimated benefit
- Effect measure: this is the clinical outcome that was reported in the clinical trial such as BP, FEV, CD_4, VL etc.
- Risk benefit: this should reported in the clinical trial and, in most cases, includes the 95% confidence level (95% CI). Absolute risk reduction, also termed risk difference, is the difference between the absolute risk of an event in the intervention group and the absolute risk in the control group.
- Number Need to Treat (NNT): gives the number of patients who need to be treated for a certain period of time to prevent one event. It is the reciprocal of the absolute risk or can be calculated using the formula on page xxxv.

Calculations

	Bad outcome	Good outcome	Total patients
Intervention group	*a*	*c*	*a + c*
Control group	*b*	*d*	*b + d*

Measure	Equation
Absolute risk:	[b/(b+d)] – [a/(a+c)]
Number needed to treat	$\frac{1}{[b/(b+d)] - [a/(a+c)]}$
Relative risk	[a/(a+c)] ÷ [b/(b+d)]
Odds ratio	$\frac{[a/(a+c)] \div [c/(a+c)]}{[b/(b+d)] \div [d/(b+d)]} = (a/c) \div (b/d)$

Reference - Aust Prescr 2008;31:12–16)

» Motivating information (Level of evidence based on the SORT system)
- The National Essential Medicines List Committee has endorsed the adoption of the SORT system for categorising levels of evidence. This system[2] contains only three levels:

Level I	Good quality evidence	Systematic review of RCTs with consistent findings High quality individual RCT
Level II	Limited quality patient oriented evidence	Systematic review of lower quality studies or studies with inconsistent findings Low quality clinical trial Cohort studies Case-control studies
Level III	Other	Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series

A: Newer product: for most newer products, level I evidence such as high quality systematic reviews or peer-reviewed high quality randomised controlled trials should be identified and referenced in the space provided.

B: Older products: many of these products were developed prior to the wide use of randomised controlled trials. However, there may be level I evidence where the product was used as the control arm for a newer product. If no level I evidence can

[2] Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician. 2004;69:550-6.

be identified, then level II data from poorer quality controlled trials or high quality observational studies should be referenced in the space provided.

» Cost considerations
  - Where a published reference supporting the review of cost is available comments should be made regarding its applicability to the South African public sector environment.
  - Possible unpublished information that can be included:
    - Cost per daily dose or course of therapy – for long term or chronic therapy such as hypertension the usual daily dose should be calculated (Dose x number of times a day) and converted into the number of dosing units e.g. tablets. This is then used to calculate the cost per day. For medications used in a course of therapy such as antibiotics this is then multiplied by the number of days in the course of therapy.
    - Cost minimisation is used where there is evidence to support equivalence and aims to identify the least costly treatment by identifying all the relevant costs associated with the treatment.
    - Cost-effectiveness analysis is used to compare treatment alternatives that differ in the degree of success in terms of the therapeutic or clinical outcome. By calculating a summary measurement of efficiency (a cost-effectiveness ratio), alternatives with different costs, efficacy rates, and safety rates can be fairly compared along a level playing field.

Where any of these have been performed tick the relevant block and send as an attachment with all the calculations. If possible, the spread sheet should be supplied electronically.

Section 3: Motivator's Details

The receipt of all submission will be acknowledged. In addition, all decisions with supporting arguments will be communicated where appropriate. This section therefore forms a vital link between the motivator and the decision making process.

Note: The evidence for decisions informing the selection of a medicine is cited in the STGs, with the respective level of evidence. For example, the following abbreviation is used to describe good quality RCT evidence: '*LoE: I'.*
Where possible, hyperlinks are provided for cited evidence.
The rationale for decision-making may be sourced from the relevant medicine reviews, costing analysis reports or NEMLC reports that is accessible from the National Department of Health website at: http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/285-phc

DEPARTMENT OF HEALTH
Republic of South Africa

Motivation form for the inclusion of a new medication on the National Essential Medicines List

Section 1: Medication details			
Generic name (or International Non-proprietary Name):			
Proposed indication:			
Prevalence of condition (based on epidemiological data, if any):			
Prescriber level			
Primary Health Care 1	Medical Officer 2	Specialist 3	Designated Specialist 4

Section 2: Evidence and motivation			
2.1 Estimated benefit			
Effect measure			
Risk difference (95% CI)			
NNT			
2.2: Motivating information (Level of evidence based on the SORT system)			
A. Newer product: High quality systematic reviews or peer-reviewed high quality randomised controlled trials (Level I)			
Author	Title	Journal ref	
B. Older product with weaker evidence base: Poorer quality controlled trials or high quality observational studies (Level II)			
Author	Title	Journal ref	
2.3: Cost-considerations			
Have you worked up the cost?	YES	NO	
	Daily cost	Cost minimisation	Cost-effectiveness analysis
Other relevant cost information if available:			
Author	Title	Journal ref	
2.4: Additional motivating comments.			

Section 3: Motivator's Details	
Name:	**Date submitted:**
Qualification:	**Registration number:**
PTC motivation: Y/N	**PTC Details:**
PTC Chair:	**PTC Chair signature:**

GUIDELINES FOR ADVERSE DRUG REACTION REPORTING

National Pharmacovigilance Programme
The South African Health Products Regulatory Authority (SAHPRA) has a responsibility to ensure the safety, efficacy and quality of all medicines used by the South African public. The National Pharmacovigilance Programme is coordinated by the SAHPRA and has a dedicated Unit, The National Adverse Drug Event Monitoring Centre (NADEMC), in Cape Town, which monitors the safety of all registered medicines in South Africa.

What is Pharmacovigilance?
Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e. adverse drug reactions or ADRs). The ultimate goal of this activity is to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an Adverse Drug Reaction (ADR)?
SAHPRA defines an Adverse Drug Reaction (ADR) as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?
All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

What happens to a report?
All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

» additional investigations into the use of the medicine in South Africa;
» educational initiatives to improve the safe use of the medicine;
» appropriate package insert changes to include the potential for the reaction, and
» changes in the scheduling or manufacture of the medicine to make it safer.

The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?
An ADR report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and that of the patient will be removed before any details about a specific adverse drug reaction are used or communicated to others. The information is only meant to improve the understanding of the medicines used in the country.

