

FIRST EDITION

# NAMIBIA

## STANDARD TREATMENT

# GUIDELINES

Republic of Namibia



Ministry of Health  
and Social Services

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**Ministry of Health and Social Services**

<http://www.healthnet.org.na/documents.html>

<http://www.nmrc.com.na/NMPCNews/Downloads.aspx>



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## Foreword

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The Ministry of Health and Social Services, as custodian of all health related issues in Namibia, places very high priority on optimum management of all patients presenting at health facilities. Conceptually, meeting this objective has always involved translation of policy into practical treatment guidelines for the management of various conditions. Many treatment guidelines have been developed since 1990 for priority diseases and conditions, and they continue to serve as practical references for uniform prescribing and dispensing of medicines in the country. However until now there has been a lack of treatment guidelines for several prevalent conditions in Namibia, especially those handled mainly in hospitals. Therefore the need was identified to have one comprehensive reference text covering the majority of conditions that health workers are faced with in Namibia. Such a reference book improves patient care by providing guidelines for the management of conditions, where previously there were none. In addition, efficiency of health workers is improved as it removes the need for health workers to refer to many different treatment guideline documents.

The development of this first, comprehensive *Namibia Standard Treatment Guidelines* publication is an important milestone in the health care delivery system in the country. The document is a result of a major collaborative

effort and wide consultation with all stakeholders and interested parties in the public and private health sectors, thus ensuring collective ownership.

Through these guidelines, we have reinforced the need to use medicines in a rational manner, in accordance with the essential medicines concept, which is aimed at ensuring availability of safe and efficacious medicines by rationalising procurement, distribution, prescribing, and dispensing of medicines.

I am proud to adopt the first *Namibia Standard Treatment Guidelines* and urge all health workers to prescribe and dispense within the boundaries of these STGs.

A handwritten signature in black ink, appearing to be 'Richard Nchabi Kamwi', written over a faint, light-colored background.

**Hon. Dr. Richard Nchabi Kamwi**  
Minister

## Preface

---

The first edition of the *Namibia Standard Treatment Guidelines* is a result of collaborative effort of health care workers across all levels of health care in the public and private health sector. For many years since independence, Namibia has relied on the *Treatment Manual for Clinics* and the *Pocket Manual for Health Workers*, which were published in 1992 and 1996, respectively, for the management of most common health conditions. Taking into account the considerable changes in policies, guidelines, disease profiles, and clinical practice, it was imperative to revise and consolidate the guidelines into a comprehensive standard treatment guideline (STG) that would be of benefit to all health care workers. In this first edition, the most prevalent disorders in Namibia were considered for inclusion into the STGs. The health information system of the Ministry of Health and Social Services and consultation with general practitioners and consultants guided the scope and content of this guideline. The preferred format was then identified through a series of focus group discussions held throughout Namibia with end users of the treatment guidelines.

The development of this guideline consisted of a series of regional consultations with practitioners across Namibia. The contributions from these consultations were reviewed by consultants in the specific fields which resulted in a

short and precise summary about common illness and the recommended management protocols that are in line with the other guidelines prepared by the Ministry of Health and Social Services. This STG provides concise guidance on the recommended approach for managing common illnesses in Namibia. For details of the layout and contents of this document please refer to the Chapter “How to Use This Book” (Page xlix).

These STGs will support medical officers, nurses, pharmacists and all other health care providers involved in the management of patients in the public and private sector in Namibia. Because of the wide consultation involved in the development of these guidelines the ministry is confident that this document reflects optimum clinical practice. As such all health workers should ensure that they familiarise themselves with the contents of these STGs and utilise them for management of patients.

My ministry would like to express sincere gratitude to all who have shown their commitment and offered valuable input during the development of the first edition of the *Namibia Standard Treatment Guidelines*. Special thanks go to the Directorate: Tertiary Health Care & Clinical Support Services and particularly the Division: Pharmaceutical Services for their foresight in identifying the need to have a comprehensive standard treatment guidelines in Namibia and for their overall co-ordination of the process. I would also like to thank Dr. Britta Lohrke, the consultant who immaculately led the guideline development process. Our heartfelt thanks also go to Management Sciences for Health/Strengthening Pharmaceutical Systems (MSH/SPS) program funded by USAID for providing the all the necessary financial and technical support needed for the formulation of this important document.

These standard treatment guidelines will go along way in ensuring that the management of common illness is consistent, predictable and enhances the rational use of medicines for optimum benefit to the patient. Updating the STG is an ongoing process and suggestions for improvements will be welcome and considered.

Standardising our treatment practises is certainly one of the strategies to realising our dream of being the leading public health provider of quality health and social welfare services in Africa. Help us realise this dream through good practice, and use these guidelines.

A handwritten signature in black ink, appearing to read 'Kahuure', is written over a light grey rectangular background. The signature is stylized and cursive.

**Mr. Kahijoro S. M. Kahuure**  
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## Acronyms and Abbreviations

---

>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
3TC	lamivudine
ABC	airway, breathing, circulation <i>or</i> abacavir
ACE	angiotensin-converting enzyme
AED	automated external defibrillator
AFASS	acceptable, feasible, affordable, safe, and sustainable (re: infant feeding)
AFB	acid-fast bacilli
AFP	alpha-fetoprotein <i>or</i> acute flaccid paralysis
AIDS	acquired immunodeficiency syndrome
ALI	acute lung injury
ALT	alanine amino transferase
ANC	antenatal care
ANF	antinuclear factor
ANUG	acute necrotising ulcerative gingivitis
AP	antero-posterior
APH	ante partum haemorrhage
ARDS	acute respiratory distress syndrome
ARMD	age-related macular degeneration
ARV	antiretroviral

ARVMIS	Antiretroviral Management Information System
ASOT	antistreptolysin-O tests
AST	aspartate aminotransferase
AXR	abdominal X-ray
AZT <i>or</i> ZDV	zidovudine
BBE	benzyl benzoate emulsion
BCG	bacillus Calmette-Guérin [TB vaccine]
BE	base excess
beta-hCG	a quantitative test for human chorionic gonadotropin [pregnancy test]
BID	<i>bis in die</i> [twice a day]
BIPP	bismuth and iodoform paste
BMD	bone mineral density
BMI	body mass index
BPH	benign prostatic hypertrophy
BPMD	bipolar mood disorder
BPR	bleeding per rectum
CCF	congestive cardiac failure
CCIN	conjunctival and corneal intraepithelial neoplasia
CD4	cluster of differential 4
C/DST	culture and drug sensitivity testing
CF	cardiac failure
CHCT	couples HIV counselling and testing
cm	centimetre
CMV	cytomegalovirus
CNS	central nervous system
COAD	chronic obstructive airway disease
COPD	chronic obstructive pulmonary disease
CPAP	continuous positive air pressure
CPD	cephalopelvic disproportion
CPR	cardiopulmonary resuscitation
CRAO	central retinal artery occlusion

CRP	C-reactive protein
CRVO	central retinal vein occlusion
C/S	caesarean section
CSF	cerebrospinal fluid
CT <i>or</i> CAT	computerized axial tomography
CTG	cardiotopograph
CVA	cerebrovascular accident
CVS	cardiovascular system
CXR	chest X-ray
D+C	dilatation and curettage
D4T	stavudine
DBS	dried blood spot
ddI	didanosine
DIC	diffuse intravascular coagulation
dL	decilitre
DM	diabetes mellitus
DOTS	internationally recognized strategy for TB control [WHO]
DPT	diphtheria, pertussis, and tetanus
DRE	digital rectal examination
DT	diphtheria and tetanus
DTs	delirium tremens
DVT	deep venous thrombosis
E <i>or</i> ETH*	ethambutol
EBV	Epstein-Barr virus
EC	exposure code
ECG	electrocardiograph
ED	erectile dysfunction
EDD	expected date of delivery
EFV	efavirenz
ELISA	enzyme-linked immunosorbent assay
EMLC	Essential Medicines List Committee
ENT	ear, nose, and throat
EPSE	extrapyramidal side effects

ESR	erythrocyte sedimentation rate
ET	endotracheal
ETH <i>or</i> E*	ethambutol
EUA	examination under anaesthesia
EXTB	extrapulmonary TB
F	French unit [type of catheter]
FBC	full blood count
FBF	fortified blended foods
FFP	fresh frozen plasma
FHR	foetal heart rate
FSH	follicle-stimulating hormone
g	gram
G	gauge
G6PD	glucose-6-phosphate-dehydrogenase
GABA	gamma-aminobutyric acid
GAD	generalised anxiety disorder
GCS	Glasgow coma scale <i>or</i> score
GGT	gamma-glutamyl transferase
GI	gastrointestinal
GIT	gastrointestinal tract
GTN	glyceryl trinitrate
GTT	glucose tolerance test
GUD	genitourinary displasia
H <i>or</i> INH*	isoniazid
HAART	highly active antiretroviral therapy
Hb	haemoglobin
HbA1C	glycated haemoglobin
HbsAG	hepatitis B surface antigen
HCT	HIV counselling and testing
HDN	haemolytic disease of the newborn
HELLP syndrome	H = haemolysis, EL = elevated liver enzymes, LP = low platelet count
HepA	hepatitis A
HepB	hepatitis B



Hep BsAg	hepatitis B surface antigen
HF	heart failure
HGT	haemogluco test
Hib	<i>Haemophilus influenza B</i>
HIV	human immunodeficiency virus
HIV SC	HIV source code
HPV	human parvovirus
HR	heart rate
HRT	hormone replacement therapy
HSV	herpes simplex virus
HT	hypertension
IBS	irritable bowel syndrome
ICP	intracranial pressure
ICU	intensive care unit
IDDM	insulin-dependent diabetes mellitus
IgG	immunoglobulin G
IOP	intraocular pressure
IM	intramuscular
IMAI	Integrated Management of Adolescent and Adult Illness
IMCI	Integrated Management of Childhood Illness
IMI	intramuscular injection
INH or H*	isoniazid
INN	International Non-proprietary Names
INR	international normalised ratio
IO	intraosseous
IPPV	intermittent positive pressure ventilation
IPT	isoniazid preventive therapy
ITP	idiopathic thrombocytopenic purpura
IU	international unit
IUD	intrauterine [contraceptive] device
IV	intravenous
IVP	intravenous pyelogram

J	joule
JNC7	<i>Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure</i>
K	potassium
KCl	potassium chloride
kg	kilogram
KS	Kaposi's sarcoma
L	litre
LAC	Legal Assistance Centre
LDH	lactate dehydrogenase
LFT	liver function test
LGV	lymphogranuloma venereum
LH	luteinizing hormone
LIP	lymphoid interstitial pneumonitis
LLETZ	large loop excision of the transformation zone
LMP	last menstrual period
LP	lumbar puncture
LPV	lopinavir
LPV/r	lopinavir/ritonavir
LVF	left ventricle failure
mcg	microgram
MCH	mean corpuscular haemoglobin
MCHC	mean corpuscular haemoglobin concentration
mcm	micrometre
MCS	microscopy, culture, and sensitivity
MCV	mean corpuscular volume
MDD	major depressive disorder <i>or</i> micronutrient deficiency disease
MDR TB	multidrug-resistant TB
mg	milligram

MI	myocardial infarction
mL	millilitre
mm	millimetre
mm Hg	millimetres of mercury
MMR	measles, mumps, and rubella
MO	morbidly obese <i>or</i> medical officer
MoHSS	Ministry of Health and Social Services
MOTT	mycobacterium other than tuberculosis
MRA	magnetic resonance angiography
MRI	magnetic resonance imaging
MSBOS	Maximum Surgical Blood Ordering Schedule
MSH	Management Sciences for Health
MTCT	mother-to-child transmission [of HIV]
MU	million units
MUAC	mid-upper arm circumference
NAMBTS	Blood Transfusion Service of Namibia
Nemlist	National Essential Medicines List
NGT	nasogastric tube
NHTC	National Health Training Centre
NIDDM	non-insulin-dependent diabetes mellitus
NMPC	National Medicines Policy Coordination
NNRTI	non-nucleoside reverse transcriptase inhibitors
NRTI	nucleoside reverse transcriptase inhibitors
NSAID	nonsteroidal anti-inflammatory medicine
NVP	nevirapine
OA	osteoarthritis
OCD	obsessive compulsive disorder
OI	opportunistic infection
OPD	outpatient department
ORS	oral rehydration salts
ORT	oral rehydration therapy

OTP	outpatient therapeutic programme
PaCO <sub>2</sub>	partial pressure of carbon dioxide in arterial blood
PAS	para-aminosalicylate
PCP	<i>Pneumocystis carinii</i> pneumonia
PCR	polymerase chain reaction
PCV	packed cell volume
PE	pulmonary embolism <i>or</i> preeclampsia
PEA	pulseless electrical activity
PEFR	peak expiratory flow rate
PEM	protein-energy malnutrition
PEP	postexposure prophylaxis
PET	preeclamptic toxæmia
PGL	persistent generalised lymphadenopathy
pH	acidity level
PHC	primary health care
PI	protease inhibitors
PID	pelvic inflammatory disease
PML	progressive multifocal leucoencephalopathy
PMO	Principal Medical Officer
PMTCT	prevention of mother-to-child transmission
PO	<i>per os</i> (by mouth)
POP	plaster of Paris
PPH	postpartum haemorrhage
PR	rectally
PRN	<i>pro re nata</i> (as needed)
PSA	prostate specific antigen
PTB	pulmonary TB
PTSD	posttraumatic stress disorder
PTT	partial thromboplastin time
PUO	pyrexia (i.e., fever) of unknown origin
PW	paediatric ward

PZA <i>or</i> Z*	pyrazinamide
QID	four times a day
R <i>or</i> RIF*	rifampicin
RA	rheumatoid arthritis
RBC	red blood cell
RCC	red cell concentrate
ReSoMal	rehydration solution for malnutrition
RH*	rifampin and isoniazid
RHZ*	rifampin, isoniazid, and pyrazinamide
RHZE*	rifampin, isoniazid, pyrazinamide, and ethambutol
RIF <i>or</i> R*	rifampicin
RPR	rapid plasma reagent
RSV	respiratory syncytial virus
RTV	ritonavir
RUTF	ready-to-use therapeutic food
Rx	prescription medication
S <i>or</i> SM	streptomycin
SaO <sub>2</sub>	oxygen saturation
SC	subcutaneous
s-Ca	serum calcium
SD	standard deviation <i>or</i> single dose
SE	status epilepticus
SFH	symphysis fundal height
SFP	supplementary feeding programme
S.I.	saturation index
SIDS	sudden infant death syndrome
SLE	systemic lupus erythematosus
SM <i>or</i> S	streptomycin
SNRI	selective noradrenaline reuptake inhibitor
SOL	space-occupying lesions
SPS	Strengthening Pharmaceutical Systems
SSRI	selective serotonin reuptake inhibitor

STEMI	ST-elevation myocardial infarction
STG	standard treatment guideline
STI	sexually transmitted infection
TB	tuberculosis
TCA	tricyclic antidepressant
TDF	tenofovir
TFT	thyroid function test
TG	triglyceride
TIA	transient ischaemic attack
TID	<i>ter in die</i> [three times a day]
TIPC	Therapeutics Information and Pharmacovigilance Centre
TMP/SMX	trimethoprim/sulfamethoxazole
TPHA	<i>Treponema pallidum</i> haemagglutination assay
TPN	total parenteral nutrition
TSH	thyroid stimulating hormone
TT	tetanus toxoid
TTP	thrombotic thrombocytopenic purpura
TVR	tumour volume ratio
U+E	urea and electrolytes
UDS	urethral discharge syndrome
URT	upper respiratory tract
URTI	upper respiratory tract infection
UTI	urinary tract infection
UV	ultraviolet
VBAC	vaginal birth after caesarean section
VCT	voluntary counselling and testing
VDRL	Venereal Disease Research Laboratory
VDS	vaginal discharge syndrome
VF	ventricular fibrillation
WACPU	Women and Child Protective Unit
WB	whole blood
WBC	white blood cell

WCC	white cell count
WCC diff	white cell differential count
WDH	Windhoek
WFH	weight-for-height [ratio]
WHO	World Health Organization
XDR TB	extensively drug resistant TB
Z <i>or</i> PZA*	pyrazinamide
ZDV <i>or</i> AZT*	zidovudine
ZN	Ziehl-Neelsen (stain)

\* It is always best to write out the complete medicine name on prescriptions, however certain HIV/AIDS medicines are often abbreviated. Although several of these medicines can have two different abbreviations, the preferred are as follows: AZT–zidovudine, E–ethambutol, H–isoniazid, R–rifampicin, Z–pyrazinamide.





## How to Use This Book

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To use the standard treatment guidelines (STGs) effectively, we strongly urge you to become familiar with the layout and content of this book. Following is a general overview of what this book contains and how to find it.

### Sections, Chapters, and Discussions

The STGs are divided into seven different sections—

- Section I. Common Emergencies and Trauma
- Section II. Diseases and Disorders according to Body Systems
- Section III. Nutrition and Lifestyle
- Section IV. Infectious Diseases
- Section V. Obstetrics and Gynaecology
- Section VI. Diseases and Disorders According to Age Group
- Section VII. Palliative Care


Each section is divided into chapters (colour-coded to help you locate them quickly) that cover specific diseases, systems, or conditions. For example, *Chapter 14. Endocrine system* is located in **Section II. Diseases According to Body Systems**. *Chapter 19. Tuberculosis* can be found in **Section IV. Infectious Diseases**.

The chapters themselves are further divided by numbers into specific conditions or disorders. For example, in *Chapter 4. Blood System*, you will find 4.1 Anaemia, 4.2

Bleeding Disorders, 4.3 Blood and Blood Products, and 4.4 Blood Cancers.

Each condition or disorder discussion can include (when relevant)—

- A brief introduction describing the trauma or disease
- Causes
- Common signs and symptoms of the disease or condition
- Clinical investigations (what tests or procedures to perform to diagnose the condition)
- Management of the disease or condition
- Health education to guide you through diagnostics and medicine and non-medicine treatments

In addition, when the patient faces a life-threatening emergency or problems that need immediate hospital or specialist attention, this is noted in the guidelines by this symbol .

You can also use the indices at the back of the book to locate the condition or medicine questions. One index covers disease conditions; the other index is medicine names.

When applicable, the material in this book is consistent with the case management guidelines of the World Health Organization (WHO) Integrated Management of Adolescent and Adult Illness (IMAI) and other national programme treatment guidelines. If medical information and practices changed and are adopted by the Ministry of Health and Social Services, the ministry will send out memos to the appropriate staff outlining the changes. Health care workers are requested to follow the direction in the memo. In addition, organizations such as WHO also periodically update their guidelines. It is therefore best to check these organizations' websites to make sure that you have the most recent information. This is particularly important when referring to HIV/AIDS guidelines because of the rapid changes in diagnosis and treatment.

## Appendixes

The appendixes contain useful forms, guidelines, and lists.

### **Appendix 1. Integrated Management of Adolescent and Adult Illness (IMAI) Algorithm**

Caregivers in the health care services who are not medical doctors can use this algorithm to guide them in assessing acute illnesses.

### **Appendix 2. Symptoms and Signs Differential List**

This list provides signs and symptoms paired with possible causes for quick access to diagnostic probable cause.

### **Appendix 3. List of Notifiable Diseases in Namibia**

The list specifies conditions health care professionals are to report to the health authorities.

### **Appendix 4. Instructions for Submitting Requests for Changes to the Nemlist**

These are guidelines on how to submit requests for changes to the Namibia Essential Medicines List (Nemlist).

### **Appendix 5. Management of Patients Who Have a History of Penicillin Allergy**

These are guidelines for treating patients with a history of penicillin allergy.

## Forms

Given the small format of the guidelines, useful images of various Ministry of Health forms could not be included in this book. However, several forms can be obtained directly from the Namibia Ministry of Health and Social Sciences National Medicine Regulatory Council (NMRC) website. They are listed below.

**For requesting changes to the Nemlist, go to**

[http://www.nmrc.com.na/NMPCNews/Downloads/  
tabid/1479/language/en-US/Default.aspx](http://www.nmrc.com.na/NMPCNews/Downloads/tabid/1479/language/en-US/Default.aspx)

**For reporting adverse drug reactions (safety reporting),  
go to**

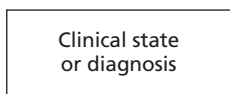
[http://www.nmrc.com.na/PVSystem/FormforHCW/  
tabid/1348/language/en-GB/Default.aspx](http://www.nmrc.com.na/PVSystem/FormforHCW/tabid/1348/language/en-GB/Default.aspx)

Please be advised that the NMRC website is being redesigned so the links above may change in the future.

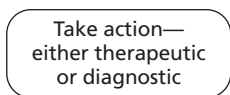
## Flow Diagrams

When a patient comes to a public health care facility, health care providers should have a problem-based approach to managing the patient's condition. Therefore, flow diagrams providing management algorithms are included in this manual.

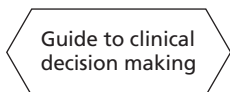
**How to use a flow diagram.** The flow diagrams read from top to bottom and from left to right. They contain three different types of blocks and arrows, with the following interpretation:



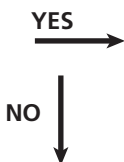
The **rectangles** usually describe a clinical state or diagnose a condition. To find more information on the management of the condition, refer to the index.



The **rounded rectangle** indicates an action, commonly either therapeutic or diagnostic.



The **hexagons** contain information that will guide your clinical decision. This box has a branching decision, whose response will lead to one of two alternative paths. It always has an entry path and two exit paths.



**Arrows** originating from decision boxes labelled YES will point right, and arrows labelled NO will point down whenever possible.

## Prescription Writing

Medicines should be prescribed only when they are necessary for treatments that have been clearly diagnosed. Not all patients or conditions need medicines. In certain conditions, simple advice and non-prescription treatment may be more suitable.

In all cases, carefully consider the expected benefit of a prescribed medication against potential risks. This is important during pregnancy where the risk to both mother and foetus must be considered.

All prescriptions must—

- Be written legibly in ink by the prescriber with the full name and address of the patient, and signed and dated by the prescriber
- Have contact details for the prescriber (e.g., name and telephone number)
- Specify the age and weight when prescribing for a infant, child, or adolescent patient

All written prescriptions must also—

- Have the name of the medicine or preparation written in full using the generic name
- Not use medicine name abbreviations because of the risk of misinterpretation.
- Avoid unnecessary use of decimal points and only use where decimal points are unavoidable. A zero should be written in front of the decimal point where there is no other figure, e.g., 2 mg, not 2.0 mg or 0.5 mL, not .5 mL
- State the treatment regimen in full—
  - Medicine name and strength
  - Dose or dosage
  - Dose frequency
  - Duration of treatment

For example, amoxicillin 250 mg every eight hours for 5 days

In the case of “as required,” a minimum dose interval should be specified (e.g., every 4 hours as required)

Comments that aim to improve these treatment guidelines will be appreciated. The submission form and guidelines can be obtained from the Therapeutics Information and Pharmacovigilance Centre (TIPC).

Comments from persons and institutions outside the public service should be sent to:

**Therapeutics Information and  
Pharmacovigilance Centre (TIPC)**

Windhoek Central Hospital

Private Bag: 13198

Windhoek, Namibia

Tel.: 061 203 2312

Fax: 061 226631

e-mail: [info@tipc.com.na](mailto:info@tipc.com.na)





# Common Emergencies and Trauma

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2. Trauma	<u>159</u>



### 1.1 Acute Airway Obstruction

The obstruction of the nasopharynx, pharynx, larynx, trachea, or bronchi resulting in the sudden onset of respiratory distress can be an emergency.

#### Causes

- Foreign body aspiration
- Croup (acute laryngotracheobronchitis)
- Acute epiglottitis
- Laryngeal oedema in anaphylaxis and trauma
- Unconscious patient with tongue obstruction
- Trauma with secretions, blood, or debris

#### Symptoms and signs

- Stridor
- Dyspnoea
- Restlessness
- Cyanosis
- Loss of consciousness

#### Management

All emergency referrals should be preceded by telephone notification and consultation whenever possible.

## 1.1.1 Foreign Body Aspiration

Foreign body aspiration is commonly caused by food, coins, or seeds. The classic sign of choking occurs immediately after the airway is obstructed.

### Management

1. Airway obstruction is an emergency; the main aim is to remove the foreign body immediately, using the following techniques:
  - Adult: Heimlich manoeuvre—Using your arm from behind, apply sudden, strong pressure on patient's abdomen (inwards and upwards). Repeat 3 to 4 times.
  - Child: Heimlich manoeuvre or back slaps
  - Baby: four rapid chest thrusts
2. If these attempts are unsuccessful, start CPR. Do an emergency tracheostomy, or insert a needle between the thyroid and cricoid cartilage, and then immediately refer the patient to the next level.

### Notes:

- Bronchoscopy needs to be performed in a hospital with equipment, high-care facilities, and the instruments for tracheostomy.
- When feasible, no patient with a history of foreign body aspiration should be sent back home without a bronchoscopy irrespective of symptoms, because some patients with foreign bodies in airways do not present with symptoms.

## 1.1 Acute Airway Obstruction

### 1.1.2 Acute Laryngotracheobronchitis (Croup) and Acute Epiglottitis

TABLE 1.1.2A Acute Laryngotracheobronchitis (Croup)

#### Definition

An acute inflammation of the upper and lower respiratory tracts. Obstruction is more severe with inflammation of the subglottic region.

#### Causes

Viral

#### Age Group

Younger children (6 months to 3 years)

#### Frequency

- More common
- Usually had common cold before

#### Signs and Symptoms

- Harsh, barking cough
- Inspiratory stridor
- Progress to expiratory and inspiratory stridor
- Ill-looking
- Saliva normal
- Retraction of chest wall
- No or low-grade fever

#### Treatment—In clinic or health centre

- Viral, therefore no antibiotics
- If severe (i.e., if expiratory stridor or cyanosis is present), refer to hospital.
- Single dose of hydrocortisone IV 5 mg/kg should be given before transfer to hospital.

#### Treatment—In hospital

- Admit and prepare for intubation and/or tracheostomy.
- Use humidified oxygen 30% to 40%.
- Perform a nasotracheal intubation, if signs of severe obstruction occur.
- Perform a tracheostomy, if intubation fails.
- Use hydrocortisone slow IV injection—
  - For children <1 year: dosage = 25 mg
  - For children 1 to 5 years: dosage = 50 mg
  - Repeat after 12 hours, if necessary
- If not responding to corticosteroid, use nebulized adrenaline—1:1000 with oxygen; 1 mL adrenaline 1:1000 diluted in 1 mL sodium chloride 0.9%. Repeat after 30 minutes until expiratory obstruction is resolved.

TABLE 1.1.2B Acute Epiglottitis

---

### Definition

Severe, rapidly progressive infection of the epiglottis and the surrounding tissues

---

### Causes

Bacterial: *Haemophilus influenzae* type B

---

### Age Group

Older children (4 to 6 years)

---

### Frequency

- Seldom occurs
  - No previous cold
- 

### Signs and Symptoms

- Slight cough
  - Suppressed crying
  - Inspiratory stridor, no expiratory stridor
  - Severely ill, pale
  - Excessive saliva
  - Sore throat and difficulty in swallowing
  - High fever  $>39^{\circ}\text{C}$
- 

### Treatment—In clinic or health centre

- Bacterial, therefore use antibiotics.
  - Do *not* examine throat.
  - Give oxygen.
- 

### Treatment—In hospital

- Admit all suspected cases.
- Perform FBC and blood culture.
- Prepare for intubation and/or tracheostomy.
- Give chloramphenicol 25 mg/kg IV every 6 hours then change to chloramphenicol PO, when appropriate, for a total 7 days—
  - For children  $<1$  year: PO dosage = 6.25 mg/kg every 6 hours.
  - For children  $>1$  year: PO dosage = 12.5 to 25 mg/kg every 6 hours.

**Note:** Change treatment according to sensitivity lab results.

---

## 1.1 Acute Airway Obstruction

### 1.1.3 Acute Laryngeal Oedema

Acute laryngeal oedema is an acute airway obstruction due to an allergic reaction and sudden swelling of soft tissue of the larynx.

#### Causes

- Insect bites and stings
- Reaction to medications and vaccination

#### Symptoms and signs

Signs and symptoms of airway obstruction occur after history of the above causes.

#### Management

See 1.18 below for a discussion of shock.

## 1.2 Severe Acute Asthma

A sudden intense and continuous aggravation of a state of asthma, not responding to normal treatment. *Prompt treatment of the patient is essential.*

### 1.2.1 Status Asthmaticus in Adults

#### Symptoms and signs

- Long duration of present attack
- No response to treatment
- Speech impossible
- Heart rate >110 beats per minute
- Breath rate >30 breaths per minute
- Excessive use of accessory muscles of respiration
- Excessive wheezing
- So-called *silent chest* (i.e., decreased breath sounds)
- Noticeable cyanosis
- Severe exhaustion
- Consciousness decreased; patient very agitated
- Blood pressure very high or very low
- Pulsus paradoxus >20 mm Hg
- PEFr <100

#### Investigations

- CXR to exclude pneumothorax, if patient stabilised
- Arterial blood gasses; MO get S.I.
- Pulse oximetry
- FBC and CRP (to exclude infections), U+E

#### Management

##### In clinic, health centre, or hospital—

1. Start treatment, and hospitalize immediately.
2. Order bed rest in Fowler's position or any position the patient prefers (sitting up).
3. Give *no* sedatives.
4. Start oxygen at 60% via face mask.
5. Administer salbutamol 0.1% solution for inhalation, or use salbutamol inhaler every 15 minutes until patient is transferred.

## 1.2 Severe Acute Asthma

6. Start an IV line (normal saline), and monitor fluid intake.
7. Give hydrocortisone 200 mg IV stat, then every 6 hours.
8. Monitor blood pressure, pulse, breathing, and oxygenation (SaO<sub>2</sub>).
9. Administer subcutaneous adrenaline 1:1000 (1 ampoule).
10. Refer if no improvement or if severe.

### In hospital—

1. Administer oxygen via face mask (4 to 6 L/min) or nasal cannula (1 to 2 L/min). Give nothing by mouth until patient is stabilized, because patient might need intubation, if not improving.
2. Follow this procedure:
  - Start nebulised salbutamol.
    - Initially, administer 10 mg (2 mL) every 20 minutes until there is improvement.
    - Then, administer every 2 to 4 hours (1 mL contains 5 mg salbutamol).
    - May be combined with ipratropium 0.5 mg.
  - OR ——
  - Administer 4 to 10 puffs of salbutamol via metered dose inhaler (1 puff = 100 mcg), preferably with a large spacer device.
  - Use adrenaline nebulisation if the response to salbutamol is poor.
  - Administer hydrocortisone 200 mg IV every 6 hours or prednisone 30 to 60 mg PO daily.
  - Maintain and monitor level of appropriate hydration.
  - Transfer patient to ICU for intubation and ventilation (if danger signs are present).

---

**Note:** Patient may need intubation before transfer to hospital.

---



### 1.2.2 Status Asthmaticus in Children

Status asthmaticus in children is characterized by persistent dyspnoea poorly relieved by bronchodilators and by exhaustion and a high pulse rate.

#### Symptoms and signs

- Respiration >50 breaths per minute (>40 breaths per minute in children over 5 years)
- Pulse >140 beats per minute ( $\geq 120$  beats minute in children over 5 years)
- In younger children, use of accessory muscles of breathing

#### Life-threatening symptoms and signs

- Cyanosis, silent chest, or poor respiratory effort
- Fatigue or exhaustion
- Agitation or reduced level of consciousness

#### Management

Status asthmaticus in children is a medical emergency, so treatment should never be delayed.

Follow this procedure:

1. Start oxygen 1 to 2 L per minute via face mask.
2. Administer nebulised salbutamol.
  - Initially, administer 0.15 mg/kg (maximum = 5 mg/dose) at 20-minute intervals for two doses.
  - Then, administer every 2 to 4 hours (1 mL contains 5 mg salbutamol).

**— OR —**

  - Administer up to 10 puffs salbutamol via metered-dose inhaler (1 puff = 100 mcg).
  - Then, administer 1 puff every 15 to 30 seconds, preferably with a large spacer device.
3. Administer prednisone PO.
  - Use 2 mg/kg per 24 hours as a single dose in the morning for 7 days.
  - If patient's response is good, prednisone can be discontinued abruptly after 7 days.

## 1.3 Acute Abdomen

- If used for longer, dosage must be gradually reduced and then stopped.
  - An inhaled steroid or an increase in the previous dose of inhaled steroid must be initiated.
- OR —**
- If oral treatment is not possible, administer dexamethasone IV 0.4 mg/kg stat. *Important: Do not repeat.*
4. If the patient shows no improvement, intubate and provide ventilator support preferably in the ICU.

### 1.3 Acute Abdomen

*Acute abdomen* is a clinical term used to describe a syndrome whose major symptom is severe acute abdominal pain. It is a serious condition and immediate management must be instituted before referral to the next level.

#### Causes

- Inflammatory
  - Acute peritonitis
  - Acute appendicitis
  - Acute pancreatitis (See “Section II. Diseases and Disorders According to Body Systems. [Chapter 7. Gastrointestinal System.](#)”)
  - Pelvic inflammatory disease (PID)
- Bowel obstruction—any blockage of the bowel that prevents food and water from passing
  - Strangulated hernia
  - Volvulus, adhesions
- Perforations
  - Acute perforation of hollow organs (e.g., stomach, duodenum, intestines), genitourinary dysplasia (GUD)
  - Blunt and penetrating abdominal trauma
  - Typhoid perforations

- Colic
  - Acute cholecystitis, cholangitis, or gallstones
  - Kidney stones
- Haemorrhagic
  - Ruptured ectopic pregnancy
  - Ruptured spleen
  - Twisted ovarian cyst
- Other causes that can mimic acute abdomen
  - Myocardial infarction
  - Diabetic ketoacidosis
  - Pneumonia
  - IBS
  - Gastroenteritis
  - Sickle cell crisis

### Symptoms and signs

- Pain (colicky or continuous, increasing in severity, sudden or gradual onset)
- Signs of shock (cold, clammy, tachycardia, hypotension)
- Fever (in acute inflammatory conditions)
- Anorexia, nausea, vomiting, dyspepsia
- Signs of dehydration, such as abdominal distension

### Investigations

- Pregnancy test should be done for all females in the reproductive age group.
- FBC and differential WCC (appendicitis, inflammation, infection)
- Glucose, U+E
- Serum amylase (pancreatitis)
- Erect CXR (to find air under diaphragm, pneumonia)
- AXR (to find distended loops in bowel obstruction)
- Ultrasound

## 1.3 Acute Abdomen

### 1.3.1 Acute Peritonitis

Peritonitis is either localised due to an inflamed organ or diffused (general) usually due to rupture of an organ with internal spilling of bowel contents and acute inflammation.

#### Symptoms and signs

- Severe tenderness (localised or all over)
- Rigidity or guarding (stiffness) of abdominal muscles
- Bowel sounds soft or very loud (tinkling)
- Rebound tenderness (sudden stabbing pain with deep palpation and sudden letting go)
- Abdominal distension

#### Management

The first priority is to start treatment and not just to refer immediately.

Follow this procedure:

1. Establish IV access with a wide-bore IV cannula (16 G or 18 G).
2. Start an IV infusion with normal saline or any other crystalloid fluid available, maximum flow 1 L every 1 to 2 hours (if the patient is in shock) until the blood pressure returns to normal, or over every 4 to 6 hours if blood pressure is normal.
3. Give nothing by mouth until the patient has been seen by the team that will decide on final treatment.
4. Pass an NGT with drainage bag if vomiting or abdominal distension is severe.
5. Ask patient to lie on his or her side. Place the patient in a comfortable position.
6. Give oxygen if the patient is in shock or tired.
7. Elevate legs if the blood pressure is low.
8. If fever is present, initiate a broad-spectrum antibiotic treatment (ceftriaxone 1g IV daily or gentamicin 5 mg/kg IV daily) plus metronidazole 500 mg IV every 8 hours. Alert the patient or relative that there may be a need to give consent for surgery.
9. Refer to the next level.

### 1.3.2 Bowel Obstruction

A bowel obstruction is the interruption of the flow of matter through the lumen of the bowel.

#### Causes

- Mechanical: tumours, masses, or volvulus, adhesions, hernias
- Functional: ileus, pseudo obstruction after surgery

#### Symptoms and signs

- Abdominal cramps
- Vomiting
- Altered bowel habits
- Abdominal distension
- Tympanic sound with percussion
- Bowel sounds, are initially increased then decrease gradually. Rectal examination usually shows an empty rectum.
- Dehydration can be present

#### Management: same as for acute peritonitis

- For mechanical obstruction, refer for surgery.
- For functional obstruction, treat underlying cause.

### 1.3.3 Acute Appendicitis

Acute appendicitis is an acute inflammation of the appendix. Initially, the inflammation is localized in the appendix, but the appendix may perforate leading to peritonitis.

#### Symptoms and signs

- Abdominal pain initially around the umbilicus, which later shifts to the right lower quadrant of the abdomen. Pain worsens with coughing, jumping, or walking.
- Nausea and vomiting
- No or low-grade fever
- Abdomen is tender.
- Positive rebound tenderness can be present.

#### Investigations

- FBC and white cell differential count
- CRP

## 1.3 Acute Abdomen

### Management

1. Inform next level before referral for laparotomy and further investigations.
2. Follow the procedure outlined for acute abdomen above.

---

**Note:** Poor outcome from acute abdomen management may occur in the following situations:

- Old patients and children under 5 years
  - Delayed presentation to health facilities
  - Delayed diagnosis (e.g., patient first treated for intestinal worms for some days before diagnosis of perforated appendicitis is made)
  - Delayed initial and specific treatment in health facilities
  - Inadequate postoperative care, often in inappropriate environments
  - Poor communication amongst the health teams between health facilities and within health facilities
-

### 1.4 Disorders Caused by Alcohol Abuse

#### 1.4.1 Alcohol Intoxication

Alcohol binging (i.e., excessive alcohol consumption per session, often resulting in acute alcohol intoxication) is a common condition.

#### Symptoms and signs

- Decreased level of awareness
- Lack of coordination and judgement
- Hypothermia
- Hypoglycaemia
- Convulsions
- Vomiting
- Patient smells of alcohol

#### Management

1. Keep patient warm.
2. Obtain full history (i.e., type, quantity, duration of alcohol and medicine intake). Consider the possibility of other alcohol ingestion, such as methylated spirit or ethylene glycol, which may present as alcohol intoxication but can later develop more serious effects.
3. Observe patient at a health facility, monitoring the level of consciousness regularly. (See 1.8 below for a discussion of coma and unconsciousness.)
4. Administer gastric lavage if alcohol was ingested within last 2 hours. Lavage needs to be done *after* endotracheal intubation, if patient is unconscious.
5. Give 50% dextrose 20 mL bolus then 5% IV infusion.
6. If the patient does not improve, refer to next level hospital.
7. If patient shows signs of encephalopathy, give 100 mg thiamine by slow IV injection, dilute in 10 mL saline, or give IM if IV injection is not possible.
8. Consider other possible causes of symptoms, such as meningitis, cerebral malaria, or diabetic coma.

### 1.4.2 Acute Alcohol Withdrawal Syndrome and Delirium Tremens

These conditions comprise a collection of signs and symptoms associated with cessation of alcohol consumption following alcohol dependency. Delirium tremens (DTs) constitute a medical emergency with a significant morbidity and mortality and should be managed in high-care settings.

#### Symptoms and signs

- Restlessness
- Trembling
- Tremor of outstretched hands
- Sweating
- Nausea and vomiting
- Altered level of consciousness
- Hallucinations
- Paranoia
- Convulsions
- Tachycardia, low or high blood pressure

#### Investigations

- Random blood sugar
- FBC
- U+E
- GGT
- Serum albumin
- Cholesterol
- Vitamin B12
- Folic acid level
- Where possible, rule out other precipitants (e.g., septicaemia, hepatitis, pancreatitis, peptic ulcer, MI, head trauma, hypoxia)



### Management

1. Admit to ward.
2. Observe closely.
3. Rehydrate orally or intravenously.
4. Treat hypoglycaemia. (See [1.10](#) below for a discussion of diabetic emergencies.)
5. Give thiamine (vitamin B1) 50 to 100 mg PO or 200 to 400 mg IM daily.
6. Treat aggressiveness or restlessness, using one of the following:
  - Diazepam 10 to 15 mg IV in 50 mL saline over 30 minutes, monitoring carefully for respiratory depression. Repeat every 8 hours.  
—— OR ——
  - Diazepam 10 mg IM  
—— OR ——
  - Lorazepam 2 to 4 mg PO stat if diazepam is unavailable
7. If aggressive, give the following:
  - Haloperidol 5 mg IV; repeat every 20 to 30 minutes until patient is calm, then 5 mg IV every 4 to 8 hours depending on condition  
—— OR ——
  - Hydroxyzine 50 to 100 mg PO stat, then every 4 to 6 hours
8. Treat convulsions (which are a high risk from day 6) using the following:
  - Acute: diazepam (see step 6 above)
  - Prophylaxis: carbamazepine 400 mg PO every 12 hours
9. Hospitalize for at least 10 days, taper dosing slowly, and maintain on oral doses (i.e., haloperidol 5 mg PO at night, diazepam 10 mg PO at night).
10. Discuss, plan, and arrange for rehabilitation before discharge from hospital.
11. Do not treat with alcohol.

### 1.5 Bites and Stings: Insects, Animals, Snakes, and Humans

Bites and stings are often painful. Multiple stings as well as stings in the mouth or throat are dangerous because they can cause airway obstruction. Urgently refer all patients with signs of serious bites or stings for medical management (e.g., those presenting with severe abdominal pain, muscle cramps, shock, or acute allergic reactions).

#### Causes

- Bees, wasps, and other insects
- Scorpions
- Spiders
- Centipedes
- Snakes
- Dogs and wild animals
- Humans

#### 1.5.1 Bee and Wasp Stings

Local pain and swelling is common. Bee and wasp stings are not usually dangerous, but some people may develop severe allergic reactions. (See [1.18](#) for a discussion of anaphylactic shock.)

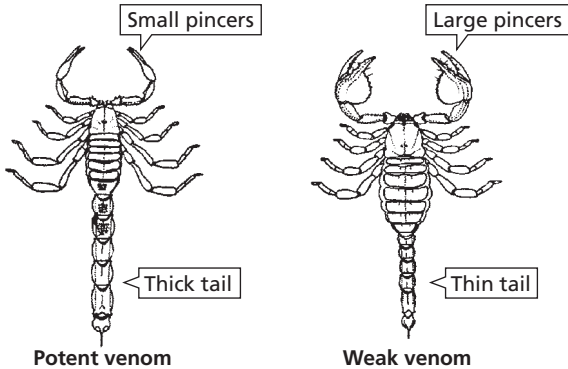
#### Management

1. Remove the stinger by *scraping* with a needle or a scalpel.
2. *Do not* squeeze the area or use a tweezers to remove the stinger.
3. Apply a cold compress or ice. For a sting in the mouth, give the patient ice to suck.
4. Give an antihistamine if the swelling is severe: chlorpheniramine 4 mg PO for adults, 1 mg PO for 1 to 5 years, and 2 mg PO for 6 to 8 years old.
5. For anaphylactic reaction (very rare), see [1.18](#) below.

### 1.5.2 Scorpion Stings

Scorpions with small pincers and thick tails are more dangerous. Some may also squirt venom. Elderly people with medical conditions as well young children are more susceptible to the venom.

FIGURE 1.5.2 Scorpions with potent and weak venom



#### Symptoms and signs

- Pain (immediate, local, intense burning)
- Nausea and vomiting
- Paraesthesia (may spread to whole body)
- Muscular pains and cramps
- Weakness and drowsiness
- In small children, often severe restlessness
- Severe scorpionism: convulsions, respiratory failure, swallowing difficulties

#### Management

1. Administer first aid.
  - Immobilize the affected part.
  - Clean the wound or wash eyes thoroughly for 10 to 20 minutes using sterile physiological saline, clean boiled water, or a neutral liquid such as milk.
  - Apply crushed ice to the sting site.

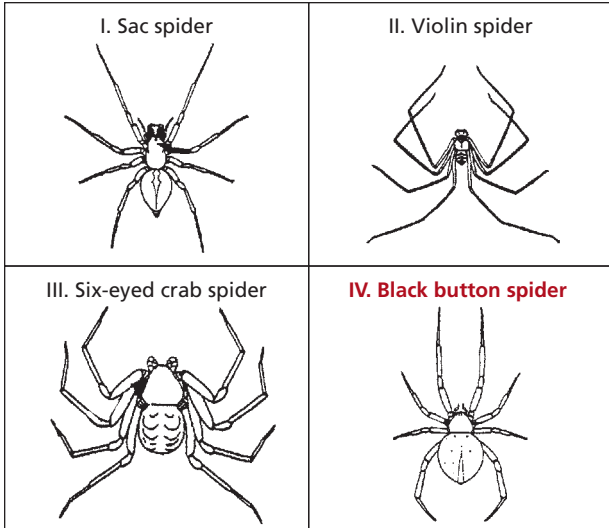
## 1.5 Bites and Stings

- Administer analgesics: paracetamol—*never* morphine or its derivatives or benzodiazepines. (See “Section VII. Palliative Care. Chapter 29. Palliative Care,” [table 29.3A](#) for dosages. See also the algorithm for pain, [figure 2.9.2.4](#) below.) For severe pain, application of a local anaesthetic (1% to 2% lignocaine) is advisable.
  - Do *not*—
    - Incise.
    - Use a tourniquet.
    - Give spider- or snake-bite antivenom.
  - If possible, bring the scorpion along for identification.
  - Refer to hospital under the following conditions:
    - Patients with systemic symptoms
    - Children and high-risk patients
    - Preferably to the ICU or high care for 24 to 48 hours
    - Assess and monitor ABC: airway, breathing, ventilator support, dysrhythmias, BP.
    - IV fluid may be necessary.
2. In cases of severe systemic envenomation, administer scorpion antisera: 10 mL IV. Have adrenaline on hand in case of anaphylaxis.
  3. Take the following additional measures:
    - Provide local pain management: infiltration in and around wound with 2 mL of 1% to 2% plain lignocaine
    - If cholinergic signs are evident, administer atropine (to reduce salivation).
    - Administer calcium gluconate (to relieve muscle pains and cramps): 10 mL of 10% IV over 10 to 20 minutes.
    - Monitor for cardiac irregularities and manage appropriately.
    - Avoid antihistamines, antibiotics, and steroids. They are *Not* used as routine and used *only* as per indication (e.g., allergic reactions)

### 1.5.3 Spider Bites

Only a few species pose a threat to people—0.01% of all known spiders. The fangs of most spiders are too short to penetrate human skin. The severity of the bite depends on the general health of the victim. Children and elderly are more adversely affected.

FIGURE 1.5.3 Four medically significant spiders



In Namibia, three spiders have *cytotoxic* venom:

- The sac spider
- The violin spider
- The six-eyed crab spider

The sac spider (*Cheiracanthium*) accounts for 75% to 80% of all spider bites in southern Africa. The bites are painless; occur primarily on face, neck, and hands; and leave two puncture marks 4 to 8 mm apart with a greenish hue (due to the venom colour). The violin spider (*Loxosceles*) is a small, delicate spider with vague violin-shaped marking on its carapace. It is often mistaken for “daddy-long-legs.”

## 1.5 Bites and Stings

The six-eyed crab spider (*Sicrius*) has a crablike flattened body with long, strong legs. Its brownish body is covered with tiny hook-like bristles to which sand clings.