Is the event possibly an ADR?

The following factors should be considered when an ADR is suspected:

1. What exactly is the nature of the reaction? (*Describe the reaction as clearly as possible and where possible provide an accurate diagnosis*.)
2. Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? (*Some reactions occur immediately after administration of a medicine while others take time to develop*.)
3. Is the reaction known to occur with the particular medicine as stated in the package insert or other reference? (*If the reaction is not documented in the package insert, it does not mean that the reaction cannot occur with that particular medicine*.)
4. Did the patient recover when the suspected medicine was stopped? (*Some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped*.)
5. Did the patient take the medicine again after the reaction abated (i.e. rechallenge). If so, did the same reaction occur again? (*In most situations it is not possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event is a strong indicator that the medicine may be responsible*.)
6. Can this reaction be explained by other causes (e.g. underlying disease/s; other medicine/s; toxins or foods)? (*It is essential that the patient is thoroughly investigated to decide what the actual cause of any new medical problem is. A medicine-related cause should be considered, when other causes do not explain the patient's condition*.)

What types of reactions should be reported?

- All ADRs to newly marketed or new medicines added to the EML
- All serious reactions and interactions
- ADRs that are not clearly stated in the package insert.
- All adverse reactions or poisonings to traditional or herbal remedies

Report even if you are not certain that the medicine caused the event.

What Product Quality Problems should be reported?

- suspected contamination;
- questionable stability;
- defective components;
- poor packaging or labeling;
- therapeutic failures.

How can ADRs be prevented from occurring?

Some ADRs are unavoidable and cannot be prevented. However, most can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?

An Adverse Drug Reaction/Product Quality Report Form is enclosed and should be completed in as much detail as possible before returning it to any of the addresses provided below. Additional forms can be obtained by contacting the SAHPRA at these

addresses. Adverse drug reaction and quality reporting may also be submitted electronically at:
https://primaryreporting.who-umc.org/Reporting/Reporter?OrganizationID=ZA

1. The Registrar of Medicines

South African Health Products Regulatory Authority, Department of Health, Private Bag X828, Pretoria, 0001.
Tel: (021) 501 0300
Email: adr@sahpra.org.za

2. The National Adverse Drug Event Monitoring Centre (NADEMC)

C/o Division of Pharmacology, University of Cape Town,
Observatory, 7925.
(021) 447 1618; Fax: (021) 448 6181

DISEASE NOTIFICATION PROCEDURES

The International Health Regulations, 2005 (IHR) and the National Health Act, 61 0f 2003 in South Africa require the rapid detection of notifiable medical conditions (NMC), as well as the prompt risk assessment, notification, verification and implementation of timely interventions.

NMCs are diseases that are of public health importance because they pose significant public health risks that can result in disease outbreaks or epidemics with high case fatality rates both nationally and internationally.

Identification of diseased persons and implementation of necessary public health actions to ensure that the disease is not spread to other people can control spread of infectious diseases within the population. Real-time surveillance and reporting NMCs provides an early warning signal and a window of opportunity to interrupt the disease transmission cycle.

Who should notify

The first health care professional to come into contact with a patient presenting with one of the prescribed NMCs is required by law to notify. This may include clinic personnel, infection control nurses, other hospital staff or private medical practitioners. Any member of the community aware of or who reasonably suspects that a person in the community is a case or carrier must immediately report this to the nearest medical health establishment for reporting of the NMC.

Which diseases to notify

Notifiable medical conditions have been sub-divided into two categories according to type of disease:

*Category 1 NMC***:** Requires to be reported immediately using the most rapid means upon clinical or laboratory diagnosis followed by a written or electronic notification within 24 hours of diagnosis.

Category 2 NMC: Requires to be reported through a written or electronic notification, within 7 days of of clinical or laboratory diagnosis but preferably as soon as possible following diagnosis.

Reporting a Notifiable Disease during an outbreak

During an outbreak of a notifiable disease, report all cases electronically or by phone, email or fax. Daily reporting by health facilities should be maintained through an Outbreak Case Line Listing Form as well through the notification form (GW17/5) to the local health authority that must report to the provincial health officials and the National Department of Health.

How to notify

» *Electronically:*
Electronic reporting via the NMC mobile or web based APP:
https://www.nicd.ac.za/nmc-overview/notification-process/

» *Paper-based:*
- Complete the case-based form (GW 17/5)

- Send the NMC Case Notification Form to NMCsurveillanceReport@nicd.ac.za or fax to 086 639 1638 or NMC hotline 072 621 3805. Form(s) can be sent via sms, whatsapp, email, fax.
- Send a copy to the NMC focal person at Sub-District/District

Any person contracting a notifiable disease and then dies from the disease should be notified twice: first as a **"CASE"** and then later as a **"DEATH".** This will ensure that when estimating the **"Case Fatality Rate"** (CFR%), all deaths in the numerator are also included in the denominator.

National NMC contact details:
Helpline: 072 621 3805
Fax no: 086 639 1638
Sms/whatsup line (for copy/photograph submissions): 072 621 3805
Email address: NMCsurveillanceReport@nicd.ac.za

List of Notifiable Medical Conditions

Category 1: *Immediate notification (within 24 hours) of diagnosis*

Acute flaccid paralysis
Acute rheumatic fever
Anthrax
Botulism
Cholera
Coronavirus disease-2019 (COVID-19)
Diphtheria
Enteric fever (typhoid or paratyphoid fever)
Food borne disease outbreak
Haemolytic uraemic syndrome (HUS)
Listeriosis
Malaria
Measles
Meningococcal disease
Multisystem inflammatory syndrome (MIS-C)
Pertussis
Plague
Poliomyelitis
Rabies (human)
Respiratory disease caused by a novel respiratory pathogen
Rift valley fever (human)
Smallpox
Viral haemorrhagic fever diseases
Yellow fever

Category 2: *Notification within seven days of diagnosis*

Agricultural or stock remedy poisoning
Bilharzia (schistosomiasis)
Brucellosis
Congenital rubella syndrome
Congenital syphilis
Haemophilus influenzae type B
Hepatitis A
Hepatitis B
Hepatitis C
Hepatitis E
Lead poisoning
Legionellosis
Leprosy
Maternal death (pregnancy, childbirth and puerperium)
Mercury poisoning
Soil transmitted helminths
Tetanus
Tuberculosis: pulmonary
Tuberculosis: extra-pulmonary
Tuberculosis: multidrug-resistant (MDR-TB)
Tuberculosis: extensively drug-resistant (XDR-TB)

USING THE ROAD TO HEALTH BOOKLET

Check and update the Road to Health booklet at each consultation and on each admission and discharge.