The fourth spider in [figure 1.5.3](#) has *neurotoxic* venom. The black button spider (*Latrodectus indistinctus*) has a round velvety abdomen with slender legs. It can be dark brown to pitch black with a reddish orange stripe or dot above the spinning organs (dorsally) and has no coloured markings ventrally. Namibia has both black button spiders (two species) and brown button spiders (two species). The black species' venom is three to four times as virulent as the brown species' venom.

---

**Note:** Black button spider bites are the most important group of spider bites requiring medical attention.

---

A fifth spider, the lesser baboon spider (*Harpactirella lightfooti*), is fairly aggressive and people sometimes get bitten. They produce a neurotoxic venom, but their bites are never fatal.

### 1.5.4 Centipede Bites

The bite is very painful, resulting in local swelling, erythema, and mild necrosis, but is not dangerous for humans.

#### Management

1. Apply ice packs, and give a lignocaine injection, if indicated.

**TABLE 1.5.3 Symptoms and Signs of Different Spider Bites and Their Management**

<p><b>Type of Venom:</b> Cytotoxic</p> <p><b>Symptoms and Signs</b></p> <ul style="list-style-type: none"> <li>• Usually a painless bite</li> <li>• Painful, swollen area develops</li> <li>• Discoloration, blistering (especially from the violin spider) and later ulceration (from the sac spider, 10 to 15 mm; from the violin spider, 30 to 100 mm; and from the six-eyed crab spider, massive ulceration with severe tissue damage), which often takes a long time to heal.</li> <li>• Systemic: sometimes headache, fever, malaise</li> <li>• Six-eyed crab spider: damage to liver, heart, kidney is possible</li> </ul> <p><b>Management</b></p> <p><b>Preventing and treating wound infection</b></p> <ul style="list-style-type: none"> <li>• Keep wound clean.</li> <li>• Elevate limb.</li> <li>• Apply antibiotic or antiseptic cream or solution (e.g., povidone-iodine)</li> </ul> <p><b>Systemic treatment</b></p> <ul style="list-style-type: none"> <li>• Administer painkillers (paracetamol, ibuprofen).</li> <li>• Give tetanus toxoid.</li> <li>• Give antibiotics, as necessary.</li> <li>• No antivenom is available or indicated. (Antisera is available, but determine whether it is for cytotoxic or neurotoxic species.)</li> <li>• Steroids and antihistamines are not proven to be of any benefit.</li> </ul> <p><b>Reconstructive procedures</b></p> <ul style="list-style-type: none"> <li>• Use debridement, if indicated.</li> <li>• If skin grafts are required, wait 4 to 6 weeks.</li> </ul>
---

## 1.5 Bites and Stings

TABLE 1.5.3 Symptoms and Signs of Different Spider Bites and Their Management (cont.)

### Type of Venom: Neurotoxic

#### Symptoms and Signs

- Usually painful bite
- Pain spreads to regional lymph nodes, muscles and joints
- Painful muscle cramps: rigid abdominal muscles, limb pains and weakness
- Nausea, vomiting
- May lose consciousness, even within 30 minutes

#### Management

##### General treatment

- Discourage activity and keep bite area still.
- Advise the patient to avoid eating and drinking.
- Apply crushed ice to bite within minutes following bite. Remove periodically to prevent tissue damage.
- Position the patient on his or her back, legs elevated above level of heart, head turned to side.
- Loosen tight clothing.
- Give artificial respiration as required, and refer.

##### Medical treatment

- Hospitalize for 24 hours to monitor vital functions.
- Black button spider antivenom is the only effective treatment for severe latrodectism—
- Give 10 mL antivenom IV. If needed, give 5 mL as follow-up dose after 4 to 6 hours.
- Usually, patient has a dramatic response within 10 to 30 minutes.
- For muscle cramps, administer 10 mL calcium gluconate 10% slowly by IV. The effect lasts only 20 to 30 minutes.
- Clean and dress the wound to prevent secondary infection

##### Do not—

- Use potassium permanganate on the wound.
- Cut the wound or bite area.
- Use a tourniquet.
- Use snakebite



### 1.5.5 Snake Bites

Snake bites that are not poisonous can cause pain, swelling, redness, and laceration. [Table 1.5.5](#) describes how to manage poisonous bites.

**TABLE 1.5.5 Snake Bite with Envenomation**  
Signs and symptoms

Early (non-specific)	Later (more specific)
<ul style="list-style-type: none"> <li>• Pain</li> <li>• Fang puncture(s). Bite marks—even after a known venomous bite—mean <i>nothing</i> in the absence of symptoms. In the absence of <i>local</i> symptoms/signs the development of <i>systemic</i> symptoms/signs are highly unlikely</li> <li>• Discolouration</li> <li>• Swelling</li> <li>• Hysteria (emotional “shock”)</li> </ul>	<ul style="list-style-type: none"> <li>• Marked increases/spreading of swelling, regional lymphadenopathy (<i>Adders</i>)</li> <li>• Marked spreading of discolouration (<i>Adders</i>, <i>Zebra snake</i>)</li> <li>• Neurotoxic. Drooling, slurred speech, double vision, paralysis (<i>Mamba</i>, <i>Cobra</i>)</li> <li>• Shock (hypovolaemic: <i>Adders</i>)</li> <li>• Bleeding (<i>Boomslang</i>, <i>Twig Snake</i>)</li> </ul>

#### First Aid

**Note:** Snakebite in a child or during pregnancy should be treated as an *absolute emergency*.

- Calm the victim and discourage activity (e.g., running, hysterical behaviour). Do not panic.
- Do not waste time in getting the victim to a doctor, hospital, or clinic. “Make haste slowly.”
- Call for help.
- Monitor vital signs (ABCs). CPR when required.
- Analgesics if available.
- Do not tamper with bite site (e.g., cut, massage, heat).
- Venom spat into eye(s): Wash the venom from face. Rinse as soon as possible with copious amounts of saline/water while rotating eyeballs. Do not rub the eyes. Take to doctor for evaluation.
- Get the victim to a doctor, hospital, or clinic.

## 1.5 Bites and Stings

TABLE 1.5.5 Snake Bite with Envenomation (cont.)

### Specific treatment at hospital by doctor

- Apply routine and *ongoing* supportive measures (breathing, hypovolaemic shock) *throughout* the management. Elevate the affected limb.
- IV-line and analgesics (non-sedative)
- IV polyvalent antivenom:
  - Early, progressive swelling (*adder*); 40 mL. (*Zebra snake*—not indicated)
  - Neurotoxic symptoms/signs (*cobra, mamba*); 60 mL *cobras*, 80 mL *mamba*
- IV monovalent antivenom: To be ordered *only* upon confirmed Boomslang bite. Not indicated for Twig snake envenomation. Appropriate blood product transfusions (RCC, FFP, Platelets) have proved life saving to restore coagulation in this rare envenoming. This antivenom can be ordered from: South African Vaccine Producers Pty (Ltd), telephone +27 11 8829940; fax +27 11 8820812
- Hospitalise: Constant monitoring (local and systemic). Ward or ICU.
- Snakebite in children or during pregnancy should be treated as an *absolute emergency*.
- Children need as much antivenom as adults
- Interventions
  - Compartmental syndrome—Perform fasciotomy
  - Debridement (*adders*)—Wait for demarcation (7–14 days)
  - *Zebra snake* bite: Early, speedy, adequate, debridement of bite area, except in face or genitalia—act more conservatively (as for *adders*).
  - Blood, blood products, plasma, FFP, or plasma expanders—*if needed*.
  - Respiratory support—ventilate if indicated.
- Venom spat into eye(s): Wash the venom from face. Rinse as soon as possible with copious amounts of saline/water while rotating eyeballs. Local anaesthetic drops (e.g., Novesin®) will facilitate the rinsing.

Source: Dr PJC (Christo) Buys

### 1.5.6 Dog and Other Wild Animal Bites

The important question is, was the animal rabid or not. Consider a stray dog or a known dog that acts aggressively or strangely to be rabid. Please refer to circular no. 255 issued in 2005 by the Permanent Secretary's Office, which outlines the national protocol for management of rabies in Namibia and ensure that any treatment given conforms to that protocol.

#### Management

- For a bite from a non-rabid dog, infections from the dog's saliva are the primary problem. Follow this procedure:
  1. Clean the wound with soap and water.
  2. Clean the wound with povidone-iodine solution.
  3. Change the dressings every second day.
  4. If the dog's owner cannot prove that the dog was vaccinated against rabies during the last 12 months, follow the procedure for a rabid bite below.
  5. Administer tetanus toxoid (if the patient has never been vaccinated or if it has been more than 10 years since last vaccination).
  6. Use prophylactic antibiotic amoxicillin (azithromycin if penicillin allergy) plus clavulanic acid only in deep wounds that have a lot of tissue damage.
  7. Always *debride* if the wound is deep and contaminated.
  8. Treat the patient's pain.
  9. Do not suture the wound if it is small and not actively bleeding.
  10. If the wound is large lacerating or strong bleeding, refer the patient to hospital with sterile pressure bandage.
- For a bite from a rabid dog or when in doubt
  1. Follow the procedure outlined above.
  2. Transfer the patient to the hospital.
  3. The dog must be killed. Dispatch the environmental

## 1.5 Bites and Stings

health team to kill the dog, and send the head to WDH Vet Laboratory for specialist investigation to prove or exclude rabies by microscopy of dog brain.

4. Give rabies vaccination. (See “Section IV. Infectious Diseases. [Chapter 23. Rabies.](#)”)
5. Give rabies immunoglobulin (See “Section IV. Infectious Diseases. [Chapter 23. Rabies.](#)”)

### 1.5.7 Human Bites

Human bites are more prone to become septic or to develop complications such as cellulitis and gangrene, than animal bites because infection with anaerobic and aerobic bacteria is common.

#### Management

1. Fresh human bites should be followed by early extensive wound cleaning and or debridement.
2. Treat simple human bites using the same procedure as for uncomplicated dog bites.
3. Debride (clean) the wound thoroughly with antiseptic solution (e.g., povidone-iodine solution).
4. Clean and dress regularly.
5. Administer IM tetanus toxoid 0.5 mL stat.
6. Administer antibiotic therapy.
  - Adults: amoxicillin 500 mg PO 3 times per day for 5 days plus metronidazole 400 mg PO 3 times per day for 5 days. Azithromycin 500 to 1000 mg PO per day for 3 days should be given to adult patients who are allergic to penicillin.
  - Children: amoxicillin 40 mg/kg PO 3 times per day plus metronidazole 7.5 mg/kg PO 3 times per day for 5 days. Azithromycin 10 to 12 mg/kg PO per day for 3 days should be given to children (>6 months) who are allergic to penicillin.

## 1.6 Burns

Burns are the skin and tissue damage caused by exposure to or contact with temperature extremes, electrical current, or a chemical agent or radiation.

### Causes

- Thermal causes: hot or cold exposure or contact with objects or liquids
- Chemical or caustic substances
- Electrical current

### Symptoms and signs

- Pain when superficial
- Painless when very deep
- Discoloured skin (black, red when superficial; white when very deep)
- Blisters (superficial burns)
- Moist, wet wound in skin
- Smell of burnt flesh
- Loss of skin

### Assessment

Assessing the seriousness of a burn is important so that the correct treatment can be chosen and the patient can be referred to hospital when necessary. The severity of a burn depends on what caused it, whether airways are involved, the depth and extent of the burn.

Assess the seriousness of a burn using three criteria: (1) How deep is the burn? (2) How much body surface has been burnt? (3) Which part of the body is burnt?

The depth of the burn can be classified as follows:

- *Superficial*—Superficial epidermal burns are red and painful, and blisters are not present. They heal by epithelisation.
- *Partial thickness*—These burns are superficial dermal burns that are blistered and painful; they also heal by epithelisation without scarring.

- *Full thickness*—Full thickness burn areas have lost all adnexal structure and heal by secondary intention with scarring. They are subdivided into—
  - *Deep dermal burns*, which are blistered with a blotchy red appearance, no capillary return on pressing and absent sensation to pin prick
  - *Full thickness burns*, which have a white or charred appearance with loss of sensation

When calculating total burn surface area, count all areas of burn except areas of erythema. [See figure 1.6.](#)

To determine admission criteria, assess the following:

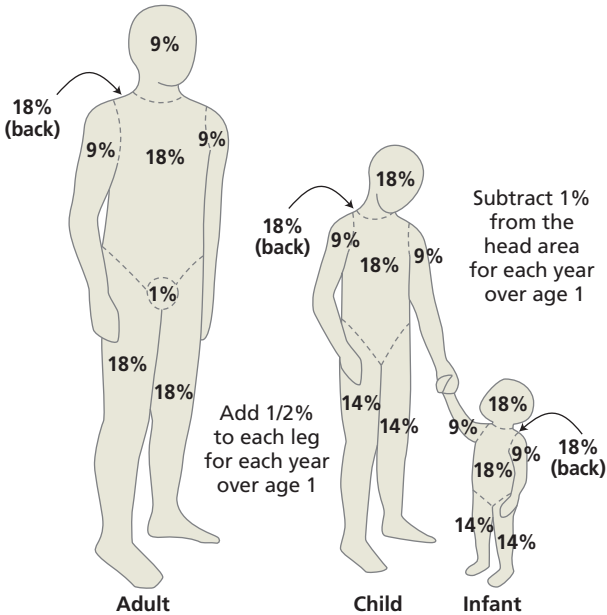
- Burns of the face and or neck
- Burns of the hands, feet, and those involving joints
- Perineal area (genitalia)
- Circumferential burns (right around) of limbs and trunk
- Inhalation burns and inhalation of toxic gases
- Neonatal burns
- Electrical burns
- Burns in patient with serious pre-existing or concomitant injuries
- Partial thickness burns of >10% body surface area
- Full thickness burn >3% body surface area
  - 15% of the adult's body surface
  - 10% of the child's body surface

### Management

For clinic and health centre care for patients who do not need hospitalisation, follow this procedure—

1. Apply cold water—*not ice*—to the burn surface within the first 30 minutes, but do not apply cold water for a long period on extensive burns. Doing so may worsen shock.
2. Chemical burns should be washed or irrigated with plenty sterile water or normal saline.
3. Check airway, breathing, pulse, and blood pressure. Be prepared to resuscitate.

FIGURE 1.6 Surface area of burns diagram



Source: Diagram adapted from the University of Michigan.  
©Copyright 2003 Regents of the University of Michigan.

4. Give analgesia for pain: paracetamol, ibuprofen, or aspirin, but be careful with aspirin because of the possible risk of bleeding.
5. Prevent wound infection, and dress the burn:
  - Gently clean the burn with sterile water (or with saline solution).
  - Dress the wound with gauze.
  - Cover with cotton wool, and then loosely wrap with a bandage one layer thick and without folds.
  - Dressings should be changed daily.
  - Apply antiseptic ointment (e.g., povidone-iodine or silver sulphadiazine).

## 1.6 Burns

- Antibiotics should not be given immediately. Give only if patient shows signs of infection and after a swab for microscopy or culture and sensitivity is taken for examination in the laboratory.
6. Administer tetanus toxoid vaccine IM 0.5 mL.
  7. *Do not burst blisters of a burn patient unless they are infected or so painful that dressings are difficult to apply.*

For first-aid management of burn patients who need hospitalisation, follow this procedure before hospitalisation—

1. Apply cold sterile water to the burn surface.
2. Manage the pain: use what is available.
3. *For all patients with severe burns, treat the fluid loss intravenously.*
  - Set up a wide-bore IV cannula.
  - Use Ringer's lactate, normal saline, Plasmalyte B.
  - The calculation for amount of fluid to be administered over 24 hours is  $4 \times \text{patient weight in kg} \times \% \text{ of body covered by burns}$ . Give 1/3 stat, 1/3 over 6 hours, and 1/3 over 12 hours.
  - If patient is in shock, run the drip fast until the blood pressure improves.
  - If patient is not in circulatory shock, run the drip at a rate of about 1 L over 2 to 4 hours.
  - For children, use Darrow's half strength with 5% dextrose solution and give 20 mL/kg of weight over 20 minutes. Give a further 20 mL/kg of weight over the next 2 hours during transport.
4. Clean and dress wound. (See #5 in previous procedures.)
5. Give tetanus toxoid vaccine IM 0.5 mL.
6. Refer patient to a hospital.

For inpatient care for hospitalised patients, follow this procedure—

1. Often ICU treatment or isolation is necessary.
2. Patients might need intubation. Clinical features sug-



gesting that tracheal intubation is likely to be needed are—

- A score of 8 or less on the Glasgow coma scale (GCS) for impaired mental status (see [table 1.8](#))
  - Facial burns
  - Singeing of facial or nasal hair
  - Oropharyngeal carbon deposits
  - Carbonaceous sputum
  - Hoarseness
  - Stridor
  - Wheezing
  - Burns covering >30% total body surface area
  - Carboxyhaemoglobin levels >10%
3. Fluids and electrolytes must be carefully controlled.
  4. Monitor input and output; catheterise.
  5. Treat burns according to depth and position.
  6. Initiate physiotherapy at the earliest opportunity.
  7. A high-protein, high-energy diet is necessary for burn patients.
  8. Skin grafts are done if necessary at a later stage.

### Complications

- Shock (from fluid loss)
- Tetanus
- Infections
- Contractures and deformity
- Deep burns heal slowly and scar easily.
- Cyanide poisoning from smoke inhalation (generated from burning plastics) may need treatment in addition to giving oxygen.
- Death, especially with extensive burns

### 1.7 Cardiopulmonary Arrest

Cardiopulmonary arrest is the cessation of breathing and circulation, which signifies clinical death.

#### Causes

- Cardiac conditions (e.g., myocardial infarction)
- Airway obstruction
- Severe haemorrhage and fluid loss
- Head injuries
- Anaphylactic shock

#### Symptoms and signs

- Unconsciousness
- Absence of major pulses: carotid and femoral
- Absence of heart sounds
- Absence of respiration; dilated, unresponsive pupils
- Blue or grey skin colour (cyanosis)
- Convulsions may precede cardiac arrest

#### Management

- In the event of hypothermia or drug/medicine overdose, a patient may appear dead, but can and must still be resuscitated.
- Resuscitate first; then diagnose and treat.
- Decisive action must be taken within 4 to 6 minutes.

## 1.7.1 Cardiopulmonary Resuscitation in Adults and Children

**Note:** ‘Children’ are defined as from age 1 year to adolescents showing signs of puberty.

Assess patient’s level of consciousness by shaking his or her shoulder and trying to revive him or her. Shout for help. Refer to [figure 1.7.1](#) for an illustration of the procedure described here. (Underlined letters in the following subheads correspond to sections of [figure 1.7.1](#))

### 1.7.1.1 The Patient’s Airway (A)

Follow this procedure—

1. Place patient on a firm flat surface. Check for spinal cord or neck injury.
2. Clear all foreign material (e.g., debris, blood, dentures, loose teeth) from the patient’s mouth.
3. If you have ruled out a spinal injury, turn an unconscious patient on his or her side to prevent obstruction of the airway.
4. Establish an open airway by tilting the head and lifting the chin.
5. Insert an oral airway (i.e., airway guard), if necessary.

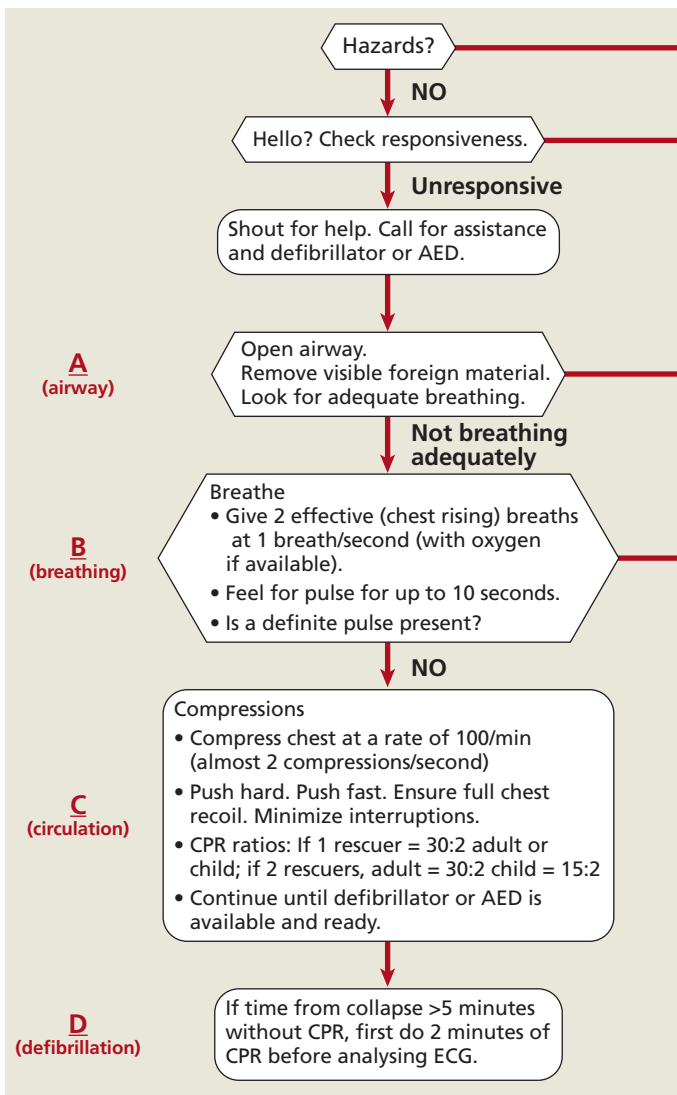
### 1.7.1.2 The Patient’s Breathing (B)

Follow this procedure—

1. Look, listen, and feel for signs of breathing.
2. Help breathing by mouth-to-mouth ventilation or a respiratory resuscitator (e.g., Ambu bag)
3. When using mouth-to-mouth ventilation—
  - Use mouth guard airway
  - Give 2 breaths
  - Keep airway open; pinch the nose closed
4. If respiratory resuscitator and mask are used for ventilation, ensure a tight seal around the mouth and nose.
5. An adult patient needs about 12 to 15 breaths/minute (i.e., one breath every 5 seconds); a child needs 12 to 15 breaths per minute.

## 1.7 Cardiopulmonary Arrest

FIGURE 1.7.1 ABCD Algorithm for CPR in adults



**YES**

Ensure scene is safe.

**Responsive**

If safe to do so—

- Treat illnesses or injuries as necessary (aspirin, inhaler, auto-injector)
- Get assistance if needed
- Reassess continuously

**Breathing**

• Place in recovery position.

- Check for continued breathing.
- Reassess continuously

**YES**

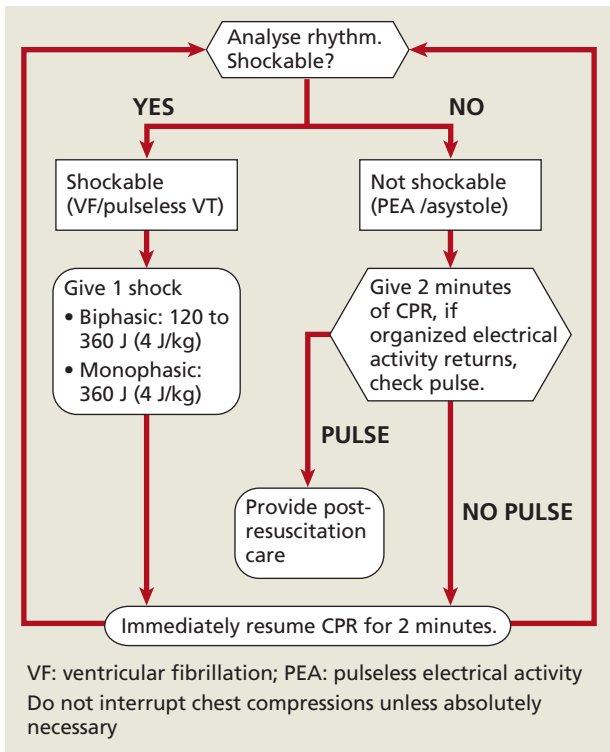
Continue rescue breaths—

- Adult: 10 to 12/minute
- Child: 12 to 20/minute
- Reassess continuously

(continues)

## 1.7 Cardiopulmonary Arrest

FIGURE 1.7.1 ABCD Algorithm for CPR in adults (cont.)



6. Continue ventilating until breathing starts.
7. Always administer oxygen when resuscitating a patient if possible.

### 1.7.1.3 The Patient's Circulation and Cardiac Condition (C)


Follow this procedure—

1. Feel for a pulse (carotid pulse or the femoral pulse).
2. If no heart beat, do cardiac massage.
3. If working alone—

- Compress sternum to a depth of 4 to 5 cm (adult) or one-third to one-half of the AP depth of the chest (child)
  - Rate of 80 to 100 compressions/minute. (Use a rhythm of '1' and '2' and '3' etc.)
  - Use a compression-to-breath ratio of 30:2 (adult and child)
4. If two rescuers are working—
- CPR ratio 30:2 (adult) 15: 2 (child)
  - One rescuer compresses the chest at a rate of 80 to 100 compressions/minute
  - Other rescuer gives 8 to 10 breaths/minute simultaneously.

### 1.7.1.4 Drips (D)

Follow this procedure:

1. Always set up an IV line.
2. Use Ringer's lactate, rehydration fluid, or Plasmalyte B. Infusion rate depends on the rate of fluid loss and underlying cause.
3. Check the patient's pulse and blood pressure regularly.
4. **Note:** Be careful not to give too much fluid to patients who—
  - Have a head injury
  - Have cardiac failure
  - Are children (20 mL/kg, then repeat if necessary). See [1.7.2](#) below for procedure for resuscitating a newborn.
5. **Refer** to the next level urgently. Continue resuscitation during transfer. 

### 1.7.1.5 Emergency Medicine Therapy

For emergency management, see appropriate sections.

### 1.7.2 Cardiopulmonary Resuscitation of a Newborn with Birth Asphyxia

Anticipate an asphyxiated newborn and be ready for resuscitation in the following situations:

- Maternal risk factors are present.
  - Age >35 years or <17 years
  - Maternal diabetes mellitus, pregnancy-induced hypertension
  - Anaemia, infection, renal disease
  - Medical therapy, maternal substance abuse
  - No prenatal care
- Pregnancy-related factors are present.
  - Antepartum haemorrhage, placenta praevia, and abruptio placentae
  - Polyhydramnios, oligohydramnios
    - ◆ Intrauterine growth retardation, diminished foetal movement
    - ◆ Multiple gestation, large or abnormal foetus
    - ◆ Postterm pregnancy
- Labour-related factors are present.
  - Preterm labour (especially <34 weeks)
  - Rupture of membranes or prolonged labour >24hours
  - Malposition or malpresentation including breech
  - Meconium-stained liquor
  - Foetal bradycardia
  - Abnormal CTG tracing
  - Uterine tetany
  - Narcotic analgesics within 4 hours of delivery
  - Emergency caesarean section
  - General anaesthesia

#### Causes

- Airway may be blocked by meconium, blood, liquor, mucous.
- Hypothermia
- Hypoglycaemia—especially in prolonged labour or stressful birth



- Medications used by the mother (e.g., opioid analgesics such as pethidine or morphine)

### Symptoms and signs

- Mucous, blood, or meconium in airways
- No breathing seen or felt
- No pulse felt at umbilical stump or no heartbeat heard with stethoscope

Refer if any of the following are present:

- Apgar score <6 at 5 minutes
- Respiratory rate >60 breaths/minute
- Respiratory distress
- Cyanosis
- Anaemia
- Jaundice
- Hypothermia
- Twitching or tremor
- Failure to suck or cry
- Glucose <2.2 mmol/L
- Small size for full gestation baby
- Large size for full gestation baby (>4.5 kg)
- Congenital abnormalities
- Ruptured membranes >24 hours before birth
- Foul-smelling liquor

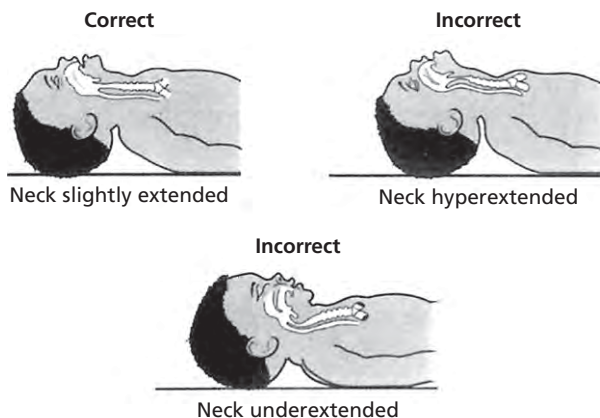
### Management

1. Be prepared. Have the following equipment ready at the birth.
  - A clean warm environment with a complete set of resuscitation equipment and medicines
  - General
    - Clock
    - Overhead radiant warmer
    - 3 clean towels or receiving blankets (one folded beneath the baby's shoulders, one for drying the baby, and one for wrapping the baby in)
    - Stethoscope
    - Gloves

## 1.7 Cardiopulmonary Arrest

- Scissors
  - Syringes 1, v2.5, 5, 10, and 20 mL
  - Needles 18, 21, and 25 gauge
  - Alcohol swabs
  - Adhesive tape
  - IV solutions 200 mL normal saline neonatal solution
  - IV giving sets and buretrol
  - Infusion pump or device such as “Dial a Flow” to control IV infusion rate
  - Pulse oximeter if available
  - Suction
    - Suction pump with pressure manometer and tubing
    - Suction catheters 5F to 10F
  - Bag and mask
    - Self-inflating resuscitation (e.g., Laerdal) neonatal size with oxygen reservoir
    - Face masks in newborn and premature sizes
    - Oxygen supply with flow meter and tubing
  - Medicines
    - Naloxone (0.4 mg/mL)
    - Adrenaline 1:1000 will need to be diluted to 1:10,000 (i.e., 1 mL 1:1000+9 mL normal saline). Always use only 1:10,000 adrenaline solution during resuscitation to avoid errors.
    - Sodium bicarbonate 4%
    - Dextrose 50%
2. Always keep the baby warm.
  3. Evaluate the infant and determine the Apgar score. To determine the Apgar score—
    - Is the baby breathing adequately (not just gasping)?
    - Is the baby’s heart rate above 100 beats per minute?
    - Is the baby centrally pink?
 Reassess in this way every 30 seconds during resuscitation.
  4. Establish an airway. **(A)** (See figures [1.7.2A](#) and [1.7.2C](#).)

FIGURE 1.7.2A Establishing an airway in a newborn



The underlined letters refer to a section of [figure 1.7.2C.](#))

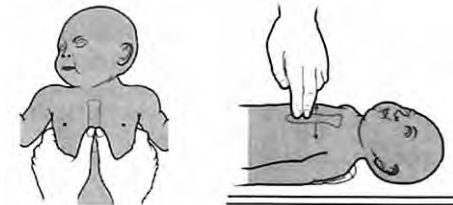
- Place a towel under the baby's shoulders to maintain correct position.
  - Wipe all secretions with gauze swabs.
  - Clear the airway if meconium-stained liquor is present.
  - Suction the mouth, throat, and nostrils gently with a large-bore catheter at low pressure (<100 mmHg). **Note:** Vigorous suctioning can cause vagal bradycardia, laryngospasm, and delayed onset of respiration. A clear airway and warmth are often all that is required. Most infants will start breathing on their own.
5. Establish breathing. **(B)** (See [figure 1.7.2C.](#))
- Mild tactile stimulation (e.g., flicking the soles of the feet).
  - If no response, administer positive pressure ventilation with a bag and mask.
  - Give free-flowing oxygen (5 L per minute) using a funnel or a cupped hand at the end of the oxygen tubing.

## 1.7 Cardiopulmonary Arrest

- Start bag and mask ventilation if—
    - Apnoeic or gasping
    - Heart rate is below 100/minute
    - Cyanosis without improvement with free-flowing oxygen
  - When using bag and mask ventilation—
    - Rate of breathing: 40 to 60 breaths per minute (not too fast)
    - If no response, check the bag and seal, oxygen flow, determine a clear airway, pass an NGT to release air from stomach.
  - Administer naloxone (0.1 mg/kg IV or IM injection stat) if—
    - Heart rate and colour have been established by adequate ventilation
    - Mother received pethidine or morphine within 4 hours of delivery
6. Maintain adequate circulation. **(C)** (See figures [1.7.2B](#) and [1.7.2C](#).)
- Ventilate the baby properly before starting chest compressions.
  - Apply chest compressions if there is no pulse or it is <60 beats/minute.
  - Lay the baby on a firm surface.
  - Imagine a line joining the baby's nipples. Place the tips of two fingers just below the midpoint of this line and press to a depth of about 2 cm.

FIGURE 1.7.2B

### Maintaining adequate circulation in a newborn

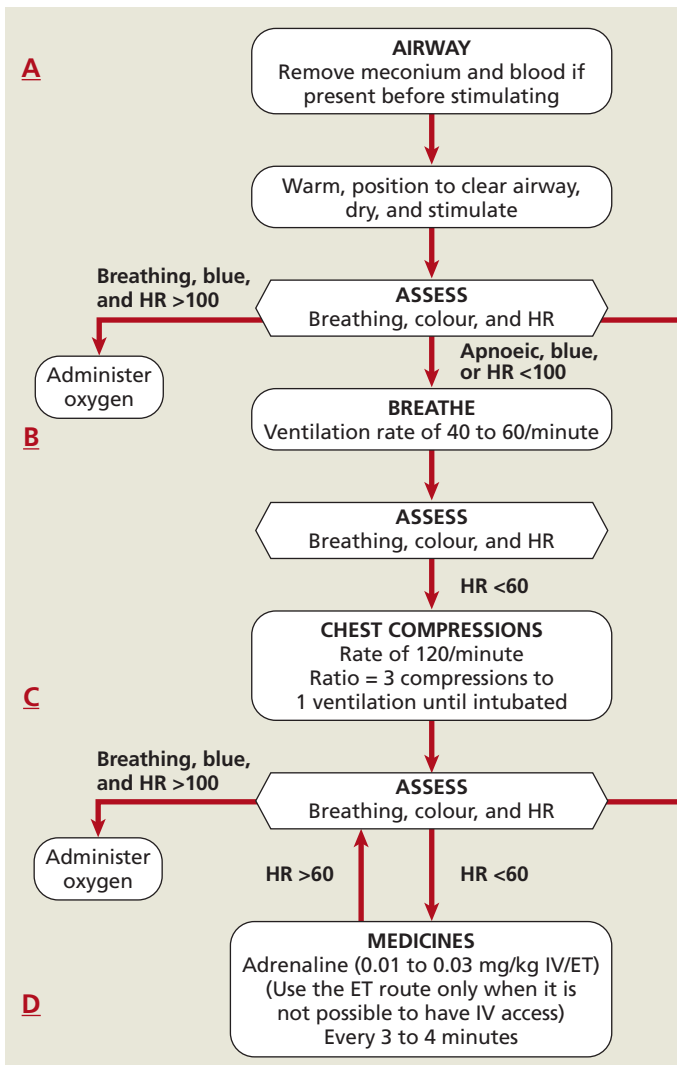


- Rate of compression should be 100/minute.
  - Compression-to-ventilation ratio should be 3:1 (if one rescuer) and 15:2 (if 2 rescuers and continuously done).
  - Intubate, if necessary.
7. Medicines (**D**) (See [figure 1.7.2C](#) and [table 1.7.2.](#))
- Give dextrose if the mother had a long and difficult labour or if the infant is restless or drowsy.
  - Give neonatal naloxone to help start breathing, if a narcotic analgesic has been given to the mother.
8. Post-resuscitation care—
- Requires ongoing monitoring and treatment for at least 6 hours.
  - Check the baby's blood glucose level.
  - Ensure that the baby is kept warm but not overheated.
  - Treat the underlying problem.
9. Refer to the next level if the baby had prolonged resuscitation or needs further resuscitation.
- If possible transport baby between mother's breasts for warmth (kangaroo method).
  - Give continuous positive airway pressure (CPAP) ventilation.
10. Discontinuing resuscitation—
- Ensure that resuscitation efforts are effective before considering withdrawal of support.
  - Stop resuscitation after 10 minutes of asystole.
  - Discontinue after 20 to 30 minutes in infant with a heart rate but no respiratory effort. **Note:** prolong resuscitation in children with hypothermia, whose mothers have used magnesium sulphate and benzodiazepines.
  - These decisions should be discussed with a more senior colleague.
  - If resources are unlimited, the baby may be ventilated for a period of 24 hours and re-evaluated.

## 1.7 Cardiopulmonary Arrest

FIGURE 1.7.2C

### ABCD Resuscitation algorithm for newborns





Use the following only if specifically indicated—

- Naloxone: 0.1 mg/kg IV/IM/SC if narcotic use suspected or if narcotic analgesic was administered to mother during labour
- Bicarbonate: 2 mL/kg of 4% w/v IV (diluted) only in prolonged resuscitation
- Dextrose: 2 mL/kg of 10% dextrose or 1 mL/kg of 50% dextrose diluted with 1 mL of sterile water
- Normal saline fluid bolus: 10 mL/kg over 5 to 10 minutes

## 1.7 Cardiopulmonary Arrest

TABLE 1.7.2 Medications for Newborns

Medicine or Indication	Dosage	Route of Administration	Points of Note
Epinephrine (adrenaline), heart rate <60 beats/minute	0.01 to 0.03 mg/kg = 0.1 mL/kg to 0.3 mL/kg of 1:10,000 IV solution 1 mg/kg = 1 mL/kg of 1:10,1000	IV or intra-tracheal	Dilute 1 mL of 1:1000 adrenaline with 9 mL of normal saline.
Dextrose hypoglycaemia	250 mg/kg to 500 mg/kg dextrose or 2.5 mL/kg to 5 mL/kg 10% dextrose in water	IV	Dilute 2 mL of 50% dextrose with 8 mL of sterile water.
Normal saline hypovolaemia	10 mL/kg	Slow IV	
Sodium bicarbonate metabolic acidosis <ul style="list-style-type: none"> <li>pH &lt;7.2</li> <li>BE &gt; -10 mmol/L</li> <li>PaCO<sub>2</sub> &lt;55 mmHg</li> </ul>	2 mL/kg of 4%	Very slow IV push	Do not give by intra-tracheal route.
Naloxone, mother received opioid	0.1 mg/kg	IV, IM, or subcutaneous	Use adult, 0.4 mg/mL ampoules



## 1.8 Coma and Unconsciousness

*Coma* is a state of profound unconsciousness from which a patient cannot be aroused even by powerful stimuli. The patient does not react to stimuli (e.g., calling of name, shaking, inflicting pain by sternal pressure). *Drowsiness* is a disorder that simulates light sleep from which the patient can be easily aroused by touch or noise and can maintain alertness for some time. *Stupor* defines a state in which the patient can be awakened only by vigorous stimuli, and an effort to avoid uncomfortable or aggravating stimulation is displayed. *Confusion* is a behavioural state of reduced mental clarity, coherence, comprehension, and reasoning

### Causes

The acronym DIMTOP provides a mnemonic device for the causes of coma:

- **D**—drugs (and medicines), including social drugs, antibiotics, antihistamines, anticholinergic medicines, and corticosteroids
- **I**—infections, such as meningitis, cerebral malaria, and encephalitis
- **M**—metabolic derangements, including dehydration, hypo- or hyperglycaemia, acidosis, electrolyte disturbances (Ca, Na), DIC, and all the anaemias
- **T**—trauma and toxins
  - Trauma—head injury (intracranial haemorrhage), stroke or CVA, subarachnoid haemorrhage, TIAs
  - Toxins—alcohol, medicine overdose (salicylates, barbiturates), and other poisons (carbon monoxide)
- **O**—oxygen and organ failure
  - Oxygen—decreased perfusion
  - Organ failure—severe pulmonary or CVS conditions; asphyxiation
- **P**—Psychiatric and poisoning
  - Psychiatric—Alzheimer’s disease, Parkinson’s disease, and dementia
  - Poisoning

## 1.8 Coma and Unconsciousness

### Investigations

- Check the level of response according to the GCS.  
See [table 1.8](#).
  - FBC and diff WCC, ESR
  - Blood glucose
  - Blood gases
  - U+E, s-Ca, LFT, thyroid functions, clotting profile
  - Urine dipsticks and toxicology
  - Blood for toxicology and drug/medication levels
  - ECG
  - X-rays (skull, cervical spine, chest)
  - CT scan or MRI
  - Lumbar puncture if infection is suspected

**TABLE 1.8 Level of Response**

(GCS 3/15 = worst; 15/15 = best)

Category	Response	Level
Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Best verbal response	Oriented	5
	Confused	4
	Inappropriate	3
	Incomprehensible	2
	None	1
Best motor response	Obeying commands	6
	Localising painful stimulus	5
	Withdrawing	4
	Flexing	3
	Extending	2
	None	1

## Management

The immediate goal in acute coma is the prevention of further nervous system damage.

### In the clinic, health centre, or hospital—

1. Check and monitor vital signs.
2. Perform emergency resuscitation (airway, breathing, circulation), and stabilise the patient.
3. Start oxygen.
4. Start IV infusion, but be careful in selection of fluids. Use normal saline or Plasmalyte B.
5. Stabilise cervical spine.
6. Place in lateral position (i.e., on the side).
7. Perform a general examination: rate by GCS; check trauma signs, alcohol smell, needle marks, medic alert band.
8. Perform a neurological examination: head and neck, pupils, fundi, eye movements, motor responses.
  - Neck stiffness (e.g., meningitis, subarachnoid)
  - Focal signs (e.g., subdural, abscess)
  - No focal signs (metabolic)
9. Perform an HGT, urine dipsticks. If blood glucose is low, see [1.10](#) below for a discussion of diabetic emergencies.
10. If the patient convulses, try to protect him or her from injury during the fit. Give oxygen and diazepam if the convulsions last longer than 5 minutes.
  - Adults: 10 mg IV over 2 to 3 minutes.
  - Children: 0.25 mg/kg PR or IV
11. Insert an NGT.
12. Insert urinary catheter.
13. Refer to hospital.

### In hospital—

1. Stabilise patient.
2. Perform thorough general and neurological examination
3. Perform special investigations.

## 1.9 Cerebral Malaria

4. Provide rapid correction of hypotension, hypoglycaemia, hypercalcemia, hypoxia, hypercapnia, and hyperthermia.
5. Provide respiratory support
  - An oropharyngeal airway is adequate to keep the pharynx open in drowsy patients who are breathing normally.
  - Tracheal intubation is indicated if there is apnea, upper airway obstruction, hypoventilation, or emesis, or if the patient is liable to aspirate.
  - Mechanical ventilation is required if there is hypoventilation or if there is an intracranial mass and induced hypocapnia is necessary.
6. Administer naloxone and dextrose if narcotic overdose or hypoglycaemia are even remote possibilities.
7. Administer thiamine 100 mg IV stat with glucose to avoid Wernicke's encephalopathy in malnourished patients.
8. Find and manage the cause of the coma.

### 1.9 Cerebral Malaria

Cerebral malaria is a life-threatening complication of malaria that may affect both children and adults and requires special attention and treatment. It is a serious disease that may rapidly cause permanent brain damage or death. The diagnosis is made on clinical signs and symptoms. The presence of malaria parasites seen under the microscope confirms the diagnosis, but their absence does not exclude the diagnosis.

Start treatment immediately when clinical suspicion of cerebral malaria is high. (See [table 1.9.](#))

*Always* exclude other causes of cerebral dysfunction. (See "Section II. Diseases and Disorders According to Body Systems. [Chapter 11. Neurological System](#) (Central

Nervous System)” for discussions of coma and delirium, and “Section II. Diseases and Disorders According to Body Systems. [Chapter 15. Psychiatric Disorders](#)” for an additional discussion of delirium.)

### Symptoms and signs

- High fever
- Headache
- Vomiting
- Neurological signs: confusion, irritability, drowsiness, convulsions, coma, focal neurological deficits, and psychoses

### Management

1. Assess airway, breathing, and circulation.
2. Refer to hospital urgently.
3. Intubate and ventilate if GCS <7/15 or if the airway cannot be maintained.
4. Start quinine, the medicine of choice for severe or complicated malaria.
  - Give IV or IM until the patient can take PO.
    - Adult—
      - ◆ Loading dose: 20 mg/kg in 5% dextrose over 4 hours
      - ◆ Followed by 10 mg/kg every 8 hours in 5% dextrose (500 mL) given over 4 hours until patient can take quinine PO
    - Children—
      - ◆ Loading dose: 20 mg/kg diluted in 10mL dextrose/kg over 4 hours
      - ◆ After 12 hours give 10mg/kg diluted in 10mL dextrose /kg over 2 hours
      - ◆ Repeat every 12 hours until patient can tolerate quinine PO
  - Switch to oral quinine when patient is stable and can swallow. (See “Section IV. Infectious Diseases. [Chapter 21. Malaria](#).”)
  - Give oral quinine to complete the full 7-day course.

## 1.9 Cerebral Malaria

5. Follow these additional measures for the management of severe or complicated malaria.
  - Patients should preferably be managed in intensive or high care.
  - Urine output should be closely monitored and fluids adjusted accordingly. Maintenance fluid should contain dextrose. In established renal failure, haemodialysis may be required.
  - Hypotension is usually due to hypovolaemia, but may also present as a result of gram negative septicaemia. Hypovolaemia will respond to fluid challenge. Septic shock will require antibiotics, inotropes, and steroids.
  - Ensure early enteral nutrition via NGT.
  - Stress ulcer prophylaxis.
  - Give blood transfusion if Hb <5g/dL.
  - Give platelets for thrombocytopaenic patients with bleeding.
  - Monitor ECG changes (i.e., prolongation of the QT-interval) from day 3 of IV quinine therapy onwards by doing one resting 12-lead ECG per day. If QT-interval is prolonged (QTc >0.48), quinine has reached toxic level and has to be paused until QT-interval is again normal; another alternative is to reduce the dose and give magnesium sulphate.

---

### Notes:

- If patient has taken malaria treatment (e.g., mefloquine, quinidine, halofantrine) do not give loading dose.
  - Quinine injection should never be given as a bolus IV injection.
    - Use an IV infusion pump if available.
    - If in renal failure, give normal dose for 48 hours but then reduce to 6 mg/kg.
-

TABLE 1.9 Treating Cerebral Malaria

Other Manifestations and Complications of Severe Malaria	Recognition	Action
Postural hypotension	Severe dizziness or faintness on standing; marked blood pressure variation in lying and standing positions	Nurse patient in bed on his or her side while on parenteral quinine to avoid severe postural hypotension. Give IV sodium chloride.
Hyperthermia, hyperpyrexia	Patient very hot to touch with a temperature of 40 °C and above; dry skin	Use fanning and tepid sponging, and give paracetamol.
Severe anaemia	Marked mucosal pallor, PCV less than 20% and Hb less than 7.0 g/dL. Hypoxia or signs of heart failure	Consider blood transfusion if Hb <5 g/dL or 4 to 6 g/dL with shock, acidosis, coma, or CF.
Cerebral involvement	Altered consciousness (confusion, delirium, stupor, or coma), convulsion, focal neurological abnormalities or psychoses	Maintain airway, give IV diazepam for convulsions (or may be given PR). Exclude hypoglycaemia.

## 1.9 Cerebral Malaria

TABLE 1.9 Treating Cerebral Malaria (cont.)