The South African Road to Health Booklet is an extremely important document for the child and family,

It is designed to support and integrate the various child health strategies such as IMCI, EPI, TB and HIV care and the Integrated Nutrition Programme. It reminds health care workers to look for, respond to, and record important events and care given to the child.

OWNERSHIP OF THE BOOKLET

The Road to Health Booklet is the exclusive property of the parent (primary caregiver) and the child. This is important as the booklet contains information on the child's health including HIV status, and if the booklet is used for other purposes, mothers may hide the booklet or refuse to allow important information to be recorded in it. This can result in the child receiving less than optimal care

USE OF THE ROAD TO HEALTH BOOKLET

Issuing the Road to Health Booklet

At birth all children should be issued with a Road to Health Booklet – in which all vital information is recorded including:

- » Name and date of birth: Page 1 (front cover)
- » Details of child and family: Page 4
- » Neonatal information: Page 5
- » Immunisations at birth: Page 6
- » PMTCT/HIV information: Page 7

Use at health service contacts

On the cover the booklet states:

"IMPORTANT: always bring this booklet when you visit any health clinic, doctor or hospital"

To use the booklet effectively the attending nurse or doctor should ask, at each attendance, to see the Road to Health booklet both due to its intrinsic value as part of a child health consultation and to emphasise the importance of the booklet and its use to the mother.

On each visit complete/record appropriately

» Well child visit routine care (incl. growth, TB status, PMTCT HIV status, feeding etc.): pages 2, 3.
» Immunisations given: page 6.
» Information on the HIV status of the mother and child (if HIV-exposed): page 8.
» Vitamin A and deworming: page 9.
» Weight for age, length/height for age and weight for length/height charting: pages 14 to19.
» Any clinical notes (ideally using IMCI classification, treatment and follow up should be made in the clinical notes): pages 21 to 27.
» Any hospital admissions should be recorded: page 19.

During the health visit certain care given will depend on whether this is a scheduled well child visit, a follow-up visit, or a first attendance for a new illness.

<table>
<tr><th>Well child visit</th><th>Sick child consultation</th><th>Follow up consultation</th></tr>
<tr><td colspan="3">Greet mother and child</td></tr>
<tr><td>Ask why she has come and whether she has any concerns.</td><td>Ask why she has come and what her concerns are.</td><td>Ask how the child is and whether any further concerns have arisen.</td></tr>
<tr><td colspan="3">Ask for Road to Health Booklet and use it.</td></tr>
<tr><td>If the child has an illness, proceed to sick child consultation (IMCI) in addition to the well child consultation.</td><td>Proceed to sick child consultation (IMCI).
Ensure that promotive aspects of IMCI (nutrition, immunisations, HIV and TB status) are covered.</td><td>Carry out the follow-up process from IMCI, but also check the well child consultation.</td></tr>
<tr><td colspan="3">Check and record all due visit items – see above.</td></tr>
<tr><td>Carry out and record the well child visit.
Note and respond to any other problems identified.</td><td colspan="2">Manage the child according to IMCI classification.
Follow up as required.
Carry out and record the well child visit.
Note and respond to any other problems identified.</td></tr>
<tr><td colspan="3">Tell mother what has been done, what was found and what this means.
Ensure the mother knows when to follow up for the next well child visit, and when to come if the child is ill or for other scheduled follow up.</td></tr>
</table>

WHO WEIGHT REFERENCES

WHO Weight-for-Length Reference Card (below 87 cm)										
Boys' weight (kg)						Girls' weight (kg)				
–4 SD	–3 SD	–2 SD	–1 SD	Median	**Length cm**	Median	–1 SD	–2 SD	–3 SD	–4 SD
1.7	1.9	2.0	2.2	2.4	**45**	2.5	2.3	2.1	1.9	1.7
1.8	2.0	2.2	2.4	2.6	**46**	2.6	2.4	2.2	2.0	1.9
2.0	2.1	2.3	2.5	2.8	**47**	2.8	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.7	2.9	**48**	3.0	2.7	2.5	2.3	2.1
2.2	2.4	2.6	2.9	3.1	**49**	3.2	2.9	2.6	2.4	2.2
2.4	2.6	2.8	3.0	3.3	**50**	3.4	3.1	2.8	2.6	2.4
2.5	2.7	3.0	3.2	3.5	**51**	3.6	3.3	3.0	2.8	2.5
2.7	2.9	3.2	3.5	3.8	**52**	3.8	3.5	3.2	2.9	2.7
2.9	3.1	3.4	3.7	4.0	**53**	4.0	3.7	3.4	3.1	2.8
3.1	3.3	3.6	3.9	4.3	**54**	4.3	3.9	3.6	3.3	3.0
3.3	3.6	3.8	4.2	4.5	**55**	4.5	4.2	3.8	3.5	3.2
3.5	3.8	4.1	4.4	4.8	**56**	4.8	4.4	4.0	3.7	3.4
3.7	4.0	4.3	4.7	5.1	**57**	5.1	4.6	4.3	3.9	3.6
3.9	4.3	4.6	5.0	5.4	**58**	5.4	4.9	4.5	4.1	3.8
4.1	4.5	4.8	5.3	5.7	**59**	5.6	5.1	4.7	4.3	3.9
4.3	4.7	5.1	5.5	6.0	**60**	5.9	5.4	4.9	4.5	4.1
4.5	4.9	5.3	5.8	6.3	**61**	6.1	5.6	5.1	4.7	4.3
4.7	5.1	5.6	6.0	6.5	**62**	6.4	5.8	5.3	4.9	4.5
4.9	5.3	5.8	6.2	6.8	**63**	6.6	6.0	5.5	5.4	4.7
5.1	5.5	6.0	6.5	7.0	**64**	6.9	6.3	5.7	5.3	4.8
5.3	5.7	6.2	6.7	7.3	**65**	7.1	6.5	5.9	5.5	5.0
5.5	5.9	6.4	6.9	7.5	**66**	7.3	6.7	6.1	5.6	5.1
5.6	6.1	6.6	6.1	7.7	**67**	7.5	6.9	6.3	5.8	5.3
5.8	6.3	6.8	7.3	8.0	**68**	7.7	7.1	6.5	6.0	5.5
6.0	6.5	7.0	7.6	8.2	**69**	8.0	7.3	6.7	6.1	5.6
6.1	6.6	7.2	7.8	8.4	**70**	8.2	7.5	6.9	6.3	5.8
6.3	6.8	7.4	8.0	8.6	**71**	8.4	7.7	7.0	6.5	5.9
6.4	7.0	7.6	8.2	8.9	**72**	8.6	7.8	7.2	6.6	6.0
6.6	7.2	7.7	8.4	9.1	**73**	8.8	8.0	7.4	6.8	6.2
6.7	7.3	7.9	8.6	9.3	**74**	9.0	8.2	7.5	6.9	6.3
6.9	7.5	8.1	8.8	9.5	**75**	9.1	8.4	7.7	7.1	6.5
7.0	7.6	8.3	8.9	9.7	**76**	9.3	8.5	7.8	7.2	6.6
7.2	7.8	8.4	9.1	9.9	**77**	9.5	8.7	8.0	7.4	6.7
7.3	7.9	8.6	9.3	10.1	**78**	9.7	8.9	8.2	7.5	6.9
7.4	8.1	8.7	9.5	10.3	**79**	9.9	9.1	8.3	7.7	7.0
7.6	8.2	8.9	9.6	10.4	**80**	10.1	9.2	8.5	7.8	7.1
7.7	8.4	9.1	9.8	10.6	**81**	10.3	9.4	8.7	8.0	7.3
7.9	8.5	9.2	10.0	10.8	**82**	10.5	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	11.0	**83**	10.7	9.8	9.0	8.3	7.6
8.2	8.9	9.6	10.4	11.3	**84**	11.0	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	11.5	**85**	11.2	10.3	9.4	8.7	8.0
8.6	9.3	10.0	10.8	11.7	**86**	11.5	10.5	9.7	8.9	8.1

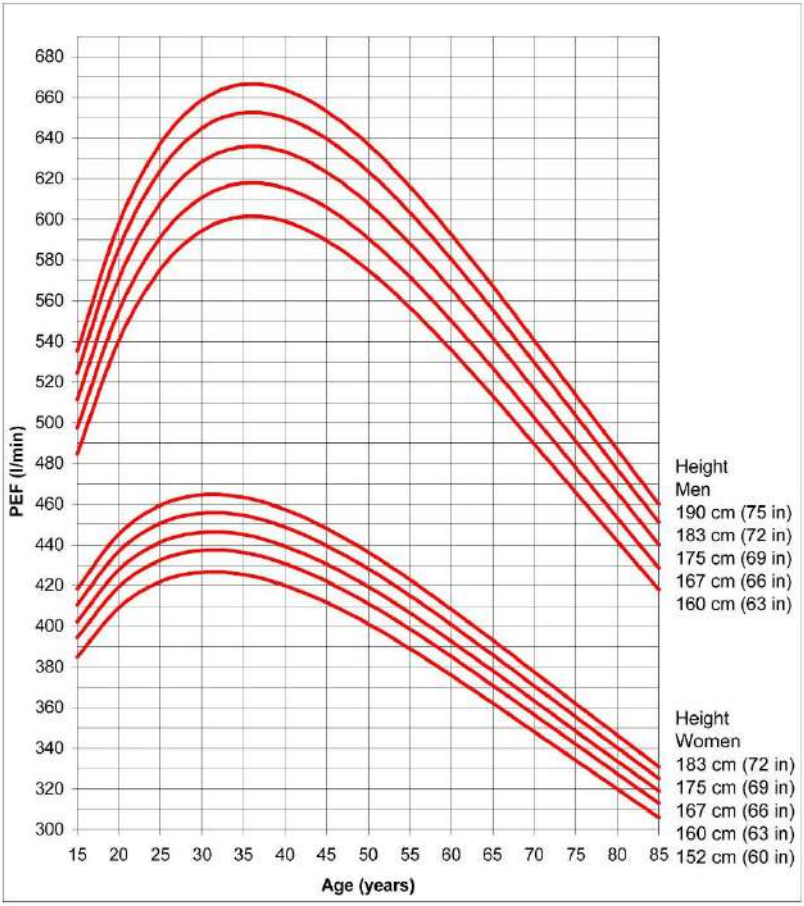
WHO Weight-for-Height Reference Card (87 cm and above)										
Boys' weight (kg)						Girls' weight (kg)				
–4 SD	–3 SD	–2 SD	–1 SD	Median	**Length cm**	Median	–1 SD	–2 SD	–3 SD	–4 SD
8.9	9.6	10.4	11.2	12.2	**87**	11.9	10.9	10.0	9.2	8.4
9.1	9.8	10.6	11.5	12.4	**88**	12.1	11.1	10.2	9.4	8.6
9.3	10.0	10.8	11.7	12.6	**89**	12.4	11.4	10.4	9.6	8.8
9.4	10.2	11.0	11.9	12.9	**90**	12.6	11.6	10.6	9.8	9.0
9.6	10.4	11.2	12.1	13.1	**91**	12.9	11.8	10.9	10.0	9.1
9.8	10.6	11.4	12.3	13.4	**92**	13.1	12.0	11.1	10.2	9.3
9.9	10.8	11.6	12.6	13.6	**93**	13.4	12.3	11.3	10.4	9.5
10.1	11.0	11.8	12.8	13.8	**94**	13.6	12.5	11.5	10.6	9.7
10.3	11.1	12.0	13.0	14.1	**95**	13.9	12.7	11.7	10.8	9.8
10.4	11.3	12.2	13.2	14.3	**96**	14.1	12.9	11.9	10.9	10.0
10.6	11.5	12.4	13.4	14.6	**97**	14.4	13.2	12.1	11.1	10.2
10.8	11.7	12.6	13.7	14.8	**98**	14.7	13.4	12.3	11.3	10.4
11.0	11.9	12.9	13.9	15.1	**99**	14.9	13.7	12.5	11.5	10.5
11.2	12.1	13.1	14.2	15.4	**100**	15.2	13.9	12.8	11.7	10.7
11.3	12.3	13.3	14.4	15.6	**101**	15.5	14.2	13.0	12.0	10.9
11.5	12.5	13.6	14.7	15.9	**102**	15.8	14.5	13.3	12.2	11.1
11.7	12.8	13.8	14.9	16.2	**103**	16.1	14.7	13.5	12.4	11.3
11.9	13.0	14.0	15.2	16.5	**104**	16.4	15.0	13.8	12.6	11.5
12.1	13.2	14.3	15.5	16.8	**105**	16.8	15.3	14.0	12.9	11.8
12.3	13.4	15.4	15.8	17.2	**106**	17.1	15.6	14.3	13.1	12.0
12.5	13.7	14.8	16.1	17.5	**107**	17.5	15.9	14.6	13.4	12.2
12.7	13.9	15.1	16.4	17.8	**108**	17.8	16.3	14.9	13.7	12.4
12.9	14.1	15.3	16.7	18.2	**109**	18.2	16.6	15.2	13.9	12.7
13.2	14.4	15.6	17.0	18.5	**110**	18.6	17.0	15.5	14.2	12.9
13.4	14.6	15.9	17.3	18.9	**111**	19.0	17.3	15.8	14.5	13.2
13.6	14.9	16.8	17.6	19.2	**112**	19.4	17.7	16.2	14.8	13.5
13.8	15.2	16.5	18.0	19.6	**113**	19.8	18.0	16.5	15.1	13.7
14.1	15.4	16.8	18.3	20.0	**114**	20.2	18.4	16.8	15.4	14.0
14.3	15.7	17.1	18.6	20.0	**115**	20.7	18.8	17.2	15.7	14.3
14.6	16.0	17.4	19.0	20.8	**116**	21.1	19.2	17.5	16.0	14.5
14.8	16.2	17.7	19.3	21.2	**117**	21.5	19.6	17.7	18.3	14.8
15.0	16.5	18.0	19.7	21.6	**118**	22.0	19.9	18.2	16.6	15.1
15.3	16.8	18.3	20.0	22.0	**119**	22.4	20.3	18.5	16.9	15.4
15.5	17.1	18.6	20.4	22.4	**120**	22.8	20.7	18.9	17.3	15.6