Other Manifestations and Complications of Severe Malaria	Recognition	Action
Renal failure	Urine output <2 mL/kg per hour. It may be associated with dark-coloured urine (haemoglobinuria), persistent vomiting, or diarrhoea.	Ensure adequate hydration. If no improvement, see "Section II. Diseases and Disorders According to Body Systems. Chapter 9. Urogenital System" on acute renal failure.
Jaundice	Yellow coloration of sclerae Bilirubin and urobilinogen in urine Urine may be dark	Evaluate jaundice, do LFT. Check Hb and G6PD status, and transfuse if anaemic. Maintain hydration to avoid renal failure.
Electrolyte, acid base, or fluid imbalance	Weakness, deep sighing respiration, dehydration, poor skin turgor, rapid pulse, sunken eyes	Encourage fluid intake or start IV sodium chloride or sodium bicarbonate.
Hypoglycaemia	Blood glucose <3 mmol/L Sweating, fast pulse, deepening coma, as complication of malaria or quinine therapy	Give dextrose 50% IV. • Adults: 50 mL of dextrose 50% • Children: 0.5 mL/kg of dextrose 50%. Diluted to 25%. Monitor random blood glucose.
Acute pulmonary oedema	Breathlessness; inability to lie flat; respiratory distress	Nurse patient in a propped up position (Fowlers); give oxygen; give furosemide 40 mg IV.



## 1.10 Diabetic Emergencies

### 1.10.1 Hypoglycaemia (Low Blood Glucose)

Hypoglycaemia is a blood glucose level  $<2.5$  mmol/L.

**Note:** Symptoms frequently occur with a blood glucose  $<4$  mmol/L in patients on oral agents or insulin.

#### Causes

The causes of hypoglycaemia are numerous. The following are the most common causes—

- Excessive or inappropriate treatment with insulin or oral agents
- Starvation (irregular meals)
- Lack of carbohydrate intake
- Metabolic problems
- Alcohol
- Prolonged vomiting or nausea (unable to eat)
- Gastric emptying disorders after gastric surgery

#### Symptoms and signs

- Early—
  - Hunger
  - Tremors
  - Sweating
  - Palpitations
  - Headache
  - Dizziness, faintness
  - Anxiety
- Later features—
  - Double vision
  - Slurred speech
- Neuroglycopaenic symptoms—
  - Drowsiness
  - Inability to concentrate
  - Confusion
  - Behavioural changes (e.g., children become difficult to control)
  - Restless with sweating

## 1.10 Diabetic Emergencies

- Convulsions in children
- Unconsciousness

### Management

Diabetics should know the signs of hypoglycaemia and *always* have sugar with them (e.g., in the form of sweets or pure sugar sachets).

### Symptomatic hypoglycaemia management

- In clinic, health centre, or hospital—
  1. For mild or moderate hypoglycaemia, give—
    - Adults glucose water to drink (50 to 100 g glucose in 100 to 200 mL water)
    - Children 50 mL bolus of 10% glucose or 10% sucrose solution (1 rounded teaspoon of sugar in 3.5 tablespoons water), PO or by NGT. Then start milk feedings every 30 minutes for 2 hours (giving one quarter of the 2-hourly feeding each time).
  2. Refer if the patient shows no improvement or if he or she has a history of or signs of uncontrolled DM.
- In hospital—
  1. For severe symptomatic hypoglycaemia, treat as for hypoglycaemic coma and follow the procedure outlined below.
  2. If no cause (e.g., having missed a meal) is obvious—
    - For patients on oral hypoglycaemic agents, reduce the oral hypoglycaemic dose by 1 or 2 steps depending on the severity of the hypoglycaemia
    - For patients on insulin therapy, reduce the appropriate insulin dose by 4 units (e.g., if a patient is on a biphasic insulin 2 times per day and the hypoglycaemia occurs during the day, reduce the morning dose).

### Hypoglycaemic coma management

- In clinic, health centre, or hospital—
  1. Administer glucose.
    - In children—
      - ◆ Start IV therapy with 10% dextrose (5 mL/kg).
      - **OR** ——
      - ◆ Give 50 mL of 10% glucose or sucrose by NGT.
      - ◆ Continue with milk feedings.
    - In adults—
      - ◆ Start IV therapy. Keep line open with 5 to 10% dextrose water.
      - ◆ Give an immediate rapid IV injection of 40 mL of 50% dextrose. **Note:** Flush the line with saline because dextrose can sclerose veins.
      - ◆ If blood glucose remains less than 4 mmol/L—
        - Give a second IV injection of 40 mL 50% dextrose
        - Continue IV therapy of 10% dextrose water
  2. Once the patient is conscious, ensure feeding or intake of carbohydrates.
  3. Refer urgently.
- In hospital—
  1. Administer glucagon 1 mg IM if available. **Note:** Do not give glucagon if the patient is hypoglycaemia due to sulphonylureas.
  2. Give thiamine 100 mg IV slowly.
  3. Re-evaluate treatment.
  4. Find cause for low glucose.
  5. Reemphasise dietary adherence to ensure good blood glucose control.
  6. Insist that the patient consult a dietician again for re-evaluation of diet.

### 1.10.2 Hyperglycaemia (High Blood Glucose)

#### Causes

- Undiagnosed DM
- Uncontrolled DM
- Interruption of treatment
- Infection
- Stress

#### Symptoms and signs

- Drowsiness
- Varying degrees of loss of consciousness, confusion, stupor
- Abdominal pain
- Nausea and vomiting
- Severe dehydration
- Shock
- Ketotic breath (sweet apple smell)
- Acidotic breathing (deep, laboured, Kussmaul breathing)
- Hyperventilation
- Sometimes subnormal temperature

#### Investigations

- Blood glucose
- Urine dipsticks and ketones
- U+E, FBC,
- Blood gases, pH
- Blood and urine MCS
- CXR, ECG, cardiac enzymes

#### Management

**Pre-coma and severe hyperglycaemia, in clinic, health centre, or hospital—**

1. Refer stat.
2. Treat as for hyperglycaemic coma (see below)—
  - IV therapy to run at a slower rate
  - First litre to run in over 1 to 2 hours

---

**Note:** Do not give any insulin.

---

**Hyperglycaemic coma and ketoacidosis**

- In clinic, health centre, or hospital—
  1. Refer stat.
  2. Start IV therapy of normal saline (see schedule below) over 30 minutes.
  3. Over the next hour continue with 1 L normal saline. If the transfer to hospital is delayed, normal saline can be continued hourly depending on clinical response.
  4. Do not give any insulin unless transfer to hospital is delayed by more than 2 hours.
- In hospital—
  1. Ensure airway and breathing are adequate.
  2. Insert nasogastric catheter and/or urinary catheter.
  3. Start fluid replacement and electrolyte replacement (correct over 48 hours)—
    - Normal saline (0.9%)
      - Adults and adolescents >15 years: 35 mL/kg per day
        - ◆ 1 L normal saline PLUS thiamine 100 mg IV over 30 minutes
        - ◆ 1 L normal saline over 1 hour, then
        - ◆ 1 L normal saline over 2, 4, 6 hours, then
        - ◆ Every 8 hours (change to rehydration fluid if HGT <13 mmol/L)
      - Children:
        - ◆ <1 yr = 80 mL/kg per day
        - ◆ 1 to 5 yrs = 70 mL/kg per day
        - ◆ 6 to 9 yrs = 60 mL/kg per day
        - ◆ 10 to 14 yrs = 50 mL/kg per day
        - ◆ Give 15 to 20 mL/kg in 1st hour, then 20 to 25 mL/kg in 2nd hour, then 20 to 30 mL/kg in following hours.
      - Adjust KCl concentration according to blood K (with 20 mmol KCl/L) 20 to 30 mmol per hour usually 30 to 60 minutes after insulin Rx is started.

## 1.10 Diabetic Emergencies

4. Give soluble insulin by IV.
  - Insulin bolus (0.1 unit/kg). *Do not* give insulin bolus in children. Maximum 20 units stat IV. Avoid if patient is shocked or has low BP.
  - Continuous insulin infusion—
    - ◆ Adults: follow with 5 to 10 units/hour until blood glucose controlled
    - ◆ Children: 0.1 units/kg per hour continuous infusion in a 60 drops/mL mini dropper. *Do not* give insulin in children until shock has been corrected.
  - Start an insulin sliding scale or insulin infusion (20 unit soluble insulin in 200 mL normal saline), 6 units per hour.
5. Check blood glucose hourly.
6. Check U+E (potassium) every 2 hours.
7. Restore acid-base balance—
  - Monitor pH. If  $<7.0$  pH, give sodium bicarbonate 500 mL.
  - If no pH measurement can be taken, give sodium bicarbonate 1 mmol/kg (e.g., 50 to 70 mL sodium hydrogen carbonate 8.0% [1 mL contains 1 mmol]).
  - If pH and blood gases can be measured, give undiluted sodium bicarbonate 8.4% solution according to the formula:  $\text{mmol needed} = \text{mL needed} = \text{weight [kg]} \times \text{base deficit} \times 0.3$ .
8. Monitor BP. Treat low BP with plasma expanders.
9. Take an ECG to exclude hypokalaemia. If the ECG shows hypokalaemia (i.e., flat T-wave, prominent U-wave and ST depression), then—
  - Withhold insulin
  - Add 20 mmol KCl (1 ampoule) into the next vacolitre of saline and not into the bulb. Check potassium every 4 hours.
10. Seek underlying cause (e.g., with CXR, urine, blood MCS).

11. Treat infection if necessary.
12. If blood glucose is controlled, transfer patient to 4 times per day subcutaneous insulin regimen (based on 24-hour total used) once ketones have cleared.
13. Reemphasise dietary adherence in order to ensure good blood glucose control.
14. Insist that patient consult dietician again for re-evaluation of diet.

### 1.10.3 Surgical Diabetic Emergencies

Surgical diabetic emergencies include acute soft tissue disorders in diabetic patients such as cellulites or abscesses (especially in feet, legs, hands, neck, and perineum).

#### Management

##### In clinic, health centre, or hospital—

1. As with other emergencies, the step to refer should not be the first on the treatment protocol. It should be the last after other urgent interventions have been done.
2. When possible, consult or inform the next level before you refer such urgent cases.
3. Refer.

##### In hospital—

1. Provide adequate hydration.
2. Ensure adequate glucose control (usually with insulin).
3. Correct electrolyte abnormalities.
4. Provide antibiotic cover preferably by IV.
5. Perform surgical drainage or debridement, and sometimes amputation in severe cases, to prevent septic shock.
6. Ensure antiseptic dressings.
7. Monitor the patient in high care or ICU depending on the severity of the condition.
8. Do not delay surgery for sepsis irrespective of glucose or electrolyte levels.

## 1.11 Heat Exhaustion

### 1.11 Heat Exhaustion and Heat Stroke

Prolonged exposure to high environmental or surrounding temperatures with excessive fluid loss and impaired heat loss mechanisms can lead to—

- Hypovolaemic shock (heat exhaustion)
- Dangerous hyperpyrexia (heat stroke)

#### Causes and risk factors

- Age (old and young and persons unused to heat)
- Debility, alcoholism
- Strenuous exercise without adequate hydration
- Long walks in the sun
- Midday, season of the year (summer)

#### Symptoms and signs

TABLE 1.11A Symptoms and Signs of Heat Stroke and Heat Exhaustion

Indications	Heat Stroke	Heat Exhaustion
Cause	Inadequate or failure of heat loss (i.e., lack of sweating)	Excessive fluid loss as a result of prolonged exposure to heat, resulting in hypovolaemic shock
Symptoms and signs	<ul style="list-style-type: none"><li>• Sudden onset</li><li>• Fatigue</li><li>• Headache, vertigo</li><li>• Hot, red, and dry skin</li><li>• Very little sweating</li><li>• Feels as if burning up</li><li>• Pulse pounding and fast (<math>&gt; \pm 160</math> to 189 beats per minute)</li><li>• Very high temperature (<math>\pm 40</math> to 41 °C)</li><li>• Disorientation</li><li>• Convulsions</li><li>• Unconsciousness</li></ul>	<ul style="list-style-type: none"><li>• Gradual weakness</li><li>• Fatigue, anxiety</li><li>• Cold, pale, clammy skin</li><li>• Drenching sweat</li><li>• Hypotension</li><li>• Slow weak pulse</li><li>• Circulatory collapse</li><li>• Temperature below normal</li><li>• Disorientation</li><li>• Unconsciousness</li></ul>



## Management

TABLE 1.11B Emergency Management of Heat Stroke and Heat Exhaustion

**Note:** Heat stroke is a serious emergency.

Heat Stroke	Heat Exhaustion
1. Resuscitate ABC.	1. Position person flat and elevate the legs to improve circulation.
2. Provide emergency cooling by— <ul style="list-style-type: none"> <li>• Fanning</li> <li>• Immersing in cold water</li> <li>• Wrapping patient in wet sheets</li> </ul>	2. Replace fluid loss PO if patient is conscious and not shocked.
3. Measure rectal temperature every 10 minutes.	3. If patient has had circulatory collapse or hypotension, or is unconscious— <ul style="list-style-type: none"> <li>• Resuscitate A, B, C</li> <li>• Start IV fluid replacement (e.g., normal saline)</li> <li>• Refer</li> </ul>
4. Continue cooling until rectal temperature is $<38^{\circ}\text{C}$ .	
5. Treat convulsion with IV diazepam <ul style="list-style-type: none"> <li>• Adult: 10 mg</li> <li>• Child: 0.2 mg/kg (maximum 10 kg)</li> </ul>	
6. Maintain hydration with IV fluids: (Ringer's lactate, normal saline, <i>not</i> glucose 5% or other “free water” solutions).	
7. Refer urgently.	

### 1.12 Hypertensive Crisis

Malignant hypertensive crisis is defined as elevated BP and/or diastolic BP >130 mm Hg associated with one or more of the following:

- Unstable angina
- Hypertensive retinopathy
- Neurological signs (e.g., severe headache, visual disturbance, confusion, coma)
- Pulmonary oedema
- Renal failure

#### Causes

- Severe pregnancy-induced hypertension (i.e., eclampsia)
- Head injury
- Intracranial haemorrhage
- Secondary hypertension (e.g., renal, endocrine)
- Primary hypertension
- Defaulting already established anti-hypertensive treatment

#### Symptoms and signs

- Hypertensive encephalopathy (i.e., confusion, altered level of consciousness, seizures, stroke or CVA, neurological fall-out)
- Acute aortic dissection (i.e., severe chest pain with sudden shock)
- Acute pulmonary oedema
- Acute myocardial infarction or unstable angina (i.e., acute chest pain or angina, dyspnoea and orthopnoea, cyanosis, cough, fatigue, shock, acute kidney failure, reduced urinary output)
- Eclampsia (i.e., high BP in pregnancy with seizures)

#### Complications

- Cardiogenic shock (e.g., severe cardiac failure or acute myocardial infarction)
- CVA (stroke)
- Renal failure

## Management

### Management objectives—

- Reduce BP rapidly (to reduce organ damage) but not to normal levels.
- Reduce BP slowly in cases where there is no end-organ failure or damage over 24 to 48 hours.
- Aim for 160/100 on day 1 of therapy.

### In clinic, health centre, or hospital—

1. Prescribe bed rest.
2. Start oxygen.
3. Refer to hospital urgently.
4. If transport is delayed for >4 hours—
  - Administer methyldopa 250 mg PO every 12 hours, and restart previous hypertensive treatment.
  - Administer furosemide 40 mg IV 2 times per day.

### In hospital—

5. Treat hypertension using the following procedure.
  - Step 1. Medicate.
    - Administer dihydralazine (25 mg/mL) 6.25 mg IV slowly (onset after 5 to 10 minutes). Check BP and heart rate. If patient has no adequate response after 30 minutes, try again with 6.25 to 12.5 mg dihydralazine IV slowly.
    - OR ——
    - Administer glyceryl trinitrate 0.5 to 1 mg sublingually (onset after 2 to 10 minutes). Check BP. If necessary, repeat after 10 to 20 minutes.
    - OR ——
    - Administer a nifedipine 10 mg capsule. Let the patient bite on it and swallow (onset after 5 to 10 minutes). Be very careful; decrease in BP may be unpredictable. Check BP. If necessary, repeat after 15 minutes.
  - Step 2. Administer furosemide 20 to 40 mg IV (recommended in kidney failure and generalised oedema.) Dehydration must be excluded.
  - Step 3. Change to oral treatment as soon as possible.

## 1.12 Hypertensive Crisis

FIGURE 1.12 Management of Severe Hypertension

### Diagnostic criteria for hypertension emergencies

- Hypertensive encephalopathy
- Acute aortic dissection
- Acute pulmonary oedema with respiratory failure
- Eclampsia
- Acute renal failure
- Microangiopathic haemolytic anaemia

Systolic BP >210 mm Hg or  
diastolic BP >130 mm Hg

Take targeted  
medical history and  
carry out physical  
examination

- BP control
- BP medication
- Recreate

Administer dihydralazine  
6.25 mg by slow IV or IM  
injection bolus and monitor  
BP *closely*.

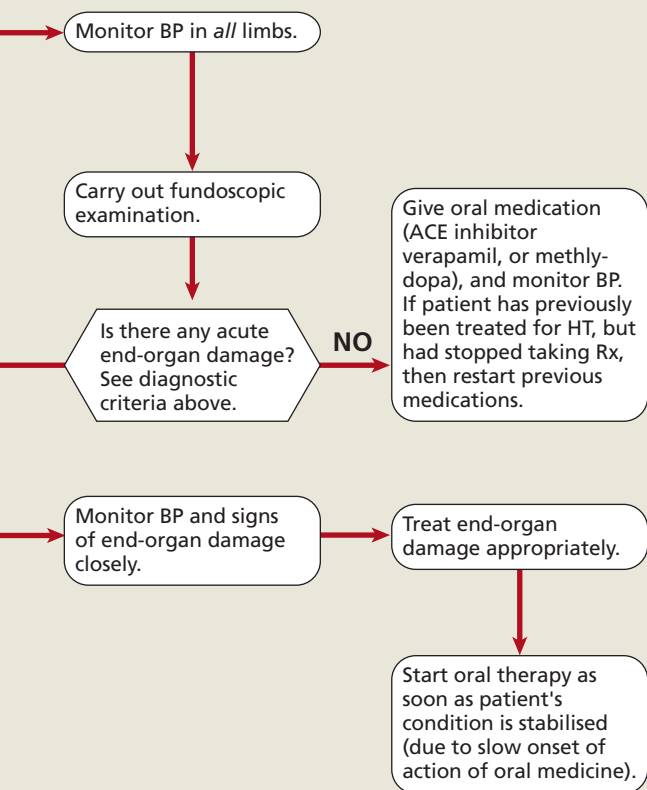
YES

Has diastolic BP dropped  
by 10% to 15% after  
2 hours?

YES

NO

Repeat administration of  
dihydralazine 6.25 mg by  
slow IV and monitor BP  
*closely*.



## 1.13 Myocardial Infarction and Unstable Angina

6. Manage severe hypertension. (See [figure 1.12](#).)
7. Treat acute kidney failure.
8. For acute aortic resection, rapidly lower BP. Decrease within 5 to 10 minutes using IV sodium nitroprusside (nitroprusside 100 mg in 250 mL normal saline at 2 to 5 mL/hour).
9. For other patients, decrease BP slowly over 24 to 48 hours.
10. For CVA and stroke, do not lower rapidly, but rather slowly and cautiously.
11. For a discussion of preeclampsia and eclampsia, see “Section V. Obstetrics and Gynaecology. Chapter 24. Obstetrics” ([24.1.2](#)).

### 1.13 Myocardial Infarction and Unstable Angina

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Myocardial infarction implies death or necrosis of myocardial tissue, as a result of insufficiency or obstruction of coronary blood supply to a segment of the myocardium.

#### Causes and risk factors

- Atherosclerosis
- Atheroma plaque formation and thrombosis
- Coronary artery spasms

#### Symptoms and signs

- Retrosternal pain (occurring behind the sternum)
- Pain may radiate to the shoulder, arms, neck, jaws, or abdomen (especially on the left side)
- Duration of pain: longer than 20 minutes
- Intensity is variable (aching, burning, or pressing character, but not always severe)
- Anxiety and sense of impending doom (death)
- Hypertension
- No response to sublingual glyceryl trinitrate tablets
- Restless

## 1.13 Myocardial Infarction and Unstable Angina

- Pallor, sweating
- Peripheral or central cyanosis, cold skin if hypotensive
- Pulse weak, irregular, fast, or very slow.
- BP may vary from hypotension to hypertension (hypotension is more common)

**Note:** Pain can be mild or absent in patients with diabetes mellitus or hypertension or in the elderly.

### Investigations

- ECG
- Cardiac markers: troponin T, troponin I, creatine kinase (CK/CK-MB)
- FBC, cholesterol
- Clotting profile (INR/PTT)
- U+E, LFT (AST and LDH)
- CXR

**Note:** Always exclude other causes of chest pain (e.g., dissecting aneurism, pulmonary embolism, pericarditis, pneumothorax).

### Management of MI and unstable angina

MI is an emergency. Fifty percent of all deaths occur within 2 to 3 hours. The first few hours are critical.

#### In clinic, health centre, or hospital—

1. Prescribe bed rest.
2. Administer aspirin 300 mg stat; patient should chew immediately.
3. Administer sublingual nitroglycerin glyceryl trinitrate (0.5 mg in every 5 minutes, maximum 3 times), unless hypotensive.
4. Start oxygen therapy at 60% by mask or nasally.
5. Insert an IV cannula immediately. Restrict fluid; use only to keep line open (i.e., 200 mL normal saline) as slow as possible.
6. Administer morphine 5 mg IV stat, then titrate 1 to 2 mg IV as necessary plus metoclopramide 10 mg IV.
7. Refer to next level urgently.

## 1.13 Myocardial Infarction and Unstable Angina

### In hospital—

1. Do an urgent ECG.
2. Classify acute coronary syndrome as ST-elevation MI (STEMI), non-ST-elevation MI, or unstable angina.

### Management of STEMI

1. Admit to ICU or high-care unit with ECG monitoring.
2. Start oxygen by mask or nasal cannula prongs.
3. Establish an IV line, if not inserted before. Administer IV fluids cautiously; beware of pulmonary oedema.
4. Start early thrombolytic therapy, if the patient presented <12 hours after onset—and only if there are no contraindications and only in consultation with physician.
5. Treat hypertension; reduce high BP before administering thrombolytics.
6. Titrate morphine, as required.
7. Administer nitroglycerin infusion for refractory pain.
8. Administer a beta blocker (i.e., atenolol)—either 5 mg IV if there are no contraindications such as heart block, LVF, asthma, hypotension or 50 to 100 mg PO.
9. Give aspirin 75 to 150 mg daily.
10. Administer heparin 60 unit/kg loading dose followed by infusion 12 unit/kg per hour; titrate to PTT 1.5 to 2.0 times control, or low molecular heparin (enoxaparin 1 mg/kg every 12 hours).
11. Treat arrhythmia and CCF accordingly.
12. Patient with heart block may need a temporary pacemaker.
13. Cardiogenic shock may be managed by dobutamine infusion and fluid titration.
14. Administer an ACE inhibitor if BP is stable.
15. Administer a statin (e.g., simvastatin 20 mg per day).
16. Stress ulcer prophylaxis. (See “Section II. Diseases and Disorders According to Body Systems. [Chapter 7. Gastrointestinal System](#)” for a discussion of peptic ulcer disease.)



## 1.13 Myocardial Infarction and Unstable Angina

17. Give a stool softener.
18. Treat hyperglycaemia with insulin infusion.

---

**Note:** The patient may require a coronary angiogram and revascularisation procedure.

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### Management of non-ST-elevation MI or unstable angina

1. Admit to ICU or high care unit with ECG monitoring.
2. Start oxygen by mask or nasal cannula prongs.
3. Establish an IV line, if not inserted before.
4. Titrate morphine, as required.
5. Administer nitroglycerine infusion for refractory pain.
6. *Do not* give thrombolytics for unstable angina or non-ST-elevation MI.
7. Administer a beta blocker, if there are no contraindications (e.g., heart block, LVF, asthma, hypotension).
8. Give aspirin 75 to 150 mg daily.
9. Administer heparin 60 unit/kg loading dose followed by infusion 12 unit/kg per hour; titrate to PTT 1.5 to 2.0 times control, or low-molecular heparin (enoxaparin 1 mg/kg every 12 hours).
10. Treat hypertension.
11. Treat arrhythmia and CCF accordingly.
12. Administer an ACE inhibitor if BP is stable.
13. Administer a statin (e.g., simvastatin 20 mg per day).
14. Consider clopidogrel or tirofiban HCL if available (antiplatelet medicines) if angina is ongoing
15. Stress ulcer prophylaxis for patients at high risk for GI bleeding. (See “Section II. Diseases and Disorders According to Body Systems. [Chapter 7. Gastrointestinal System](#)” for a discussion of peptic ulcer disease.)
16. Give a stool softener.
17. Treat hyperglycaemia with insulin infusion.

---

**Note:** The patient may require a coronary angiogram and revascularisation procedure.

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### Complications

- Cardiac failure
- Arrhythmias, heart block
- Pericarditis
- Systemic embolism from mural thrombosis
- Myocardial rupture
- Dressler's syndrome–late pericarditis

### Health education

- Discuss and modify risk factors. (See “Section II. Diseases and Disorders According to Body Systems. Chapter 3. Cardiovascular System” for a discussion of angina.)
- Provide the dietary measures as given for cholesterol-aemia (see “Section II. Diseases and Disorders According to Body Systems. Chapter 14. Endocrine System” for a discussion of cholesterol disorders) and refer to dietician.
- Provide life-style advice (e.g., regular exercise, no smoking).
- Check BP, and see monthly.

## 1.14 Near Drowning

*Near drowning* refers to asphyxia or partial asphyxia from a fluid medium, with the person either recovering spontaneously or after having been resuscitated.

### Types of drowning

- Dry drowning—very little aspirated fluid; asphyxia due to laryngospasm
- Drowning in water

**Note:** There is no significant difference in outcome or management between fresh and salty water submersion injury.

### Symptoms and signs (obvious from history)

- Blocked airways filled with fluid
- Body temperature low (cold water)
- Developing pulmonary oedema (“secondary drowning”)

### Potential complications

- Respiratory system: aspiration pneumonitis, pulmonary oedema, acute lung injury (ALI) also known as 2° drowning
- Cardiac system: cardiac arrhythmias, hypotension
- Central nervous system: hypoxic brain damage, convulsions
- Metabolic acidosis
- Electrolyte abnormalities
- Digestive system: gastric distension

### Management

**In clinic or health centre before hospital admission—**

1. Get to the victim as quickly as possible.
2. Start resuscitation or ventilation immediately (even in the water).
3. Do not try to remove water from the lungs or stomach; it will drain passively.
4. Suction or wipe mouth clear using a handkerchief or a cloth.

## 1.14 Near Drowning

5. Do not interrupt resuscitation regardless of how long victim has been submerged.
6. Continue resuscitation even after prolonged cold water submersion and fixed, dilated pupils.
7. Start chest compression once victim is horizontal on a firm flat surface.
8. Dry the patient's body well, and keep warm with blankets.
9. Assume a neck injury if trauma is suspected. (See "Section I. Common Emergencies and Trauma. Chapter 2.. Trauma" for a discussion of neck injury.)
10. Refer immediately and continue resuscitation during transport.

### **In hospital—**

1. Admit to a hospital, even when the victim responded well to CPR.
2. Admit to ICU if the patient is in respiratory distress or hemodynamically unstable or level of consciousness is depressed.
3. Start re-warming and hemodynamic monitoring.
4. Consider mechanical ventilation depending on respiratory status and level of consciousness.
5. Maintain adequate arterial and cerebral perfusion pressure by cautiously using isotonic fluids and inotropes.
6. Reduce intracranial pressure by head up positioning. Maintain normocarbia, normoglycaemia sedation, and use anticonvulsants to prevent seizures.
7. Use antibiotics only in the case of contaminated water aspiration.

## 1.15 Poisoning and Overdose of Medications and Drugs

*Poisoning* and *overdose* refer to the acute toxic effects of chemicals and excessive dosage of medicines. Acute poisoning is becoming increasingly common and requires immediate and correct intervention to save life.

### Causes

- *Accidental*—Accidental ingestions commonly occur in small children <5 years, exploring their environment (e.g., swallowing paraffin or household cleaners). Insecticide poisoning is common amongst farm workers when proper precautions are not observed. Eating of poisonous mushrooms, berries, and plants is also classified as accidental.
- *Deliberate*—Deliberate ingestions can be self-induced, attempted suicide (para- or pseudo-suicides) with medication (e.g., analgesics, barbiturates, antidepressants, large doses of aspirin or paracetamol and industrial and agricultural chemicals).
- *Homicidal or nonaccidental*—Intentional poisoning of person by someone else are classified as homicides or attempted homicides.

### Symptoms and signs

- Sudden onset of illness usually with vomiting and diarrhoea
- Change in muscle tone, skin colour, body temperature, and pulse
- Burns or blisters on lips and in the mouth
- Constricted or dilated pupils
- Seizures, shock, drowsiness, or unconsciousness or coma
- Hypo- or hyperglycaemia

### Investigations

- History of poisoned patient
  - Obtain the history from the patient, family, friends,

## 1.15 Poisoning and Overdose

or witnesses. Ascertaining the nature and amount of toxin ingested is important.

- Ask the relatives to bring all patient's medicines, drugs, or traditional herbs or the ingested chemical to the hospital.
- Clinical examination of a poisoned patient—A full general physical examination is necessary if poisoning is suspected.
  - Pulse rate and regularity or rhythm of pulse
  - Blood pressure for signs of shock
  - Temperature—hyperpyrexia or hypothermia
  - Pupil size—constriction or dilation
  - The odour of the patient's breath
  - Rate and type of breathing
  - Dry, sweaty, or jaundiced skin; markings from traditional healer treatments
  - Possible decrease in urine output

### Management

In clinic, health centre, or hospital—

1. Clear airways and support vital functions.
2. Contact the Therapeutics Information and Pharmacovigilance Centre (TIPC)
  - Telephone number: 061 203 2312
  - E-mail: [info@tipc.com.na](mailto:info@tipc.com.na)
3. If the patient is unconscious—
  - Maintain a clear airway
  - Establish an IV line with dextrose-saline
  - Intubate if GCS <7 or 8 out of 15
4. If poison is on the skin, wash with plenty of water for 10 minutes.
5. Use activated charcoal through NGT. Activated charcoal absorbs most poisons and prevents the poison from passing from bowel into rest of body.
  - Dosage for children: 25 to 50 g in ½ cup of water
  - Dosage for adults: 50 to 100 g in 1 cup of water
  - Repeat after 4 hours.

6. Stomach wash-outs should be considered only in cases when a life-threatening amount of poison that is not absorbed by charcoal (lithium, iron) was taken within the previous hour.
  - Contraindicated in paraffin, acid, or corrosives poisoning
  - Only if can be done within 1 hour of poisoning
  - Intubate first in an unconscious patient and protect airways.

---

**Note:** Never make the patient vomit if he or she is unconscious, has convulsions, has taken paraffin, acid, corrosives, or organophosphates

---

7. Refer all cases of suspected poisoning to hospital.

### Health education for all poisons

- Keep dangerous substances out of the reach of children. Do not store medicines or poisons in areas used for food storage.
- Clearly mark containers having dangerous material.
- Never use soft drink containers for storage of poisons.
- Lock away poisons and medicines in a cupboard.
- Avoid contamination of food and drinks when using insecticides or pest control and agricultural chemicals during insect spraying campaigns; use appropriate protective clothing.
- If patient is suicidal, refer for psychological or psychiatric counselling.

### 1.15.1 Acids and Other Corrosive Poisoning

Many household cleaning agents contain acid or corrosive poisons, meaning that they burn body surfaces severely. Examples are Jik, caustic soda, and drain and toilet bowl cleaners.

#### Symptoms and signs

- Severe burning pain in the mouth, throat, oesophagus, and stomach

## 1.15 Poisoning and Overdose

- Severe abdominal pain
- Vomiting blood and with most damage in the stomach
- Rapid, shallow breathing
- Rapid weak pulse

### Management

1. Do *not* induce vomiting.
2. Give milk to neutralise the acid.
3. Transfer the patient to hospital.
4. If in shock and hypotensive, replace fluid lost by IV.

### 1.15.2 Aspirin or Salicylates Poisoning

Aspirin is present in many analgesic, cold, and flu preparations (e.g., Disprin, Anadin, APC, Codis). These tablets contain 300 to 500 mg aspirin per tablet; 5 to 10 tablets containing aspirin can cause severe toxic effects in infants.

#### Symptoms and signs

- Rapid breathing rate
- High temperature
- Vomiting
- Ringing in the ears (tinnitus)
- Convulsions and coma

#### Management

1. Perform gastric lavage with water (if aspirin was ingested within one hour).
2. Give activated charcoal as soon as possible—100 g followed by 50 g every 4 hours.
3. If the patient is conscious, give 5% sodium bicarbonate solution PO together with a high fluid intake.
4. If the patient is severely ill and unconscious, give IV fluid and electrolyte replacement. Elimination of salicylate by the kidney is enhanced by infusing sodium bicarbonate solution to make the urine alkaline (i.e., forced alkaline diuresis) aimed to make urine pH=7.5 to 8.5.



### 1.15.3 Alcohol Poisoning

See 1.4 above.

### 1.15.4 Iron Poisoning

If a pregnant mother has been prescribed iron tablets (e.g., ferrous sulphate tablets), her children can accidentally ingest the iron. Each iron tablet contains 150 to 200 mg iron. As little as 60 mg/kg of iron—or 5 to 8 tablets—may kill an infant or toddler.

#### Symptoms and signs

- Nausea, vomiting, abdominal pain
- Fever
- Gastrointestinal bleeding
- Rectal bleeding
- Rapid breathing
- Vomiting blood
- Shock

#### Management

1. Empty the stomach (i.e., induce vomiting using ipecac syrup).
2. Resuscitate the patient.
3. Perform gastric lavage if the iron was ingested within 1 hour.
4. Transfer patient to tertiary level hospital for desferrioxamine therapy (15 mg/kg per hour infusion; maximum 80 mg/kg per day).

### 1.15.5 Paracetamol Poisoning

Large doses (7 g: 14×500 mg tablets or 200 mg/kg for children) can cause permanent liver damage and death. The effects become clinically evident 2 to 3 days after the poisoning.

#### Symptoms and signs

- In first 24 hours, anorexia, abdominal pain, nausea, vomiting
- After 48 to 72 hours, kidney and liver failure and jaundice.

## 1.15 Poisoning and Overdose

### Management

#### In clinic, health centre, or hospital—

1. Induce vomiting or do gastric lavage if paracetamol was ingested within 1 hour.
2. Give activated charcoal 50 to 100 g (effective up to 8 hours after ingestion).
3. Refer urgently to hospital if large dose has been taken (6 to 10 tablets in children or 10 to 20 tablets in adults).  
Note: All patients with overdose should have urgent paracetamol blood levels tested.

#### In hospital—

1. Give N-acetylcysteine within 10 to 15 hours of ingestion.
  - Initial dosage: 150 mg/kg IV infusion in 200 mL of 5% dextrose over 15 minutes
  - Then, 50 mg/kg in 500 mL of 5% dextrose over 4 hours
  - Followed by, 100 mg/kg in 1,000 mL of 5% dextrose over 16 hours
2. Otherwise, start symptomatic treatment.
3. Admit the patient to the ICU if in renal failure or if he or she presents with acidosis, encephalopathy, or INR changes.

### 1.15.6 Petroleum Poisoning

Paraffin poisoning is the most common type of petroleum poisoning. Paraffin is often kept in cool drink bottles and looks like water. Its great danger and that of other petroleum poisons is the toxic effect on the lungs when it is inhaled or aspirated. Ingested paraffin can be easily aspirated into the lungs, especially after vomiting, causing aspiration pneumonitis. Petroleum products include kerosene or paraffin, petrol, turpentine, benzene, and methylated spirits.

#### Symptoms and signs

- Coughing
- Shortness of breath

- Tachypnoea
- High fever
- Crepitations in the lungs may often be heard on auscultation
- Persistent burping (particularly seen after petrol ingestion)

### Management

1. Do *not* induce vomiting for paraffin and petroleum poisoning. Vomiting can result in aspiration of the liquid.
2. Do *not* use activated charcoal because it may induce vomiting.
3. Give nothing PO.
4. Do *not* perform gastric lavage.
5. If the patient is in severe respiratory distress, give oxygen therapy via facemask while transferring patient to hospital for further management.

### 1.15.7 Antidepressant and Barbiturate Poisoning

These substances are often taken as an overdose in suicide attempts.

#### Management

##### Management of tricyclic antidepressant

(e.g., amitriptyline, imipramine, and other antidepressants) poisoning

- Primary intervention—
  1. There is no specific remedy, and diuresis is of no help.
  2. Perform gastric lavage if within 1 hour of ingestion.
  3. Do not induce vomiting.
  4. Give 100 g of activated charcoal, then 50 g every 4 hours orally.
  5. Transfer the patient to the next level.
- Secondary intervention—
  1. Treat cardiac arrhythmias. (See “Section II. Diseases and Disorders According to Body Systems.

## 1.15 Poisoning and Overdose

Chapter 3. Cardiovascular System” for a discussion of how to manage cardiac arrhythmias.)

2. Treat hypotension with fluids and later dopamine.
3. Treat convulsions with diazepam.
4. Systemic acidosis may require correction by infusion of sodium bicarbonate.

### **Management of barbiturate poisoning—**

Death is usually due to respiratory depression, circulatory failure or (at a later date) pneumonia.

1. The airway must be kept clear; if the cough reflex is absent, an endotracheal tube should be inserted.
2. Perform gastric lavage only within 1 hour of ingestion.
3. Ventilate if the patient has respiratory depression.
4. Fluid and calories must be given by IV.
5. Appropriate antibiotic should be given if pulmonary infection develops.

### **Management of morphine poisoning**

1. Administer naloxone (10 mcg/kg) 0.4 to 2.0 mg stat every 2 to 3 minutes IM, IV, or subcutaneously to a maximum of 10 mg.

## 1.16 Pulmonary Oedema

Pulmonary oedema is the accumulation of fluids in the lungs. It is characterized by extreme breathlessness and is life-threatening.

### Causes

- Cardiac: acute severe left heart failure
  - Myocardial infarction
  - Severe mitral valve disease
  - Arrhythmias
- Pulmonary
  - Acute lung injury and acute respiratory distress syndrome (ARDS)
  - Aspiration pneumonia
- Other
  - Pancreatitis
  - Sepsis
  - Trauma
  - Burns with ARDS
  - Head injury
  - Liver failure

### Symptoms and signs


- Dyspnoea, tachypnoea
- Cyanosis
- Wheezing
- Crepitations in the lungs
- Cough with frothy blood-tinged sputum
- Anxiety, sweating
- Tachycardia, orthopnoea, chest pains
- Shock with peripheral shut-down

### Investigations

- CXR
- ECG
- Arterial blood gasses, FBC, U+E, LFT

## 1.16 Pulmonary Oedema

### Management

1. Refer patient to hospital urgently. 
2. Do not delay treatment.
3. Prop up the patient (Fowler's position).
4. Administer oxygen by face mask.
5. Establish an IV access.
6. Administer furosemide—
  - Dosage for adult: 40 to 80 mg IV stat repeated when necessary
  - Dosage for children: 1 mg/kg per dose increased by 1 mg/kg per dose at intervals of 6 to 12 hours up to a maximum of 6 mg/kg per dose.
  - Maximum daily dose: 6 mg/kg per dose
7. Connect to ECG monitor.
8. Monitor vital signs.
9. Monitor input–output (insert urinary catheter).
10. Administer morphine: 2.5 to 10 mg IV.
11. Administer metoclopramide: 10 mg IV.
12. Administer glyceryl trinitrate: 0.5 mg sublingually.
13. Treat underlying cause.
14. Treat bronchospasm.
15. Treat hypertension.
16. Treat arrhythmias.
17. Treat pulmonary infection, if necessary.
18. Start mechanical ventilation in ICU if no improvement.

## 1.17 Status Epilepticus

Status epilepticus (SE) is defined as more than 30 minutes of continuous seizure activity or two or more sequential seizures without full recovery of consciousness between seizures. SE may be convulsive or non-convulsive, generalised or partial. Convulsive SE is associated with the highest risk of morbidity and mortality.

### Causes

See “Section II. Diseases and Disorders According to Body Systems. Chapter 11. Neurological System (Central Nervous System)” for a discussion of seizures and convulsions.

### Investigations

- Temperature
- Blood glucose
- U+E
- Malaria smear
- EEG (after referral)
- MRI, CT (after referral)
- Lumbar puncture in children

### Management

**Note:** The risk of brain damage is high if seizures persist for more than 2 hours, so SE should be terminated as soon as possible.

Table 1.17A outlines treatment of SE for adults and children. Table 1.17B provides the schedule of diazepam for adults and children. Figure 1.17 illustrates the treatment process for a convulsing child.

TABLE 1.17A Management of SE in Adults and Children &lt;12 Years

Step	In Adults and Children ≥12 Years	In Children <12 Years	Remarks
<b>All Patients</b> Support vital functions—			
	<ul style="list-style-type: none"> <li>Assess airway, breathing, and circulation; intervene accordingly</li> <li>Place patient in lateral position</li> <li>Provide oxygen mask</li> <li>Insert IV cannula and draw blood for investigations (i.e., FBC, U+E, Ca, LFT, toxicology if indicated)</li> </ul>		
<b>Step 1. Give diazepam.</b> (See <a href="#">table 1.17B.</a> )	<p>Before diazepam administration—</p> <ul style="list-style-type: none"> <li>Give thiamine 100 mg IV</li> <li>If patient is hypoglycaemic (&lt;3 mmol/L) or if glucose cannot be measured, give 50 mL of 50% dextrose IV immediately</li> <li>If seizures continue after administration of the maximum dose, proceed to step 2.</li> </ul>	<p>Before diazepam administration—</p> <ul style="list-style-type: none"> <li>If patient is hypoglycaemic (&lt;3 mmol/L) or if glucose cannot be measured, give 1 to 2 mL/kg of dextrose 50% IV immediately</li> <li>If seizures continue after administration of the maximum dose, proceed to step 2.</li> </ul>	<p>Sedation, apnoea, respiratory depression, and hypotension are possible.</p> <p>Half life: 30 minutes</p>



TABLE 1.17A Management of SE in Adults and Children &lt;12 Years (cont.)

Step	In Adults and Children ≥12 Years	In Children <12 Years	Remarks
<b>Step 2. Give phenytoin.</b>	<p><b>All Patients</b></p> <ul style="list-style-type: none"> <li>• Prepare IV phenytoin 200 mL in 0.9% saline solution over ½ hour, and flush IV line before and after with normal saline to avoid local venous irritation.</li> <li>• Monitor ECG and BP during infusion.</li> <li>• Monitor phenytoin levels</li> </ul>		Cardiovascular collapse with rapid infusion, arrhythmias, hypotension, and phlebitis are all possible.
	<ul style="list-style-type: none"> <li>• Loading dose: 18 mg/kg IV</li> <li>• Then: up to 100 mg 3 or 4 times per day</li> <li>• If seizures do not stop, give extra doses of 5 mg/kg up to a maximum total dose of 30 mg/kg</li> <li>• Thereafter, give maintenance doses of 100 mg for 6 to 8 hours</li> <li>• The maximum rate is 50 mg per minute because of the risk of cardiac arrhythmias</li> </ul>	<ul style="list-style-type: none"> <li>• Neonates—               <ul style="list-style-type: none"> <li>- Loading dose: 20 mg/kg IV</li> <li>- Then: 2.5 to 5.0 mg/kg IV 2 times per day</li> </ul> </li> <li>• Children ≥1 month to &lt;12 years—               <ul style="list-style-type: none"> <li>- Loading dose: 18 mg/kg IV</li> <li>- Then: 2.5 to 5.0 mg/kg IV 2 times per day</li> </ul> </li> </ul> <p>Infuse at 1 mg/kg/min Maximum rate 50 mg/min Total maximum dose 1500 mg</p>	Mix only with normal saline.

TABLE 1.17A Management of SE in Adults and Children &lt;12 Years (cont.)

Step	In Adults and Children ≥12 Years	In Children <12 Years	Remarks
<b>Step 2. (cont.)</b>	<p><b>All Patients</b></p> <ul style="list-style-type: none"> <li>• If seizures do not stop, give extra doses of 5 mg/kg up to a maximum total dose of 30 mg/kg</li> <li>• Thereafter, give maintenance doses of 100 mg for 6 to 8 hours</li> <li>• The maximum rate is 50 mg per minute because of the risk of cardiac arrhythmias.</li> </ul>		
<b>Step 3. Give phenobarbital.</b>	<p>If status still continues without adequate response, proceed to step 3.</p> <p>Give phenobarbital—</p> <ul style="list-style-type: none"> <li>• Dose: 15 to 20 mg/kg IV</li> <li>• Infusion rate: 100 mg per minute</li> <li>• Monitor levels</li> </ul>	<p>Give phenobarbital—</p> <ul style="list-style-type: none"> <li>• Loading dose: 20 mg/kg IV</li> <li>• Infusion rate: 2 mg/kg per minute to a maximum of 30 mg/kg per minute.</li> <li>• Repeat in 30 minutes up to two times at 10 mg/kg if needed</li> <li>• Maximum single dose: 1,000 mg</li> <li>• Monitor levels</li> <li>• Hypotension and respiratory depression (especially if used after benzodiazepines) are possible.</li> </ul>	<p>Hypotension and respiratory depression (especially if used after benzodiazepines) are possible.</p>

TABLE 1.17A Management of SE in Adults and Children &lt;12 Years (cont.)

Step	In Adults and Children $\geq 12$ Years	In Children <12 Years	Remarks
Step 4. Refer.	<p><b>All Patients</b></p> <ul style="list-style-type: none"> <li>If seizures do not cease and more than an hour has elapsed since the start of treatment, immediately refer the patient to the ICU for intubation and anaesthesia. Order a brain CT scan and LP, if necessary.</li> </ul>		

TABLE 1.17B Diazepam Dosing Options for Adults and Children with SE

Note: Choose one option only for the patient.

Dose, Administration, and Remarks	IV Bolus	IV Injection	IV Infusion	PR
<b>Adults and Children ≥12 Years</b>				
<b>Dose</b>	0.3 mg/kg	10 to 20 mg	10 mg in 200 mL 5% dextrose	10 to 20 mg
<b>Administration</b>	Stat Repeat as needed.	Slowly—1 mg over 30 seconds	Slowly— over 6 hours	Stat
<b>Remarks</b>	Do <i>not</i> exceed 30 mg in 8 hours.	Maximum dose 40 mg	Maximum dose of 40 mg	Maximum dose 40 mg

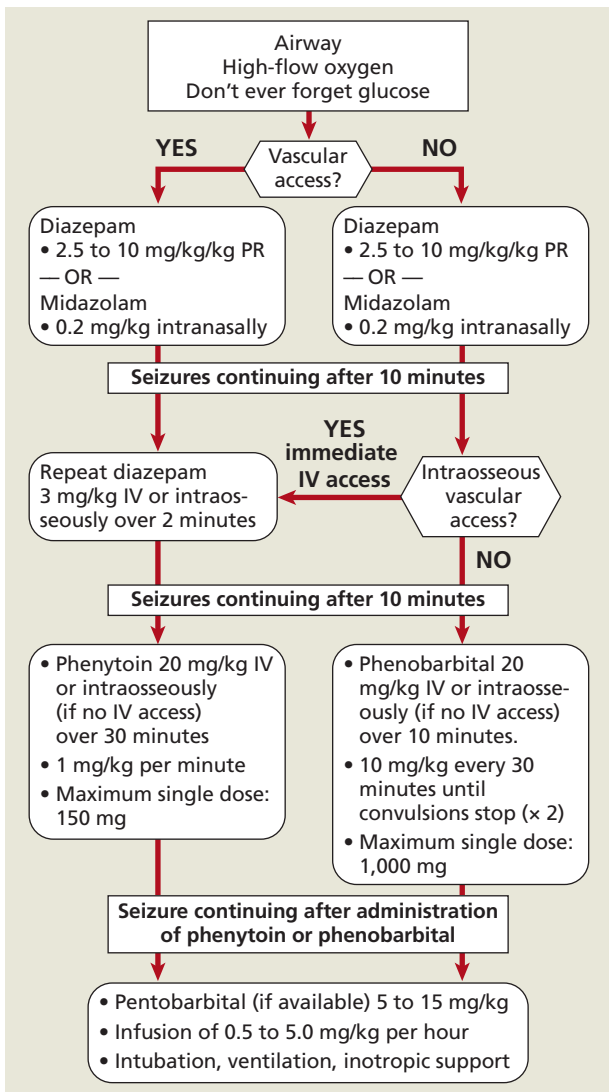
TABLE 1.17B Diazepam Dosing Options for Adults and Children with SE (cont.)