PEAK EXPIRATORY FLOW RATES (PEF CHARTS)

Suggested reference peak expiratory flow (PEF) values for children:

Height (cm)	PEF		PEF	
	Caucasian		African	
	Male	Female	Male	Female
100	127	142	120	126
101	131	145	124	130
102	135	149	128	133
103	138	152	131	137
104	142	156	135	140
105	146	159	139	144
106	150	163	143	148
107	154	166	147	151
108	158	170	151	155
109	162	174	155	159
110	166	178	159	163
111	170	182	163	167
112	175	185	168	171
113	179	189	172	175
114	184	193	176	179
115	188	197	181	184
116	193	202	186	188
117	197	206	190	192
118	202	210	195	197
119	207	214	200	201
120	212	218	205	206
121	217	223	210	210
122	222	227	215	215
123	227	232	220	220
124	232	236	226	225
125	237	241	231	230
126	243	245	236	235
127	248	250	242	240
128	254	255	248	245
129	259	259	253	250
130	265	264	259	255
131	271	269	265	260
132	276	274	271	266
133	282	279	277	271
134	288	284	283	277
135	294	289	289	282
136	300	294	295	288
137	307	299	302	293

Peak expiratory flow in normal adult subjects



Adapted with kind permission from Nunn AJ Gregg I, Br Med J 1989:298;1068-70 and Clement Clarke International.

CALCULATING % PREDICTED PEAK FLOW RATE

- Take the best of 3 of the patient's observed peak flow rate:
  e.g. 200, 180, 190 performed – so take 200.
- Find the patient's sex, age and height predicted value from nomogram or table:
  e.g. 440 for a woman of age 25 years and height 167 cm
- Divide patient's observed peak flow rate over their predicted peak flow rate:
  e.g. 200/440 = 0.45
- Multiply by 100:
  e.g. 0.45X100 = 45%

So, in this example, the patient's observed peak flow rate is 45% of predicted.

CALCULATING PEAK FLOW VARIABILITY

There are a number of methods for calculating PEF variability.

One method is described below:

- Subtract the lowest from the highest reading.
- Divide by the highest reading.
- Multiply by 100.

So, in this example, where a patient has readings of 300 to 400, the variability is 25%. If these readings were taken before and after a test dose of salbutamol, asthma is diagnosed. (See Section 17.1.2 Chronic asthma).

INDEX OF CONDITIONS

INDEX OF MEDICINES

ABBREVIATIONS

3TC	lamivudine
ABC	abacavir
ABG	arterial blood gas
ACE-inhibitor	angiotensin-converting-enzyme inhibitor
ACR	albumin/creatinine ratio
AED	automated external defibrillator
AEFI	adverse events following immunisation
AIDS	Acquired Immune Deficiency Syndrome
Al^{3+}	Aluminium salts
ALT	alanine transaminase
AMI	acute myocardial infarction
ARB	angiotensin II receptor blockers
ART	antiretroviral therapy
ARV	antiretroviral medicine
AST	aspartate aminotransferase
ATV/r	atazanavir/ritonavir
AZT	zidovudine
BAL	balanitis/balanoposthitis
BCG vaccine	Bacillus Calmette–Guérin vaccine
BMI	body mass index
BP	blood pressure
BPH	benign prostatic hyperplasia
°C	degree(s) Celsius
Ca^{2+}	calcium salts
CAB	circulation airways breathing
cap(s)	capsule(s)
CCF	congestive cardiac failure
CD4	cluster of differentiation 4
CHC	community health centres
CKD	chronic kidney disease
cm	centimetre
CMV	cytomegalovirus
CNS	central nervous system
CO_2	carbon dioxide
COC	combined oral contraceptive
COPD	chronic obstructive pulmonary disease
CPR	cardiopulmonary resuscitation
CrAg	cryptococcal antigen
CSF	cerebrospinal fluid
CVA	cerebral vascular accident
CVD	cardiovascular disease
CVS	cardiovascular system
d4T	stavudine
DD	Darrows dextrose
ddI	didanosine
GW	genital warts
DKA	hyperglycaemia diabetic ketoacidosis
dL	decilitre
DMARDs	Disease Modifying Anti-rheumatic Drugs
DNA	deoxyribonucleic acid
DoH	Department of Health
DEET	di-ethyl 3-methylbenzamid
DHIS	District health information system
DKA	hyperglycaemia diabetic ketoacidosis
dL	decilitre
DMARDs	Disease Modifying Anti-rheumatic Drugs
DNA	deoxyribonucleic acid
DoH	Department of Health
DRESS	drug reaction with eosinophilia and systemic symptoms
DR-TB	drug resistant tuberculosis
DRV/r	darunavir/ritonavir
DTaP	diptheria, tetanus, acellular pertussis
IO	intra-osseus
IPT	isoniazid preventive therapy
IPV	inactivated polio vaccine
IRIS	immune reconstitution inflammatory syndrome
IU	international unit
DTG	dolutegravir
E or EMB	ethambutol
e.g.	example
ECG	electrocardiogram
EDP	Essential Drugs Programme
EE	ethinyloestradiol
EFV	efavirenz
eGFR	estimated glomerular filtration rate
ELISA	enzyme-linked immunosorbent assay
EML	essential medicine list
EMS	emergency medical services
EPI	expanded programme on immunisation
EPSE	extra-pyramidal side effects
ETAT tool	Emergency Triage Assessment and Treatment tool
ET	endotracheal tube
ETV	etravarine
F-75	Formula-75 (therapeutic milk)
FBC	full blood count
FDC	fixed-dose combination
Fe^{2+}	Iron salts
FTC	emtricitabine
FiO_2	fraction of inspired oxygen
FLACC scale	face, legs, activity, cry, consolability scale
FTA	fluorescent treponemal antibody
FTA-ABS	fluorescent treponemal antibody assay
FTC	emtricitabine
g	gram
GCS	Glasgow coma scale
GI	gastro-intestinal
GN	glomerular disease
GOR	gastro-oesophageal reflux
GORD	gastro-oesophageal reflux disease
GUS	genital ulcer syndrome
H or INH	isoniazid
Hb	haemoglobin
HB	hepatitis B
HbA1c	glycosylated haemoglobin
HBeAg	hepatitis B e-antigen
HBsAb	hepatitis B surface antibody
HBsAg	hepatitis B surface antigen
HBIG	hepatitis B immune globulin
HBV	hepatitis B virus
Hep B	hepatitis B vaccine
HCTZ	hydrochlorothiazide
HCW	healthcare worker(s)
HDL	high-density lipoprotein
HHS	hyperosmolar hyperglycaemic state
Hib	*Haemophilus influenzae* type b
HIV	human immunodeficiency virus
HIV PCR	HIV polymerase chain reaction (test)
HMGCoA	3-hydroxy-3-methylglutaryl–coenzyme A
HPV	human papillomavirus
HR	heart rate
HSV	herpex simplex virus
HT	hormone therapy
HTS	HIV testing services
IBS	irritable bowel syndrome
ICD10 codes	International Classification of Diseases 10th Revision codes
IDDM	insulin-dependent diabetes mellitus
IM	intramuscular
IMCI	Integrated management of childhood illnesses
InSTI	integrase strand transfer inhibitor
PEP	post exposure prophylaxis
pg	page
PGL	persistent generalised lymphadenopathy
PHC	primary healthcare
PI	protease inhibitor

IUCD	intrauterine contraceptive device
IV	intravenous
kg	kilogram
KDIGO	Kidney Disease: Improving Global Outcomes
L	litre
LABA	long-acting beta$_2$ agonist
LAP	lower abdominal pain
LDL	low-density lipoprotein
LFT	liver function test(s)
LGBT	lesbian, gay, bisexual, transgender
LGE	lineal gingival erythema
LIP	lymphoid interstitial pneumonitis
LoE	level of evidence
LP	lumbar puncture
LPC	liquor picis carbonis (coal tar)
LPV/r	lopinavir/ritonavir
LV	left ventricular
m^2	square metre
MAM	moderate acute malnutrition
MC	molluscum contagiosum
mcg	microgram
MC&S	microscopy, culture and sensitivity
MCV	mean corpuscular volume
MDI	metered dose inhaler
MDR TB	multi drug-resistant tuberculosis
MEC	Medical eligibility criteria
mEq	milliequivalent
mg	milligram
MHCA	Mental Health Care Act
min	minute
mL	millilitre
mm	millimetre
mmHg	millimetre(s) of mercury
mmoL	millimole
MTB	*Mycobacterium tuberculosis*
MTCT	mother to child transmission
MU	million units
MUAC	mid upper arm circumference
MUS	male urethritis syndrome
MVA	manual vacuum aspiration
NAGI	National Advisory Group on Immunisation
NCD	non-communicable disease
NDoH	National Department of Health
NEMLC	National Essential Medicines List Committee
NHLS	National Health Laboratory Service
NICD	National institute for communicable diseases
NIMART principles	Nurse Initiated Management of Antiretroviral Therapy principles
NMC	Notifiable medical condition
NMS	neuroleptic malignant syndrome
NNRTI	non-nucleoside reverse transcriptase inhibitor (RTI)
NRTI	nucleoside RTI
NSAID	non-steroidal anti-inflammatory drug
NSTEMI	non ST elevation myocardial infarction
OT	occupational therapist
PCR	protein/creatinine ratio
PCV	pneumococcal conjugated vaccine
PEF	peak expiratory flow
PEFR	peak expiratory flow rate
TT	tetanus toxoid vaccine
U&E	urea & electrolytes
UE	ung emulsificans/emulsifying ointment
UEA	ung emulsificans aqueosum (aqueous cream)
UTI	urinary tract infection
UV	ultraviolet
UVA	ultraviolet A
UVB	ultraviolet B
VDS	vaginal discharge syndrome
PID	pelvic inflammatory disease
PJP	*Pneumocystis jiroveci*
PL	pubic lice
PML	progressive multifocal leukoencephalopathy
PMTCT	prevention of mother to child transmission
PPE	papular pruritic eruption
PPG	post-prandial glucose
PPH	post-partum haemorrhage
PPIP	Perinatal problem identification programme
PPROM	preterm prelabour rupture of membranes
PrEP	pre-exposure prophylaxis
PROM	prelabour rupture of membranes at term
P-SATS	Paediatric South African Triage Scale
PTL	preterm labour
PTSD	post-traumatic stress syndrome
PZA or Z	pyrazinamide
R	rifampicin
RAL	raltegravir
Rh	Rhesus
RNA	ribonucleic acid
RPR	Rapid Plasmin Reagin
RTHB	road to health booklet
RTI	respiratory tract infection
RTUF	ready to use food
RV	rotavirus
SABA	short-acting beta$_2$ agonist
SAHPRA	South African Health Products Regulatory Authority
SAM	severe acute malnutrition
SBP	systolic blood pressure
SAPS	South African Police Services
SC	subcutaneously
SJS	Stevens-Johnson syndrome
sol	solution
SPF	sun protection factor
SSRI	selective serotonin re-uptake inhibitor
SSS	sugar and salt solution
SSW	scrotal swelling
STEMI	ST elevation myocardial infarction
STG	standard treatment guideline
STI	sexually transmitted infection
susp	suspension
SSW	scrotal swelling
T4	thyroxine
tab(s)	tablet(s)
TB	tuberculosis
TBSA	total body surface area
Td	tetanus and diptheria
TDF	tenofovir
TEN	toxic epidermal necrolysis
TG	triglycerides
TIA	transient ischaemic attack
TOP	termination of pregnancy
TPAb	rapid treponemal antibody test
TPHA	*Treponema pallidum* haemagglutination
TPPA	*Treponema pallidum* particle haemagglutination
TPT	Tuberculosis preventive therapy
TSH	thyroid-stimulating hormone
TST	tuberculin skin test
VHF	viral haemorrhagic fever
VL	viral load
VVM	vaccine vial monitor
WFI	water for injection
WHO	World Health Organization
WHZ	weight-for-height Z-score
XDR TB	extensively drug-resistant TB
Zn^{2+}	zinc salts