Dose, Administration, and Remarks	IV Bolus	IV Injection	IV Infusion	PR
	Paediatric (Children <12 Years)			
<b>Dose</b>	0.3 mg/kg			2.5 to 10 mg/kg
<b>Administration</b>	Stat Give 0.5 to 2.0 mg over 1 minute  Repeat once after 10 minutes if needed.			Stat  Repeat once after 10 minutes if needed.
<b>Remarks</b>	Maximum total dose: 10 mg			

**Note:** When diazepam is given by IV, a risk of venous thrombophlebitis and hypotension and/or apnoea may occur. Equipment for reversing respiratory depression with mechanical ventilation (e.g., an Ambu bag or ventilator) must be available.

## 1.17 Status Epilepticus

FIGURE 1.17 The convulsing child



## 1.18 Shock

Shock is a syndrome characterized by decreased perfusion of the tissues in the body. Shock may be classified as—

- Hypovolaemic shock
- Cardiogenic shock
- Septic shock
- Anaphylactic shock
- Spinal shock

### Health education

- Identify the cause.
- Avoid cause.
- Inform the patient about using a medic alert necklace or bracelet.

### Management of shock

See [table 1.18](#) for a description of the five types of shock.

### Management anaphylactic shock in adults and children

See [figure 1.18](#) for an algorithm of anaphylactic shock.

Anaphylaxis is the development of a sudden, acute hypotensive reaction (i.e., an excessive allergic reaction). This reaction causes the release of histamine and, although rare, is acutely life threatening.

Follow this procedure to manage anaphylactic shock.

1. Interrupt injection/infusion; leave IV cannula or establish IV access.
2. Place patient in recumbent position. Head and upper body must be lowered; raise legs
3. Airway must be kept clear. Follow ABC.
4. Give oxygen.
5. Monitor BP.
6. Give adrenaline 1:1000 IM without delay. Dosages—
  - <6 months: 50 mcg or 0.05 mL
  - 6 months to 6 years: 120 mcg or 0.12 mL
  - 6 to 12 years: 250 mcg or 0.25 mL

## 1.18 Shock

- Adults and children >12 years: 500 mcg or 0.5 mL  
Repeat after 5 minutes guided by BP, pulse, and respiratory function until the patient is better.

TABLE 1.18 Treating Shock

### Type of Shock: Hypovolaemic shock

Classification according to blood loss:

- Mild <20%
- Moderate 20 to 40%
- Severe >40%

### History

- Severe bleeding
- Trauma
- Severe diarrhoea
- Severe vomiting

### Symptoms and Signs

- Rapid weak pulse
- Normal or low BP
- Confusion, restlessness
- Decreased level of consciousness
- Obvious or concealed bleeding

### Emergency Treatments

1. Stop the bleeding.
2. Have patient lie down and raise legs.
3. Replace fluid rapidly by IV using Ringer's lactate (or haemacell or Plasmalyte B) as follows:
  - Adult: fast until BP systolic >100 mmHg
  - Child: 20 mL/kg fast, then 10 mL/kg per hour
4. If Hb <7 g/dL, replace blood loss with packed cells if available.
5. Give oxygen therapy via facemask.
6. Refer for specialised care.



TABLE 1.18 Treating Shock (cont.)

<b>Type of Shock:</b> Cardiogenic shock
<b>History</b>
<ul style="list-style-type: none"> <li>• Heart disease (e.g., MI, angina)</li> <li>• Severe chest pain not relieved by rest or daily therapy</li> </ul>
<b>Symptoms and Signs</b>
<ul style="list-style-type: none"> <li>• Tachycardia</li> <li>• Low BP</li> <li>• Signs of pulmonary distress</li> <li>• Frothy, pink white sputum</li> <li>• Central cyanosis</li> <li>• Cold limbs</li> <li>• Anxiety</li> <li>• Pericardial effusion</li> </ul>
<b>Emergency Treatments</b>
<ol style="list-style-type: none"> <li>1. Give oxygen via face mask.</li> <li>2. Administer furosemide 40 mg IV stat, if patient is severely cyanosed and coughing, has pink sputum, and is quite short of breath.</li> <li>3. Administer thiamine 100 mg IM.</li> <li>4. Refer.</li> <li>5. See <a href="#">1.13</a>.</li> </ol>

## 1.18 Shock

TABLE 1.18 Treating Shock (cont.)

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**Type of Shock:** Septic shock

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**History**

- Severe infection
  - Pneumonia
  - Abdominal sepsis
  - Meningitis
  - Osteitis or osteomyelitis
  - Pelvic infections
- 

**Symptoms and Signs**

- Strong, rapid pulse
  - Low BP
  - Warm peripheries
  - Very ill looking patient
  - Rapid breathing
  - Cyanosis
  - Very high fever:  $>38\text{ }^{\circ}\text{C}$
  - Sometimes hypothermia with a temperature  $<35\text{ }^{\circ}\text{C}$
- 

**Emergency Treatments**

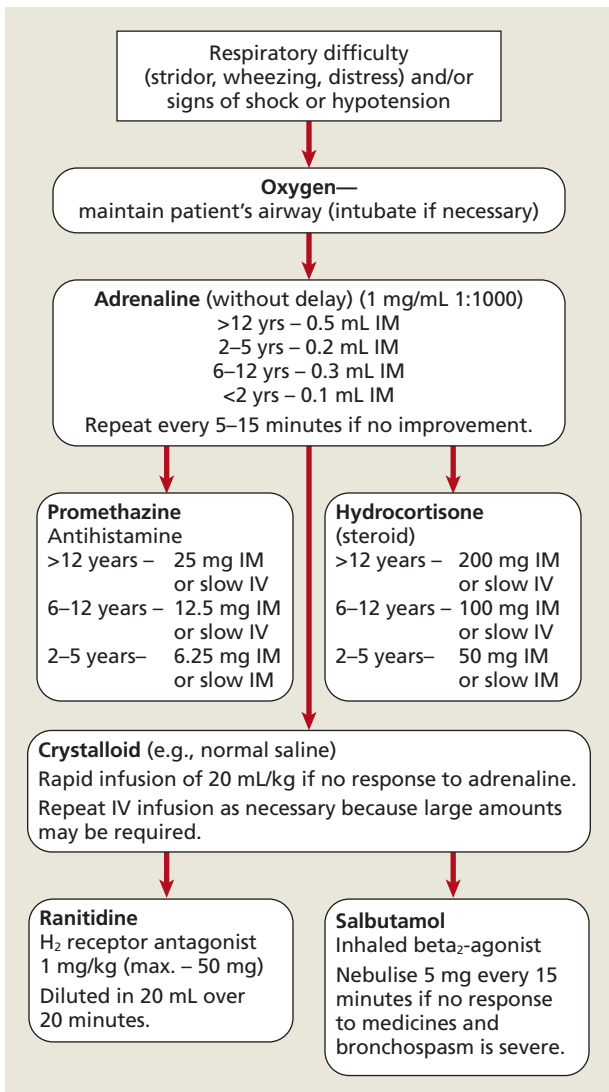
1. Correct hypotension with IV fluid replacement.
  2. Oxygen therapy via facemask.
  3. Do rapid test for malaria.
  4. If suspicious of cerebral malaria, treat with quinine and refer to hospital.
  5. Refer urgently for medical management.
-

TABLE 1.18 Treating Shock (cont.)

<b>Type of Shock:</b> Anaphylactic shock
<p><b>History</b> History of allergic reactions to bee stings, snakebites, immunizations, medications (e.g., penicillin, streptomycin) foods, or blood transfusions</p>
<p><b>Symptoms and Signs</b></p> <ul style="list-style-type: none"> <li>• Rapid, weak pulse</li> <li>• Circulatory collapse</li> <li>• Hypotension (low BP)</li> <li>• Rapid, difficult breathing</li> <li>• Pale, cold clammy skin</li> <li>• Facial and laryngeal oedema</li> <li>• Itching</li> <li>• Wheezing, bronchospasm</li> <li>• Very anxious, restless</li> <li>• Unconsciousness</li> <li>• Rash, urticaria</li> </ul>
<p><b>Emergency Treatments</b> See <a href="#">figure 1.18</a>.</p>
<b>Type of Shock:</b> Spinal shock
<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Spinal injury</li> </ul>
<p><b>Symptoms and Signs</b></p> <ul style="list-style-type: none"> <li>• Low BP</li> <li>• Bradycardia</li> </ul>
<p><b>Emergency Treatments</b></p> <ol style="list-style-type: none"> <li>1. Follow ABC of resuscitation.</li> <li>2. If BP does not respond to fluids, start dopamine infusion (10 to 20 mcg/kg per minute).</li> <li>3. Titrate according to response.</li> <li>4. Give spinal injury Rx. (See “Section I. Common Emergencies and Trauma. <a href="#">Chapter 2. Trauma</a>” for a discussion of spinal cord injuries.)</li> <li>5. Refer.</li> </ol>

## 1.18 Shock

FIGURE 1.18 Anaphylactic shock algorithm



## 1.19 Urinary Emergencies

### 1.19.1 Acute Urinary Retention

Sudden acute onset of urinary retention with rapid de-compensation of the systems proximal to the site of the obstruction

#### Causes

- Previous gonorrhoea infection with urethral stricture
- Urethral stone causing obstruction
- Prostatitis
- Benign prostate hypertrophy
- Prostate cancer
- Trauma, also due to poor quality long-term (latex) catheters
- Old injury
- Neuropathic bladder


#### Symptoms and signs

- Acute urinary retention
- Severe suprapubic or lower abdominal pain
- Bladder distension, abdominal distension
- No passing of urine at all or just a dribble

#### Investigations

- Rectal digital examination
- Medical examination
- Urine MCS
- U+E (later)
- Search for cause: try passing a F16 or F18 catheter to identify strictures
- Prostate specific antigen (PSA)

#### Management in clinic, health centre, and hospital

1. **Refer** to hospital immediately. 
2. If referral is delayed, the patient must be catheterised by the clinic staff. Catheterization is done in the following way:
  - Use a sterile small catheter (16G Foleys catheter).

## 1.19 Urinary Emergencies

- Place adequate amount K-Y jelly on catheter tip and into urethra.

---

**Note:** Make sure the catheter balloon is in the bladder and not in the urethra before the balloon is inflated, usually with 7 to 10 mL of sterile water (in order to prevent bleeding from urethra and later a permanent and draining urethral stricture). Male: push in until catheter bifurcation, and make sure there is no pain by filling Foleys balloon.

---

3. Perform suprapubic cystostomy or large-bore needle drainage (2 cm above pubic symphysis) if catheterisation not possible and no other means are available.
4. Once the pressure is alleviated in the patient, the emergency is over. Refer the patient to the hospital.

### 1.19.2 Obstructive Renal Failure

#### Causes

- Ureteric obstruction
- Neurogenic bladder
- Bladder outflow obstruction

#### Investigations

- Sonar (hydronephrosis if urgent relief of obstruction is needed)
- U+E (creatinine  $>130 \mu\text{mol/L}$ , usually no proteinuria)

#### Management

1. If full bladder, attempt catheterization. If not possible insert a suprapubic catheter and refer urgently. Monitor output—if over 200 mL per hour give saline or rehydration fluid especially in elderly to replace loss over and above 200 mL per hour.
2. If only hydronephrosis, refer.

## 2.1 Abdominal Injuries

Traumatic injuries to the abdomen are common. The abdominal cavity contains many important organs, vessels and membranes. Acute abdominal injuries may be life-threatening.

### Causes

- Motor vehicle accidents
- Blows to abdomen (fighting, punching, kicking)
- Stab wounds

### Symptoms and signs

- General: vital signs can indicate shock (BP can be low, tachycardia, tachypnoea)
- Acute abdomen:
  - Marked tenderness (localised or all over)
  - Rigidity or guarding (stiffness) of abdominal muscles.
  - Bowel sounds are not heard.
  - Rebound tenderness (sudden stabbing pain with deep palpation and sudden letting go)

### Investigations

- FBC, U+E
- Sonar
- Abdominal X-ray

### Management in clinic, health centre, or hospital


#### General management of abdominal injuries—

1. Assess the patient.
  - Take a clear history.
  - Examine the vital signs: pulse, BP, breath rate, confused or comatose state
2. Examine the abdomen thoroughly.
3. Check for other injuries.
4. Test urine for blood.


#### Management of patients in shock or seriously injured—

1. Use ABC emergency resuscitation if necessary.
2. Give nothing PO.

## 2.1 Abdominal Injuries

3. Start an IV line with 5% dextrose or rehydration fluid.
4. Do *not* give a laxative.
5. Monitor patient carefully for changes in vital signs.
6. If the patient has an open trauma, cover and keep bowel inside abdomen.
7. If the patient has an abdominal obstruction (evidenced by excessive vomiting or abdominal distension), insert NGT.
8. **Refer** to hospital urgently. 

### If the patient has no signs of acute abdomen or shock—

1. Check vital signs.
2. Observe for 4 to 6 hours
3. Give simple analgesic (e.g., paracetamol).
4. Instruct the patient to return to clinic if—
  - Patient complains of weakness
  - Patient has blood in urine
  - Abdominal pain worsens
  - Patient notices abdominal distension
5. Give only fluids for 24 hours, no solids.
6. If the patient is a pregnant woman, check foetal heart and urine, and **refer** to doctor. 

### Management in hospital

1. Use emergency ABC resuscitation if necessary.
2. Find the exact injury by special investigations.
3. Do a laparotomy for local inspection of injury and treatment.



### 2.2 Acute Bleeding (Haemorrhage) and Wound Care

A wound is a break in the skin usually from an injury that may be either superficial or deep and may be associated with broken bones. It may be clean or contaminated by dirt or foreign bodies that can cause infection.

#### Causes

Trauma to the skin during motor vehicle accidents, occupational accidents, fights, or stab wounds

#### Management

1. Stop the bleeding.
  - Apply manual pressure or a temporary pressure bandage over wound.
  - Raise (elevate) the injured part.
2. Inspect the wound. Look for tissue, vascular, nerve, bone, and other local damage.
3. Anaesthetise the wound for inspection and suturing. Use—
  - Lignocaine 2% for small appendages (e.g., of fingers, toes)
  - Lignocaine plus epinephrine 2% for other body parts
4. Prevent infection of the wound.
5. Remove all dirt and foreign bodies from the wound.
6. Thoroughly clean the wound with water, soap, and diluted povidone-iodine.
7. Ligate or clamp arteries or veins with mosquito forceps.
8. Suture larger, deeper wounds with a plaster strip to bring the edges of a wound closer together. Superficial or shallow wounds usually do not require sutures. Suturing is also a useful method to control bleeding in a wound.
  - Use catgut or chrome sutures.
  - Remove chrome sutures after 5 to 7 days.

## 2.2 Acute Bleeding and Wound Care

**Note:** Bites or gunshot wounds should be sutured only in cases of severe bleeding.

9. Promote healing.
  - Use clean dressings, and change them frequently.
  - Leave small wounds open.
  - Elevate wound.
  - Apply betadine ointment.
  - Prescribe antibiotics (broad spectrum) if there is a danger of infection.
  - Gunshot wounds, bites, and wounds that are more than 8 hours old should not be sutured, but rather cleaned and dressed.
10. Provide pain relief.
  - Give paracetamol, tramadol, or pethidine (according to severity of injury).
  - Treat for shock.
11. Give tetanus toxoid IM stat.

### Health education

- Urge regular follow-up of patients' wounds.
- All wounds should heal. If not, the patient must come back.
- Refer to hospital if wound does not heal.

## 2.3 Chest Injuries

Trauma to the chest is a major problem in the emergency department of a hospital or clinic. Injury to the chest may affect the bony chest cage, heart, pleurae and lungs, diaphragm, or mediastinal contents.

### Classification

- *Blunt, nonpenetrating injuries*—These injuries result in damage to the structures within the chest cavity without communicating with the outside of the chest wall. They are caused primarily by impact with a motor vehicle steering wheel.
- *Penetrating injuries*—Penetrating injuries disrupt chest wall integrity and result in alteration in the pressure inside the thoracic cavity. Such injuries usually result from stab or gunshot wounds.

### Differential diagnosis

- Rib fractures (flail chest)
- Tension pneumothorax, pneumothorax, haemothorax, pneumo-haemothorax
- Diaphragmatic rupture
- Heart injury, pericardial tamponade
- Aorta and oesophagus rupture
- Vascular injury

### 2.3.1 Rib Fractures

#### Causes

- Most commonly blunt chest injury

#### Symptoms and signs

- Pain at the site of injury, increasing on inspiration or coughing
- Localized tenderness and crepitus on palpation
- Shallow breathing plus impaired movement
- Antero-posterior compression of the chest produces pain
- Ribs 3 through 10 are most commonly fractured
- Pneumo-haemothorax

## 2.3 Chest Injuries

### Management

1. Examine carefully.
2. Look for symptoms and signs of pneumothorax.
3. Provide pain relief with, for example, paracetamol, diclofenac IM, or ibuprofen tablets.
4. Do not strap the chest.

### Health education

- Inform the patient that the pain will last for a long time.
- Advise the patient not to participate in sport until better.
- Urge the patient to try to reduce irritants in lung and decrease coughing (e.g., stop smoking).
- Suggest he or she do light work only.

### 2.3.2 Flail Chest

When multiple ribs or the sternum are fractured in more than one place, a portion of the chest wall becomes separated from the chest cage resulting in a flail chest.

### Symptoms and signs

- Severe chest pain over the injured area
- Paradoxical (irregular) chest movement
- Severe dyspnoea
- Tachypnoea with shallow breathing
- Use of abdominal and other accessory muscles to breathe
- Decreased or absent breath sound on auscultation over the injured area
- Increased anxiety

### Management

Treatment depends on the state of patient. Follow these procedures:

1. Refer and admit to hospital.
2. If patient has no respiratory problems, observe closely.
3. If patient has respiratory problems, intubate or ventilate as needed.
4. Watch out for tension pneumothorax.

### 2.3.3 Pneumothorax

Pneumothorax may be classified as follows:

- *Tension pneumothorax* occurs when air leaks into the pleural cavity and cannot escape during expiration. The accumulating air builds up positive pressure in the pleural cavity resulting in—
  - Lung collapses on the affected side
  - Mediastinal shift towards the unaffected side (i.e., the heart is shifted to the opposite side of the injury)
  - Compression of mediastinal contents (i.e., the heart and great blood vessels are compressed resulting in acute shock and cardio-respiratory arrest)
  - Surgical emphysema as diagnosed on antero-posterior (AP) and lateral CXR
- *Pneumothorax* means air in the pleural cavity between the lung and the chest wall. It occurs as a result of either penetrating or nonpenetrating injuries and can also occur spontaneously (e.g., from the rupturing of emphysematous bullae).
- *Haemothorax* means blood in the pleural cavity, following blunt chest trauma as well as from a penetrating injury. Source of the bleeding may be the chest wall, the lung tissue, or other vascular structures within the chest (e.g., large blood vessels).
- *Pneumo-haemothorax* means that both free air and blood accumulate in the pleural cavity.

#### Symptoms and signs for pneumo-haemothorax

- Tachycardia
- Low blood pressure (hypotension)
- Cyanosis
- Respiratory distress
- Fast, shallow breathing (tachypnoea)
- Recession of rib spaces (rib retraction)
- Use of accessory muscles of respiration
- Less movement on wounded side
- Laboured breathing

## 2.3 Chest Injuries

- Bubbly, crackly feeling skin
- A shift in trachea and heart apex
- On percussion: pneumothorax—resonant or hollow; haemothorax—dull
- Auscultation: decreased or no breath sounds
- *Always* check for abdominal injury.
- *Always* check for heart and blood vessel injury. (Acute shock = tachycardia, hypotension, profuse sweating, extremely anxious, pallor, acute distress, cardiac arrest)

### Management

#### In clinic, health centre, or hospital—

1. Dress the wound, but do *not* suture.
2. Refer to hospital for X-rays and further management.
3. Start an IV infusion (e.g., with Ringer's lactate).
4. Look for bleeding. A quantity of blood loss >50 mL per hour indicates the need for surgical intervention.
5. Look for respiratory arrest or shock.
6. Resuscitate if necessary (i.e., use ABC).
7. For *tension pneumothorax*, if no doctor is available to insert an intercostal drain, a health care worker should drain the chest in the following way:
  - Briskly and carefully insert a large needle through the chest into the pleural cavity.
  - Insert the IV needle in the second and third rib space in the midclavicular line. The needle should be placed along the mid-clavicular line just above the upper border of the third rib avoiding the lower border of the second rib, which covers the neurovascular bundle.
  - Connect the needle to an IV line ending in a bottle filled with antiseptic fluid or sterile water.
  - Leave the needle in until a proper intercostal drain has been inserted.
  - Prevent air from entering pleural cavity by placing the end of the IV line in fluid.

### In hospital—

1. Perform X-ray examination.
2. Insert chest drain and underwater drain: right side (fifth intercostal space); left side (sixth intercostal space).
  - Use a local anaesthetic.
  - Make an incision.
  - Insert drain.
  - Surgically fix drain to skin.
  - Check drain regularly.
3. Assess speed of bleeding to rule out indications for urgent thoracotomy.
4. Take chest X-ray to check correct positioning of drain.
5. Check level of Hb, respiratory rate, and saturation.

### 2.4 Disaster Management for Multiple Casualties

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#### 2.4.1 Sorting and Triage

When an accident or incident involves a number of injured people, triage must be performed. Assess the injuries using the following criteria.

- **Priority I**—Life-threatening injuries
  - Severe head (intracranial bleeding) and neck injuries
  - Severe facial injuries
  - Uncontrollable haemorrhage
  - Blunt abdominal trauma with hypotension
  - Unstable chest injuries
- **Priority II**—Serious but not life threatening
  - Temporary loss of consciousness
  - Multiple rib fractures without respiratory distress
  - Blunt abdominal trauma without hypotension
  - Severe soft tissue injury without excessive haemorrhage
- **Priority III**—Not serious but needing hospital assessment
  - No hypovolaemia
  - No hypotension
  - No head injuries
  - No abdominal injuries
  - No respiratory distress
- **Priority IV**—Does not need hospital treatment
- **Priority V**—Unsalvageable patient or patient who has died

---

**Note:** All patients with serious multiple injuries (I, II, III) should be **referred** to hospital for expert treatment. 

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### 2.4.2 Pre-hospital Assessment and Patient Evaluation

Perform pre-hospital assessment according to the following procedures, and then refer to [figure 2.4.2](#) for patient evaluation.

1. For a critical patient, resuscitate immediately (e.g., ABC).
2. Perform an assessment. Check for major traumatic injuries.
  - Check the vital signs—
    - BP
    - Pulse
    - Breathing
    - Pupils
    - Skin
    - Level of consciousness
  - Examine—
    - Head and neck
      - ◆ Palpate skull, but do *not* flex neck.
      - ◆ Ask patient to self-rotate neck and ask about pain.
    - Face
      - ◆ Palpate.
      - ◆ Ask patient to clench teeth.
      - ◆ Check vision. Look for squinting.
    - Upper limbs
      - ◆ Grip hands.
      - ◆ Move limbs.
      - ◆ Check pulse and nerves.
    - Spine
      - ◆ Check movements of legs.
      - ◆ Palpate for pain.
    - Chest and abdomen
      - ◆ Press rib cage.
      - ◆ Palpate abdomen for pain.
    - Pelvis and lower limbs
      - ◆ Press on pelvis.
      - ◆ Check movement of toes and legs

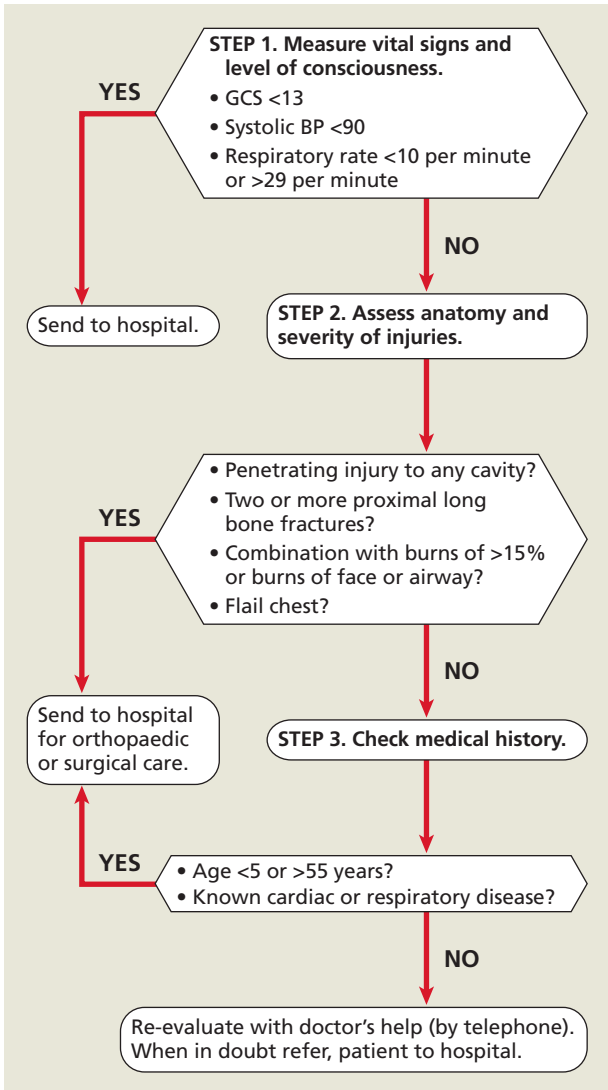
## 2.4 Disaster Management

3. For an unconscious patient, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of coma and the unconscious patient.
4. For spinal injury, see [2.10](#) in this chapter for a discussion of spinal cord and neck injuries.
5. Perform necessary resuscitation and first aid before transport to hospital. For resuscitation, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of cardiopulmonary resuscitation.
6. Check for injury to lung. See [2.3](#) in this chapter for a discussion of chest injuries.
7. Stop haemorrhages. See [2.2](#) in this chapter for a discussion of acute bleeding (haemorrhage) and wound care.
8. Splint fractures. See [2.6](#) in this chapter for a discussion of fractures and dislocations.
9. Spinal injury needs special care. See [2.10](#) in this chapter for a discussion of spinal cord and neck injuries.
10. Provide pain relief (analgesia). Give tramadol hydrochloride—50 mg tablets 3 times per day or tramadol hydrochlorite SC 100 mg (maximum 400 mg per day) rather than paracetamol.
11. Do *not* give anti-inflammatories; they may cause gastric bleeding or kidney failure.
12. Give *no* corticosteroids (e.g., methylprednisolone injection).
13. Inform the hospital of the patient’s arrival.
14. Send a referral letter with the patient.

### 2.4.3 Transport to Hospital

- If possible, accompany the patient to hospital.
- Take emergency equipment and medications along.
- Continue resuscitation, suctioning if necessary; prevent aspiration.
- Continue important first aid during the journey.
- Give oxygen to all seriously injured patients (e.g., face mask, Ambu bag, airway).

FIGURE 2.4.2 Algorithm of patient evaluation



## 2.4 Disaster Management

- Keep drip running. Avoid giving too much fluid to children or patients with head injury or MI.
- Check and record the vital signs during transport.
- Ensure proper positioning of patient during transport.
  - Spinal injury: flat on back with neck collar
  - Unconscious: on side
  - Head injury: head elevated slightly
- Reassure the patient.

### 2.4.4 Hospital Treatment

- Continue resuscitation if necessary.
- Treat according to presenting injury.

## 2.5 Eye Trauma

Trauma to the eye can be blunt (e.g., from a fist or catapult) or sharp and penetrating. All parts of the eye can be affected and must be treated independently. Any trauma must always be methodically examined.


### Causes

- Minor trauma—often foreign bodies
- Blunt trauma
- Penetrating trauma—any sharp or big objects that have penetrated the eyeball
- Burn wounds—chemical, heat, snake venom in the eye

### Symptoms and signs

See [table 2.5](#).

### Management

1. Refer **urgently** to hospital, if— 
  - The cornea is unclear
  - The vision is bad
  - The eye is leaking blood or clear fluid
2. Do *not* exert pressure on the eyeball.
3. Cover with an eye pad.
4. For pain relief, give paracetamol.

### 2.5.1 Contusions of the Eye

#### Haematoma of eyelid

- This is the classic black eye.
- *Always* inspect the eyeball to exclude further damage.
- Place an ice pack on the injured eye.

#### Subconjunctival haemorrhage

- Usually involves only one sector and does not extend backwards into the orbital tissue.
- If it does extend into the orbital tissue, it may have been caused by an intra-orbital haemorrhage and may signify orbit fracture.
- No treatment is needed. The subconjunctival haemorrhage will resolve spontaneously in 2 weeks.

TABLE 2.5 Summary of Eye Injuries

Indications	Blunt Trauma	Penetrating Trauma	Burn Wounds
Symptoms	<ul style="list-style-type: none"> <li>• Pain</li> <li>• Swelling of the eyelid</li> <li>• Decrease in vision (rarely)</li> </ul>	<ul style="list-style-type: none"> <li>• Pain</li> <li>• Decrease in vision</li> <li>• History very important</li> </ul>	<ul style="list-style-type: none"> <li>• Pain</li> <li>• Decrease in vision</li> <li>• History very important</li> </ul>
Signs	<ul style="list-style-type: none"> <li>• Haematoma of the eyelid (blue discoloration)</li> <li>• Bleeding seen on the white of the eye (subconjunctival)</li> <li>• Bleeding behind the cornea (hyphaema)</li> <li>• Decreased eye movement</li> <li>• Post-traumatic infection (uveitis)</li> <li>• Contusion cataract</li> </ul>	<ul style="list-style-type: none"> <li>• Laceration of the cornea or conjunctiva</li> <li>• Pupil size abnormal or irregular</li> <li>• Iris protruding out of the wound</li> </ul>	<ul style="list-style-type: none"> <li>• Burn wound of the eyelid</li> <li>• Laceration of the cornea</li> </ul>

### Corneal abrasion

- The corneal epithelium has been stripped away.
- The eye is painful and irritated.
- The abrasion stains well with fluorescein and blue light.
- Apply antibiotic ointment chloramphenicol 1% to the eye 4 times per day.
- Cover with an eye pad. The epithelium regenerates quickly.

### Injury to the iris

- Look for blood in the anterior chamber (hyphaema).
- For management in clinic, health centre, or hospital—
  1. Refer to hospital.
  2. Occlude the eye.
  3. Sedate to restrict activity; prescribe bed rest.
  4. Examine the pupil. If it is not round, refer.
- For management in hospital—
  1. Start topical steroids: dexamethasone 0.10% eye drops initially; 1 to 2 drops hourly then reduce to 3 times per day depending on severity.
  2. Administer atropine 1% eye drops 2 times per day.
  3. Administer tranexamic acid PO to stop bleeding: 15 to 25 mg/kg 2 to 3 times per day.
  4. Give paracetamol PO 1,000 mg 3 times per day.

### Injury to the lens

- Look for red reflex, if not visible, refer.
- The lens may dislocate, rupture, or form a contusion cataract.
- Look for the lens. If it is in the vitreous, refer.

### Injury to the retina

- Look for red reflex, if not visible, refer.
- If the patient has a loss of vision, and anterior structures are normal, it is a possible retinal problem.

Refer. 

### 2.5.2 Perforating Eye Injuries

#### Injury to the eyelids

- Wounds of eyelids require prompt suturing, with exact repair of lid margin.
- If lower canaliculus is involved, refer.
- Burns of the lids are serious and must be referred.

#### Injury to the cornea and sclera

- These perforations can be small, and referral is necessary if suspicion is high, or if you are uncertain.
- Do not press on the eye during eye examination.

### 2.5.3 Nonperforating Eye Injuries

A foreign body may be embedded in the cornea.

#### Management objectives

- Relieve pain.
- Prevent infection.
- Prevent damage that can cause permanent loss of vision.

#### Management

**In clinic, health centre, or hospital—**

1. Turn over (evert) the upper lid.
  - Remove the foreign body by flushing the eye with clean water

— OR —

  - Remove with wet sterile cotton bud tip by just touching the foreign body lightly and removing.
2. Refer to hospital immediately if—
  - The foreign body is in central cornea.
  - The foreign body cannot be easily removed.
  - The patient has a sudden loss of vision or a greater loss of vision than expected.
  - You suspect perforation.



**In hospital—**

1. Remove foreign body. Most foreign bodies can be removed safely from the cornea under topical anaesthesia, with good visualization, and using a needle. Magnifying lenses are very helpful.
  - Attempt removal only if you are confident. Use needle to move from medial to lateral. Never use this procedure on a child.
  - Never scratch or wipe the eye hard.
2. After removal, give chloramphenicol 1% ointment for 2 to 3 days.

**2.5.4 Chemical Injury to the Eye**

The most acute emergency in ophthalmology is a chemical burn.

**Immediate management**

1. Give topical anaesthesia.
2. Irrigate the eye with clean water or saline for 20 minutes.
3. Evert upper eyelid and remove debris with cotton bud.
4. Repeat irrigation until eye is clean of debris.
5. Refer urgently.
6. Prescribe follow-on treatment—
  - Instruct the patient to apply a topical antibiotic until re-epithelisation has taken place: chloramphenicol 1% eye ointment or 0.5% eye drops 4 times per day.
  - Follow with topical anti-inflammatory preparation: dexamethasone 0.5% drops 4 times per day and prednisolone 1% drops 4 times per day, 1 to 2 drops in the injured eye.

**2.5.5 Retinal Arterial Occlusion**

See “Section II. Diseases and Disorders According to Body Systems. Chapter 13. Ophthalmology.” for a discussion of retinal arterial occlusion.

### 2.6 Fractures, Dislocations, and Sprains

#### 2.6.1 Fractures

Fractures (broken bones) are very common injuries. Fractures are not always obvious, and X-rays are often necessary to diagnose them. The two main types are simple and compound fractures. Fractures damage not only bones, but also surrounding blood vessels, nerves, muscles, tendons, and ligaments. Sometimes internal organs could be damaged.

#### Symptoms and signs

- History of recent trauma
- Painful swelling
- Difficulties in moving
- Bone out of normal position
- Bone moves easily or is deformed
- Tenderness of bone on palpation
- An open wound
- If the limb distal to fracture is cold, pale, and has no pulse, the injury is an emergency.

#### Investigations

X-ray of the deformed, suspected area

#### Management

1. Assess the injury.
  - Examine the area of the suspected fracture for deformity, movement, and pain.
  - Examine the blood supply distal to the possible fracture. Check the pulse distal, skin warmth and colour.
  - Examine the nerve supply to the distal limb. Check sensation and movement of distal limb.
  - Examine the joints distal and proximal to the fracture for normal function and movement.
  - Do a brief general examination (i.e., check for other injuries).


**Note:** If the limb distal to the suspected fracture is cold, pale, pulseless, painful and has no sensation, the limb needs *urgent* attention.

2. Apply immediate first-aid treatment.
  - Resuscitate the patient as necessary.
  - Relieve pain. Refer to pain management.
  - Clean any open wound, and cover with sterile dressing.
  - Stop bleeding by pressure.
  - Immobilise the fracture using a splint and bandage.
  - If the fracture is severe or the patient is in shock, set up IV line of normal saline or Plasmalyte B.
  - Transfer the patient to a hospital or doctor for X-rays and further care.
3. Immobilise in the best position.
  - *Clavicle and shoulder:* An arm sling supporting the elbow
  - *Humerus:* A collar and cuff
  - *Elbow:* Immobilise with a plaster of Paris (POP) back slab bend 90°. **Note:** *Always* check pulse and sensation.
  - *Forearm:* Immobilise with a POP back slab and a sling. Keep the hand elevated to help drain oedema fluid.
  - *Wrist and hand:* Ask the patient to hold a bandage or tennis ball in the palm of injured hand, and apply a POP back slab under the wrist and hand.
  - *Fingers:* Immobilise by strapping fractured finger to the next finger.
  - *Pelvis and femur:* Immobilise whole body and transfer to hospital. Always give IV fluids.
  - *Knee and below:* Immobilise by strapping injured leg to the other leg or use a hardback slab splint. Apply POP.

## 2.6 Fractures, Dislocations, and Sprains

**Note:** When blood supply and nerves to a distal limb are seriously damaged, sometime gentle traction of the fracture can restore the blood supply to the distal limb

### 4. Provide follow-up care.

- Check that plaster casts are not too tight, too loose, or worn out. Warning signs that POP cast is too tight are swelling distally, numbness, pain, cold and bluish limb, loss of sensation. Split open POP immediately, or **refer** to hospital urgently. 
- Advise on exercises to help strengthen the healing bone.

### 2.6.2 Dislocations and Sprains

Dislocations are joints that have been displaced from their anatomical position by force. Sprains are episodes of high impact or strain on the ligaments around a joint. There is no fracture of underlying bone. Injury is to soft tissue, causing inflammation.

#### Cause

- Motor vehicle accidents
- Sports injuries
- Play in children
- Falling or tripping

#### Symptoms and signs

- Acute pain (severe, dull pain, not sharp as in fracture) around joint
- History of recent incident
- Swelling
- Redness
- Movement of sprained joint still possible but painful
- Movement of dislocated joint not possible
- Strange angulations of limb or joint
- No fever

## Management

1. Realign dislocated joint immediately.
2. If displacement not reduced, refer to hospital.
3. Provide ice packs continually.
4. Elevate joint.
5. Usually, no POP is needed.
6. Provide pain relief.
7. Administer anti-inflammatory treatment.
8. Order rest and immobilisation for 10 to 14 days.

## 2.7 Head Injuries

Head injuries cause more death and disability than any neurological disease. The brain is more sensitive to trauma than most organs and if severely damaged is unable to heal completely. Injury to the head may result in—

- Direct damage to the brain
- Rupture of blood vessels in and around the brain
- Severe swelling of brain tissue (cerebral oedema)

### Causes

- Motor vehicle accidents
- Gunshot wounds
- Falls from heights
- Blows to the head

### Symptoms and signs

The symptoms and signs depend on the severity of injury and can include the following:

- History of trauma to the head
- Impaired level of consciousness that has not been induced by drugs, medications, alcohol, or an underlying disease process
- Low GCS
- Loss of consciousness
- Headaches, drowsiness
- Restlessness

## 2.7 Head Injuries


- Intolerance to light
- Pupil size changing (i.e., dilating); unequal pupils
- Signs of elevated intracranial pressure (ICP)—
  - Change in consciousness
  - Elevated BP
  - Slow pulse and respiration
  - Vomiting
- Signs of skull base fracture—
  - Otorrhoea (i.e., blood draining from the ear or ears)
  - Rhinorrhoea (i.e., clear or pink-stained fluid [CSF] draining from nose)
  - Peri-orbital bruising (so-called *raccoon eyes*)
- Deep scalp injuries with underlying fractures of the skull
- Haemotympanum (i.e., blood behind the eardrum)
- Open skull fracture and exposed cerebral tissue

### Investigations


- GCS
- Pupillary, motor, and sensory examination and reflexes
- Do *not* do a lumbar puncture.
- Skull X-ray. If the patient has a skull fracture, refer for CT scan.
- CT scan (non-contrasted), available only in specialised centres
- Urine toxicology—only if the mechanism of injury is uncertain
- Blood alcohol levels—only if the mechanism of injury is uncertain

### Management of the unconscious patient

#### Notes:

- Hypoxia and shock should be avoided at all cost.
- **Refer** all patients to hospital. 
- Do *not* give sedatives. Sedatives should be prescribed only after a proper diagnosis has been made and specific indications are evident.

For emergency management, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of coma and unconsciousness, and follow this procedure:

1. Resuscitate using ABC.
2. Clear airway.
3. Affix a neck collar.
4. Provide supplemental oxygen therapy via facemask (6 to 10 L per minute).
5. Ensure adequate circulation.
6. Maintain adequate BP (i.e., systolic minimum of 100 mm HG).
7. Start IV fluid replacement (i.e., normal saline, Ringer’s lactate). **Note:** Be careful not to overhydrate. Avoid glucose-containing fluids.
8. Insert a urinary catheter.
9. Position patient with head slightly elevated (approximately 30°) to reduce cerebral oedema.
10. Prevent aspiration. Lay patient on his or her side.
11. Give antacids or H<sub>2</sub> antagonists (e.g., ranitidine).
12. Insert NGT. **Note:** Insert the tube through the mouth if fluids are draining from the ears or nose.
13. Treat convulsions. Refer to “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of status epilepticus (1.17).
14. Treat elevated ICP:
  - Do *not* ever give steroids.
  - Maintain airway and BP.
  - Administer mannitol infusion 0.25 g/kg over 30 to 60 minutes—only if the BP is normal and there is clinical deterioration. During transport give every 6 hours, if necessary.
15. If the patient has a skull-base fracture, no antibiotics are indicated routinely.
16. Treat open skull fracture:
  - **Refer** to hospital. 

## 2.7 Head Injuries

- Start antibiotics: chloramphenicol 1g every 6 hours plus cloxacillin<sup>1</sup> 1g every 6 hours.
- In contaminated wounds, add metronidazole 500 mg IV every 8 hours.

### Management of the conscious patient

1. Obtain and record accurate history.
2. Examine skull carefully for abrasions, contusions, and lacerations.
3. Search for other injuries.
4. If the patient is confused, suffering from amnesia, or was unconscious, observe for at least 24 hours.
5. If no improvement, refer for further investigations.
6. If improved, send home.

### Health education

- Patient should be closely observed by family members for a few days.
- Patient should return to the clinic if he or she has any continuing adverse symptoms or signs.
- Advise the patient to rest.
- Educate the patient on neurological signs to watch for.
- Advise patient to drink enough fluids and eat normally.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy



## 2.8 Limb Injuries

Any injury to a limb needs urgent assessment for damage to arteries or veins, nerves and other soft tissues.

### Causes

- Motor vehicle accident
- Stab wounds
- Shooting


### Symptoms and signs

- Pain
- Haemorrhage
- Tissue destruction
- Foreign bodies and debris
- Malformation of limb
- Loss of sensation
- Inability to move
- Cold, pale limb
- No pulse

### Management

1. Taking a history is very important. Knowing the type of trauma can determine the damage expected.
2. Determine extent and severity of injury. Make quick initial assessment.
3. Debride the area—
  - Remove all foreign bodies.
  - Clean with povidone–iodine or sterile water.
4. Stop the bleeding—
  - Apply a temporary pressure bandage.
  - Use permanent suturing. **Note:** After suturing, always check pulse, peripheral arteries, and skin temperature.
  - Refer to hospital for vascular surgery by doctor if not able to stop the bleeding or suture.
5. Examine thoroughly; make final assessment.
6. Check large arteries and veins (e.g., pulse, peripheral blood flow, and skin colour and temperature).

## 2.9 Pain

7. Check nerves for sensation, movement, and reflexes.
8. Check bones and joints for deformation and movement.
9. Check for muscle and tendon damage by examining movements of limbs.
10. Treat any disorder found.
11. If unsure, always splint and keep immobile.
12. Under most circumstances, elevate the injured limb, but if limb is cold, keep flat.
13. **Refer** to hospital urgently. 

### 2.9 Pain

---

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage, or it is described in terms of such damage; thus, it is a dual phenomenon of the perception of pain and an emotional reaction to it. Pain is a subjective sensation and is always unpleasant.

#### 2.9.1 Pain Manifestations

Often one type of pain presents in the guise of another, and the four types shown in [figure 2.9.1](#) can overlap.

##### 2.9.1.1 Physical Pain

*Physical pain* refers to the somatic source of pain and can be related to—

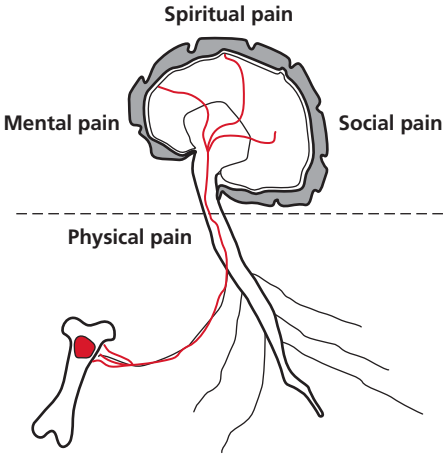
- Disease (e.g., visceral, bone, soft tissues) directly
- Treatment (e.g., neuropathy, colitis)
- Disease or treatment (e.g., post-herpetic neuralgia, deep vein thrombosis) indirectly
- Other pain (e.g., arthritis, bedsores, tension headaches)

##### 2.9.1.2 Mental Pain

Emotional pain often manifests as anxiety, such as—

- Fear of pain and suffering
- Fear of death and dying

FIGURE 2.9.1 Total pain



- Anger at being ill
- Anger at the failure of treatment
- Anger at the inability to access treatment

### 2.9.1.3 Social Pain

Social pain stems from a sense of loss and often manifests as depression—

- Loss of job and income
- Loss of position in family
- Loss of effectiveness in community
- Loss of body image
- Facing loss of life

### 2.9.1.4 Spiritual Pain

Spiritual pain occurs when a patient start to—

- Weigh the significance of his or her life
- Question the meaning of life

Spiritual pain may or may *not* have a religious component.

### 2.9.2 Assessment of Pain

#### 2.9.2.1 Pain in Adults

- Believe the patient.
- “Measure” the pain (e.g., using a numerical rating scale).
- Perform a physical examination.
- Perform a psychological evaluation.
- Make a diagnosis.

#### 2.9.2.2 Pain in Children

Use the technique outlined by the acronym QUESTT for pain assessment—

- **Q**—Question the child, if he or she is verbal and parent or caregiver in both verbal and nonverbal children.
- **U**—Use pain rating scales as appropriate.
- **E**—Evaluate behaviour and physiological changes.
- **S**—Secure the caregiver’s involvement.
- **T**—Take the cause of pain into account.
- **T**—Take action and evaluate response.

Many tools for pain assessment and following the course of child’s pain are available. Two tools requiring the child’s response are the faces scale and the visual analogue scale. The Wong-Baker Faces Scale is illustrated in [figure 2.9.2.2](#). A child who can comprehend this scale can use it to indicate pain levels.

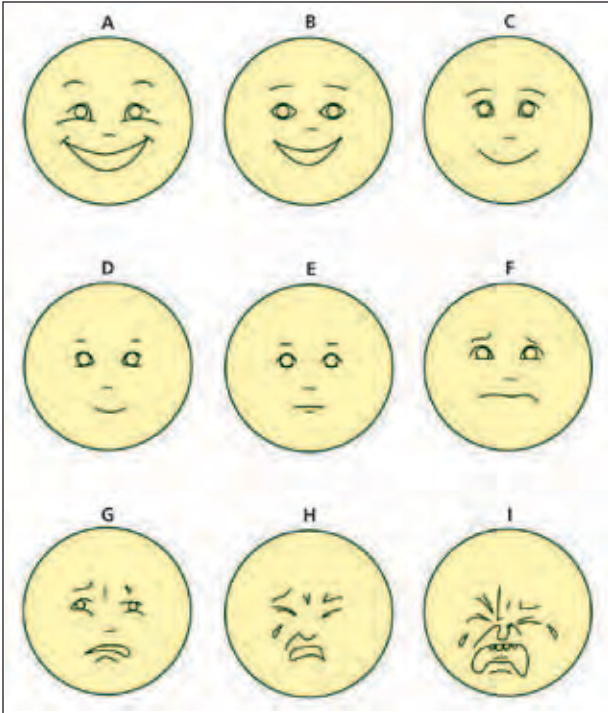
To use the visual analogue scale with an older child, ask the child about his or her pain, with 0 being no pain at all and 10 being the worst possible pain. Draw a 10 cm line (e.g., 0\_\_\_\_\_10) and let the child indicate where on the line the perceived pain level is located.

Use direct observation in nonverbal infants.

#### 2.9.2.3 History of the Patient’s Pain

Determine the following about the history of the patient’s pain—

FIGURE 2.9.2.2 The Wong-Baker Faces Scale



- Onset—How did the pain start? Did it start suddenly or slowly?
- Location—Where is pain situated?
- Intensity—Is the pain severe, moderate, or mild?
- Radiation—Where does pain spread to?
- Character—Is the pain continuous, intermittent, diffuse, sharp, dull, pressure, or throbbing?
- Aggravating factors—Do rest or movement, vomiting or eating, breathing or coughing, and positioning affect the pain?
- Relieving factors (see also aggravating factors)—What

analgesics are being taken currently? What effect do they have?

- Accompanying symptoms—Does the patient have fever, breathlessness, anxiety, vomiting, or neurological symptoms?

### 2.9.2.4 Identifying Affected Systems or Organs

Determine the location of the pain, and refer to the algorithm in [figure 2.9.2.4](#) for management.

#### Chest

- Heart—left side or central chest pain, continuous or intermittent, spread to left side of neck and left arm, pressure, dull
- Aorta—central, severe
- Pleuritis—worse when deep breathing, usually on *one side* of chest
- Lung—seldom in TB, pain when pleura involved (pneumonia), plus haemoptysis, plus cough
- Sternum or ribs—breathing increases, direct pressure tender
- Breast—local, continuous, nodule or mass or bloody discharge and check for lymph node in axilla
- Intercostal muscles—previous activity normal, history, more with deep breathing, movement

#### Abdomen

- Perform a pregnancy test if the patient is female.
- Gastritis—continuous when caused by spicy food; epigastric pain, especially with alcohol use
- Ulcer—before or after food, burning, and can spread to back
- Gallstones—cramps, right side hypochondrium, spread to shoulder blade
- Liver—dull, right hypochondrium, continuous
- Appendix—umbilical then RIF, increasing,
- Kidney stone—cramps, flank, downward, blood in urine
- Pyelonephritis—fever, severe flank pain, symptoms

and signs of UTI

- Bladder—suprapubic, frequency, dysuria
- Sigmoid colon—LIF, cramps or continuous, changed defecation

### Skin

- Herpes zoster—dermatome area, blisters at different stages, pain can occur both before and after appearance of blisters
- Ulceration—clearly demarcated, underlying history, DM
- Insect or spider bite—local lesion, sepsis around, especially if patient has history of bite
- Cellulitis—widespread area, inflamed, red swollen

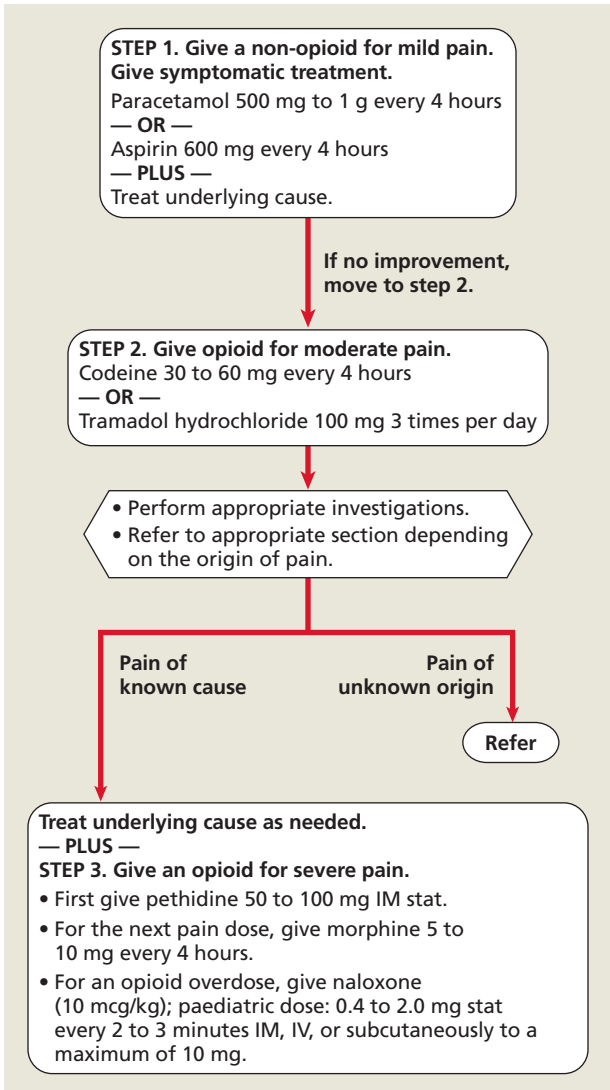
### Back pain

- Sciatic nerve—better when flexion, always radiates to some part of the leg and knee
- Lumbar pain—history of wrong positioning, better when stretching back or extension

### Headache

- Migraine—Classic migraine involves (1) visual disturbance of some sort (flashing light or even brief loss of vision), (2) nausea (and vomiting), and (3) pain—may be an aura or warning pain but then rapidly becomes intense unilateral or generalised. Often patient wants to be in a quiet, dark room.
- Tension—history of overwork and stress, dull pain usually band-like across forehead, or bitemporal, or in base of neck
- Hypertension—dull, moderate to severe, no focal signs its usually a generalised headache
- Tumour—often continuous pain in same place, neurological signs, fall-out. Classically, tumour headaches occur in the *morning* and then may or may not clear
- Malaria—high fever, anaemia, malaria area or recent visit to a malaria area, hepatosplenomegaly
- Meningitis—high fever, meningism

FIGURE 2.9.2.4 Algorithm of pain





### 2.10 Spinal Cord and Neck Injuries

#### 2.10.1 Spinal Cord Injuries

Fractures of the spinal column are serious and dangerous. Too much movement at the fracture site may cause injury to the spinal cord and result in permanent paralysis of the limbs.

##### Causes

- Motor vehicle accidents (e.g., motor car or motorcycle accident)
- Fall from a height
- All cases of near drowning, especially diving in swimming pools, farm dams, or rivers
- Stab wounds near the spine
- Gunshot injuries
- Sports injuries (especially water skiing and rugby and other contact sport)

##### Symptoms and signs

- Pain over the spine
- Paresis or paralysis of the limb
- Low BP with normal or low pulse
- Autonomic dysfunctions (e.g., urinary retention or bowel incontinence)

##### Investigations

- X-ray of the neck and spine These X-rays must always be taken in suspected cases.
- CT scan in patients who have head injuries or who are unable to cooperate

##### Management


###### In clinics, health centres, and hospitals—

- Take the necessary precautions if a spinal injury is suspected—
  1. Do *not* flex or bend the spine.
  2. Try not to move the position of the patient's back, neck, and head.

## 2.10 Spinal Cord and Neck Injuries

3. Place a rigid cervical collar around the neck or stabilise neck with blocks.
4. Move the patient carefully on to a firm base; move and turn the patient's body as a single unit.
5. Keep the head supported while moving the patient onto the base.
6. Unless the patient is critically ill, take time and care in transporting.

**For emergency management of the severely injured, follow this procedure—**

1. First attend to any life-threatening condition such as an active haemorrhage or obstructed airway.
2. Stabilize the patient's spine to prevent any further injury to the spinal cord.
3. Evaluate respiratory function (e.g., rate, depth, pattern of breathing). **Note:** Respiratory depression may occur in high cervical lesions as a result of injury.
4. Monitor the pulse, BP, and respiratory rate.
5. Give IV fluids (e.g., Ringer's lactate, Plasmalyte B, or normal saline).
6. Give nothing PO.
7. Pass an NGT, and leave to drain.
8. Insert an indwelling urinary catheter if control over bladder function has been lost.
9. Administer analgesia:
  - Give paracetamol 1g IV every 6 hours or as needed; tramadol or pethidine; and morphine low dose.
  - Do *not* give high dose of opiates because they may suppress respiratory function or anti-inflammatory medicines because they may cause gastric ulceration.
10. Pay attention to pressure points.
11. Give antacids or H<sub>2</sub> antagonists. **Note:** This step is important.
12. **Refer** to hospital urgently. 

### In hospital—

1. Give steroids.

---

**Note:** Steroids have minimal impact on outcome. Be aware of possible complications. Do *not* give steroids without prior specialist consultation or if >3 hours have passed after accident. Give methylprednisolone and not any other cortisone. Administration of methylprednisolone is as follows:

- Give within 3 hours of the injury. The earlier the better.
- Give 30 mg/kg over 1 hour followed by 5.4 mg/kg per hour for 23 hours.

2. Transfer to spinal unit for specialist care.

### 2.10.2 Neck Injuries

Spinal injuries are seen more commonly in the cervical region than in the thoracic and lumbar regions. Cervical injuries are usually more serious, associated with more severe spinal injuries and hold a greater risk of permanent disability.

#### Causes

- Motor vehicle accidents, such as a whiplash injury
- Sports injuries

#### 2.10.2.1 Soft Tissue Injuries

The first type of neck injury to look for is a soft tissue injury.

#### Symptoms and signs

- History of trauma
- Stiff painful neck
- No neurological deficit
- Local pressure tenderness
- Sometimes severe limitation on movement of neck

### Management

**Note:** Regard all neck injuries as potentially unstable and refer patient for medical management and X-rays of the neck after emergency management (see discussion of spinal injuries above)

1. Apply a rigid neck collar.
2. Give analgesia for the pain (e.g., paracetamol) or and anti-inflammatory (e.g., diclofenac or ibuprofen). Give anti-inflammatories only if no spinal injury suspected.
3. Refer to hospital for neck X-ray and medical management.

### 2.10.2.2 Cervical Fractures

Cervical fractures may or may not be associated with spinal cord injuries. Spinal cord injuries could be—

- *Incomplete:* the patient has sparing of motor or sensory function (i.e., an area of sensation or a flicker of voluntary movement below the lesion)
- *Complete:* identified by poor prognostic signs (see below) in the absence of spinal shock


### Symptoms and signs

- Severe neck pain or severe pain in a specific area of the back
- Feeling of pins-and-needles or paraesthesia in the limbs:
  - In the hands and arms, the sensation indicates a cervical vertebrae (neck) lesion
  - In the lower limbs, it indicates a thoracic or lumbar vertebrae lesion
- Unexplained shock (i.e., bradycardia, hypotension, cold feet)
- Tenderness and pain or redness or injuries over fractured vertebrae
- Loss of sensation in the limbs or below the fracture
- Paralysis of the limbs below the fracture

- Unexplained respiratory difficulty or marked diaphragmatic breathing
- Little or no control over micturition (i.e., urinary incontinence or retention and loss of bowel control)
- Priapism in males (i.e., inappropriate penile erection)

### Management

**In clinic or health centre (see procedure for spinal cord injury above)—**

1. Examine entire spine carefully. **Note:** If the patient has pain or decreased movement, suspect neck injury.
2. Do *not* bend or flex spine.
3. Apply rigid neck collar.
4. Give pain relief (e.g., paracetamol).
5. **Refer** to hospital urgently. 
6. Transport carefully on firm base.

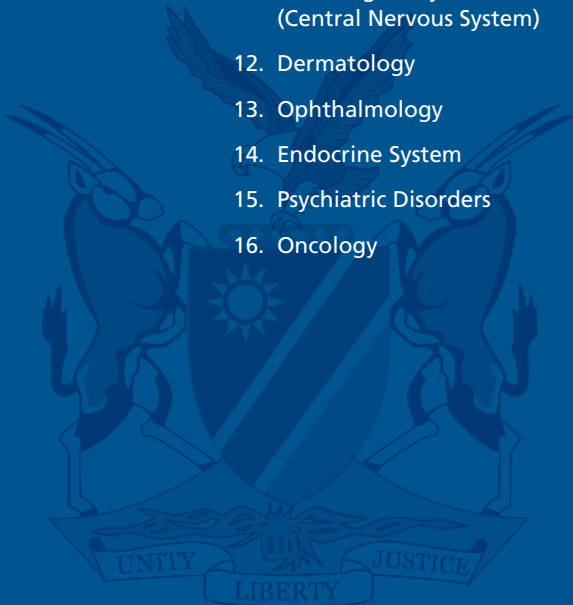
**In hospital—**

1. Transfer to spinal unit for specialist care.



# Diseases and Disorders According to Body Systems

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### 3.1 Cardiac Arrhythmias

Cardiac arrhythmias are disorders of cardiac rate, rhythm, and conduction. Arrhythmias can come from the atria or ventricles. The following are examples of common arrhythmias:

- Bradycardia (heart rate [HR] <60 per minute)
- Tachycardia (HR >100 per minute)
- Atrial fibrillation (irregular pulse)
- Atrial flutter (approximately 300 per minute)
- Complete heart block (very slow and regular HR)
- Extrasystoles “jumping heart”
- Supraventricular tachycardia (fast but regular HR)
- Ventricular tachycardia
- Ventricular fibrillation is an *emergency*.

#### Causes

- Rheumatic heart disease
- Ischaemic heart disease
- Hypertension
- Thyrotoxicosis
- Cardiomyopathy
- Hypokalaemia
- Digitalis poisoning
- Pericardial disease
- Recent cardiac surgery
- Excessive ingestion of caffeine (e.g., tea or coffee)
- Chronic alcohol abuse
- Medications—
  - Cough and cold medicines containing CNS stimulants
  - Herbal medicines (e.g., ginseng)
- Others—stress, tobacco

#### Symptoms and signs

- Palpitations (an awareness of the heart beat)
- Dizziness
- Syncopal attacks, sudden death
- Chest discomfort, dyspnoea
- Headache



**Note:** If danger signs (i.e., chest pain, cardiac disease, dyspnoea, dizziness, or syncope) are present *always refer*. ⚠️  
A patient with intermittent arrhythmias can have a normal cardiac rhythm in between attacks.

During an arrhythmia, examination of peripheral pulses and the heart may give an indication of the diagnosis as follows.

- *Atrial fibrillation*—Pulse rhythm and volume are irregular.
- *Extrasystoles*—Pulse is basically regular, but missed beats may occur either at regular or random intervals.
- *Paroxysmal supraventricular tachycardia*—Pulse rate is usually fast and regular between 140 and 220 beats per minute.
- *Complete heart block*—Pulse is slow (30 to 50 per minute) and regular.

### Investigations

- ECG
- FBC, U+E, calcium, magnesium
- CXR
- Thyroid functions
- Digitalis blood levels
- Echocardiogram

### Management

**Management objectives are to—**

- Control the heart rate
- Restore sinus rhythm (if possible)
- Prevent or treat associated complications
- Treat the underlying condition

**Note:** Using an anti-arrhythmic medicine is dangerous without first doing an ECG.

## 3.1 Cardiac Arrhythmias

### Management procedure—

1. Always rule out a carotid bruit before massage because of the danger of dislodging thrombus causing embolus.
2. Refer symptomatic patient to next level immediately.
3. Do an ECG.
4. Sedate an awake patient with midazolam 2.5 to 5.0 mg IV stat.
5. Give analgesia morphine 2.5 to 5.0 mg IV stat.
6. Treat acidosis.
7. Correct electrolyte imbalances.
8. Decide on DC shock.

---

### Notes:

- Choice of medicine treatment depends on the type of arrhythmia and severity of symptoms.
  - Precipitating conditions should be treated.
  - Refer all patients for specialist evaluation, even when the arrhythmia is controlled.
- 

### Health education

- Reassure the patient.
- Instruct the patient to avoid an excessive intake of alcohol, coffee, or tea (if these are the precipitating factors).

## 3.2 Chest Pain

### Causes

- Originating from heart and aorta (see 3.5 below in this chapter for a discussion of ischaemic heart disease)
  - Ischaemic heart disease (i.e., angina pectoris, myocardial infarction)
  - Acute pericarditis
  - Dissecting aortic aneurysm
- Originating from lungs and pleura (see “Section II. Diseases and Disorders According to Body Systems. Chapter 5. Respiratory System”)
  - Pneumonia with pleurisy
  - Pleural effusion
  - Pulmonary embolism
  - Pneumothorax
- Originating from oesophagus (see “Section II. Diseases and Disorders According to Body Systems. Chapter 7. Gastrointestinal System”)
  - Reflux oesophagitis
  - Hiatus hernia
- Originating from chest wall (See “Section II. Diseases and Disorders According to Body Systems. Chapter 10. Musculoskeletal System”)
  - Costochondritis
  - Rib fractures
  - Intercostals myalgia or neuritis

**Note:** Take a detailed history of the patient to include the following:

- *Site of pain:* located centrally, sternally, lateral over chest wall, over ribs, front or back?
- *Time of onset:* at day or night, at rest or during exertion, with movements or deep breathing?
- *Duration of pain:* all the time, intermittent, only sometimes at night?
- *Nature of pain:* sharp burning, dull, pressure-like, light or severe?

## 3.2 Chest Pain

- *Radiation*: to arms, neck, back, or shoulder blades?
  - *Relieving and worsening factors*: better when resting, worse on movement or exercise, shallow breathing relieves pain?
- 

### Investigations

- Heart (See 3.5 below of this chapter for a discussion of ischaemic heart disease.)
  - Resting ECG
  - Sonar or ultrasound
- Lung
  - CXR
  - Sputum MCS
- Gastrointestinal tract
  - Gastroscopy

### Management

Management is done according to the cause; refer to the appropriate section of this manual.

### 3.3 Congestive Heart Failure

Congestive heart failure (HF) is the inability of the heart to pump the needed amount of blood through the circulatory system, leading to oedema of the lower limbs and lungs and swelling of the liver.

#### Causes

- Cardiomyopathy (e.g., idiopathic, alcohol-induced, ischaemic, HIV-induced, or postpartum)
- Rheumatic valvular disease
- Hypertension
- Congenital heart disease
- Severe anaemia
- Lung disease (e.g., pulmonary embolism, pulmonary hypertension, pulmonary stenosis)
- Medicines (e.g., digoxin, beta blockers)
- Infections (e.g., endocarditis and myocarditis)

#### Symptoms and signs

- Left HF
  - Dyspnoea on exertion
  - Paroxysmal nocturnal dyspnoea; difficulty breathing at night when lying down
  - Orthopnoea (the patient can breathe better in an upright position)
  - Wheezing
  - Cough with frothy sputum, occasionally pink
  - Tachycardia
  - Tachypnoea (i.e., rapid breathing)
  - Crepitations over the lungs
  - Changes in heart sounds or rhythm
  - Apex beat displaced (i.e., large left ventricle)
  - Anxiety, sweating, and nasal flare
- Right HF
  - Swelling of lower limbs
  - Fatigue
  - Enlargement of the liver

## 3.3 Congestive Heart Failure

- Swelling of blood vessels in the neck (i.e., jugular vein distended)
- Ascites (i.e., abdominal swelling due to fluid)
- Cyanosis, paleness
- Anxiety, sweating, and nasal flare (more common in left HF)
- In children
  - Failure to thrive
  - Difficulty in feeding

### Investigations

- FBC
- U+E
- Creatinine
- Glucose
- LFT
- Troponin T, cardiac enzymes if MI expected
- CXR
- ECG
- Heart sonar

### Management

The objectives of HF management are to—

- Reduce symptoms and improve cardiac function
- Correct underlying cause and aggravating factors
- Prevent deterioration of cardiac function

Follow this procedure.

1. When the patient first presents, take the initial steps.
  - Reassure the patient.
  - Place the patient in an upright position.
  - Give oxygen.
  - Give furosemide 40 mg IV or IM stat (only if severely dyspnoeic).
  - Correct underlying cause (e.g., hypertension, arrhythmia, anaemia, or pulmonary infection)

---

### Notes:

- For recommendations on giving thiamine, see “Section I. Common Emergencies and Trauma. [Chapter 1.](#)”

## 3.3 Congestive Heart Failure

Emergencies” for a discussion of alcohol abuse.

- Dosages for medicines need to be adjusted for children.
- 
2. Prescribe an ACE inhibitor—perindopril 2 mg PO daily at night and increase to 4 mg daily if necessary (contraindicated if systolic BP <105 mm Hg).
  3. Administer medicine to treat fluid retention.
    - Diuretics should be used if the patient has symptoms of fluid overload.
      - If overload is mild, use amiloride/hydrochlorothiazide (5 mg/50 mg) 1 tablet daily.
      - If moderate to severe or if the patient has renal impairment, use furosemide 20 to 160 mg daily given in 1 to 2 divided doses.
    - Add potassium chloride tablets 600 mg daily only with high doses furosemide >80 mg.

— OR —

    - Add spironolactone 25 to 50 mg daily in single doses.
  4. Administer digoxin.
    - Loading dose:
      - If urgent: 500 mcg stat then 250 mcg every 8 hours for 3 doses.
      - If less urgent: 125 to 250 mcg 2 times per day for 7 days.
    - Maintenance: Usually 125 to 250 mcg once daily

---

**Note:** Step 4 is first-line treatment, especially if patient has concurrent atrial fibrillation. Reserve for patients with systolic dysfunction who are not responding adequately to perindopril plus diuretic

---

5. Administer isosorbide dinitrate.
  - Dosage: 40 mg 2 times per day up to 3 times per day if not responding.
  - Allow for a nitrate-free period.
  - Consider in patients who are not responding to perindopril plus diuretic with or without digoxin.

### 3.3 Congestive Heart Failure

- If still unsatisfactory, consider referral to specialist physician.
- 6. Administer additional medications.
  - Beta-blockers: start low dose once compensated (i.e., no fluid overload)  
—— OR ——
  - A combined alpha-beta blocker may be used (e.g., carvedilol)

#### Health education

- See the patient at least monthly.
- Control the blood pressure.
- Look for oedema, enlargement of the liver, and crepitations over the lungs and swelling of neck veins.
- Advise the patient that if symptoms and signs recur, to seek help from the nearest facility.
- Continue prescribed treatment, if patient is stable.
- Advise patient to follow a healthy low-fat, low-salt diet (see “Section IV. Diseases and Disorders According to Body Systems. Chapter 14. Endocrine System” for a discussion of cholesterolaemia dietary measures) and to lose weight if overweight or obese (see “Section III. Nutrition and Lifestyle” for a discussion of obesity). Refer to dietician.
- Instruct the patient to rest frequently to reduce the workload of the heart.
- Recommend low-grade exercise such as walking under supervision.
- Urge the patient to take his or her medications regularly.



### 3.4 Hypertension (High Blood Pressure)

Hypertension is blood pressure (BP) that is consistently above 140/90 mm Hg. To get an accurate reading, take 3 measurements during at least 2 different occasions. Classifications are shown in [table 3.4A](#). **Note:** BP is always measured after at least 5 to 10 minutes of rest, using the appropriate cuff size and taken at the level of the heart.

TABLE 3.4A Classification of Hypertension

Classification (JNC7) <sup>a</sup>	Systolic BP (mm Hg)	Diastolic BP (mm Hg)
Normal	<120	<80
High normal— Pre-hypertension	120 to 139	80 to 89
Mild hypertension—Stage 1	140 to 159	90 to 99
Moderate to severe hypertension—Stage 2	>160	>100

<sup>a</sup> JNC7 is the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*.

#### Causes and risk factors

- Smoking
- Dyslipidaemia
- Obesity (especially a large waist circumference and abdominal obesity)
- Lack of physical exercise
- Family history of hypertension or cardiovascular disease
- Diabetes mellitus
- Drug/medicine intake or caffeine
- Renal or cardiovascular disease

#### Symptoms and signs

- Often, no symptoms at all
- BP raised as described in [table 3.4A](#)
- Occasional headaches
- Dizziness

## 3.4 Hypertension (High Blood Pressure)


If high blood pressure is combined with one of the symptoms or signs in [table 3.4B](#), **refer** the patient immediately. 

TABLE 3.4B Symptoms and Signs of Danger

Symptoms	Signs
<ul style="list-style-type: none"><li>• Severe headache</li><li>• Vertigo</li><li>• Confusion</li><li>• Drowsiness</li><li>• Coma</li><li>• Impaired vision</li><li>• TIAs</li><li>• Sensory or motor deficit (paralysis)</li><li>• Palpitations, chest pain</li><li>• Shortness of breath, difficult breathing</li><li>• Swollen ankles</li><li>• Thirst, polyuria, and nocturia</li><li>• Haematuria</li><li>• Cold extremities</li><li>• Intermittent claudication</li></ul>	<ul style="list-style-type: none"><li>• Motor or sensory defects</li><li>• Fundoscopic abnormalities</li><li>• Murmurs over heart and neck</li><li>• Arrhythmias</li><li>• Left ventricular hypertrophy</li><li>• Rhonchi and crepitations</li><li>• Peripheral oedema (legs)</li><li>• Proteinuria, raised creatinine</li><li>• Pulses absent or weak, ischaemic skin lesions</li></ul>

### Complications

- Retinopathy (eye problems)
- Stroke or CVA
- Angina, MI
- Kidney failure
- Impotence
- Peripheral arterial and/or vascular disease

### Investigations

- Body weight, body mass index, abdominal circumference
- Urine dipsticks, urinalysis (protein, glucose and blood)
- U+E and creatinine (baseline *and* annual)
- Blood glucose (fasting)
- Lipids (cholesterol and triglycerides)
- ECG and/or CXR

### Management objectives

- Avoid causes and any aggravating factors.
- Control blood pressure—
  - Target BP is <140/90 mmHg but difficult to achieve in all cases
  - Target BP for those with other risk factors should be  $\leq 130/80$

### Management of mild hypertension (JNC7 stage 1)

If the patient has no sign of complications and high normal to mild BP, follow this procedure—

1. Provide health education and nonpharmacological measures.
  - Recommend dietary measures. The following are only basic guidelines. Refer the patient to a registered dietician for individualized dietary counselling. (See also “[Section III. Nutrition and Lifestyle](#).”)
    - Lose weight if overweight or obese.
    - Decrease salt (i.e., sodium) intake. Instead, use herbs, garlic, chilli pepper, and curry to flavour food.
    - Restrict alcohol intake.
    - Reduce intake of coffee and other caffeine-containing beverages.
    - Increase calcium intake by including two portions of fat-free or low-fat dairy products in the diet daily.
    - Increase sources of folic acid and vitamins B12 and B6 (such as legumes, whole grain cereals and starches, eggs, fish, and meat).
    - Decrease saturated fat intake and increase unsaturated fat consumption, especially omega-3 fat sources such as fatty fish (e.g., mackerel, sardines, haddock, pilchards, salmon, and tuna).
    - Increase fruit and vegetable intake.
  - Urge the patient to stop smoking.

## 3.4 Hypertension (High Blood Pressure)

- Recommend daily exercise, but only mild or moderate exercise (i.e., nothing strenuous).
  - Prescribe long-term stress medication if necessary.
2. Check BP monthly. If no improvement after 3 months, start hypertension medication.

### Management of moderate to severe hypertension (JNC7 stage 2)

If the patient has no organ damage or symptoms and signs of complications, follow this procedure—

1. Administer thiazide diuretic—amiloride/hydrochlorothiazide (5 mg/50 mg) half a tablet daily.
2. If no response, add ACE inhibitor—
  - Perindopril 4 to 8 mg daily
  - Check creatinine 2 to 3 days after starting.
3. If no response, change to calcium channel blocker—
  - Verapamil 80 mg 3 times per day
  - OR ——
  - Isradipine 2.5 to 5.0 mg 2 times per day
  - Do not give the two together, if possible.
4. If no response, consider one of the following:
  - Beta blocker—atenolol starting with 50 mg daily (take resting pulse regularly)
  - Alpha blocker—doxazosin 1 mg daily initially, increase to 2 mg daily after 1 to 2 weeks and thereafter to 4 mg daily if necessary; maximum, 16 mg daily
  - Methyldopa 250 mg 2 times per day up to 3 times per day initially. Increase gradually to a maximum of 1 g daily. Do *not* use with reserpine.
  - Change thiazide to a loop diuretic (e.g., furosemide 40 to 80 mg once daily)
5. If no response, consider minoxidil, usually in combination with a beta blocker and diuretic and perindopril as well as a calcium channel blocker.

**Note:** Always maximise the current medication before adding additional treatment. Most patients need more than one anti-hypertensive medicine to control BP, so

## 3.4 Hypertension (High Blood Pressure)

treatment needs to be individualised. Continue health education and dietary measures (see instructions above for management of mild hypertension), and refer the patient to a dietician for individualized dietary counselling.

---

### Management of a hypertensive crisis

A hypertensive crisis is defined as organ damage and/or systolic >180 mm Hg and diastolic >110 mm HG. (See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of hypertensive emergency.)

### Health education

- Recommend a special hypertension clinic.
- Review all patients monthly.
- Check BP, weight, and urine in clinic.
- Enquire about general health and side effects of the medication
- Reinforce dietary measures and health education (see instructions above for management of mild hypertension).
- Perform U+E and creatinine tests once a year, or more frequently if BP is severe or proteinuria is present.

### 3.5 Acute Ischaemic Heart Diseases

#### 3.5.1 Angina Pectoris

Angina pectoris is severe, central, crushing, retrosternal chest pain often brought on by exertion, heavy meals, or severe stress (tension and anxiety). It usually does not radiate to the neck, arms or epigastric region. It can be intermittent and relieved by rest.

#### Causes and risk factors

Any circumstance leading to the narrowing of the coronary arteries and resulting in insufficient blood supply to the heart muscle can cause angina, including—

- Smoking
- Hypertension
- High blood lipid levels or hypercholesteraemia (family history of hyperlipidaemia)
- Obesity or overweight
- Lack of exercise (i.e., a sedentary lifestyle)
- Stress
- High level of homocysteine
- Diabetes mellitus
- Family history of coronary artery disease
- Age (i.e., risk increases with age)
- Sex (more common in men than women)

#### Symptoms and signs

Central crushing chest pain that—

- Increases with exercise or emotional stress
- Is relieved with rest
- Can be intermittent
- Usually does not radiate

#### Investigations

- Resting ECG
- Sonar or ultrasound
- FBC, U+E, cardiac enzymes, cholesterol or lipogram
- Coronary angiography

### Management

#### In clinic or health centre—

1. Reassure the patient.
2. Refer to next level.

#### In hospital—

See also “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of MI and unstable angina.

1. Reassure the patient.
2. Evaluate to exclude MI.
3. For unstable angina (i.e., increasing frequency of attacks, severe, and occurring at rest), admit the patient to the ICU.
4. Enforce strict bed rest (for unstable angina).
5. Confirm the diagnosis; take a resting and stress ECG and, when possible, a coronary angiography.
6. Start oxygen via face mask (for unstable angina).
7. Give aspirin 300 mg stat, then 75 to 150 mg daily.
8. Administer lipid-lowering treatment, if indicated.
9. For patients having acute attacks, follow this procedure—
  - Step 1. Administer glyceryl trinitrate (GTN) tablets 500 mcg sublingually as needed. If episodes occur more than 2 times per week, move to the second step.
  - Step 2. Add a beta blocker—atenolol 50 to 100 mg/day given in 1 or 2 doses.
  - Step 3. Contraindications to beta blockers include asthma, obstructive airways disease, heart failure, and heart block.
  - Step 4. Add a nitrate—isosorbide dinitrate 10 to 40 mg 3 times per day; use nitrate as the second step if patient has left ventricular impairment.
  - Step 5. Add a calcium-channel blocker (unless patient is already receiving verapamil)—diltiazem 60 to 120 mg 3 times per day. Verapamil may be used over the long term.

## 3.5 Acute Ischaemic Heart Disease

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**Note:** Heparin 5,000 IU IV plus aspirin (300 mg PO stat) reduce incidence rate of MI.

---

### 3.5.2 Acute Myocardial Infarction

See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of MI and unstable angina.

### 3.5.3 Peripheral Artery Disease

See [3.6](#) below for a discussion of peripheral vascular disorder.

### 3.5.4 Pulmonary Oedema

See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of pulmonary oedema.



### 3.6 Peripheral Vascular Disease

#### 3.6.1 Deep Venous Thrombosis

Deep venous thrombosis (DVT) is usually due to blockage of a normal blood vessel by a clot (e.g., a large vein in the leg).

##### Risk factors

- Age
- Obesity
- Varicose veins
- Prolonged travel
- Immobility or bed rest
- Pregnancy
- History of previous DVT
- Surgery
- Cardiac problems
- Medicines (e.g., oestrogen in high doses)
- Polycythemia (high haematocrit)
- Thrombotic and other haematological diseases

##### Symptoms and signs

- Pain in lower leg
- Swelling
- Inflammation (warmth, redness, swelling, loss of function)

##### Investigations

- Doppler or ultrasound
- Venogram
- Coagulation screen: FBC, INR, PTT

##### Management

###### In clinic, health centre, or hospital—

1. Enforce bed rest.
2. Elevate the limb.
3. Provide pain relief. (See “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of pain.)
4. Refer to hospital.

## 3.6 Peripheral Vascular Disease

### In hospital—

1. Obtain evidence of thrombosis.
2. Do a coagulation screen.
3. Start anticoagulants—
  - Heparin: 5,000 IU IV (loading dose), then IV infusion of 1,000 to 2,000 IU per hour

—— OR ——

  - Heparin: 1 mg/kg subcutaneously every 12 hours
  - Check PTT.

—— PLUS ——

  - Warfarin: 5 to 10 mg PO; start at same time as heparin then adjust dose according to INR (2 to 3 × control)
    - Discontinue heparin if INR is in therapeutic range.
    - Continue at least 6 weeks to 6 months.
    - **Note:** Paracetamol is preferred because NSAIDs may increase risk of bleeding.

### 3.6.2 Peripheral Arterial Disease

Peripheral arterial disease (PAD) is a condition in which the arteries that carry blood to the legs (and, rarely, the arms) become narrowed or obstructed, interfering with normal blood flow. **Note:** All arteries are at risk.

#### Causes

- Hardening of the arteries (i.e., arteriosclerosis)
- Build up of plaque (hard, fat-laden tissue)
- Narrowing of the arteries

#### Symptoms and signs

- Most people have no symptoms; only 1 in 3 have symptoms.
- Absent pulses in the limbs
- Leg pain (i.e., discomfort in the calves, thighs, and buttocks)
- Intermittent claudication (e.g., pain after walking a certain distance)

- Pain disappearing with rest
- Tingling, numbness
- Skin discoloration
- Hair loss on feet or toes
- Arms and other arteries in the body may be affected (consider heart attack or stroke)

### Investigations

- Doppler ultrasound test
- X-ray, angiography
- Magnetic resonance angiography (MRA)

### Management

1. Provide health education. Advise the patient to—
  - Stop smoking.
  - Lose weight, if overweight or obese. (See “Section III. Nutrition and Lifestyle” for a discussion of obesity.)
  - Eat a healthy, low-fat diet. (see “Section IV. Diseases and Disorders According to Body Systems. Chapter 14. Endocrine System” for a discussion of dietary measures under cholesterolaemia). Refer the patient to a dietician.
  - Be active and exercise regularly (e.g. brisk walking, vigorous housework, or swimming)
2. Continue previously prescribed medicines, such as—
  - Anti-hypertensives
  - Cholesterol-lowering agents
  - Anti-diabetic agents
3. Start antiplatelet therapy— Give aspirin 150 to 300 mg PO daily.
4. Perform an angioplasty.
5. Perform peripheral bypass surgery.

## 4.1 Anaemia

*Anaemia* may be defined as a haemoglobin (Hb) level that falls below the reference ranges for the age and sex of the individual, as shown in [table 4.1](#).

**TABLE 4.1 Normal Reference Haemoglobin Values**

Adults (>13 years)	Haemoglobin (g/dL)
Males	14.3 to 18.3
Females	12.1 to 16.3
Infants and Children	Haemoglobin (g/dL)
Birth	18.0 to 27.0
1 day to 1 week	16.0 to 25.5
1 week to 1 month	12.0 to 21.8
1 month to 6 months	10.0 to 15.0
6 months to 2 years	10.5 to 13.7
2 to 3 years	10.8 to 14.2
3 to 5 years	11.1 to 14.7
5 to 8 years	10.7 to 15.1
8 to 13 years	10.3 to 15.5

Source: Adopted from South Africa Institute of Medical Research (SAIMR) Reference Ranges for Haematology.

### Causes

- Increased loss of red blood cells—
  - Acute blood loss: traumatic, surgical, or obstetric haemorrhage
  - Chronic blood loss: usually from gastrointestinal, urinary, or reproductive tracts (e.g., parasitic infestation such as hookworm, inflammatory disorders, malignancy, and menorrhagia)
- Decreased production of normal red blood cells—
  - Nutritional deficiencies: iron, vitamin B12, folate, malnutrition, malabsorption, and in the newborn, vitamin K
  - Viral infections: HIV
  - Bone marrow failure: aplastic anaemia, malignant infiltration of bone marrow, leukaemia

- Reduced erythropoietin production: chronic renal failure
- Chronic illness (e.g., cancer, HIV, TB, leukaemia or other blood cancers)
- Lead poisoning
- Increased destruction of red blood cells (haemolysis)
  - Infections: viral, bacterial, parasitic (e.g., malaria)
  - Medicines: sulphonamides, methyldopa, dapsone, chemotherapy, ARVs, lead poisoning
  - Autoimmune disorders: antibody-mediated haemolytic disease
  - Inherited red cell or haemoglobin disorders: sickle cell disease, thalassaemia, G6PD deficiency, spherocytosis
  - Haemolytic disease of the newborn (HDN)
  - Other disorders: disseminated intravascular coagulation, haemolytic uraemic syndrome, thrombotic thrombocytopenic purpura, hypersplenism

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**Notes:**

- Anaemia is *not* a diagnosis.
  - A careful history and physical examination with the help of a variety of laboratory tests is essential to determine the cause of the anaemia.
  - HIV medicines (e.g., zidovudine) can cause anaemia.
- 

**Symptoms and signs**

- Tiredness, weakness
- Exercise intolerance
- Pale colour of skin and mucosa
- Dizziness, faintness, headaches
- Intermittent claudication

**Symptoms of decompensation**

- Rapid heartbeat or palpitations
- Dyspnoea
- Signs of heart failure—
  - Oedema (in severe cases)

## 4.1 Anaemia

- Low central venous pressure, low blood pressure, low urine output, shock
- Poor peripheral perfusion
- Hepatosplenomegaly

### Investigations

- Ward Hb, urine dipsticks, and test for faecal occult blood
- Red cell morphology—
  - FBC including differential WCC and with red cell indices (parameters): MCV, MCH, MCHC, reticulocyte count
    - ◆ High MCV indicates vitamin B12 or folate deficiency megaloblastic anaemia, thyroid disease, chronic alcohol ingestion, cytotoxics, and antifolate medicines.
    - ◆ Normal MCV indicates acute blood loss, pregnancy, renal failure, bone marrow infiltration or suppression, anaemia due to chronic disease.
    - ◆ Low MCV indicates iron deficiency, sideroblastic anaemia, thalassaemia (suspect if level is too low for the level of anaemia and RBC is raised).
    - ◆ Increased reticulocytes indicate haemolytic anaemia.
  - Other studies in special conditions include—
    - ◆ Malaria smear
    - ◆ Peripheral blood smear (where diagnosis is uncertain)
    - ◆ Nutritional deficiencies: iron studies, serum ferritin, serum vitamin B12, serum folate
    - ◆ Decreased production: reticulocyte count, bone marrow aspiration
    - ◆ Haemolysis: LDH, haptoglobin, indirect bilirubin
    - ◆ Infections and infestations: blood smear, stool analysis

### Management

See [figure 4.1](#) for a management algorithm.

**Management in clinic, health centre, and hospital—**

1. Check the haemoglobin level.
2. If Hb is <6 g/dL, refer to hospital.
3. If Hb is 6 to 10 g/dL and—
  - The patient is asymptomatic and not acutely bleeding, find the cause of the anaemia.
  - The patient is symptomatic or decompensating, refer to hospital. (See 4.3 of this chapter for a discussion of blood and blood products.)
4. If Hb is >10 g/dL but below normal value, give dietary advice and follow up regularly.

**Management in hospital—**

1. Determine the cause of the anaemia and treat accordingly.
2. Transfuse under the following conditions.
  - If Hb is <6 g/dL in acute anaemia transfusion is usually necessary.
  - If Hb is <6 g/dL in chronic anaemia, transfusion might not be necessary, but assess clinically.
  - If Hb is 6 to 10 g/dL, re-evaluate taking principles of good transfusion practise into consideration.
  - If Hb is >10 g/dL, no transfusion is necessary.
  - In severe anaemia in malnourished children, a blood transfusion is required if Hb is less than 4 g/dL or if the child is in respiratory distress and Hb is 5 to 6 g/dL. Give—
    - Red cell concentrate 10 mL/kg body weight slowly over 3 hours
    - Furosemide 1 mg/kg IV at the start of the transfusion
  - Be careful not to exceed the volume of 10 mL/kg (total) in severely malnourished children.

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**Note:** If the severely anaemic child has signs of cardiac failure, transfuse only 5 to 7 mL/kg.

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3. Address dietary measures for nutritional causes. Advise the patient to—
  - Eat a healthy diet (see “Section III. Nutrition and

## 4.1 Anaemia

Lifestyle” for a discussion of a healthy diet). Refer the patient to a registered dietician for dietary counselling.

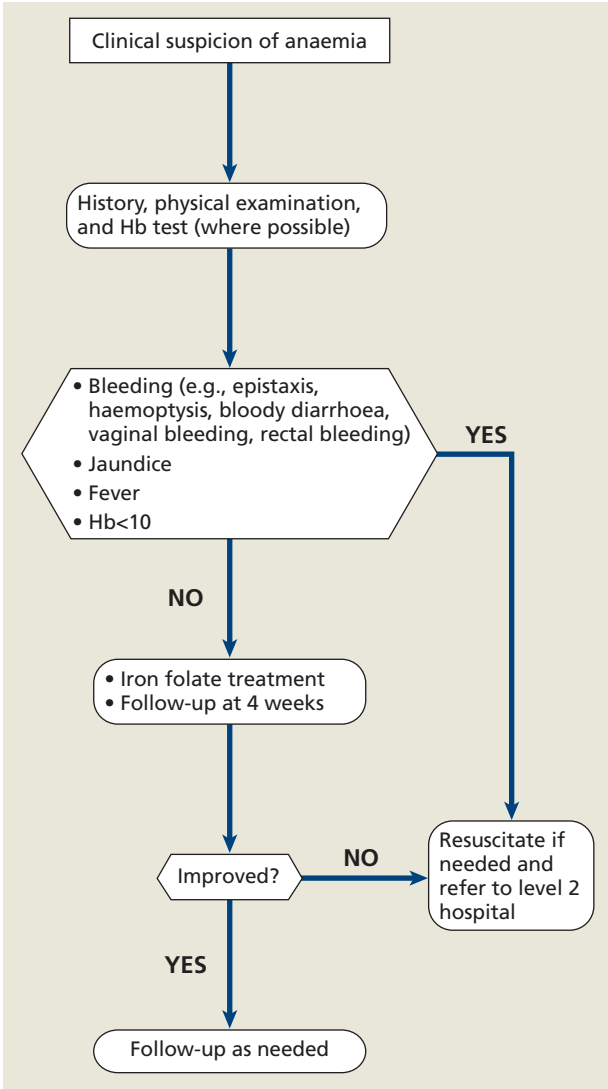
- Eat especially iron-rich foods such as liver; beef kidneys; molasses; meat; sardines; oysters; chicken liver; eggs; dried apricots, prunes, peaches, and raisins; and fresh green leafy vegetables.
  - Avoid drinking non-herbal tea, coffee, milk, and milk products with meals (especially with those meals containing iron-rich foods) because these items decrease the absorption of iron from food.
  - Eat or drink a vitamin C-rich food or drink with meals (e.g., oranges and other citrus fruit, guavas, tomatoes, potatoes, fresh green vegetables, broccoli, cauliflower, peppers, or fresh chillies).
4. If iron deficiency anaemia is suspected or confirmed—
- Treat pregnant women with ferrous fumarate (60 mg)/folic acid (400 mcg) once daily for 1 month.
  - Treat other patients 5 years or older with ferrous sulphate (65 mg iron)—adults: 130 mg PO daily for 1 month.
  - Enteric coated tablets and sustained release capsules should be avoided in children. Give ferrous gluconate syrup 250 mg/5mL.
  - Check Hb after 3 weeks. If Hb has not increased by at least 1 g/dL, refer to hospital.

### Health education

- Advise patient on prevention of anaemia—
  - Healthy diet
  - Malaria prevention
  - General hygiene
- Explain the side effects of oral iron therapy: diarrhoea, abdominal discomfort, constipation, or black stools.
- Instruct the patient to return for follow-up after 1 month, or earlier if there are symptoms of decompensation.



FIGURE 4.1 Anaemia management algorithm



### 4.2 Bleeding Disorders

A bleeding disorder is suspected if a patient has unexplained bruising and bleeding (i.e., no history of trauma). Prolonged bleeding (or oozing) can also occur after injury or surgery (e.g., tooth extraction, small cut).

#### Causes

- Blood vessel defect—
  - Age (e.g., easy bruising, senile purpura)
  - Acquired (e.g., severe infections, a side effect of medicines such as steroids or NSAIDs)
  - Genetic (e.g., hereditary telangiectasis, connective tissue disorders)
- Platelet defect—
  - Decreased platelet number (e.g., from blood cancers, aplastic anaemia, medicines, chemicals, viruses)
  - Platelet defects
  - Increased destruction (e.g., autoimmune disease, heparin, hypersplenism, massive blood transfusion, DIC, TTP, uraemia)
- Coagulation defect—
  - Hereditary (e.g., haemophilia A or B, von Willibrand's disease)
  - Acquired (e.g., anticoagulant treatment, liver disease, alcoholism, DIC)
  - Vitamin K deficiency in the neonate
- Infections such as haemorrhagic fevers
- Idiopathic onychia
- History—
  - Family history
  - Medicine or alcohol use
  - Liver disease

#### Symptoms and signs

- Bruising of skin, petechiae, ecchymoses, purpura
- Bleeding from mucosal membranes
- Epistaxis (i.e., spontaneous nosebleeds)

- Haemarthrosis (i.e., bleeding into joints)
- Haematomas (i.e., bleeding into muscles)
- Bleeding in GIT, melena (i.e., black stools)
- Bleeding into the brain
- Prolonged bleeding after operations, injuries, or cuts

### Investigations

- FBC (platelet count)
- Coagulation tests—
  - PT—prothrombin time (prolonged in factor VII, X, V, II, or I deficiencies, liver disease or warfarin treatment)
  - INR—international normalised ratio (for the monitoring of anticoagulation therapy)
  - PTT—partial thromboplastin time (prolonged in factor VIII, XII, XI, IX, X, V, and I deficiencies)
  - Fibrinogen assay and FTP (longer in fibrinogen deficiencies, heparin treatment, DIC)
- Blood smear
- Test for haemorrhagic fevers

### Management

1. Always find the root cause of the bleeding disorder and treat accordingly.
2. Refer the patient to hospital if cause cannot be determined locally. Refer if any of the following conditions are present: spontaneous bleeding; bleeding into muscles or joints, GIT, or CNS; or bleeding patients who are on warfarin, are postpartum, or have a family history of bleeding.
3. If bleeding is life threatening, see “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of acute bleeding (haemorrhage) and wound care.
4. Give phytonadione (vitamin K) injection to—
  - Newborn: 1 mg for a full-term baby or 500 mcg for a preterm baby IM or IV, repeated every 8 hours if necessary

## 4.2 Bleeding Disorders

- Children: 3 to 5 mg IM or IV
  - Adult: 10 mg IM
5. For patients with haemophilia A and von Willebrand's disease, use Haemosolvate<sup>®</sup> (factor VIII concentrate).
  6. For patients with haemophilia B, use Haemosolvex<sup>®</sup> (factor IX complex). Dosages for factor VIII and IX are calculated according to a special formula (refer to package insert or call the blood bank).
  7. Provide platelet infusion in hospital. (For indications, see 4.3 below.)
  8. To reverse the effect of warfarin, give vitamin K, and only if patient has severe or active bleeding, give fresh frozen plasma (FFP).
  9. For a fibrinogen problem, give FFP or cryoprecipitate.