DECLARATION OF INTERESTS

Selection of medicines for the essential medicines list requires measures to ensure that the best possible assessment of scientific evidence is achieved in an independent environment, free of either direct or indirect pressures. Thus, to assure the credibility of the process, it is necessary to avoid situations in which financial or other interests may unduly influence decision-making.

All members of the NEMLC, combined PHC/Adult Hospital Level Technical Expert Review Committee and Secretariate were required to make formal declarations of interest on application and at the start of each meeting. Guidance for declaring, assessing and handling conflicts of interests is outlined in the NEMLC conflict of interest policy, accessible at: http://www.health.gov.za/index.php/national-essential-medicine-listcommittee-nemlc. The following specific declarations were noted and managed during the development of the 7th edition of the PHC STGs and EML:

PHC/Adult Hospital Level Committee (2020-2022)	
Dr H Dawood (Vice Chairperson: 2020-2022)	ACTA study (Cryptococcal meningitis): DSMB Member; ACTG 5225 study (Cryptococcal meningitis): Study investigator; AMP study: Investigator of record;Adcock Ingram: Speaker for HIV discussion for GPs, 2017; AMP: investigator of records; Biomiereux: Biofire diagnostic workshop; HPCA Research Ethics Committee member; HPTN: HPTN077 study; MSD: Attendance of SAASP meetings and ESCMID 2018 conference; Novartis South: Speaker fees, 2015; Pfizer South Africa: SA Pneumococcal disease summit: 2017, 2018; IDEAL Summit, 2018; Advisory Committee for Cef/taz; Sanofi: Honorarium: IPT talk, 2020; The Infectious Diseases Society of Southern Africa (IDSSA): President elect; The HIV Prevention Trials Network (HPTN): HPTN07; The South African HIV Clinicians Society: Cryptococcal meningitis management guidelines.
Prof M Blockman	Various pharmaceutical companies provides research sponsorship to the University of Cape Town (nil to member).
Ms SM McGee	Employed by the South African Medical Association that receives sponsorship from a number of different commercial entities in order to provide CPD activities, conferences etc. Member has no direct contact with potential sponsors (pharmaceutical and devices companies) and no impact on their selection/ terms etc.
Dr JS Nel	AbbVie: Remuneration for lectures on HIV, cryptococcal meningitis and COVID-19; Cipla: Remuneration for lectures on HIV, cryptococcal meningitis and COVID-19; NICD: Research on cryptococcal meningitis (EFFECT trial); WHO: Research on COVID-19 (Solidarity trial); SA HIV Clinicians Society: Guidelines member for cryptococcal meningitis, adult ART and transplant HIV guidelines.
Dr L Robertson	Sanofi Aventis: Lunch and attend price sensitivity meeting on public sector cost of amisulpiride March 2018; Speaker honorarium donated to the Society for Mental Health and Deafness via South African Society of Psychiatrists (SASOP) April 2015; Lundbeck: Lunch - January 2019; Astra Zeneca: Lunch 25 July 2017; Dr Reddy's Laboratories: Annual sponsorship for congress attendance and accommodation, 2014 – 2019; Tropical Health Consulting LLP: contracted as Technical Advisor regarding psychotropic medicine availability in Ghana for 'Ghana Somubi Dwumadie', an NGO run programme within the UK AID Leave No One Behind programme and funded by the UK Foreign, Commonwealth Development Office.
Dr S Takuva	HIV Vaccine Trials Network (HVTN) and COVID-19 Prevention Network (CoVPN): Janssen Pharmaceuticals, GSK Pharmaceuticals, Novartis, Sanofi Pasteur, Mordena, Novovax: Member is a medical monitor and also in protocol safety review teams of a number of studies which use products or molecules from these companies; member is salaried by the HVTN/CoVPN via US NIH and BMGF grants (and not paid by these companies pharmaceutical companies).
Dr N Tsabedze	Servier Laboratories SA (Pty) Ltd: Consultancy (New Hypertension Guideline Management); Novartis SA (Pty) Ltd: Consultancy to develop a Heart Failure Tool box; Boehringer–Ingelheim, Novonordisk,

	Eli-Lilly, AstraZeneca and Adcock Ingram: Speaker Fees for Webinars & Advisory Board Services; Wits University/ NovoNordisk: SELECT Phase III Trial; Wits University/TAKEDA: Research Grant - Fabry's Disease in South Africa; HEFSSA/NPC: Heart Failure Guidelines Committee Member (SAMJ).
Dr TE. Zulu	Employed by the Government Employees Medical Scheme
Secretariat to the PHC/Adult Hospital Level Committee (2020-2022)	
Ms TD Leong	ISPOR-SA: Sponsorship and honorarium for ISPOR-SA 2019 conference.