### Health education

Urge the patient to—

- Prevent injury.
- Avoid injections and unnecessary surgery.
- Visit the clinic or hospital immediately if any symptoms occur.
- Continue all medication as prescribed.

Advise prophylactic therapy for haemophiliacs before traumatic procedures such as tooth extraction or surgery.

## 4.3 Blood and Blood Products

The Blood Transfusion Service of Namibia (NAMBTS) supplies whole blood, blood components and plasma derivatives (see *Guidelines for the Appropriate Clinical Use of Blood and Blood Products in Namibia*).

- All blood is tested for HIV, hepatitis B and C, and syphilis
- Cold chain maintenance is vital at all times before transfusion.
- Standard blood administration procedures must be followed at all times.
- Adverse transfusion reactions must be reported to NAMBTS.

### 4.3.1 Whole Blood

#### Indications

- Exchange transfusion in neonates (using less than 5-day old blood); dosage: 80 to 100 mL/kg (repeat  $\times 2$  for hyperbilirubinemia)
- Patients needing red cell transfusions where red cell concentrates are not available
- Massive acute haemorrhage greater than 25% of total blood volume if red cell concentrate (RCC) and fresh frozen plasma (FFP) not readily available

#### Therapeutic effect

- 1 unit of whole blood (WB) gives an Hb increment of 1g/dL in an average adult of 70 kg bodyweight

#### Notes:

- WB is *not* a source of functional coagulation factors.
- WB is *not* a source of functional platelets.
- WB *does* contain—
  - Plasma (so allergic transfusion reactions more likely)
  - Leucocytes (so febrile transfusion reactions more likely)
  - Citrate (chelates calcium and, therefore, reduces patient calcium)

### 4.3.2 Red Cell Concentrate

RCC contains—

- Hardly any plasma
- Fewer leucocytes
- No citrate

#### Indications

- Adults—
  - Replacement of red cells in anaemic patients (after diagnosis of causes of the anaemia)
  - If Hb <6 g/dL, then transfusion usually needed
  - If Hb 6 to 10 g/dL, then transfusion depends on clinical condition of the patient
  - If Hb >10 g/dL, then transfusion usually not necessary
  - Acute blood loss (after initial resuscitation with crystalloid or colloid solutions)
- Children—
  - Significant cardiopulmonary disease if Hb <11 g/dL
  - Acutely ill children on assisted ventilation if Hb below normal levels
  - Prior to major surgery—
    - ◆ If Hb <8 g/dL in children
    - ◆ If Hb <10 g/dL in infants <4 months
  - Chronic symptomatic anaemia—
    - ◆ If Hb <7 g/dL in children
    - ◆ If Hb <8 g/dL in infants <4 months
  - Dosage: 10 to 15 mL/kg

#### Therapeutic effect

- Adult: 1 unit RCC gives an Hb increment of 1 g/dL in an average 70 kg adult
- Paediatric: 10 to 15 mL/kg gives an Hb increment of 2 to 3 g/dL

### 4.3.3 Platelet Concentrate

- Always transfuse immediately.
- Never store in hospital refrigerator.

#### Indications

- Adults—Platelet concentrate is used to control bleeding episodes due to—
  - Thrombocytopenia resulting from defective platelet production: aplastic anaemia, leukaemia
  - Defective platelet function (i.e., inherited and acquired platelet disorders)
  - Disseminated intravascular coagulation (DIC)
  - Massive transfusions (due to dilutional effect)
  - **Note:** Not in idiopathic thrombocytopenic purpura (ITP) and thrombotic thrombocytopenic purpura (TTP) unless patient has life-threatening haemorrhage
- Children—Platelet concentrate is used in the following circumstances—
  - Bleeding with thrombocytopenia
    - ◆ If the platelet count is  $<50 \times 10^9/L$  in children
    - ◆ If the platelet count is  $<100 \times 10^9/L$  in infants  $<4$  months
  - Bone marrow failure
    - ◆ If other risk factors present and platelet count is  $<20 \times 10^9/L$  in children and  $<100 \times 10^9/L$  in infants  $<4$  months
    - ◆ If no other risk factors present and platelet count is  $<10 \times 10^9/L$  in children and  $<50 \times 10^9/L$  in infants  $<4$  months
  - Prior to surgery if platelet count is  $<50 \times 10^9/L$
  - Functional platelet disorders and bleeding, irrespective of platelet count

#### Dosage

- Single random donor platelets: 1 single donor platelet unit per 10 kg body weight
- Pooled random donor platelets: 1 pooled unit per adult
- Aphaeresis platelets: 1 aphaeresis unit per adult

## 4.3 Blood and Blood Products

### Therapeutic effect

One aphaeresis or pooled unit should raise platelet count by  $50 \times 10^9/L$ .

#### Notes:

- A platelet count of  $>50 \times 10^9/L$  rarely poses likelihood of bleeding even in major surgery (for more on risk of bleeding associated with thrombocytopenia, see *Guidelines for the Appropriate Clinical Use of Blood and Blood Products in Namibia*).
- Use the term *megaplatelets* for either pooled or aphaeresis platelets.

### 4.3.4 Fresh Frozen Plasma

#### Indications

- Adults—
  - Immediate reversal of warfarin effect (i.e., prior to surgery and in case of bleeding)
  - Vitamin K deficiency associated with active bleeding
  - DIC
  - TTP
  - Hereditary coagulation factor disorders (if specific coagulation concentrates are not available)
  - In massive transfusions
  - Liver disease
- Children—
  - Haemorrhagic disease of the newborn (HDN); use in addition to vitamin K administration
  - Same as for adults

### Therapeutic effect

FFP contains physiological levels of all clotting factors.

- FFP should not be used for the correction of hypovolaemia.
- The clotting profile of the patient should be monitored.



### Dosage

- Adults: Initial dose 15 to 20 mL/kg, then reassess.
- Children: Initial 10 to 15 mL/kg, then reassess.

### 4.3.5 Good Transfusion Practices

1. Give a transfusion only if no appropriate alternatives exist.
2. Benefits of a transfusion must outweigh the risks.
3. Obtain informed consent in writing before infusing blood products.
4. For elective surgery, order blood according to Maximum Surgical Blood Ordering Schedule (MSBOS).
5. Good surgical and anaesthetic technique can prevent the need for transfusion.
6. Provide the required details on the Blood Requisition Form accurately.
7. Follow the correct procedures for patient and blood product identification.
8. Cold chain maintenance of blood is vital.
9. Transfuse judiciously and re-evaluate the need for continued transfusion. (Do not over-transfuse.)
10. When emergency group O Rh negative blood is used, supply cross-match specimens as soon as possible.
11. Monitor the patient before, and regularly during and after the transfusion.
12. Maintain adequate records of the transfusion to ensure traceability. Always include the reasons for the transfusion.
13. In massive, rapid transfusions, which are defined as (a) >10U in 24 hours, (b) >50% blood volume loss, or (c) blood loss at >150 mL per minute—
  - Restore blood volume. Use a large cannula and warmed crystalloids. Aim for normal BP and urine output >30 mL per hour.
  - Contact key personnel (e.g., doctor, anaesthetist, blood bank).
  - Arrest bleeding.

## 4.4 Blood Cancers

- Request blood early—
  - Transfuse RCC early (maintain Hct at >30%).
  - If >5U RCC expected, order FFPs and platelets.
- Transfuse RCC, FFPs, and platelets (mega units) in a ratio of 6:6:1.
- Request laboratory investigations early. Monitor electrolytes (including calcium levels), clotting profile, and metabolic changes.
  - Beware of dilutional coagulopathy.
  - Prevent acidosis.
  - Prevent hypothermia. Warm all fluids.
- Replace blood filters after 4 units. Never flush used blood filters.

### 4.4 Blood Cancers (Leukaemia, Lymphoma, and Myeloma)

Blood cancer is uncontrolled proliferation of abnormal cell lines in the bone marrow. In adults, the formation of all blood cells takes place in the bone marrow.

Blood cancers are classified as follows:

- Leukaemia
  - Acute or chronic
  - Lymphoblastic or myeloid (i.e., acute lymphocytic leukaemia [ALL], acute myeloid leukaemia [AML], chronic lymphocytic leukaemia [CLL], chronic myelogenous leukaemia [CML])
- Lymphoma
  - Hodgkin's
  - Non-Hodgkin's
  - Burkitt's
- Myeloma

#### Causes

- Genetic
- Unknown (usually)

- Chemicals
- Drugs and medicines
- Radiation exposure

### Symptoms and signs

- Anaemia
- Leucopenia or leucocytosis (may be accompanied by infections)
- Thrombocytopaenia, usually indicated by bleeding (i.e., haemorrhage) in skin or joints
- Peripheral lymph gland swelling
- Hepatosplenomegaly
- Night sweats, pruritus (i.e., itching)
- Weight loss
- Fever

### Investigations

- FBC and differential WCC, blood film, blood culture
- ESR
- LFT
- Bone marrow aspirate and biopsy
- Radiology; CXR, CT
- Lymph node biopsy

### Management

1. Refer patient to hospital for final diagnosis.
2. Refer patient to the oncology department in Windhoek or Oshakati.

### 5.1 Asthma

See also “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of acute airway obstruction.

Asthma is a chronic inflammatory disease of the airways with reversible narrowing or obstruction of the bronchi. It presents with wheezing, breathlessness, and cough due to—

- Bronchospasm
- Inflammation and thickening of the mucous membranes of the airways (oedema)
- Secretions blocking the airway lumen

#### Causes

The cause of asthma is unknown but the following factors are associated with the development of asthma—

- Allergens (e.g., house dust, perfumes, animal airs, mites)
- Medicines (e.g., propranolol and aspirin)
- Environmental (e.g., cold air)
- Infections (viral or bacterial)
- Emotions
- Family history
- Nonadherence to asthma treatment and management

#### Symptoms and signs

- Breathlessness
- Wheezing
- Cough (chronic nocturnal cough)

#### Danger signs

Consider admission to ICU if the patient presents with any of these signs:

- Inability to speak
- Cyanosis
- Severe distress
- Confusion and exhaustion, drowsiness
- Pulsus paradoxus

- So-called *silent chest* (i.e., decreased breath sounds)
- High pulse rate—children >140 per minute; adults >110 per minute
- High respiratory rate—children >60 per minute; adult >30 per minute
- Repeat attacks despite good compliance or oral steroids

### Investigations

- FBC
- CXR
- Pulse oximetry
- Peak flow rate
- Blood gases
- ECG
- Pulmonary function test

### Management

Categorize the patient's asthma according to the following definitions and see [table 5.1](#)—

- *Intermittent asthma*: <2 episodes per week or <1 episode at night per month
- *Mild persistent asthma*: 2 to 4 episodes per week or 2 to 4 night episodes per month
- *Moderate persistent asthma*: >4 episodes per week or >4 night episodes per month
- *Severe persistent asthma*: continuous wheezing or frequent night episodes
- *Severe acute asthma (status asthmaticus)*: See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of severe acute asthma (status asthmaticus).

**Management of an acute asthma attack in clinic, health centre, or hospital—**

1. Calm the patient. Help him or her to sit, leaning slightly forward and resting on a support.
2. Give oxygen via close-fitting face mask 6 to 8 L per minute. Keep oxygen saturation above 90%.

## 5.1 Asthma

3. Give salbutamol inhalation solution nebulised with oxygen via face mask at the following dosages:
  - Adults: 5 mg (1 mL) plus 1 mL saline
  - Children:
    - 2 to 5 years: 1.25 mg (0.25 mL) every 30 minutes until there is relief
    - 5 to 12 years: 2.5 mg (0.5 mL) every 30 minutes until there is relief
  - OR ——
  - Give salbutamol via metered-dose inhaler using a spacer device, one puff every 15 to 30 seconds for up to 10 puffs, titrate dose according to response. Use of metered-dose inhaler with a spacer device is preferred in children who have mild to moderate asthma.
4. If no improvement, repeat dose after 20 to 30 minutes, up to 3 times. Ensure that patient inhales properly.
5. If improved or patient stopped wheezing and can lie down:
  - Refer the patient if he or she has hypoxia, if there is a change in consciousness, if peak expiratory flow is worsening, or if he or she has a history of multiple attacks.
  - At discharge, provide the patient with health education and a short course of oral prednisolone at the following dosages:
    - Adults: 50 mg per day for five days
    - Children:
      - ◆ <2 years 10 mg per day for 3 days
      - ◆ 2 to 5 years 20 mg per day for 3 days
      - ◆ >5 years 30 to 40 mg per day for 3 days
6. If no improvement, see “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of how to manage severe acute asthma (status asthmaticus) in adults and children.

TABLE 5.1 Stepwise Management of Asthma

Note: Start at the step most appropriate to initial severity.

Category	Frequency of Symptoms	Treatment
Intermittent	Fewer than 2 episodes per week or fewer than 1 episode at night per month	Salbutamol inhaler when required
Mild persistent	2 to 4 episodes per week or 2 to 4 night episodes per month	Beclomethasone <ul style="list-style-type: none"> <li>• Adults: 100 mcg 2 times per day</li> <li>• Children: 50 mcg 2 times per day and salbutamol inhaler when required</li> </ul>
Moderate persistent	More than 4 episodes per week or more than 4 night episodes per month	Higher dose of inhaled steroid <ul style="list-style-type: none"> <li>• Adults: 200 mcg 2 times per day</li> <li>• Children: 100 mcg 2 times per day</li> </ul> Plus (if available) a long-acting beta 2 agonist (salmeterol) <ul style="list-style-type: none"> <li>• Adults and children over 4 years: 50 mcg 2 times per day</li> <li>• Children: 2 to 4 years 25 mcg 2 times per day)</li> </ul>

## 5.1 Asthma

TABLE 5.1 Stepwise Management of Asthma (cont.)

Category	Frequency of Symptoms	Treatment
Severe persistent	Continuous wheezing or frequent night episodes	<p>Increase inhaled corticosteroid dose to a maximum of—</p> <ul style="list-style-type: none"> <li>• Adults: 2000 mcg per day</li> <li>• Children: 800 mcg per day</li> </ul> <p>To the above, add a trial of either—</p> <ul style="list-style-type: none"> <li>• Theophylline               <ul style="list-style-type: none"> <li>- Adults: 200 to 400 mg 2 times per day (slow release tablets)</li> <li>- Children: 9 mg/kg 2 times per day</li> </ul> </li> <li>— OR —</li> <li>• Salbutamol tablets               <ul style="list-style-type: none"> <li>- Adults: 4 mg 3 times per day</li> <li>- Children:                   <ul style="list-style-type: none"> <li>» &lt;2 years: 1 mg 3 times per day</li> <li>» 6 to 12 years: 2 mg 3 times per day</li> <li>» &gt;12 years: 4 mg 3 times per day</li> </ul> </li> </ul> </li> </ul>
Severe acute (status asthmaticus)	Persistent, severe symptoms. If patient has poor control of persistent symptoms, refer to specialist care.	<p>Add prednisone to the above</p> <ul style="list-style-type: none"> <li>• Adults: 20 to 30 mg PO per day</li> <li>• Children: 1 mg/kg per day</li> </ul> <p>Use lowest possible dose to achieve adequate control, when using oral steroid over the long term.</p>



**To step treatment down or up, follow this procedure:**

- Review treatment every 3 months.
- Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months.
- Reduce dose of inhaled oral corticosteroid slowly (up to 50% reduction at each 3-month review).
- If symptoms worsen, increase the therapy to the level on which the patient was previously controlled.
- Always maintain patient on lowest controlling step.

**Health education**

Inform the patient about the importance of—

- Understanding the disease, danger signs, and treatment
- Taking medication as directed and following the recommended management
- Using proper inhaler technique
- Avoiding triggers of asthma including dust, smoke and other precipitating
- Stopping smoking
- Not running out of medicine

Children can sometimes outgrow asthma.

### 5.2 Bronchitis

#### 5.2.1 Acute Bronchitis

Bronchitis is an inflammation of the bronchial mucosa due to an infection or irritation.

##### Causes

- Viral (e.g., common cold, influenza, measles)
- Bacterial
- Other irritants (e.g., smoking, chemicals)

##### Symptoms and signs

- Cough (dry initially, wet later)
- Cough associated with chest pain
- Fever (temperature usually  $<39^{\circ}\text{C}$ )
- Rhonchi
- Wheezes
- Sputum is muco-purulent or purulent (thick yellow or green)

##### Management

1. Treat at the clinic.
2. Treat fever with paracetamol 500 to 1000 mg PO 3 times per day.
3. Treat infection with antibiotics only if cough is productive. Give amoxicillin at the following dosages:
  - Adults: 500 mg PO 3 times per day for 5 days
  - Children: 20 to 40 mg/kg per day in 3 divided doses for 5 to 7 days

In case of penicillin allergy, give azithromycin in the following dosages:

- Adults: 500 mg once daily
  - Children: 10 mg/kg once daily for 3 days
4. For symptomatic control of cough, use steam inhalation, adequate hydration, and tea with honey.
  5. Refer to hospital if severe respiratory distress occurs.
  6. Think of TB if cough has lasted  $>3$  weeks without improvement.

### Health education

Advise the patient to—

- Stop smoking.
- Drink a lot of water.
- Come back if no improvement after 2 days.

### 5.2.2 Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (COPD) is also known as chronic obstructive airway disease (COAD), and includes chronic bronchitis, chronic asthma, emphysema and other nonreversible inflammatory obstructive pulmonary diseases. **Note:** Always rule out TB.

#### Causes

- Smoking of tobacco products
- Constant irritation such as air pollution, chemicals, dust, or smoke
- Allergic irritation (e.g., grasses, animal hair, house dust mite)
- Chronic infections

#### Symptoms and signs

- Cough for a long period with production of sputum
- Sputum usually white (If patient's sputum is yellow, think of secondary bacterial infection.)
- Dyspnoea, shortness of breath
- Wheezing
- Rhonchi
- Later—
  - Difficult, grunting breathing (especially in children)
  - Reduced chest expansion
  - Use of auxiliary chest musculature for breathing

#### Investigations

- Sputum for microscopy
- CXR

## 5.2 Bronchitis

### Management

1. Determine the underlying causes and urge the patient to avoid them if possible.
2. Advise patient to stop smoking. This intervention is the most important one for smokers.
3. Give antibiotics if sputum is yellow. See instructions above on management of acute bronchitis.
4. Because viral and bacterial infections can cause acute exacerbations or bronchitis or pneumonia, treat promptly with relevant antivirals or antibiotics<sup>1</sup>.
5. If the patient is wheezing, give salbutamol 200 mcg every 4 to 6 hours, when required.
6. Review for signs and symptoms of TB, HIV/AIDS, or lung cancer.
7. If no improvement, refer.

### Health education

- Urge the patient to—
  - Avoid smoke or dust.
  - Stop smoking.
  - Drink plenty of water to liquefy the secretion and sputum.
- If there is no improvement in the patient's condition after 1 week, he or she must return to the clinic.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 5.3 Influenza, the Common Cold, and Acute Tonsillitis and Pharyngitis

### 5.3.1 Influenza

Influenza (commonly called the *flu*) is a contagious respiratory illness caused by influenza viruses. The influenza virus attaches itself mainly to respiratory epithelium, but causes symptoms in other systems as well. The influenza virus can undergo mutations and can re-infect a patient every year. The patient with a common cold usually does not present as sick as would the influenza patient.

#### Cause

- Viral with incubation period of 1 to 3 days
- Patients with immune suppression are more vulnerable

#### Symptoms and signs

- Fever
- Tiredness, weakness
- Myalgia (i.e., muscle pain)
- Headache
- Runny or stuffy nose
- Cough (**Note:** Yellow sputum usually indicates a secondary bacterial infection.)
- Sore throat
- In children, feeding difficulty

#### Management

1. Treat the symptoms.
2. Urge bed rest.
3. Give paracetamol for pain and fever.
4. Instruct the patient to drink plenty of water and other fluids.
5. Encourage the patient to eat foods rich in vitamin C such as fruits and vegetables.
6. Prescribe antibiotics (usually amoxicillin) only for patients with secondary bacterial infections and for

## 5.3 Influenza and the Common Cold

patients with underlying heart or renal conditions. For patients who have a penicillin allergy, prescribe azithromycin 500 to 1000 mg PO daily for 3 days for adults and azithromycin 10 mg/kg per day for 3 days to a maximum of 500 mg for children >6 months.

7. Encourage annual immunization for patients who have compromised immune systems and patients at risk (i.e., the elderly >65 years, young patients with chronic heart disease, chronic lung disease including asthma, chronic renal failure and diabetes mellitus). Annual immunizations are not available in the Ministry of Health and Social Services.

### Health education

Instruct the patient to—

- Get bed rest.
- Drink plenty of fluids to decrease sputum viscosity.
- Use salt water drops in the nose to help clear mucus.
- Come back to clinic, if no improvement after 1 week.
- Maintain good hygiene practices (i.e. wash hands frequently with soap, cover nose and mouth when sneezing and coughing) to reduce transmission

### 5.3.2 Common Cold

See “Section II. Diseases According to Body Systems. Chapter 6. Ear, Nose, and Throat Systems” (6.2.4).

### 5.3.3 Acute Tonsillitis and Pharyngitis

See “Section II. Diseases According to Body Systems. Chapter 6. Ear, Nose, and Throat Systems” (6.3.1).

### 5.4 HIV and the Respiratory System

#### 5.4.1 TB

See “Section IV. Infectious Diseases, Chapter 19. Tuberculosis.”

#### 5.4.2 Bacterial Pneumonia

See 5.5 below.

#### 5.4.3 PCP

*Pneumocystis jirovecii* pneumonia (PCP) is pneumonia caused by the fungus *Pneumocystis jirovecii* (previously called *Pneumocystis carinii*) and occurs in severely immuno-compromised patients (CD4 count usually <200). It is an AIDS-defining illness.

#### Symptoms and signs

- Dry cough
- Dyspnoea
- High fever
- Malaise
- Tachypnoea
- Tachycardia
- Cyanosis
- Few chest signs (may be a few fine crackles but auscultation may be normal)

#### Investigations

- CXR (normal in early disease; later shows diffuse infiltrates)
- Pulse oximetry
- Sputum tests (sputum often only obtained after nebulisation; no sputum in PCP)

#### Management

Treatment should be instituted as early as possible, following this procedure:

1. Prescribe co-trimoxazole (trimethoprim/sulfamethoxazole [TMP/SMX]). Administer 20 mg of TMP/SMX

## 5.4 HIV and the Respiratory System

per kg body weight based on TMP, IV or PO divided in 3 to 4 doses per day for 21 days (approximately 1 tablet of co-trimoxazole 400/80 mg tablet per 5 kg body weight in 3 to 4 divided doses for 21 days). In addition, in patients with severe hypoxia (i.e., patients with a room air  $\text{PaO}_2$  value  $\leq 70$  mmHg), give prednisone at the following dosages:

- Adults—
    - Start with 40 mg PO 2 times per day, for 5 days (days 1 through 5)
    - Then 40 mg PO once per day, for 5 days (days 6 through 10)
    - Then 20 mg PO once per day, days for 11 days (days 11 through 21)
  - Children—
    - Start with 1 mg/kg/dose 2 times per day for 5 days (days 1 through 5)
    - Then 0.5 mg/kg/dose 2 times per day for 5 days (days 6 through 10)
    - Then 0.5 mg/kg once per day for 11 days (days 11 through 21),
2. A rash reaction to high dose co-trimoxazole is common, including a typical allergic rash. If it occurs, give promethazine 10 mg 2 times per day or chlorpheniramine 4 mg 3 to 4 times per day. Stop co-trimoxazole only if rash is extensive or there is mucosal involvement.
  3. Run FBC 2 times per week (neutropaenia) to monitor treatment. With moderate neutropaenia ( $>500$ ), reduce the dose by a quarter.
  4. For prophylaxis, prescribe co-trimoxazole 2 tablets (960 mg) per day until a CD4 count above 350 is obtained on two consecutive occasions at least six months apart (or clinical stage 3 or 4).



### 5.4.4 Respiratory Fungal Infections

#### Management

1. For systemic mycotic infections or systemic candidiasis, administer amphotericin B at 0.25 to 1.0 mg/kg per day over 4 hours IV for at least 4 weeks, depending on disease response. Total dose should be 30 to 35 mg/kg over 4 to 8 weeks.
2. Administer itraconazole 200 to 400 mg PO daily.
3. Administer fluconazole 800 mg daily (if itraconazole is not available).
4. Follow the treatment instructions given by the hospital.

### 5.4.5 Pulmonary Kaposi's Sarcoma

#### Symptoms and signs

- Associated with cutaneous or oral Kaposi's Sarcoma
- Dyspnoea
- Low-grade fever

#### Investigations

- CXR (nodular or reticular pattern, often pleural effusion)
- Pleural biopsy if pleural effusion
- Bronchoscopy (be careful of bleeding)
- A gallium scan

#### Management

1. Refer for specialist care.
2. Use systemic chemotherapy.
3. Alpha-interferon (which is not on the Nemlist) can induce partial remission.

### 5.5 Pneumonia

Pneumonia is an inflammation of the lung tissue (parenchyma) due to bacterial, viral, or fungi infection. For a discussion of tuberculosis, see “Section IV. Infectious Diseases. [Chapter 19. Tuberculosis.](#)”

#### Causes

- Bacteria
- Virus
- Fungus
- Chemical
- Depending on the time of onset of symptoms pneumonia can be classified as hospital or community acquired

#### Symptoms and signs

- In adults—
  - Cough (productive or nonproductive)
  - Sputum production (yellow, green, rusty, or bloody)
  - Fever
  - Difficulty in breathing, dyspnoea, tachypnoea
  - Chest pain during deep breathing or coughing
  - Anorexia
- In children—
  - Difficulty with feeding
  - Crying, coughing, grunting
  - Seldom, sputum production
  - Severe chest indrawing (retraction)
  - Nasal flaring
  - Fast respiratory rate
  - Fever
  - Wheezing, rhonchi
  - Bronchial breathing
  - Cyanosis, tachycardia
  - Consolidation and a plural effusion
- Danger signs—
  - Tachypnoea respiratory rate >30 per minute
  - Chest or rib retraction
  - Hypoxia

- Low BP
- Confusion
- Indication for hospital admission (children)—
  - All children younger than 2 months
  - Impaired level of consciousness
  - Inability to eat or drink
  - Cyanosis
  - Stridor in a calm child
  - Grunting
  - Severe chest indrawing
  - SaO<sub>2</sub> <92% room air
  - Severe malnutrition
  - Failure to respond to ambulatory care or clinical deterioration on treatment.

TABLE 5.5A Normal Respiratory Rates

Age	Normal Respiratory Rate per Minute
<2 months	<60
2 months to 1 year	<50
1 to 5 years	<40
Adult	<12

### Investigations

- FBC, differential WCC
- CXR
- Sputum culture
- Investigate for TB

### Management in clinic, health centre, and hospital

1. Nurse patient in comfortable position.
2. Keep well hydrated.
3. Control fever with paracetamol.
4. Enforce bed rest.
5. Continue breastfeeding small child; ensure good diet for all other patients. (See “Appendix 1. Integrated Management of Adolescent and Adult Illness (IMAI) Algorithm”)

## 5.5 Pneumonia

TABLE 5.5B Treatment of Pneumonia in Children

Symptoms		Diagnosis	Treatment
<b>&lt;2 Months</b>	<b>&gt;2 Months</b>		
<ul style="list-style-type: none"> <li>Stopped feeding well</li> <li>Abnormally sleepy</li> <li>Stridor</li> <li>Wheezing</li> <li>Fever or low temperature</li> </ul>	<ul style="list-style-type: none"> <li>Fast breathing</li> <li>Chest indrawing</li> <li>Signs of severe disease</li> </ul>	Very severe pneumonia	<ul style="list-style-type: none"> <li>Refer urgently to hospital.</li> <li>Keep young infant warm.</li> <li>Give first dose of benzylpenicillin<sup>a</sup> IV 100,000 units/kg in four divided doses plus gentamicin IV at the following dosages:               <ul style="list-style-type: none"> <li>- &lt;12 years 2.5 mg/kg</li> <li>- &gt;12 years 2 mg/kg</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Severe chest indrawing</li> <li>Fast breathing</li> </ul>	<ul style="list-style-type: none"> <li>Fast breathing</li> <li>Significant chest indrawing</li> </ul>	Severe pneumonia	<ul style="list-style-type: none"> <li>Refer urgently to hospital.</li> <li>Keep infant warm.</li> <li>Give first dose of benzylpenicillin* IV 100,000 units/kg in four divided doses.</li> </ul>

<sup>a</sup> Refer to appendix 5 for treating patients with a history of penicillin allergy

TABLE 5.5B Treatment of Pneumonia in Children (cont.)

Symptoms		Diagnosis	Treatment
<2 Months	>2 Months		
	<ul style="list-style-type: none"> <li>• Fast breathing</li> <li>• No chest indrawing</li> </ul>	Pneumonia	<ul style="list-style-type: none"> <li>• Advise home care.</li> <li>• Give amoxicillin<sup>a</sup> PO. (See dosages below in 5.5.1.)</li> <li>• Treat fever.</li> <li>• Treat wheezing.</li> <li>• Ask to see the child again in 2 days for reassessment.</li> </ul>
<ul style="list-style-type: none"> <li>• No fast breathing</li> <li>• No chest indrawing</li> <li>• No symptoms or signs of severe disease</li> </ul>	<ul style="list-style-type: none"> <li>• No fast breathing</li> <li>• No chest indrawing</li> </ul>	No pneumonia	<ul style="list-style-type: none"> <li>• Advise home care.</li> <li>• Keep warm.</li> <li>• Breastfeed regularly.</li> <li>• Return, if infant deteriorating.</li> </ul>

<sup>a</sup> Refer to appendix 5 for treating patients with a history of penicillin allergy

### 5.5.1 Community-Acquired Pneumonia

If the ambulant, respiratory rate is normal (see [table 5.5A](#)), proceed with first-line treatment.

- First-line treatment for community-acquired pneumonia is amoxicillin<sup>1</sup> at the following dosages:
  - Adult: 500 mg PO 3 times per day for 5 days
  - Children:
    - ◆ 0 to 5 months: 62.5 mg 3 times per day (2.5 mL of 125 mg/5 mL) syrup
    - ◆ 6 months to 5 years: 125 mg 3 times per day (or 5 mL of 125 mg/5 mL syrup)
    - ◆ 6 to 12 years: 250 mg 3 times per day
    - ◆ > 12 years: 500 mg 3 times per day
    - ◆ **Note:** In children <5 years, high-dose amoxicillin<sup>1</sup> can be given.
- Second-line treatment or treatment of patients who are allergic to penicillin<sup>1</sup> is as follows:
  - Dosages:
    - ◆ Adult: azithromycin 1 g PO per day for 3 days
    - ◆ Children: azithromycin 10 mg/kg per day PO for 3 days
  - In severe pneumonia—
    - ◆ Admit patient.
    - ◆ Administer benzylpenicillin:
      - Adult: 2 million units every six hours
      - Children: 100,000 units per kg in four divided doses
    - ◆ Consider addition of cefuroxime based on sputum results.

### 5.5.2 Hospital-Acquired Pneumonia

Treat adults with IV ampicillin<sup>1</sup> 500 mg 4 times per day plus gentamicin 5 mg/kg per day (to a maximum 240 mg per day), or treat with cefuroxime 750 to 1,500 mg IV in 3 divided doses per day.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

Treat children with IV ampicillin<sup>1</sup> 50 to 100 mg/kg per day in divided dose (or IV) plus gentamicin 5 mg/kg per day, or treat with cefuroxime 75 to 150 mg/kg per day IV in 3 divided doses.

Thereafter, change antibiotic as guided by culture and sensitivity.

### 5.5.3 HIV Pneumonia

For HIV pneumonia, especially encapsulated bacteria (*pneumococcus* and *haemophilus*), in patients who have had symptoms >2 to 4 weeks; who have TB, PCP, fungal pneumonia (*cryptococcus*, *histoplasmosis*); or who have toxoplasma pneumonia, follow the instructions for hospital-acquired pneumonia. Refer, if the patient is toxic or hypoxic to change to IV ampicillin<sup>1</sup> along with either a cephalosporin *or* gentamicin.

Patients with HIV are at risk for a number of pulmonary infections. Follow instructions for hospital-acquired pneumonia for patients who have—

- Symptoms for >2 to 4 weeks
- TB
- PCP
- Fungal pneumonia (*cryptococcus*, *histoplasmosis*)
- Toxoplasma pneumonia

### 5.5.4 Aspiration Pneumonia

Treat aspiration pneumonia with three medicines:

- Benzylpenicillin<sup>1</sup> at these dosages—
    - Adults: IV 2 million units every eight hours
    - Children: 15 to 35 mg/kg per day, 3 divided doses—
  - Gentamicin by slow IV injection 3 to 5 mg/kg per day, 3 divided doses,
- **AND** —
- Metronidazole IV 500 mg every 8 hours.

### 6.1 Ear Disorders

#### 6.1.1 Otitis Externa

Otitis externa (OE), or outer ear canal infection, is an acute or chronic inflammation of the whole or part of the skin lining the external ear due to bacterial, fungal, or viral infection; chemical irritants; or foreign bodies.

##### Causes

- Trauma (i.e., scratching, cleaning with sticks, cotton ear buds)
- Bacterial infection secondary to scratching
- Virus infections such as herpes simplex and myringitis bullosa haemorrhagica (i.e., blood-filled blisters)
- Foreign substances (e.g., cotton wool, stones, insects, seeds)
- Moisture in the ear (e.g., shampoo, soap, contaminated swimming water)
- Fungal infections (especially in diabetes mellitus)
- Inappropriate use of antibiotic eardrops (i.e., overgrowth of fungi)
- Allergic conditions (e.g., dermatitis, eczema)

##### Symptoms and signs

- Itching
- Pain in the ear when chewing
- Watery or purulent discharge from the ear
- Tenderness when touching or pulling the pinna
- Hearing loss (i.e., ear feels blocked)
- Red and swollen ear canal
- Often white cheesy debris (fungal)
- Often scaling and crusting (bacterial)
- Eardrum often normal on otoscopy
- Tenderness during otoscopy



## Management

### In clinic, health centre, or hospital—

1. Give paracetamol for pain.
2. Clean the ear as well as possible.
3. Prescribe 1% acetic acid drops—4 drops 4 times per day.
4. If no improvement within 4 days or if getting worse, refer patient to hospital.

### In hospital—

1. Clean with suction and if not possible, then syringe ear carefully to remove debris.
2. If a bacterial infection is present, prescribe antibiotic eardrops.
3. In the case of severe general symptoms or sepsis, prescribe a systemic antibiotic such as erythromycin or cloxacillin.<sup>1</sup> This severity of infection occurs *very* seldom.
4. If eczema is present, refer to “Section II. Diseases According to Body Systems. Chapter 12. Dermatology” for a discussion of eczema.
5. If a fungal infection is present, instruct the patient to clean and dry the ear regularly and to use 1% acetic acid drops and benzoic acid ointment or clotrimazole cream.

## Health education

### Advise patient that he or she should—

- Never insert foreign objects into the ear
- Always keep the ear canal dry
- Understand that normal ear wax is not dirty and does not have to be removed unless it obstructs the ear
- Not scratch ears with foreign objects or fingernails
- Not use swabs to clean the ear

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 6.1.2 Otitis Media

Otitis media (OM) or middle ear infection is of two types:

- *Acute*—of sudden onset in the middle ear. It is usually found in children younger than 5 years and usually comes after a cold or flu.
- *Chronic*—an infection that does not clear for over one month. It can be suppurative (pus discharge with perforated eardrum) or serous (eustachian tube blockage due to allergy or infection).

#### Causes

- Viral infections of upper respiratory tract (e.g., rhinitis, common cold)
- Bacterial infections (e.g., streptococcus, haemophilus influenza)
- Chronic allergy
- Chronic enlargement of tonsils, adenoids
- OM not adequately treated (chronic)
- Bottle feeding in infants

#### Symptoms and signs (acute)

- In adults—
  - Fever
  - Pain in the ear
  - Headache
  - Malaise, weakness
- In children—
  - High fever
  - Acutely painful ear
  - Irritable, crying
  - Poor sleeping patterns
  - Itching ears
  - Poor feeding
  - Pain upon drinking and chewing
  - Nausea and vomiting
  - Diarrhoea
  - Sometimes purulent discharge from the ears
  - Otoscopy: eardrum is red and dull, instead of white or grey and shining

**History and symptoms and signs (chronic)**

- Previous treatment for acute OM
- Previous history of perforated eardrum
- Discharge from the ear for more than one month
- Painless
- Hearing loss
- Deafness in children with speech impairment, poor school performance
- Fluid level behind eardrum.

**Management for acute OM****In clinic, health centre, or hospital—**

1. Give paracetamol for pain and fever.
2. Prescribe an antibiotic.
  - Adults: amoxicillin<sup>1</sup> 500 mg every 8 hours for 5 days
  - Children: phenoxymethylpenicillin<sup>1</sup> 25–50 mg/kg per day in four divided doses. Amoxicillin<sup>1</sup>: less than 20 kg, 40 mg/kg per day divided in 3 doses, every 8 hours for 5 to 10 days; more than 20 kg, 250 to 500 mg every 8 hours for 5 to 10 days
3. Follow up after 1 to 2 days (especially small children).
4. Refer if—
  - No improvement after acute OM treatment
  - Severe fever, vomiting, and drowsiness in children
  - Swelling over mastoid area
  - Perforated eardrum that does not heal
  - Facial palsy or neurological signs
  - Pus discharge from ear more than one month after starting treatment
  - Stiffness of the neck
  - OM frequently recurring (i.e., more than 4 episodes within 6 months)

**In hospital—**

1. Find and treat underlying cause according to culture and sensitivity.
2. Where culture and sensitivity services are not avail-

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 6.1 Ear Disorders

able, start second-line antibiotic: cloxacillin<sup>1</sup> or erythromycin.

3. Perform a myringotomy and/or grommet, if necessary to relieve bulging eardrum.
4. Remove all pus from ear canal regularly—ear toilet.
5. Dry the perforation and instil 1% acetic acid drops.
6. Insert grommets in chronic serious OM.
7. Perform tympanoplasty to restore eardrum if the perforation does not show signs of spontaneous healing after 3 months.

### Complications of OM

- Acute mastoiditis
- Meningitis
- Subdural or extradural abscess
- Brain or neck abscess

### Health education

- In discharging (suppurative) OM, do not plug the ear with cotton wool.
- Advise parents to keep baby's head a little higher when feeding.
- Request that patient come back if there is no improvement or if neurological signs develop.

### 6.1.3 Foreign Body in the Ear

A foreign body in the ear canal can be any small object that is usually inserted by the patient (especially small children) or an insect that crawls into the ear canal.

#### Common foreign bodies

- Insects
- Organic material (e.g., peas, peanuts, raisins)
- Inorganic materials (e.g., pearls, stones, sticks, tips of ear buds, cotton wool)

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## Symptoms and signs

- Usually history of insect or other foreign body entering or inserted into the ear
- Foreign body can be seen during otoscopy
- Signs of self-inflicted trauma in attempts to remove foreign object
- Signs of secondary infection

## Management

### In clinic, health centre, or hospital—

1. Try to remove the object by straightening ear canal (pull on pinna) and shaking the head with affected ear turned downwards.
2. Only if eardrum is intact, try—
  - Removal by syringing with lukewarm water.
    - ◆ Do this only when you can see that the ear drum is intact and the patient is cooperative.
    - ◆ *Never* syringe vegetable material because it swells.
  - Removal of live insects by—
    - ◆ Killing the insect by using cooking or olive oil
    - ◆ Removing the insect carefully with crocodile forceps under direct vision and *only* when patient cooperates fully.
3. *Never* attempt removal in uncooperative child.
4. If removal was successful, check whether eardrum is intact and check for infection
5. Refer the patient if—
  - The foreign body is deep in the ear canal.
  - It is a vegetable-type of object.
  - The patient is uncooperative.
  - Eardrum perforation is evident or suspected.

### In hospital—

1. Removal of the foreign body in theatre under general anaesthetic is sometimes required.

### 6.1.4 Wax Impaction

Wax in the ear canal is a normal physiological defence mechanism of the body against insects and infection. Usually the canal is cleared of wax spontaneously. Wax impaction is, therefore, a collection of ear wax to an extent of causing ear canal blockage.

#### Causes

Enthusiastic unnecessary cleaning of the ear pushing wax deeper into ear with swabs, cotton wool, sticks, or other items.

#### Symptoms and signs

- Blocked ear
- Impaired hearing or deafness in one ear
- Tinnitus (i.e., ringing in the ears)
- Itchiness
- Discomfort, but little pain

#### Management

1. Remove wax—
  - If hearing is impaired. **Note:** Usually hearing is impaired only if wax totally obstructs ear canal or wax is impacted onto the ear drum.
  - If there is discomfort, dizziness, or pain
2. Syringe the ear.
  - Use a 10 or 20 mL syringe if an ear syringe is not available.
  - Use lukewarm water.
  - Cover the patient.
  - Use a kidney dish for collecting the water that will be coming out of the ear after syringing.
  - Do not insert syringe too far into the ear canal.
  - Do not obstruct the ear canal completely with the syringe tip. Injected water must be able to run out freely.
  - Inject water upwards and backwards slowly.
  - Frequently re-examine.
  - The eardrum often looks red after syringing.

3. Do *not* syringe the ear if—
  - There is severe pain (usually due to OM, OE, or impaction of wax onto drum).
  - The ear drum is perforated.
4. If syringing is unsuccessful, insert a wax softener, such as sunflower or olive oil, into ear canal for 20 to 30 minutes or overnight.
5. Try syringing again next day.
6. Refer the patient to hospital if still unsuccessful.

### 6.1.5 Furuncle (Boil)

A furuncle is a boil due to infection of a hair follicle in the external ear canal.

#### Causes

Staphylococcus bacterial infection often after scratching, vigorous cleaning or impaction of foreign body

#### Symptoms and signs

- Severe pain
- The boil can be seen in ear canal
- Severe tenderness on touching or moving pinna
- Swelling around the ear (over mastoid process or tragus)
- Peri-auricular lymphadenopathy

#### Management

1. Give oral antibiotics: cloxacillin<sup>1</sup> or erythromycin.
2. Give an analgesic: paracetamol or an NSAID.
3. Do *not* attempt to incise or drain.
4. Let the patient come back after 2 days for review.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 6.2 Nose and Paranasal Sinus Disorders

#### 6.2.1 Nasal Obstruction

Nasal obstruction is the blockage of airflow through the nose.

##### Causes

- Mechanical
  - Septal abnormality (e.g., deviation, haematoma, abscess)
  - Intranasal mass (e.g., foreign body, polyp, tumour)
  - Extranasal obstruction (e.g., adenoid hypertrophy, polyp, nasopharyngeal tumour, choanal atresia)
- Turbinate or mucosal (i.e., nasal passages and sinuses) dysfunction
  - Infection—acute or chronic
    - ◆ Nonspecific: bacterial, viral, fungal, mixed
    - ◆ Specific: TB, syphilis, sarcoidosis
  - Allergic or vasomotor
  - Rhinitis medicamentosa
  - Endocrine imbalance: pregnancy, oral contraceptives, hypothyroidism

##### Management

1. Refer to an ear, nose, and throat (ENT) specialist.

#### 6.2.2 Trauma to the Nose

For major trauma to the head, see “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma.](#)”

##### Causes

- Usually: a blow or punch to the nose
- Occasionally: penetrating wounds
- As part of more extensive facial bones and skull base injuries

##### Symptoms and signs

- Deformity
  - Depression (flattening of nasal bridge), lateral displacement



## 6.2 Nose and Paranasal Sinus Disorders

- External swelling (follows quickly); may obscure bone deformity
- Black eye (common): periorbital and subconjunctival haemorrhage (ecchymosis)
- Pain
  - Usually not severe after initial impact
  - Tenderness remains longer
- Epistaxis
  - Frequent
- Nasal obstruction
  - Septum dislocation or fracture
  - Septum haematoma

### Investigations

- Skull X-ray
  - Medicolegally: important
  - Clinically: of little value (to exclude concomitant facial bone fractures)

### Management

1. Refer to an ENT specialist as soon as possible for management.

### 6.2.3 Foreign Body in the Nose

#### Causes

- *Exogenous*—most common cause; usually in children (1 to 4 years old); usually an object (e.g., buttons, beads, paper, rubber, vegetable material) in only one nostril, but objects may be in both nostrils
- *Endogenous*—blood clot, dry pus (look for septum perforation)

#### Symptoms and signs

- Nasal discharge—usually unilateral, very foul smelling, and mucopurulent; sometimes blood stained. **Note:** Consider a unilateral nasal discharge in a child to be a foreign body until proven otherwise.
- Nasal obstruction
- Excoriation around the nostril(s)

## 6.2 Nose and Paranasal Sinus Disorders

- Sneezing
- Foreign body is commonly seen in the nostril

### Management

- In a cooperative child or adult—
  - Forceful nose-blowing may expel the foreign body.
  - Use a blunt hook or forceps under direct vision (e.g., a head lamp and nasal speculum).
- In an uncooperative patient—
  - Refer.
  - Remove foreign body under general anaesthesia to prevent aspiration into lungs.

### 6.2.4 Nasal and Sinus Infection

#### Common Causes

- External nose—furunculosis of vestibule. See “Section II. Diseases According to Body System. [Chapter 12. Dermatology](#)” for a discussion of furuncle.)
- Nasal cavities—Because of the continuity of the nasal mucosa with the sinuses, some infection is usually present in the latter at the same time, constituting rhinosinusitis. When the sinus infection overshadows that in the nasal cavities (called *rhinitis*), the condition is termed *sinusitis*
  - Acute rhinitis—The common cold (coryza): viral infection (influenza, coxsackie, reo, ECHO, rhino, RSV, adeno, para-influenza), usually complicated by a secondary bacterial infection (streptococcus, staphylococcus, *Haemophilus influenzae*, *Moraxella catarrhalis*)
  - Chronic rhinitis can be—
    - ◆ Nonspecific—from neighbouring tonsillitis, adenoiditis, sinusitis, chronic irritation (from smoke, dust, snuff, or pollution), nasal obstruction, metabolic (from diet imbalance, vitamin deficiency, hypothyroidism, or alcohol overindulgence)

## 6.2 Nose and Paranasal Sinus Disorders

- ◆ Specific—from syphilis, TB, leprosy, fungal infection
- Acute sinusitis—cause: pneumococcus, streptococcus, staphylococcus, *H. influenza*, *Escherichia coli*.
  - ◆ Acute sinusitis may follow acute rhinitis.
  - ◆ Swimming and diving cause direct spread of nasal infection.
  - ◆ Dental infection or extraction cause spread of infection from tooth root to maxillary antrum.
  - ◆ Predisposing factors include the following—
    - Local factors such as nasal and sinus ostia obstruction due to allergy, polyps; neighbouring infections; previous infection in same sinus
    - General factors such as chilling, fatigue, poor diet, atmospheric irritants, or pollution
- Chronic sinusitis—cause: mixed, streptococcus, anaerobes, *E. coli*, pneumococcus, proteus
  - ◆ Nonspecific—follows single or repeated acute sinusitis attacks
  - ◆ Specific—TB, syphilis, fungal (actinomycosis)
  - ◆ Chronic

---

**Note:** Infection may be restricted to a single sinus, affect several sinuses (multi-sinusitis), or all the sinuses (pansinusitis—unilateral or bilateral).

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### Symptoms and signs

- Infections of the external nose
  - Pain; red, swollen, tender nasal tip
  - Headache and fever
  - Evacuation of pus usually spontaneously in 4 to 5 days
- Common cold (coryza)
  - Ischaemic stage: incubation (1 to 3 days)—sneezing, shiver, malaise
  - Hyperaemic stage: profuse watery rhinorrhoea, nasal obstruction, pyrexia

## 6.2 Nose and Paranasal Sinus Disorders

- Secondary infection stage: thicker yellow or green discharge
- Resolution stage: in 5 to 10 days
- Chronic rhinitis
  - Nasal obstruction: marked, usually alternates from side to side
  - Postnasal drip: clear, viscid becoming mucopurulent
  - Blocked or heavy feeling in nose; mild headache and mental apathy common
  - Transient hypo/anosmia (i.e., inability to smell)
- Specific chronic rhinitis—syphilis
  - Congenital
  - Acquired
- Acute sinusitis
  - Pain over infected sinus (stabbing or aching, worse on bending or coughing); sometimes referred pain to other sites
  - Discharge in nose or nasopharynx if open sinusitis
  - Nasal obstruction due to mucosal swelling
  - Tenderness can often be elicited over maxillary and frontal sinuses
  - Constitutional symptoms: pyrexia, malaise, mental depression, halitosis
- Chronic sinusitis
  - Nasal, postnasal discharge
  - Anosmia, hyposmia, cacosmia (i.e., the perception of a bad smell due to some intrinsic cause)
  - Constitutional (usually mild): malaise, anorexia, mental apathy, sore throat, cough

### Management

- Infections of the external nose—
  - Early: Local antibiotic ointment tetracycline
  - Later: Systemic wide-spectrum antibiotic
- Common cold (coryza)—
  - Prophylactic—avoiding contact with known cases

## 6.2 Nose and Paranasal Sinus Disorders

- Therapeutic—general symptomatic management
  - ◆ Rest and warmth (ideally, stay in bed)
  - ◆ Analgesics
  - ◆ Antihistamines, ascorbic acid (vitamin C): of doubtful value
  - ◆ Antibiotics: reserve for secondary infections
- Local—
  - ◆ Steam inhalations
  - ◆ Saline drops
  - ◆ Vasoconstrictors: oxymetazoline nasal spray or drops give quick, temporary relief, but advise the patient not to abuse them.
- Chronic rhinitis—
  - General (i.e., predisposing factors)—Advise the patient to correct some general factors such as tobacco or alcohol use and to avoid others such as contact with anyone who has a cold.
  - Local—Treat any sinusitis or adjacent infection with mild vasoconstrictors and saline nasal drops.
- Acute sinusitis—
  - Treat the infection using antibiotics PO for 10 to 14 days: amoxicillin<sup>1</sup> or azithromycin.
  - Treat the pain using—
    - ◆ Analgesics (e.g., paracetamol or NSAIDs)
    - ◆ Local heat (e.g., hot water bottle or steam)
  - Establish drainage using—
    - ◆ Decongestant solutions (oxymetazoline drops)
    - ◆ Irrigation
- Chronic sinusitis—
  - Prescribe systemic antibiotics.<sup>1</sup>
  - Provide drainage using—
    - ◆ Decongestants
    - ◆ Irrigation

If the patient shows no improvement, refer to an ENT specialist. Patients with chronic or recurrent sinusitis

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

should be evaluated for underlying inflammation, allergy, immunodeficiency, or anatomic abnormalities.

### 6.2.5 Nasal and Sinus Allergy

Allergic rhinitis is the state in which two or more of the following symptoms are present for more than one hour on most days—

- Nasal discharge
- Blockage
- Sneezing or itching

#### Causes

- An increased nasal response to normal stimuli (e.g., allergens) resulting in nasal congestion, sneezing, and rhinorrhoea. This symptomatic nasal disorder is induced by exposure to allergens (inhaled, ingested, injected, and contact) eliciting an IgE mediated response.
- Classification of allergic rhinitis:
  - Intermittent (seasonal)—mild, moderate, or severe and caused by inhalants such as tree pollen, grass, or mould spores
  - Persistent (perennial)—mild, moderate, or severe and cause by house dust mites, animal dander, cockroaches, or food

#### Symptoms and signs

- ‘Sneezers and runners’
  - Severe sneezing and watery nasal discharge
  - Minimal blockage
  - Worse during the day, better at night
  - Often associated conjunctivitis
- ‘Blockers’
  - Severe nasal blockage without itching
  - Thick mucous in nose and as a postnasal drip
  - Persistent during day and night
- Co-morbidity
  - >75% of patients with allergic asthma have allergic rhinitis and vice versa

- >40% of allergic rhinitis patients have allergic conjunctivitis

### Investigations

- Thorough history and ENT examination
- Allergy tests (skin prick testing, CAP RAST blood tests, challenge tests)
- CT of sinuses when indicated

### Management

#### General—Follow these four steps:

1. Allergen identification and avoidance and environmental control
2. Pharmacotherapy
3. Immunotherapy
4. Surgery

#### Medical—

- Mild—
  - Provide symptomatic treatment only.
  - Give oral antihistamines.
  - Do *not* give systemic decongestants.
  - Do *not* give antibiotics if serous or watery.
  - Give antibiotics (i.e., amoxicillin<sup>1</sup>) *only* if purulent (according to MCS).
- Mild to moderate—
  - Prescribe intranasal corticosteroid spray (e.g., beclomethasone dipropionate nasal spray) 50 mcg 1 to 2 times per day in each nostril.
  - Give oral antihistamine (e.g., chlorphenamine syrup [2 mg/5 mL] or tablets [4 mg] 3 times per day).
  - Give decongestants (local short course <2 weeks).
- Severe—
  - Prescribe a topical nasal steroid (e.g., beclomethasone dipropionate 50 mcg 1 to 2 times per day in each nostril).
  - Give oral antihistamine.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 6.2 Nose and Paranasal Sinus Disorders

- Prescribe a short course of systemic steroids.
- Refer to an ENT specialist if no improvement.

### 6.2.6 Tumours, Cysts, and Polyps of the Nose and Sinuses

Refer to an ENT specialist.

### 6.2.7 Adenoids

Problems with adenoids comprise hypertrophy of nasopharyngeal tonsil sufficient to produce symptoms.

#### 6.2.7.1 In Children

##### Causes

- Physiological: At 3 to 7 years of age (most common)
- Inflammation

##### Symptoms and signs

- Nasal obstruction which leads to—
  - Mouth-breathing
  - Difficulty in eating (especially infants)
  - Noisy breathing
  - Drooling and snoring
  - Toneless voice
  - So-called *adenoid facies*: pinched nostrils, prominent incisors, spongy gums, excessive thirst, lack of development of thorax with flat chest and round shoulders
- Eustachian tube obstruction
- Symptoms and signs due to inflammation include nasal and postnasal discharge, cough, otitis media, rhinitis, sinusitis, cervical adenitis
- General disturbances such as mental dullness and apathy, bad posture, deafness, nocturnal enuresis, habit tics; night terrors may be aggravated by adenoids
- Visualisation of adenoids
  - Older cooperative children: indirect nasopharyngoscopy with mirror



- Younger or uncooperative children: soft tissue lateral X-ray of nasopharynx
- If very large, may be seen posterior of soft palate
- Examination under anaesthesia (EUA) sometimes justifiable

### Management

1. Use conservative treatment when symptoms are mild. Give non-irritant decongestant nasal drops for short period; recommend fresh air, sensible diet, breathing and postural exercises; explain the proper nose-blowing technique.
2. When symptoms are marked or unresponsive to conservative treatment, refer to an ENT specialist.

#### 6.2.7.2 In Adults

Refer to an ENT specialist.

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**Note:** Adults should not have adenoids and if they do, tumours and/or HIV should be ruled out.

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#### 6.2.8 Epistaxis (Nosebleed)

Bleeding from the nose is called *epistaxis*.

##### Causes

- Local
  - Idiopathic: commonest cause
  - Traumatic: fractures, nose-picking, foreign bodies
  - Inflammatory: acute or chronic rhinitis
  - Neoplastic: benign or malignant tumours of the nose, sinuses, or nasopharynx
  - Environmental: high altitude, air-conditioned rooms cause drying of mucosa, seasonal allergy
  - Endocrine: associated with menstruation
- Systemic or general
  - Raised arterial pressure (temporary or permanent)
    - ◆ Hypertension (commonest)
    - ◆ Excitement

## 6.2 Nose and Paranasal Sinus Disorders

- Raised venous pressure
  - ◆ Cardiac disorders
  - ◆ Pulmonary disorders (whooping-cough, pneumonia)
- Diseases of blood and blood vessels (e.g., leukaemia, haemophilia, malaria, vitamins C and K deficiency, severe liver disease, renal failure)
- Medicines (e.g., aspirin, NSAIDs, alcohol, anticoagulants)

### Symptoms and signs

- Bleeding from the nose (anterior or posterior)
- Usually anterior (Little's area 80%)
- Spitting blood (sometimes)

### Management

#### In clinic, health centre, or hospital—

1. Reassure patient.
2. Instruct patient to sit with head forward and slightly down.
3. Pinch nostril firmly between index finger tip and thumb and hold for 5 to 10 minutes. Do *not* let go to check in between.
4. Instruct the patient not to blow his or her nose.
5. Check vital signs if bleeding is profuse.
6. If the underlying cause is alcoholism, give phytomenadione (vitamin K) 10 mg IM.
7. Refer if—
  - Bleeding does not stop
  - Vital signs decompensate
  - Bleeding recurs
  - Bleeding is from anywhere else other than nose (e.g., skin, mucous membranes)
  - Foreign body or tumour suspected
  - Hepatosplenomegaly present

### In hospital—

1. Treat the underlying cause.
2. Resuscitate if necessary.
3. Pack the nose using—
  - Ribbon gauze with bismuth and iodoform paste (BIPP): layer for layer, and left in place for a maximum of 5 days
  - Nasal tampons
4. If still bleeding into the throat, use the following procedure:
  - Insert a Foley's catheter through nose into nasopharynx.
  - Inflate with water.
  - Pull forwards until posterior passage is blocked.
  - Tape catheter to the patient's face.
  - Re-pack with BIPP-gauze.
  - Remove after 2 days.
5. Examination and cauterisation under a general anaesthetic is sometimes necessary.

### Health education

- Tell the patient—
  - Do not blow nose or scratch in nose for 24 hours after the bleeding stopped.
  - Come back to the clinic if bleeding starts again.
- Give iron supplements if anaemic.

### 6.3 Throat Disorders

#### 6.3.1 Acute Tonsillitis and Pharyngitis (Sore Throat)

Infection and inflammation of the throat and tonsils are usually due to viral or bacterial causes. If the tonsils are still *in situ*, the sore throat is usually due to tonsillitis. Lack of tonsils does not exclude acute pharyngitis.

##### Causes

- Streptococcal bacterial infection is the major cause and needs to be treated to prevent complications.
- Many different virus infections (often those associated with common cold, influenza, and nasal infections)
- Infectious mononucleosis
- Diphtheria
- Herpangina

##### Symptoms and signs

- Sore throat
- Dysphagia (difficulty in swallowing)
- Malaise
- Headache
- Earache
- Fever
- Vomiting (sometimes in children)
- Red and inflamed tonsils, pharynx
- Pus collections and follicles on tonsils
- Enlarged lymph glands of the neck (cervical)
- Halitosis
- Sometimes diffuse red rash
- *Danger:* development of rheumatic fever if not treated properly

##### Management

- Patients <15 years with sore throat, dysphagia, fever, red and inflamed tonsils, follicles on the tonsils, or enlarged lymph glands need active treatment.

- Follow this procedure—
  1. Provide pain relief (e.g., paracetamol)
  2. Recommend gargling with salt water or diluted chlorhexidine.
  3. If available, provide local antibiotic spray.
  4. Prescribe antibiotics:
    - Phenoxymethylpenicillin<sup>1</sup>
      - ◆ Adults: 500 mg PO four times daily for 5 days
      - ◆ Children: 250 mg/5 mL PO four times daily for 5 days
    - OR —
    - Benzathine penicillin<sup>1</sup>
      - ◆ Adults: 1.2 million units stat
      - ◆ Children: 0.6 million units stat
    - OR —
    - Azithromycin
      - ◆ Adults: 1 g PO daily for 3 days
      - ◆ Children: 10 mg/kg per day PO for 3 days

### 6.3.2 Acute Stridor

See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of acute airway obstruction.

### 6.3.3 Hoarseness

Hoarseness is a change in the normal voice to become softer and/or inaudible. It can be of sudden onset or chronic.

#### Causes

- Acute laryngitis (e.g., infection with virus or bacteria)
- Tracheal, laryngeal candidiasis
- Chronic laryngitis
- Nodules on vocal cords
- Carcinoma of larynx or vocal cords
- History of smoking and alcohol
- Chronic irritants (e.g., smoke, chemicals)

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 6.3 Throat Disorders

- Allergy and chronic postnasal drip
- Vocal cord paralysis
- Myxoedema (e.g., hypothyroidism)

### Symptoms and signs

- Underlying URT infection (e.g., sore throat, influenza, common cold)
- General malaise or weakness
- Fever if infection present
- Sometimes pain
- Cough and constant clearing of throat (chronic)

### Management

1. If hoarseness has lasted >3 weeks, refer.
2. Advise the patient to rest his or her voice.
3. Recommend inhalation of steam.
4. Counsel the patient to stop smoking and using alcohol.
5. Do *not* give decongestants or antihistamines.
6. Usually *no* antibiotics are needed.

## 7.1 Acute Abdomen

See “Section I. Common Emergencies and Trauma. Chapter 2. Trauma” for a discussion of acute abdomen.

## 7.2 Anorectal Disorders

### 7.2.1 Constipation

Difficult evacuation of faeces is called *constipation*. Normal bowel habits vary greatly. It is normal to pass stool 1 to 3 times per day, but it is also normal to pass stool every 2 to 5 days. Breastfeeding babies may have only one stool per week.

#### Causes

##### Medical—

- Diet with insufficient fibre or roughage
- Bottle feeding in babies
- Inadequate fluid intake
- Immobility
- Irritable bowel syndrome (IBS)
- Chronic laxative use
- Lack of exercise
- Medications: atropine, codeine-containing medicines, anti-inflammatory medicines, morphine
- Hypothyroidism
- Pregnancy

##### Surgical—

- Anal fissure
- Perianal disease
- Carcinoma of rectum, sigmoid colon. **Note:** Ruling out these two conditions is especially important in the elderly.
- Foreign body, sutures
- Pelvic mass (fibroid uterus)
- Gastrointestinal obstruction

## 7.2 Anorectal Disorders

### Symptoms and signs

- Faeces are too hard and passed out in small or large lumps
- Infrequent defecation
- Pain or strain on defecation
- Feeling of incomplete evacuation (tenesmus)

### Investigations

- Digital rectal examination
- Occult blood in stool
- Faecal occult blood, especially if patient is >50 years
- Abdominal X-ray

### Management

#### Primary intervention—

1. Rehydrate to increase faecal bulk and soften stool.
2. Continue breastfeeding in babies.
3. For major dietary measures, refer to dietician.
4. Recommend basic dietary changes such as—
  - Increasing gradually the fibre content of the diet, especially by eating more fruit, dried fruit, vegetables, oats, beans, lentils, wheat bran, brown bread, whole wheat cereals, grains, starches, and yellow maize
  - Increasing fluid intake by drinking more water (6 to 8 glasses per day) but avoiding coffee and black tea
5. Recommend increased physical activity. Encourage the patient to exercise daily (e.g., brisk walking).
6. Give bisacodyl tablets or suppositories (10 to 20 mg at night) or paediatric glycerine, which is a stimulant laxative.
7. If these attempts have no effect, try lactulose liquid and fibre supplement
8. Refer if patient has—
  - Unexplained rectal bleeding
  - Persistent abdominal problems
  - Weight loss



### Secondary intervention—

1. Try sennosides or enemas.
2. Apply dietary measures (see above under primary intervention).
3. Investigate further.

### Health education

See dietary changes suggested in primary intervention above.

### 7.2.2 Haemorrhoids

Haemorrhoids are enlarged blood vessels in the rectum, which may be displayed outside the rectum during defecation. They are often called *piles*. See [table 7.2.2](#).

#### Cause

- Constipation, hard stools
- Dehydration
- Pregnancy
- Physical inactivity

#### Symptoms and signs

- Bright red blood, often found on toilet paper or dripping into the pan
- Mucoid discharge
- Perianal itch
- Prolapse of something out of the anus

#### Investigations

- FBC
- Proctoscopy or sigmoidoscopy (to exclude anal, rectal cancer)

#### Management

##### Mild haemorrhoids: primary intervention—

1. Patient must reduce his or her own haemorrhoids by first putting petroleum jelly on his or her finger and then lightly pushing the haemorrhoids back into the rectum.
2. Treat constipation by giving bisacodyl tablets 10 mg at night or when necessary to soften stools.

## 7.2 Anorectal Disorders

TABLE 7.2.2 Progression of Haemorrhoids

Mild	Moderate	Severe
Minimal pain	Severe pain	Severe pain
Minimal bleeding	Moderate bleeding	Severe bleeding
Minimal prolapse that can easily be pushed back into rectum	Prolapse of haemorrhoids that can be pushed back into rectum only with effort	<ul style="list-style-type: none"> <li>• Prolapse of haemorrhoids that cannot be pushed back into rectum</li> <li>• Strangulation, thrombosis, infection, ulceration</li> </ul>

3. Advise the patient to avoid straining or prolonged sitting during defecation.
4. Recommend sitz baths in water with povidone-iodine.
5. Encourage the patient to drink a lot of water (6 to 8 glasses per day).
6. Encourage the patient to exercise regularly.
7. Recommend that the patient increase the fibre content of his or her diet. See dietary measures as for constipation, and refer patient to a registered dietician for individualized dietary counselling. Dietary treatment depends on symptoms and side effects the patient has.

### Moderate haemorrhoids—

1. Give stool softeners (i.e., bisacodyl 10 mg at night as needed or 2 times per day for 2 weeks).
2. Insert bismuth subgallate compound suppositories for pain relief if necessary.
3. Apply zinc ointment locally.

### Severe haemorrhoids—

1. Refer to next level.
2. Order bed rest with elevation of legs.
3. Give pain medication.
4. Try digital reduction; if impossible take to theatre or reduce under sedation.

5. Treat infection with antibiotic.<sup>1</sup>
6. Treat iron deficiency with oral iron supplements. (See “Section II. Diseases and Disorders According to Body System. Chapter 4. Blood System” for a discussion of anaemia.)
7. Recommend surgery (haemorrhoidectomy) if no improvement.

### Health education

- Haemorrhoids can be caused by any of the following: straining during defecation, constipation, pregnancy, or prolonged sitting.
- Provide dietary measures as for constipation and refer the patient to a dietician.
- Advise the patient to drink 2 glasses of water with every meal and between meals.
- Remind the patient to wash hands after reducing haemorrhoids.
- Patient should return if there is no improvement after 2 weeks.

### 7.2.3 Anal Fissures or Tears

Anal fissures or tears are common sequelae of constipation and are characterised by sudden onset of pain and red blood per rectum.

#### Cause

- Constipation, hard stools
- Anal intercourse; foreign bodies inserted in rectum

#### Symptoms and signs

- Anal pain and itching
- Red blood per rectum
- Pain on defecation and staining of pants with blood

#### Investigations

- Visual and digital examination of anal area
- Rule out haemorrhoids and cancers

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 7.2 Anorectal Disorders

### Management

1. Advise patient to avoid straining during defecation.
2. Advise patient to increase the fibre content of his or her diet. See dietary measures as for constipation, and refer to a registered dietician if no improvement.
3. Instruct the patient to use laxatives only when constipation is severe. Warn against chronic use.
4. Use topical anaesthetic if available.
5. Refer if patient has severe pain, an unusually tight anus, or no response to medication.

### 7.2.4 Acute Diverticulitis and Acute Colitis

*Diverticula* are mucosal pouches that develop from a weak part in the mucosal wall usually of the large intestines and sigmoid colon. It is usually found in the lower large intestine and sigmoid colon. The diverticula may become inflamed, and this inflammation will cause diverticulitis.

*Colitis* is the inflammation of large parts of the colon (usually in ulcerative colitis), and any part of the intestines (small or large bowel) in Crohn's disease.

#### Cause

- Mainly unknown
- Low-fibre diet
- Genetic, family history
- Smoking (aggravating factor)
- Inappropriate use of antibiotics

#### Symptoms and signs

- Asymptomatic in 90% (diverticula)
- If acute diverticulitis: presents similar to appendicitis, but on the *left* side
- Left iliac fossa pain; left lower abdomen
- Right iliac fossa (iliocaecal inflammation in Crohn's disease)
- Fever
- Nausea and vomiting
- Rebound tenderness when severe signs of acute

abdomen. See “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of acute abdomen.

- Rectal bleeding (red blood)

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**Note:** Complications are abscess formation, perforation, haemorrhage, fistula formation, intestinal obstruction.

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### Investigations

- FBC, diff WCC, ESR
- C-reactive protein (CRP)
- Stool cultures, occult blood
- Abdominal X-ray (AXR)
- Sonar or ultrasound
- Barium enema
- Sigmoidoscopy
- CT

### Management

#### In clinic or health centre—

1. Refer to hospital if patient presents with severe signs or signs of decompensation. See “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of acute abdomen.
2. Provide pain relief.
3. Provide symptomatic treatment.
4. Refer to a registered dietician for dietary counselling.

#### In hospital—

1. Prescribe medicine according to culture sensitivity tests for ulcerative colitis or Crohn’s disease:
  - Sulphasalazine (500 mg tablets)
    - Adults: Initial 1000 to 2000 mg every 6 hours to a maximum 12 g in 24 hours.  
Remission: 2 g daily
    - Children: Initial 40 to 60 mg/kg in 3 to 6 divided doses  
Remission: 20 to 30 mg/kg in 3 divided doses

## 7.2 Anorectal Disorders

2. Prescribe steroids:
  - Hydrocortisone 100 mg IV every 6 hours for an acute attack
  - Prednisolone tablets 40 to 60 mg daily
3. Recommend surgery if necessary.
4. Refer patient to a registered dietician for dietary counselling. For patients with acute diverticulitis, a low-residue diet with a lower fat content, elemental diet, or in complicated cases, TPN, may be required, followed by a *gradual* return to a high-fibre diet. In cases of obstruction or perforation, large pieces of coarse plant matter such as pips, peel, seeds, and nuts should be restricted.

### 7.2.5 Colorectal Cancer

Colorectal cancer is usually found in the elderly. Any change of toilet patterns needs to be followed up and investigated.

#### Associated factors

- Diets high in fat and an excessive red meat intake
- Diets low in fibre
- Genetics, family history of cancer
- Benign adenoma
- Familial adenomatous polyposis

#### Symptoms and signs

- Change in defecation pattern (i.e., more or less frequent stools, smaller stools, constipation, or diarrhoea)
- Straining at defecation
- Fresh bleeding per rectum
- Feeling of fullness in abdomen
- Seldom pain, but may have colic
- Emaciation, tiredness, and anaemia

#### Investigations

- Faecal occult blood
- Double contrast barium enema
- Colonoscopy

- FBC and diff
- LFT

### Management

1. Refer to next level for surgery or chemo- or radiotherapy and dietary advice.
2. Consult with the oncology department.

## 7.3 Diarrhoea

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### 7.3.1 Diarrhoea without Blood

Diarrhoea without blood is defined as the passing of loose stool more than 3 to 5 times per day. It can be acute (lasting only a few days) or chronic and persistent (continuous for more than 14 days), and it can lead to dehydration and loss of electrolytes.

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**Note:** Dehydration has to be detected or excluded. Establish whether blood is in the stool.

---

### Causes

- Food poisoning (e.g., salmonella)
- Contaminated water (e.g., with toxins, infectious organisms, or bacteria viruses)
- Unhygienic circumstances such as stool contamination of the hand
- Side effects and interactions of certain medicines such as antibiotics
- Intolerance to certain foods such as foods containing lactose, gluten, or fat
- Poor nutrition

### Symptoms and signs

- Refer to [table 7.3.1](#) to determine the level of dehydration from diarrhoea.

TABLE 7.3.1 Assessing Dehydration

Symptoms and Signs	Moderate Dehydration (3% to 8%)			Severe Dehydration (>8%)
	Mild Dehydration ( $\leq 3\%$ )			
General condition	Alert, responsive	Restless, irritable	Floppy, weak	
Eyes	Normal	Sunken (also sunken fontanel in children)	Deeply sunken	
Tears	Present	Minimal or absent	Absent	
Mucous membranes	Moist	Dry	Very dry	
Thirst	Drinks normally	Thirsty	Drinks poorly	
Skin pinch	Retracts quickly	Retracts slowly (1 to 2 seconds)	Retracts very slowly (>2 seconds)	
Skin turgor	Normal	Diminished	Very diminished	
Neurological state	Normal	Drowsiness, altered neurological status	Lethargic, comatose	
Signs of shock	None	None	Yes (see text)	
<b>Treatment</b>				
—	At home	At primary level or ORT corner	At secondary level	



**Signs of shock and in need of immediate treatment**

- Tachycardia
- Cool, mottled, pale peripheries
- Capillary refill >2 seconds
- Rapid, deep breathing (acidotic breathing)
- Floppy, lethargic, or comatose



**Investigations**

- If treatment fails or blood or mucous is in the stools: stool culture and microscopy
- In severe dehydration: U+E, FBC, CRP, blood gas

**Management****Plan A: For mild dehydration, treat diarrhoea at home.**

- Children—
  1. Advise parents or caregivers on how to treat diarrhoea at home:
    - Give more fluids to prevent dehydration (10 mL/kg after each loose stool or vomit). Provide more frequent breastfeeding. Provide oral rehydration salts (ORS) solution and food-based fluids for children who are not breastfeeding. Give small amounts at a time, but give often.
    - Give the child enough food (e.g., soft porridge, pureed foods, yoghurt).
    - Come back if the child does not improve.
  2. Show the parents or caregivers how to mix ORS, and how to give it to the child. If no ORS packs are available—
    - Use boiled, cooled clean drinking water (1 litre).
    - Add 6 to 8 teaspoons of sugar.
    - Add 1/2 teaspoon of salt.
  3. Teach parents or caregivers how to prevent diarrhoea at home: drink from a cup; feeding bottles should not be used.
  4. Recommend that the child drink fruit juices.
  5. Give the parents or caregivers at least 2 packs of ORS (or substitute as above).

## 7.3 Diarrhoea

6. Recommend the following dosages of ORS:
  - <2 years = 50 to 100 mL after every loose stool
  - >2 years = 100 to 200 mL after every loose stool
7. Continue treatment until diarrhoea has stopped.
8. Instruct parents or caregivers that if the child shows no improvement, they should return to the primary level.
9. If the child shows no improvement or has the following signs—is very ill, not drinking, or drowsy; has fever, bloody stools, or many watery stools—**refer.** 
- Adult—
  1. Drink frequent small amounts of fluids, but avoid coffee.
  2. Take ORS: 200 to 300 mL after every loose stool.
  3. If no improvement, **refer.** 

**Plan B: For moderate dehydration, treat with ORS at the primary level.**

- For children, adolescents, and adults—
  1. Give ORS in first 4 hours according to Integrated Management of Childhood Illness (IMCI) guidelines ( $\text{mL} = \text{weight in kg} \times 75$ ).
    - Give amount of fluid according to age and weight of child.
    - Give 1 to 2 L (<30 kg adolescent) and 2.2 to 4.0 L (adult)
    - Give ORS slowly using a cup; if patient vomits, wait for 10 minutes then resume.
    - Continue breastfeeding on demand.
  2. Re-evaluate after 4 hours. If the patient is better, continue plan A; if not, continue ORS in clinic at as primary intervention or go to plan C
  3. Give zinc sulphate if available.

**Plan C: For severe dehydration, treat with IV fluids, or refer to hospital.**

- Children, adolescents, and adults—
  1. IV or intraosseous fluid resuscitation is indicated—
    - Start IV fluids immediately.
    - OR ——
    - Refer within 30 minutes.
  2. Give Plasmolyte B, rehydration fluid, Ringer's lactate. If not available, give 1/2 Darrow's or normal saline at the following infusion rates—
    - <12 months: first hour, give 30 mL/kg; then 70 mL/kg per hour maintenance for 5 hours
    - 1 to 5 years: first 30 minutes, give 20 to 30 mL/kg; then 70 mL/kg maintenance for 2.5 hours
    - Adults and older children: first 30 minutes, give 30 mL/kg; then 100 mL/kg maintenance for 2.5 hours
  3. As an alternative, use NGT infusion at 20 mL/kg per hour for 3 hours. If no improvement, refer. ⚠
  4. Reassess at 1 to 2 hours, 3 to 4 hours, and 6 hours (i.e., frequently).
  5. Re-categorise into plan A, B, or C, as appropriate.
  6. Start ORS as soon as possible (5 mL/kg per hour).

#### Notes:

- Always check for malnutrition.
- Always check for malaria if patient has fever.
- Always check immunisations.
- Manage children's feeding during gastroenteritis—
  - Formula fed: milk feeds should never be stopped for more than 4 hours.
  - Breastfed: continue breastfeeding throughout rehydration and maintenance phases.

#### Health education

- Stress food and personal hygiene.
- Instruct the patient or caregiver to give fluids (e.g.,

## 7.3 Diarrhoea

breast milk, ORS, rice water, weak tea, fruit juice, or water) as soon as diarrhoea develops. Give small amounts frequently.

- Instruct the patient or caregiver to give fluids after every loose stool.
- Stress that ORS should *never* be mixed using any fluid other than water.
- Recommend that small amounts of soft food (e.g., soft porridge, yoghurt, pureed foods) be given to a patient with diarrhoea.
- Refer for dietary counselling.

### 7.3.1.1 Cholera

Cholera is water-secreting diarrhoea caused by the *Vibrio cholerae* bacterium. It occurs primarily in the north-eastern part of the country, which experiences seasonal floods. It is a very serious, rapidly spreading disease.


#### Symptoms and signs

- Sudden explosive, rice watery diarrhoea
- Excessive vomiting and fever
- No pain or colic
- Rapid onset of severe dehydration
- Possibility of anuria and collapse
- Weak condition
- Decrease in consciousness

#### Investigation

- Stool culture and sensitivity (MCS)
- Rectal swabs for *V. cholerae*

#### Management

1. Assess the patient for dehydration.
2. For rehydration, see treatment plans A, B, and C in 7.3.1 above.
3. **Refer** to hospital with IV infusions or ORS. 
4. Prescribe antibiotics: doxycycline 300 mg stat or co-trimoxazole in children.

## Health education

Consider local practices and remedies when giving health education and stress the following to the patient.

- Rehydrate with plenty of fluids.
- Continue breastfeeding or weaning.
- Do *not* drink dirty water.
- Boil all water for drinking
- Dispose of stools in a safe area.
- Wash hands before preparing food and after using the toilet.
- Wash all vegetables well before cooking or eating.
- Do *not* eat food that is not well cooked. The only exception is raw food that is peeled before eating (e.g., bananas).
- Use latrines wherever possible.

### 7.3.1.2 Typhoid Fever

Typhoid fever is an acute life-threatening febrile illness characterized by persistent high grade fever  $> 38^{\circ}\text{C}$ . The three types of cases are defined as follows:

- *Confirmed case*—a patient with fever ( $>38^{\circ}\text{C}$ ) that has lasted at least 3 days, with laboratory confirmed positive culture of *Salmonella typhi*
- *Probable case*—a patient with fever ( $>38^{\circ}\text{C}$ ) that has lasted at least 3 days and with a positive serodiagnosis or antigen detection test but without *S. typhi* isolation
- *Chronic carrier*—excretion of *S. typhi* in stools or urine (or repeated positive bile or duodenal string cultures) for longer than 1 year after onset of acute typhoid fever. Short-term carriers also exist.

## Causes

- *S. typhi*
- *Salmonella paratyphi* A & B

## Symptoms and signs

- High-grade fever  $>38^{\circ}\text{C}$  with profuse sweating
- Headache, malaise, and anorexia

## 7.3 Diarrhoea

- Exanthema (rose spots) on chest, abdomen, and back
- Gastroenteritis and constipation
- Diarrhoea usually without blood

**Note:** Complicated cases present with—

- Intestinal perforation with all signs of peritonitis accompanied by sudden rise in pulse rate and hypotension
- Marked abdominal tenderness, rebound tenderness, and guarding with subsequent abdominal rigidity
- Altered mental status

### Investigations

- Stool occult blood
- Rectal swab, stool MCS
- Bone marrow and blood culture
- Urine MCS
- FBC (left shift)
- Widal test
- Abdominal X-ray (free air)

**Note:** Blood, urine, and stool specimens should be submitted many times to facilitate isolation of *Salmonella* because it is intermittently shed.

### Management

**In clinic, health centre, and hospital—**

1. Start oral or IV hydration.
2. Use antipyretics.
3. Ensure appropriate nutrition.
4. Prescribe ceftriaxone 1 g 2 times per day for 10 to 14 days.

**In hospital, prescribe—**

- Chloramphenicol 500 mg 4 times per day for 14 to 21 days
- OR ——
- Ciprofloxacin 250 to 500 mg 2 times per day for 7 to 14 days

**In the clinic, health centre, or hospital for all carriers—**

- To provide clearance for chronic carriers, prescribe ciprofloxacin 750 mg 2 times per day for 28 days.

**Health education**

- Recommend the following to the patient.
  - Avoid faecal contamination of water and food.
  - Practice good personal hygiene (e.g., washing hands with soap after using the bathroom and before food preparation).
  - Avoid raw food, shellfish, and ice cream.
  - Stay isolated for duration of infection.
  - Use disinfection measures.
- Screen all food handlers biannually for *Salmonella*.

**7.3.2 Dysentery and Diarrhoea with Blood and Mucous**

Dysentery is an inflammation of the colon and rectum characterised by diarrhoea with blood and slimy mucus. The most common cause of dysentery is infection with shigella bacteria; another cause is amoeba infection. The infection, which is usually transmitted by flies and contaminated food, is most common during the summer months.

**Causes**

- *Shigella dysenteriae*
- Enterohaemorrhagic *Escherichia coli*
- Amoeba
- Inflammatory bowel disease such as ulcerative colitis, Crohn's disease

**Symptoms and signs**


- Diarrhoea with slime and blood
- Diffuse lower abdominal pain, usually with colic
- Often fever
- Painful defecation

## 7.3 Diarrhoea

### Investigations

- Stool microscopy and culture
- FBC

### Management

1. Assess the patient for dehydration.
2. Rehydrate as before according to plan A, B, or C in 7.3.1 above.
3. Treat with an oral antibiotic for *Shigella*: nalidixic acid. Give a total of 50 mg/kg per day in 4 divided doses for 5 to 7 days for a maximum of 10 days.
  - Children:
    - 2 to 12 months = 2.5 mL
    - 1 to 5 years = 5 mL
  - Adults: 1 g 4 times per day for 5 days
4. Review the child after 2 days if patient is—
  - <1 year of age
  - Initially dehydrated
  - There is still blood in the stool
5. If the stool is still bloody after 2 days—
  - Change to a second oral antibiotic and **refer.** 
  - Do *not* use constipating agents for patients with bloody diarrhoea.
6. Refer for dietary counselling in case of inflammatory bowel disease.

#### 7.3.2.1 Amoebiasis

Amoebiasis is caused by contamination of water and food by stools that contain *Entamoeba histolytica* or *E. coli*.

#### Symptoms and signs

- Foul-smelling diarrhoea with blood and mucous
- No fever usually
- Abdominal cramps
- May become chronic, and then the patient will have pain in the upper right quadrant of the abdomen.
- With a liver abscess the following will be found: fever, weight loss.



**Note:** Amoebic liver abscess is a complication of amoebiasis.

## Management

1. Rehydration according to plan A, B, or C in 7.3.1 above.
2. Give metronidazole 3 times per day for 5 days (10 days in HIV infection) at the following dosages—
  - Adult: 400 mg
  - Children: 40 mg/kg per day

### 7.3.3 Persistent Diarrhoea

Persistent diarrhoea is an episode of diarrhoea that starts acutely and lasts at least 14 days.

#### Causes

- Infective
  - Rotavirus
  - Aeromonas, campylobacter, shigella, entero-adherent *E. coli*
  - *Giardia lamblia*
  - Cryptosporidium, *Isospora belli*, *Microspora*, *Mycobacterium avium-intracellulare* (HIV associated)
- Non-infective
  - Side effect of ART, particularly protease inhibitors
  - Lactose intolerance and pancreatic insufficiency, which may lead to malabsorption and steatorrhoea
  - Mucosal damage (e.g., Crohn's disease)
  - Colon or rectal cancer

#### Risk factors

- Previous diarrhoea infection
- Nutritional status
- Breastfeeding practice

#### Investigations

- FBC, ESR
- HIV tests
- Stool MCS
- Sigmoidoscopy

## 7.3 Diarrhoea

### Management

See figures 7.3.3A and 7.3.3B and table 7.3.3.

#### In clinic, health centre, or hospital—

1. Rehydrate according to plan A, B, or C in 7.3.1 above.
2. Give nalidixic acid: a total of 50 mg/kg per day given in 4 divided doses for 5 to 7 days for a maximum of 10 days if—
  - Patient has not yet been treated with antibiotics
  - Patient has persistent bloody diarrhoea

---

#### Notes:

- In case of relapse, prolonged treatment up to 3 weeks may be required.
- Antibiotics should not be used in persistent diarrhoea except for certain specific pathogens. *Shigella* is known to cause persistent diarrhoea and can be treated with antibiotics; antibiotics should be used when *Shigella* is isolated by stool culture or when the stool is bloody. Non-specific antibiotic therapy, given without knowing what is causing the diarrhoea episode, has *not* proved to be effective against persistent diarrhoea and should not be used.

- 
3. Consider other causes according to the prevalence in the area (e.g., amoebiasis and bilharzia).
  4. Continue fluid replacement and appropriate nutrition all the time.
  5. In areas where giardiasis is common, prescribe metronidazole 400 mg 2 times per day for 5 days.
  6. If the patient does not respond, refer for further examination and treatment.

#### In hospital—

1. Perform the following investigations:
  - Rectal swab, stool MCS
  - Rotavirus antigen test
  - Stool ZN stain
  - HIV test

2. Make the following special considerations in patients who are HIV-positive:
  - Bloody diarrhoea that does not respond to nalidixic acid may be due to campylobacter.
  - Toxic symptoms (fever, low blood pressure, tachycardia, pallor) may indicate *Clostridium difficile* infection. Stop all antibiotics and give oral metronidazole. Relapse may occur.
  - Large-volume diarrhoea may be due to cryptosporidia, microsporidia, and *I. belli*. The patient may have a low-grade fever. *I. belli* usually requires prolonged treatment with co-trimoxazole to reduce the occurrence of relapses.
  - Fever and small-volume diarrhoea (often bloody) with faecal leucocytes may indicate CMV colitis at very low CD4 counts. Complications include perforation or toxic megacolon.
  - Mycobacterial infections, including TB, are often associated with systemic symptoms including fever, weight loss, and night sweats.
  - Protozoal infections should be treated with metronidazole.
  - Consider worm infections including *Strongyloides stercoralis*.

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**Note:** Unexplained chronic diarrhoea (>1 month) is a stage 3 diagnosis and patients should start ARVs as soon as stable.

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3. Only after all required examinations have been done and necessary treatments have been given, may anti-diarrhoeal agents be prescribed at hospital. These patients may be referred back to clinic or health centre for continuation of this treatment. Prescribe the following:
  - Loperamide (2 mg tablets)
    - Adults: 2 stat, then 1 after every loose stool
    - Children >6 years: 1 stat, then 1 after every stool

## 7.3 Diarrhoea

- Do *not* give to the elderly, infants, or children <6 years. Do *not* give to patients who have bloody diarrhoea.
- Codeine 30 mg PO every 4 to 6 hours as needed

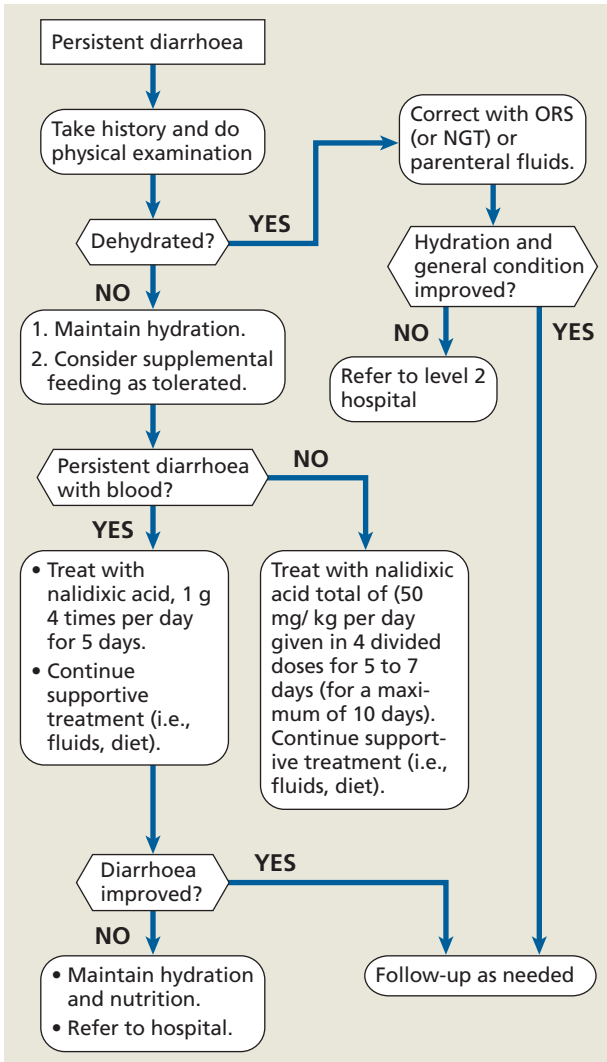
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**Note:** Anti-diarrhoeal agents should not be given to patients with bloody diarrhoea, elderly patients, or children.

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4. Refer to a dietician for dietary counselling.

FIGURE 7.3.3A Persistent diarrhoea in adults—management in a clinic



## 7.3 Diarrhoea

FIGURE 7.3.3B Persistent diarrhoea in adults—management in a hospital

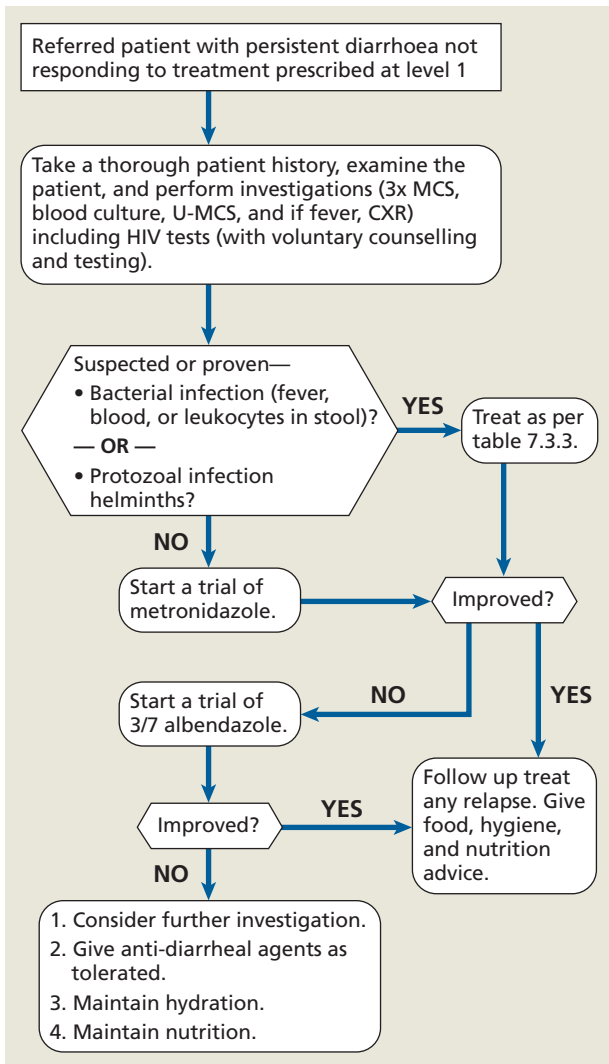


TABLE 7.3.3 Persistent Diarrhoea

Causes	Symptoms and Signs		Investigations		Management
	Parasites				
<i>G. lamblia</i>	Diarrhoea	Fresh stool microscopy (plus aspirate upper GIT)	Metronidazole 400 mg 3 times per day for 5 days or albendazole 400 mg once per day for 3 days		
<i>E. histolytica</i>	Diarrhoea and blood in stool	Fresh stool microscopy	Metronidazole 400 mg 3 times per day for 10 days		
<i>S. stercoralis</i>	Diarrhoea and blood in stool	Fresh stool microscopy	Albendazole 400 mg once per day for 3 days		
<i>I. belli</i>	Diarrhoea	Fresh stool microscopy	Co-trimoxazole 2 tablets 2 times per day for 7 to 21 days		
Cryptosporidium	Diarrhoea	Fresh stool (AFB stain)	HAART		
Microsporidium	Diarrhoea	Fresh stool microscopy	HAART, albendazole 400 mg 2 times per day for 4 to 6 weeks		

## 7.3 Diarrhoea

TABLE 7.3.3 Persistent Diarrhoea (cont.)

Causes	Symptoms and Signs	Investigations		Management
		Bacteria		
<i>Salmonella</i> species	Diarrhoea, fever, and blood in stool	Stool microscopy, culture, and haemoculture		Nalidixic acid 1g 4 times per day for 5 days or ciprofloxacin 500 mg 2 times per day for 5 to 7 days PO or IV
<i>Shigella</i> species	Diarrhoea, fever, and blood in stool	Stool microscopy and culture		Erythromycin 500 mg 4 times per day for 7 days or ciprofloxacin 500 mg 2 times per day for 5 to 7 days PO or IV
<i>Campylobacter</i>	Diarrhoea, fever, and blood in stool	Stool microscopy and culture		Erythromycin 500 mg 4 times per day for 7 days or ciprofloxacin 500 mg 2 times per day for 5 to 7 days PO or IV.
<i>C. difficile</i>	Diarrhoea and fever	Stool microscopy and culture		Stop other antibiotics. Manage toxic shock. Metronidazole 400 mg PO 3 times per day for 10 days



TABLE 7.3.3 Persistent Diarrhoea (cont.)