National Essential Medicines List Committee (2017-) ***NEMLC members in office during the review of the 2020 PHC STGs and EML:***	
Dr G Reubenson (Vice Chair)	Pfizer: International Conference support: 2018
Dr H Dawood	See above
Prof K Cohen	Non-commercial entity: Co-author of journal article on the use of IPT in HIV-infected pregnant women, submitted to NEMLC.
Dr R de Waal	Non-commercial entity: Co-author of journal article on the use of IPT in HIV-infected pregnant women, submitted to NEMLC.
Mr A Gray:	Non-executive director of Jembi Health Systems; World Health Organization: Member of the Guideline Development Group for the management of severe influenza; subject to confidentiality requirements as the WHO guidance is yet to be finalised
Dr G Grobler	Jannsen: Sponsored to attend the 33rd ENCP online; GEMS: Psychiatry Expert Panel.
Dr T Kredo	SA- Medical Research Council: Receipt of grants.
Prof G Maartens	Non-commercial entity: Co-author of journal article on the use of IPT in HIV-infected pregnant women, submitted to NEMLC.
Ms N Makalima	Haemophilia Medical and Scientific Advisory Council meeting (7-8 November 2019): conference and travel sponsorship
Prof P Ruff	Wits University Health Consortium: Clinical trial funding and honoraria from various pharmaceutical companies involved in oncology trials and funds are directed to Wits Health Consortium.
Mr R Wiseman	Employed by Liberty Health
Secretariat to the National Essential Medicines List Committee	
Ms TD Leong	See above

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- National Department of Health, South Africa.
- Better Health Programme, South Africa (BHPSA). The United Kingdom's Better Health Programme (BHP) is a global health system-strengthening programme led by the United Kingdom Foreign, Commonwealth and Development Office (FCDO) and delivered in South Africa by Mott MacDonald.

USEFUL NUMBERS AND URL LINKS

POISONS INFORMATION CENTRES	
Poison Information Helpine	0861555 777
Red Cross War Memorial Children's Hospital Poisons Information Service	0216585308 Email: poisonsinformation@uct.ac.za http://www.paediatrics.uct.ac.za/poisons-information-centre
Tygerberg Poison Information Centre	0219388596 www.sun.ac.za/poisoncentre
University of the Free State Poison Control and Medicine Information Centre	082491 0160
Information on poisons	https://www.afritox.co.za/
COMMUNICABLE DISEASES	
COVID-19 hotline	Clinicians: 080011131 Public: 080002999 http://www.nicd.ac.za/ https://sacoronavirus.co.za/
NICD hotline (Rabies, Viral Haemmorhagic Fever outbreak, emerging respiratory pathogens, etc.)	082883 9920
South African Vaccine Producers	0113866063/2/00
National notifiable medical conditions surveillance	Helpline/ sms/ WhatsApp line: 0726213805 Fax: 0866391638 Email: NMCSurveillanceReport@nicd.ac.za
MEDICINE INFORMATION CENTRES	
Medicine Information Centre (Cape Town)	0214066829 0861100531
Amayeza Info Centre	011678 2332
National HIV Healthcare Worker Hotline	0800 212 506 0214066782
DEPARTMENT OF HEALTH	
National Department Health website	www.health.gov.za
Essential Drugs Programme	www.health.gov.za/edp.php Email: SAEDP@health.gov.za
Third line ART applications	Email: TLART@health.gov.za
Medicine stock availability reporting	Email: stockalert@health.gov.za
The National Adverse Drug Event Monitoring Centre (NADEMC):	021 4471618 Fax: 021448 6181 012 842 7609/10
South African Health Products Regulatory Authority (SAHPRA)	adr@sahpra.org.za 021 501 0300 https://primaryreporting.who-umc.org/Reporting/Reporter?OrganizationID=ZA
Central Chronic Medicine Dispensing and Distribution (CCMDD)	012 395 8988 012 395 8362 Email: nhiccmddadmin@health.gov.za

OTHER NUMBERS

Women abuse helpline	0800150150
Child line	0800055555
South African Police Services Crime Stop	086010111
National Human Trafficking Helpline	0800222777
Suicide helpline	0800567567

MISCELLANEOUS

Antiretroviral pregnancy registry	http://www.APRegistry.com/
Antiretroviral therapy: drug-drug interactions	https://www.hiv-druginteractionslite.org/checker http://www.mic.uct.ac.za/
Asthma control test™	https://www.asthmacontroltest.com/
BMI-based CVD risk tool	https://www.framinghamheartstudy.org/fhs-riskfunctions/cardiovascular-disease-10-year-risk/#
eGFR calculator	https://www.kidney.org/professionals/KDOQI/gfr_calculator
Ideal weight calculator	https://www.mdcalc.com/ideal-body-weight-adjusted-body-weight
Mental health conditions: support groups	www.SADAG.org www.SAFMH.org.za
Renal impairment: Medicines requiring dose adjustment in renal impairment	http://www.globalrph.com/index_renal.htm
Scorpion identification	http://www.cmej.org.za/index.php/cmej/article/view/2545/2580
Spider identification	http://www.cmej.org.za/index.php/cmej/article/view/2547/2582
Valproate: acknowledgement of risk form	http://www.sahpra.org.za/wp-content/uploads/2020/08/6.28_Valproate_Annual_Risk_Acknowledgement_Form_Dec18_v1.pdf

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Chapter 12

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