Causes	Symptoms and Signs	Investigations	Management
<i>E. coli</i>	Diarrhoea and fever	Stool microscopy and culture	Cefuroxime 750 mg 3 times per day for 7 days
<b>Viruses</b>			
CMV	Diarrhoea and blood in stool	Biopsy	No etiologic therapy available
HIV	Diarrhoea	None indicated	HAART
<b>Other</b>			
Malignancies such as Kaposi's sarcoma or lymphoma	—	—	HAART
Idiopathic (possibly HIV infection)	—	—	HAART

### 7.4 Epigastric Disorders

#### 7.4.1 Gastro-Oesophageal Reflux Disease and Oesophagitis

Gastro-oesophageal reflux disease (GORD) is a disease syndrome of upper abdominal and epigastric complaints caused by reflux of acids, fluids, or food into the oesophagus. It can lead to an inflammation of the oesophagus called *oesophagitis*.

##### Causes

- Gastro-oesophageal reflux, due to poor function of lower oesophageal sphincter
- Medications such as nitrates, contraceptives, calcium channel blockers, and benzodiazepines
- Smoking, alcohol
- Caffeinated beverages, oily foods
- Slow stomach emptying as in pyloric stenosis
- Hiatus hernia
- Abdominal distension or raised abdominal pressure from pregnancy, obesity, or gastric obstruction (e.g., gastric tumour, pyloric stenosis, tumours, tight clothing)

##### Symptoms and signs

- Regurgitation with heartburn
- Retrosternal chest pain
- Postprandial nausea (after eating) with a bitter acid taste in mouth
- Vomiting
- Anorexia and loss of appetite
- Pain on swallowing or dysphagia
- Belching (winds)
- Bloating
- Shortness of breath on lying down (especially at night)
- Hoarseness and laryngitis
- Tooth decay, bad breath, gum problems

## Investigations

- Start treatment before investigations.
- Investigate only if—
  - Treatment does not work after 4 weeks
  - Patient is >50 years
  - Patient has severe and continuing symptoms and signs (e.g., unexplained weight loss, painful swallowing, bleeding, or anaemia)
- Investigations to order—
  - FBC and diff WCC, ESR
  - Barium meal
  - *Helicobacter pylori* tests (stool *H. pylori* antigen test)
  - Oesophagoscopy or gastroscopy

## Management

### In clinic, health centre, or hospital—

1. Provide health education on diet, dietary measures, and lifestyle changes. **Note:** The following are basic guidelines. Dietary therapy will depend on the patient's symptoms. Refer patient to a registered dietician for individualized dietary counselling.
  - Avoid food and drinks that precipitate symptoms.
  - Eat six *small* meals per day. Do *not* eat just before retiring to bed (i.e., eat 2 to 3 hours before going to bed). If you do want to rest after a meal, ensure that your upper body is slightly elevated on a large pillow.
  - The disease is caused by an excess amount of acid in the stomach with reflux due to a poorly functioning gastric valve.
  - Lose weight (if overweight or obese). See “[Section III. Nutrition and Lifestyle](#)” for a discussion of obesity.
  - Stop smoking.
  - Reduce alcohol intake.
  - Exercise regularly. Avoid pain pills such as aspirin and anti-inflammatories.
  - Sleep with head of bed raised.

## 7.4 Epigastric Disorders

### 2. Medicate.

- Step 1. Recommend antacids between meals and in the evening to control the pain:
  - Aluminium hydroxide/magnesium trisilicate 1 to 2 tablets after meals
  - Aluminium hydroxide suspension 10 to 15 mL 3 times per day
- Step 2. Prescribe H<sub>2</sub> antagonists—
  - Ranitidine tablets 150 mg 2 times per day for 4 weeks
  - Then increase to 300 mg 2 times per day if necessary
  - Maintenance therapy 150 mg at night
  - Add metoclopramide 10 mg 3 times per day for 3 days

### 7.4.2 Gastritis and Peptic Ulcer Disease

Gastritis results from excessive acid in the stomach. This excess acid erodes the lining of the stomach and duodenum (the first part of the small bowel) and later causes a raw area, called a *peptic ulcer*.

#### Causes

- Caffeine-containing beverages
- Alcohol and smoking
- Emotional tension (i.e., stress)
- Anti-inflammatory treatment such as indomethacin, aspirin, and other NSAIDS

#### Symptoms and signs


- General—
  - Epigastric, retrosternal pain
  - In a gastric ulcer: pain immediately after intake of food
  - In a duodenal ulcer: pain usually before food and relieved after food
- Nonbleeding ulcer—
  - Gastritis: usually after excessive alcohol intake

- Epigastric abdominal pain 1 to 2 hours after food, or when the stomach is empty
- Pain that can wake patient at night
- Pain alleviated by food, milk, or antacid medication
- Nausea, vomiting (sometimes blood)
- Discomfort on palpation of the upper abdomen
- Bleeding ulcer
  - Sudden weakness and dizziness
  - Cold and clammy skin (when patient has lost a lot of blood)
  - Sudden urgent feeling of having to defecate
  - Ground-coffee-brown vomitus
  - Black stools (i.e., melena)
- Perforated ulcer
  - Acute abdominal pain (see “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of acute abdomen)
  - Signs of peritonitis such as rigid abdomen
  - Nausea and vomiting (with coffee-ground-brown colour indicating blood)
  - Fever
  - Shock (weak pulse, clammy skin, and low blood pressure)

### Management

1. Medicate as for GORD:
  - Step 1. Recommend antacids between meals and in the evening to control the pain:
    - Aluminium hydroxide or magnesium trisilicate 1 to 2 tablets after meals
    - Aluminium hydroxide suspension 10 to 15 mL 3 times per day
  - Step 2. Prescribe H<sub>2</sub> antagonists:
    - Ranitidine tablets 150 mg 2 times per day for 4 weeks
    - Then increase to 300 mg 2 times per day if necessary

## 7.5 Liver Disease

- Maintenance therapy 150 mg at night
  - Add metoclopramide 10 mg 3 times per day for 3 days
2. Treatment for eradication of *H. pylori*:
    - Clarithromycin 500 mg 2 times per day for 1 week
      - Plus ranitidine 150 mg 2 times per day for 1 week
      - Plus metronidazole 400 mg 2 times per day for 2 weeks
    - OR —
    - Amoxicillin<sup>1</sup> 1 g 2 times per day for 1 week
      - Plus ranitidine 150 mg 2 times per day for 1 week
      - Plus metronidazole 400 mg 2 times per day for 2 weeks
  3. Advise patient to make changes to his or her diet and lifestyle. See above guidelines for GORD, and refer to dietician.
  4. For bleeding and perforated ulcer, refer to hospital. 

## 7.5 Liver Disease

### 7.5.1 Jaundice

*Jaundice* refers to yellowish discoloration of the sclera and skin due to raised level of bilirubin in the body. Bilirubin is a by-product of red blood cell breakdown. It is processed in the liver and then excreted into the small intestine (in bile); some of it is reabsorbed and excreted in urine.

#### Causes

- Increased breakdown of red blood cells
  - Haemolytic anaemia
  - Haemolytic transfusion reactions (incompatible blood transfusion)
  - Hypersplenism
  - Medicines

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

- Infections (e.g., malaria)
- Sickle cell disease
- Thalassaemia
- Haemolytic disease of the newborn
- Intrahepatic problems
  - Hepatitis (usually infection with hepatitis viruses)
  - Hepatocellular carcinoma
  - Cirrhosis (from alcohol abuse, iron overload)
  - Medicines (e.g., HAART, isoniazid)
  - Pregnancy
- Extrahepatic problems
  - Gallstones
  - Pancreatic carcinoma
  - Pancreatitis
  - Biliary duct strictures

### Investigations

- LFT (AST, ALT, bilirubin), Coomb's test, haptoglobin
- Hepatitis tests (A, B, C)
- Sonar or ultrasound of bile ducts and gallbladder
- Malaria test and sickle cell screen
- Hepatitis profile
- Liver biopsy

### Management

#### In clinic and health centre—

1. Refer all patients to the next care level.

#### In hospital—

1. Treat according to underlying cause.
2. Use phototherapy with UV light for newborn babies.
3. Discontinue offending factors.

### 7.5.2 Hepatitis

Hepatitis is an acute inflammation of the liver cells, that is, acute parenchymal damage.

#### Causes

- Virus infection—such as hepatitis A, B, C, (D), and E; CMV; Epstein Barr

## 7.5 Liver Disease

- Hepatitis A and E can be transmitted by eating food or drinking water that is contaminated by stool (faeco-oral).
- Hepatitis B and C can be transmitted during blood transfusion and from instruments that are not sterilized properly (blood and body fluids)
- Other infections (non-viral)—toxoplasmosis, leptospirosis
- Drugs, poisons, and medicines
- Alcohol

### Symptoms and signs

- Weakness and malaise
- Low-grade fever
- Nausea, loss of appetite, and vomiting
- Pain or tenderness over the right upper abdomen
- Jaundice, yellow sclera (the white of the eyes appears yellow)
- Enlarged liver
- Dark urine
- Stools may be pale
- Severe pruritus (itchiness) of the skin

### Investigations

Refer to jaundice (7.5.1 above).

### Management

1. Refer to higher care level.
2. For hepatitis A, provide supportive treatment.
3. For hepatitis B and C—
  - Provide supportive treatment.
  - Refer to a specialist.
4. For dietary measures, refer to dietician and a specialist physician.

### Health education

- Advise bed rest.
- Provide patient with the temporary dietary measures and refer to dietician.



- Urge patient to avoid alcohol because it worsens the disease.
- The disease is spread by contaminated water or food (hepatitis A, B, E), and therefore boiling all drinking water and protecting food against flies is necessary.
- Advise patient to wash his or her hands with soap and water after using the toilet.
- Stress the importance of using a sanitary toilet or burying all stools so that the disease cannot be spread.
- All family members must also wash their hands after they have been to the toilet.
- Warn against sharing items that the patient puts in the mouth (e.g., cutlery, crockery, toothbrushes).

### 7.5.3 Liver Cirrhosis

Cirrhosis is a chronic disease of the liver with necrosis of the liver cells followed by fibrosis and nodule formation.

#### Causes

- Excessive drinking of alcohol
- Postviral hepatitis
- Iron overload
- Drugs, poisons, and medicines
- Biliary cirrhosis (children)
- Autoimmune diseases

#### Symptoms and signs

- Nausea, vomiting, and loss of appetite
- Weakness
- Weight loss
- Malaise
- Loss of libido (i.e., no desire for sex)
- May be jaundiced
- Enlargement of the male breasts
- Enlarged liver initially; later the liver will decrease in size
- Spleen may be enlarged
- Ascites (i.e., fluid in abdominal cavity) and oedema


## 7.5 Liver Disease

- Distension of the blood vessels on the abdomen
- Vomiting of blood from ruptured blood vessels in the oesophagus (i.e., haematemesis)
- Signs of liver failure include—
  - Severe ascites
  - Severe jaundice
  - Flapping tremor of the hand
  - Delirium
  - Coma

### Investigations

See jaundice (7.5.1 above).

### Management

1. **Refer** all jaundiced patients to hospital. 
2. Provide supportive treatment by referring patient to a dietician and specialist physician.

### Health education

- Advise the patient to stop drinking alcohol.
- Discuss dietary measures as for hepatitis, and refer to dietician.
- Caution patient on use of herbs that may destroy the liver. Patients should always ask doctor before using any medication.
- Instruct the patient to return if condition deteriorates.

## 7.6 Pancreatitis

Pancreatitis is acute or chronic inflammation of the pancreatic tissue with severe abdominal pain.

### Causes

- Alcohol
- Gallstones
- Postsurgical effects
- Trauma
- Medicines (e.g., steroids, azathioprine)
- Protein-energy malnutrition
- Hyperlipidaemias
- Infections (mumps)

### Symptoms and signs

- Epigastric pain radiating to the back and exacerbated by an alcoholic binge (chronic)
- Weight loss (chronic)
- Nausea and vomiting
- Epigastric tenderness; guarding and rigidity of abdomen
- Complications: multiorgan failure (e.g., renal, respiratory, DIC, shock, hyperglycaemia or DM, hypocalcaemia, steatorrhoea or fatty stools)

### Investigations

- Serum amylase and urine amylase
- FBC, CRP, U+E, LFT, blood sugar
- Serum calcium and blood gases
- AXR (to rule out perforated peptic ulcer)

### Management

#### In clinic, health centre, and hospital—

1. Give nothing PO.
2. Insert an NGT for pain relief.
3. Refer hospital if severe.

## 7.6 Pancreatitis

### In hospital—

1. Administer pethidine 50 mg IM stat or tramadol 100 mg.
2. Enforce bed rest.
3. Prescribe a broad-spectrum antibiotic: ceftriaxone 1g daily and metronidazole 500 mg IV 3 times per day.
4. Treat organ failure if necessary.
5. Refer to dietician.

### Management of acute pancreatitis

1. Withhold oral and enteral feeding.
2. Support with IV fluids.
3. If oral nutrition cannot be initiated, start nutrition support:
  - For less severe cases of prolonged acute pancreatitis, tube feeding can be initiated beyond the ligament of Treitz using a defined formula diet.
  - For severe acute pancreatitis, parenteral nutrition should be initiated.
  - If triglycerides are <400 mg/dL before TPN initiation, use a 3-in-1 solution and monitor TG levels.
  - If triglycerides are elevated (>400 mg/dL), use a dextrose-based solution, monitor serum glucose frequently, and treat as needed with insulin.
4. Once oral nutrition is started, urge the patient to follow the dietary guidelines below. **Note:** These are basic dietary guidelines. Refer patient to a registered dietician for individualized dietary counselling.
  - Eat easily digestible foods such as low-fibre foods (e.g., maize porridge; white bread; macaroni; boiled potato, sweet potato, or white rice; boiled soft meat, fish, or chicken; boiled carrots, pumpkin, beetroot, or spinach; bananas, pawpaw, or fruit puree; plain low-fat yoghurt, Omaere, or milk).
  - Avoid gas-forming foods and drinks (e.g., onions, garlic, beans, cabbage, broccoli, cauliflower, eggs, gas cool drinks, soda water) if not tolerated.

- Consume a low-fat diet.
- Eat six small meals and include a small portion of starchy foods at every meal or snack; avoid too much sugar and sugary foods.
- Increase lean protein intake.
- Increase calorie intake.
- Ensure an adequate intake of vitamin C, B-complex vitamins, folic acid, and fat-soluble vitamins in water-miscible form.
- Ensure an adequate intake of antioxidants including selenium-containing antioxidants.
- Ensure an adequate intake of calcium, magnesium, and zinc.
- Consume no alcohol, coffee, or caffeine drinks (e.g., no cola), because they are pancreatic stimulants.
- Limit gastric stimulants (e.g., peppermint, spearmint and black pepper) if not tolerated.

### Management of chronic pancreatitis

1. Urge the patient to follow nutrition guidelines as in acute phase (see above).
2. Use tube-feeding if oral diet is not adequate.
3. Supplement pancreatic enzymes: pancrealipase 234.2 mg (1 capsule) 3 times per day with a meal.
4. Supplement fat-soluble vitamins and cyanocobalamin (vitamin B12).

### Health education

- Provide dietary measures (see above), and refer patient to dietician.
- Discuss tips for handling nausea and vomiting (e.g., dry meals, taking liquids a few hours before or after meals, using ice chips, sipping beverages, asking physician about available anti-emetics.)
- Home enteral nutrition support may be needed in the malnourished patient (e.g., Ensure®).
- Urge the patient to stop smoking.

### 7.7 Parasitic GIT Infestations

Intestinal worms enter the human body through ingestion of the worm eggs in food or water via dirty hands or through injured skin when walking barefoot. The following are examples.

- *Tapeworms* are long, segmented worms that require a host within which to mature. Intestinal tapeworms can develop when humans ingest undercooked pork that contains tapeworm larvae or food contaminated with their eggs. The tapeworm grows to a length of up to 10 meters and continually releases eggs. Free eggs or whole segments are released periodically into the stool of the carrier and can survive in the environment for many months.
- *Strongyloides stercoralis* (sometimes called pinworms) adult females measure 2 to 3 mm in length by 30 to 50 µm. Infection occurs when exposed skin comes in contact with contaminated soil. Pinworms inhabit the crypts of the small intestine and lay eggs that hatch within the epithelium, liberating larvae in the lumen. *Strongyloides* is the only helminth to secrete larvae (and not eggs) in faeces. Typically, larvae appear in faeces approximately 1 month after skin penetration.
- *Hookworm* is a roundworm infestation affecting the small intestine and lungs. The worms are about 1.25 cm long. The larvae penetrate the skin, and migrate to the lungs via the bloodstream; they enter the airways and cause coughing. After travelling up the windpipe, the larvae are swallowed. When the larvae are swallowed, they infect the small intestine and develop into adult worms. Adult worms and larvae are excreted in the faeces.
- *Ascaris* are the largest roundworm to infect humans; they are typically 20 to 30 cm long and are pink or white. Whipworm is a type of roundworm that infects the large intestine. Typically, the eggs are passed

through faeces and are infectious for several weeks in optimum conditions (i.e., warm, moist, shaded soil). Species in the genus *Ascaris* are transmitted via the fecal-oral route, primarily from ingestion of agricultural products or food contaminated with parasite eggs.

- *Threadworm* (genus *Enterobius*) adult females are 8 to 13 mm long, and 0.5 mm thick. They are spread by human-to-human contact, generally through ingesting (swallowing). Once the eggs are ingested, it takes about 4 to 6 weeks for them to appear around the anus. Humans are the only natural host. Fecal-oral contamination via fomites (i.e., toys, clothes) is a common method of infestation. After ingestion, eggs usually hatch in the duodenum within 6 hours. Worms mature in as little as 2 weeks and have a lifespan of approximately 2 months. Because of the short incubation time until the ova are infectious, eggs that are deposited under the fingernails during scratching and then placed in the mouth may be a mode of reinfestation.

### Symptoms and signs

- Usually no symptoms
- Abdominal cramps
- Low-grade abdominal pain, vague
- Sometimes low-grade abdominal distension
- Worms in sputum
- Worms in stools or on the anal skin
- Rectal prolapse occasionally
- Loss of appetite and weight loss
- Pruritus (itchiness) of the anal area, especially at night
- Anaemia
- May present with signs of intestinal obstruction or appendicitis
- If the worms are in the lungs they cause a reaction, with the following signs—
  - Cough, fever
  - Sputum spotted with blood

## 7.7 Parasitic GIT Infestations

- Occasionally plural effusion
- Crepitations and wheeze

### Investigations

- Stool microscopy and FBC
- Rectal swab

### Management

1. Administer albendazole.
  - Adults and children >2 years: 400 mg stat (2× 200 mg tablets)
    - For whipworm: 400 mg daily for 3/7, repeat after 3 weeks
    - For strongyloides stercoralis: 400 mg 2 times per day for 3 days
  - Children <2 years or <10 kg: (100 mg/5 mL syrup)
    - For roundworm, hookworm, pinworm, or threadworm: 200 mg stat
    - For whipworm: 200 mg daily for 3 days, repeat after 3 weeks
    - For strongyloides stercoralis: 200 mg stat
2. For tapeworm in children, administer praziquantel 20 mg/kg stat.
3. Treat anaemia and malnutrition.
4. If the patient has pinworms, treat the whole family.
5. If you see segments of tapeworm (taenia), refer the patient to the next level.
6. Pregnant women should preferably be treated after delivery.

### Health education

- Explain that the eggs of the worms are spread from stool to mouth and urge patients to—
  - Wash hands with soap and water before preparing or cooking food.
  - Wash food items that are eaten raw or uncooked (e.g., vegetables and fruit).
  - Cook meat (especially pork), chicken, and fish thoroughly.



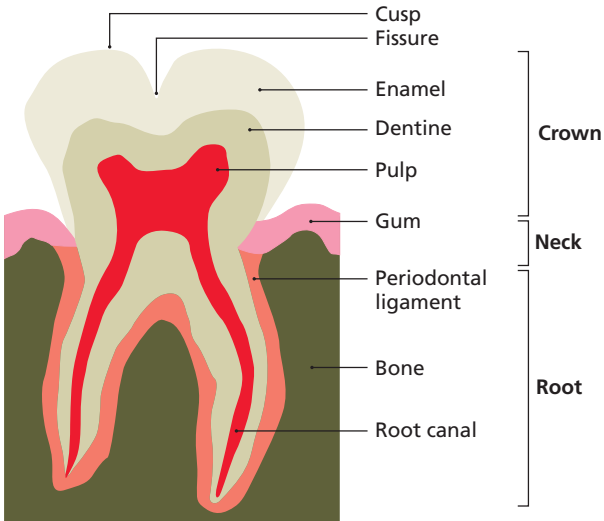
## 7.7 Parasitic GIT Infestations

- Not eat meat that has cysts.
  - Boil milk that was not bought in shops but obtained directly from animals before consumption.
  - Use a good toilet or bury stools and wash hands with soap and water after having been to the toilet.
  - Wash underwear in hot water and washing powder.
  - Avoid walking barefooted because some worms enter the body from wet soil through the feet.
- Provide, if necessary, dietary measures for anaemia and malnutrition. (See “Section II. Diseases According to Body Systems. Chapter 4. Blood System” for a discussion of anaemia and “Section III. Nutrition and Lifestyle” for a discussion of malnutrition.)

### 8.1 Toothache

Toothache is usually caused by dental caries, an abscess of the tooth, or a more widespread infection of the gums. Figure 8.1 illustrates the anatomy of the tooth.

FIGURE 8.1 **Anatomy of the tooth**



#### 8.1.1 Dental Caries

Dental caries is a bacterial disease that affects the enamel of the tooth (the hard tissue). Demineralisation or decalcification of the enamel by acid formation of the bacteria slowly dissolves the enamel until cavitations reach into the pulp and dentine of the tooth, causing the painful stimulation of the dental nerves leading to a toothache.

##### Causes

- Eating too much sugary food or refined carbohydrates (e.g., sugar, sweets, honey, soft drinks)
- Poor or no oral hygiene (i.e., no regular brushing and cleaning of the teeth)
- Genetically soft enamel (very seldom)

## Symptoms and signs

- Toothache (i.e., pain in and around the tooth)
- Pain that often gets worse with hot or cold food or liquids
- Pain either local or spread to other areas of the gum and jaw
- Discoloration of the tooth
- Cavities in the tooth

## Management

1. Give paracetamol for pain relief—
  - Adult: 500 mg to 1 g stat
  - Children: crushed 500 mg or 125 mg/5 mL syrup
2. Refer to dental clinic or dentist for filling of the cavity or tooth extraction. **Note:** Do *not* put any medication (e.g., paracetamol, aspirin) directly on teeth or gums.

## Health education

- Advise about oral hygiene: daily cleaning of teeth with toothbrush and floss or traditional methods.
- Advise on good diet and proper preparation of foods; recommend limiting sugar intake.
- Recommend the use of fluoride mouth rinses for patients who live in areas where water does not naturally contain adequate fluoride.
- Urge regular visits to dentist (at least once a year).
- Avoid tetracycline during pregnancy and in small children to prevent tooth staining.

### 8.1.2 Abscess of the Tooth

An abscess is a localised area that is filled with pus, a liquid produced by inflamed or infected cells.

#### Cause

Infection of a rotten tooth spreading to its roots and the tissue around it (jaw and gums) causing painful swelling with often palpable lymph glands

## 8.1 Toothache

### Symptoms and signs

- Toothache
- Sometimes fever
- Tenderness
- Swelling of face
- Lymph glands palpable in neck

### Management

1. Provide pain relief; give paracetamol.
2. Prescribe antibiotics:<sup>1</sup>
  - Penicillin V 500 mg 3 times per day  
—— OR ——
  - Amoxicillin
    - Adult: 250 mg
    - Children: 125 mg/5 mL 3 times per day for 5 days
  - In case of penicillin allergies, give azithromycin 1 g 1 time per day for 3 days  
—— PLUS ——
  - Metronidazole
    - Adult: 400 mg
    - Children: 200 mg/5 mL 3 times per day
3. Refer to dental clinic or dentist.

### 8.1.3 Periodontitis or Periodontal Disease

Periodontitis, or periodontal disease, is an inflammatory and degenerative condition of the soft and bony tissues supporting the teeth. The four common types and their symptoms are as follows—

- *Herpes stomatitis*: The whole mouth seems inflamed and painful. This condition, which is caused by a viral infection, is usually only superficial.
- *Gingivitis*: The infection can be superficial around the tooth without destruction of underlying bone. It is often caused by bacterial infection and is reversible.
- *Destructive periodontal disease*: If gingivitis is allowed to continue unchecked over a period of time, there is progressive loss of gingival tissues, loosening attach-

ment (loose teeth), and loss of alveolar bone. Teeth start falling out within months to years if treatment is not sought.

- *Acute necrotizing ulcerative gingivitis or periodontitis:* Also called trench mouth or Vincent's angina with severe ulceration, this type of periodontitis causes necrosis of gums and soft tissue.

### Causes

- Poor oral hygiene, calculus
- Insufficiently treated dental caries or abscess
- Crooked teeth
- Smoking
- Alcohol abuse
- Poor diet
- Compromised body immunity

### Symptoms and signs

- Red and swollen gums
- Bleeding gums especially when brushing
- Small lesions and ulcers on gums (occasionally)
- Pockets containing pus
- Elongated and/or loose teeth
- Pain

### Management

#### In clinic, health centre, or hospital—

1. Have the patient rinse his or her mouth with warm salt water or chlorhexidine solution 4 times per day.
2. If pus is present, use metronidazole or combination of metronidazole with amoxicillin.<sup>1</sup>
3. Recommend tooth brushing with very soft brush even if gums bleed.
4. Give paracetamol for pain.
5. Refer to dentist if symptoms continue after 10 days.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### In hospital—

1. Consider HIV and VCT.
2. If the patient's condition is severe and not improving, prescribe clindamycin 150 mg 4 times per day for 5 days.

## 8.2 Trauma

---

### Causes

- Motor vehicle accidents
- Interpersonal injury
- Falls (e.g., in epilepsy)


### Symptoms and signs

- Pain
- Swelling
- Deformation of face
- Difficulties in chewing
- Difficulties in opening mouth

### 8.2.1 Maxillofacial Injury

A maxillofacial injury is a fracture of mandible, maxilla, and zygomatic bones, with or without displacement.

### Management

1. Check for patency of airways.
2. Stop any bleeding.
3. Provide pain relief.
  - In clinic or health centre, give paracetamol or NSAIDs (e.g., aspirin or ibuprofen).
  - In hospital, give tramadol 50 mg tablets or pethidine injection.
4. **Refer** to dental clinic, dentist, or maxillofacial surgeon urgently. 

## 8.3 Excessive Bleeding after Tooth Extraction

### 8.2.2 Tooth Luxation

*Tooth luxation* in this context refers to a tooth or teeth being knocked out.

---

**Note:** Knocked-out permanent teeth should be replaced as quickly as possible.

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#### Causes

- Road traffic accidents
- Sports injuries
- Children playing

#### Management

1. Provide pain relief. Give paracetamol.
2. Refer to dental clinic as soon as possible, but no later than 3 to 6 hours after the accident.
3. Keep tooth in the patient's mouth (adults) or in cow's milk (children) until it can be re-implanted.

---

**Note:** Do *not* wipe the root surface with swab, alcohol, or disinfectant.

---

## 8.3 Excessive Bleeding after Tooth Extraction

#### Causes

- Haemorrhage due to traumatic extraction
- Bleeding disorder of patient
- Medication (e.g., aspirin or anticoagulants)

#### Management

1. Make a roll of cotton, gauze, or clean handkerchief or take a black tea bag.
2. Place it over the socket and make the patient bite firmly for 20 to 30 minutes.
3. Repeat if still bleeding.
4. Refer to dental clinic if not stopped.
5. Avoid repeated rinsing.

### 8.4 Ulceration

#### 8.4.1 Aphthous Ulcer

Aphthous ulcers are superficial, painful small lesions (sometimes multiple) with yellow-white edges found on the mucus membrane in the mouth.

---

**Note:** These ulcers do *not* constitute an infection and can appear at any time in a healthy person.

---

#### Causes

- Iron and folic acid deficiencies
- Stress
- Lack of sleep
- Premenstrual cycle
- HIV/AIDS

#### Management

**In clinic, health centre, or hospital—**

1. No treatment is necessary in most cases.
  2. Advise patient to rinse mouth with warm salt water or chlorhexidine 3 to 4 times per day.
  3. Apply gentian violet 0.5% paint as needed.
  4. Advise the patient to maintain good oral and dental hygiene.
  5. Apply topical anaesthetic in children if feeding and drinking is a problem.
  6. If a secondary infection occurs, prescribe both—
    - Amoxicillin<sup>1</sup> 250 mg 3 times per day plus metronidazole 200 mg 3 times per day for 5 days
    - Prednisone 40 mg daily for 5 days
  7. In HIV—
    - First-line treatment, prescribe topical steroids (e.g., betamethasone or steroid mouthwashes)
- PLUS —
- Tetracycline 250 mg dissolved in 180 mL water 4 times per day as mouthwash

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<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy



## — PLUS —

- Oral hygiene (e.g., chlorhexidine mouthwash).
- Refer severe cases to hospital or dentist.

**In hospital—**

1. For severe refractory cases, prescribe oral prednisolone.
2. Refer patient to dentist if ulcers are large and sloughy; add systemic broad-spectrum antibiotic treatment.
3. Opioid analgesia may be required if patient unable to eat.

**8.4.2 Ulceration of Gums**

Any ulceration of the gums that is deep and bleeding and does not disappear within 7 to 10 days should be investigated.

**Causes**

- Oral cancer (alcohol and smoking are major causes)
- Infections—
  - STIs (e.g., syphilis, gonorrhoea)
  - Primary herpes simplex type 1
  - HIV/AIDS (oral Kaposi's sarcoma)
- Acute necrotizing ulcerative gingivitis
- Nutritional causes: malnutrition, protein deficiency, vitamin C deficiency
- Metabolic causes: diabetes mellitus
- Mechanical and chemical irritants: smoking, chewing of tobacco

**Symptoms and signs**

- Ulcers
- Pain
- Bleeding (rare)

**Management**

1. Recommend a chlorhexidine mouth rinse.
2. Treat as for STIs: acyclovir 400 mg 3 times per day for 5 to 10 days (until lesions have completely healed).
3. Instruct patient that his or her use of analgesics should be regular and routine.
4. Test for HIV (offer VCT).

### 8.5 Oral Presentations in HIV/AIDS

Figure 8.5 provides an algorithm of oral manifestations of HIV in adults.

#### Notes:

- Oral manifestations are common in HIV/AIDS, especially at lower CD4 counts and among smokers.
- Lesions often cause serious discomfort and contribute to malnutrition and weight loss without adequate treatment.
- HIV-positive patients should see a dentist annually.
- Appropriate hygiene and eating habits reduce the incidence and recurrence, and patients should be encouraged to stop smoking.

#### 8.5.1 Acute Necrotising Ulcerative Gingivitis

Acute necrotising ulcerative gingivitis (ANUG) causes swelling and spontaneous bleeding of the marginal gums and severe pain. It is recognised by destruction of the interdental gum, which is covered by whitish pseudomembranes and a foul smell. ANUG progresses rapidly and may lead to loss of teeth.

#### Management

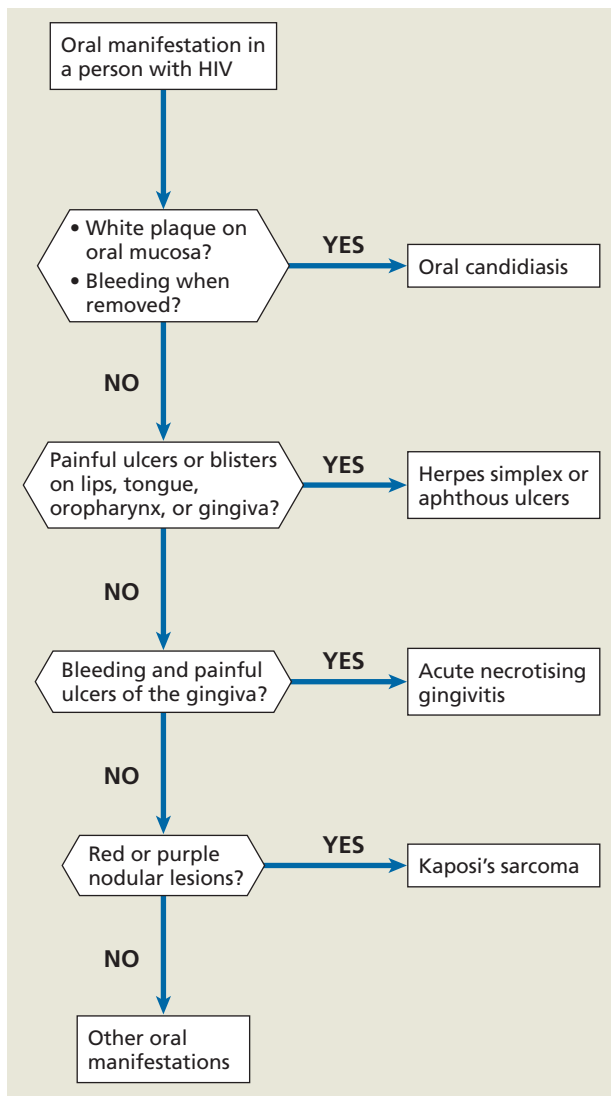
##### In clinic or health centre—

1. Refer patients to a dentist for debridement.

##### In hospital—

1. Provide early debridement and scaling of the gingiva with a cotton tip soaked in peroxide 3% to remove all dead tissue.
2. Irrigate the mouth with povidone–iodine or chlorhexidine 0.2% mouthwash.
3. Prescribe oral metronidazole 400 mg 2 times per day for 7 to 10 days.
4. Instruct patient to follow up daily or every other day for continued cleaning.

FIGURE 8.5 Oral manifestations of HIV disease in adults



### 8.5.2 Oropharyngeal Kaposi's Sarcoma


Oropharyngeal Kaposi's sarcoma usually presents as painless red or purple macules or nodules, or sometimes large ulcers (often painful). Lesions are most commonly seen on the hard palate.

---

**Note:** Kaposi's sarcoma on the palate invariably is an indication of visceral Kaposi's, which may be asymptomatic.

---

#### Management

1. **Refer** patient to hospital. 
2. Patient should be commenced on ARVs.
3. If lesions fail to improve within 6 to 12 months, symptomatic patients may be referred to oncology.
4. If in doubt, take a biopsy.

### 8.5.3 Parotid Enlargement

Parotid enlargement is common in HIV, often in association with other painless lymphadenopathy.

#### Management

1. Usually no specific treatment is required. Salivary gland disease often responds to ARV treatment.
2. If xerostomia (dry mouth) is also present, treat as below (8.5.4).
3. If inflammation is acute, suspect infection. Give broad-spectrum antibiotics.
4. If the gland is fluctuant and/or other lymphadenopathy is present, aspirate and/or take biopsy for TB.
5. Parotid enlargement may also be due to Kaposi's sarcoma, lymphoma, or leukaemia. Confirm by biopsy.

### 8.5.4 Lack of Saliva or Dry Mouth

Lack of saliva or dry mouth (xerostomia) is common in HIV. It may also be a side effect of medications, such as didanosine, protease inhibitors, and antidepressants.

#### Management

1. Provide supportive treatment. Instruct the patient to stimulate saliva with sugar-free chewing gum or palm leaves in case of a dry mouth.
2. Commencing ARV commonly relieves symptoms of xerostomia if it is caused by HIV infection.
3. Refer severe cases to dentist.

## 8.6 Oral Thrush or Candidiasis

This fungal infection with the candida species of the oral cavity is usually seen in children, persons with full or partial dentures, or immune-compromised persons.

#### Causes

- Unhygienic preparation of bottle feedings
- Poor oral hygiene
- Malnutrition
- Alcohol abuse
- HIV/AIDS, leukaemia, cancers
- Other secondary infections, such as influenza, herpes simplex type 1
- Prolonged use of antibiotics
- Diabetes mellitus

#### Symptoms and signs

- Sores or blisters in mouth; can be painful when eating
- Whitish plaque around gums and mouth, removable when lightly scratched
- Fever
- Swollen lymph glands in neck

#### Management

**In clinic, health centre, or hospital—**

1. Advise patient on good oral hygiene.

## 8.6 Oral Thrush or Candidiasis

2. Treat and eliminate the cause if possible.
3. Give paracetamol for pain relief.
4. Paint the oral cavity with gentian violet.
5. Instruct the patient to rinse his or her mouth with chlorhexidine solution 3 to 4 times per day.
6. Advise the patient to rehydrate (i.e., drink plenty of water).
7. Prescribe first-line treatment:
  - Nystatin oral cream or suspension 4 to 5 times per day for 5 days at the following dosages—
    - If the patient has had symptoms <2 weeks: 100,000 units 4 times per day for 5 days
    - If the patient has had symptoms >2 weeks: 200,000 to 500,000 units 4 times per day for 5 to 10 days
  - In severe cases give nystatin tablets. Instruct the patient to rinse around the mouth for 1 minute and swallow. Tablets can be used successfully because of their prolonged contact time with the infected area.
8. Refer if—
  - Dehydration is severe.
  - Patient shows no improvement.

---

**Note:** Extensions of lesions into the pharynx or pain on swallowing indicate oesophageal candidiasis, which can lead to malnutrition and weight loss.

---

### In hospital—

1. If no improvement, give either fluconazole 200 mg for 7 days or 800 mg stat.

---

### Notes:

- Recurrence is common and may be prevented by maintenance treatment with daily fluconazole when symptoms occur more than 3 times a year. The best treatment for oesophageal candidiasis is ART.
  - Persistent oral candidiasis is a stage 3 WHO condition and such a patient is eligible for HAART (if not already on it).
-

## 9.1 Sexually Transmitted Infections

Sexually transmitted infections (STIs) are diseases that are transmitted via intercourse, especially unprotected oral, vaginal, and anal sex. STIs are spread to children as well, during pregnancy and childbirth. STIs—

- Are serious and can cause complications and long-term sequelae (e.g., infertility)
- Can be asymptomatic or symptomatic
- Can be spread to sexual partners if not treated
- Increase the risk of transmission and acquisition of HIV/AIDS

The symptoms and signs of an STI may disappear, but the disease remains.

### Health education

- Discuss the following points with patients:
  - The cause of disease, treatment, long-term implications, and importance of complying with treatment
  - The risk for acquiring and transmitting HIV infection
  - Methods of lowering risk of acquiring STIs and HIV, including abstinence and delaying sexual activity among youth, monogamy, and use of male and or female condoms
  - The need to change sexual behaviour
  - Behaviour change and the choices available
  - Perceived barriers to behaviour change
  - Sexual behaviour changes the patient should make
  - Importance of prompt care-seeking for symptoms at appropriate medical sites
  - Notification, treatment, and counselling of partners
  - Confirming the three essential decisions:
    - ◆ To complete treatment,
    - ◆ To change any risk sexual behaviour
    - ◆ To see that their sexual partners are treated
- Offer the health promotion package—the Five Cs:
  - Counsel and educate on risk reduction

## 9.1 Sexually Transmitted Infections

- Condom promotion and provision
- Compliance with treatment
- Contacting and treating partners
- Confidentiality
- Offer counselling for HIV testing (VCT)
  - Take blood for RPR test

### 9.1.1 Urethral Discharge

*Urethral discharge* is defined as the presence of secretion (pus) from the anterior urethra that is accompanied by burning or urethral discomfort when passing urine.

#### Causes

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Trichomonas vaginalis*
- Infections with multiple pathogens (e.g., *Mycoplasma genitalium*, herpes simplex, *Ureaplasma urealyticum*), and rarely genitourinary TB.

#### Symptoms and signs

- Discharge from urethra (white, yellow, brown, bloody)
- Pain or painless
- Itchiness
- Dysuria
- Genital lesions or rashes on hands, chest, or feet may indicate the presence of other STIs.

#### Management

See [figure 9.1.1](#).

See also *Guidelines for the Management of Sexually Transmitted Infections using the Syndromic Approach*.

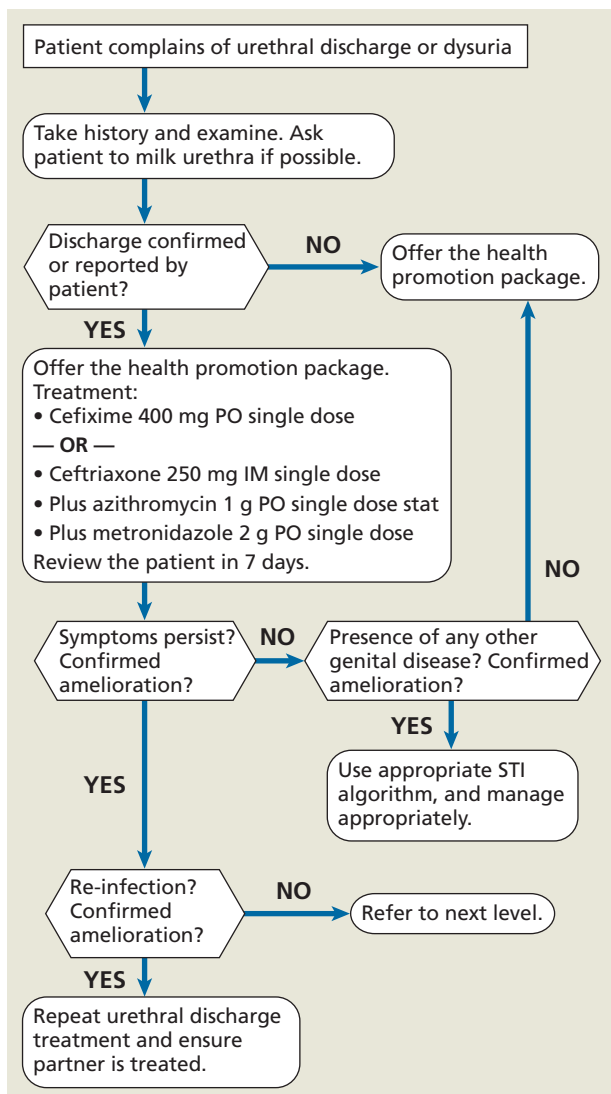
When cefixime becomes available, then ceftriaxone will no longer apply here and will be reserved for treatment of complications of urethral discharge syndrome (UDS) and vaginal discharge syndrome (VDS) only.

#### Health education

See [9.1](#) above.



FIGURE 9.1.1 Algorithm for UDS



## 9.1 Sexually Transmitted Infections

### 9.1.2 Genital Ulcer Disease

A genital ulcer is the loss of continuity of the skin and mucosa of the genitalia.

#### Causes

- Most important—
  - Herpes simplex (multiple, vesicular or blister lesions, painful)
  - *Treponema pallidum*, syphilis (single, painless, with firm border)
- Other causes—
  - *Chlamydia trachomatis* (lymphogranuloma venereum [LGV])
  - *Klebsiella granulomatis*
  - *Haemophilus ducreyi* (soft, painful chancroid ulcer, irregular shaped border)
  - Mixed infections
  - Trauma
  - Scabies

#### Symptoms and signs

- Ulcer or ulcers
- Pain or painless
- Itchiness (pruritus)
- Suppuration of fluids
- Bleeding
- Enlarged lymph nodes, skin nodules
- Symptoms of secondary syphilis (i.e., rash, hair loss, sore throat, malaise, headache, weight loss, fever, or swollen lymph nodes)

#### Management

**Note:** See [figure 9.1.2](#).

1. Take history and examination
2. Offer the health promotion package.
3. Offer VCT.

#### Health education

See [9.1](#) above.

### 9.1.3 Vaginal Discharge Syndrome

When vaginal discharge is clear and odourless, it is normal and related to normal cycle changes. VDS denotes changes in amount, consistency, colour, and odour of the discharge.

**Note:** 72% of VDS in Namibia is not a result of sexual transmission but rather is due to bacterial vaginosis and candida.

#### Causes

- *Trichomonas vaginalis* (often asymptomatic or itchy, yellow-green, frothy discharge)
- *Candida albicans* (white, lumpy, or thick discharge; itching, with red inflamed vulva)
- Bacterial vaginosis (*Gardnerella vaginalis* and other bacteria) (non-itchy, grey or white, fishy smell)
- Neisseria gonorrhoea (off-white discharge)
- *Chlamydia trachomatis* (non-itchy, green or yellow, smelly, bubbly, and frothy)
- VDS often occurs in pregnancy, diabetes, and immunodeficiency and from the use of oral contraceptives.

#### Symptoms and signs

- Often asymptomatic (difficult to diagnose)
- Vaginal discharge
- Itching, pruritus (scratched skin)
- Dysuria
- ‘Strawberry’ cervix (*T. vaginalis*)
- White plaques (candida)

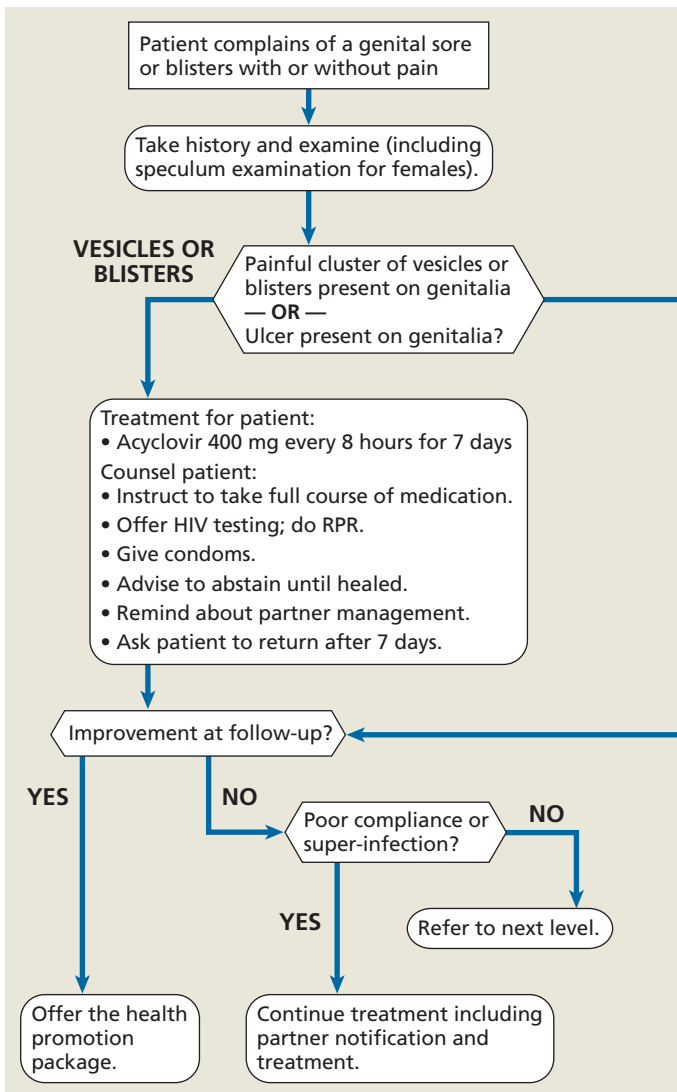
#### Management

**Note:** See [figure 9.1.3](#).

1. Take history and examine.
2. Establish risk factors by asking the following:
  - Cervical mucoid or inflamed cervix that bleeds easily on examination?
  - Any STI history within the past year?
  - Partner with symptoms of STI?
  - Age under 25?

## 9.1 Sexually Transmitted Infections

FIGURE 9.1.2 Algorithm for genital ulcer



### ULCERS



#### Treatment for patient:

- Benzathine penicillin 2.4 MU in stat
- Plus acyclovir 400 mg every 8 hours for 7 days
- Plus azithromycin 1g PO stat

#### Treatment for partner:

- Azithromycin 1g PO stat
- Benzathine penicillin 2.4 MU in stat

#### Counsel patient:

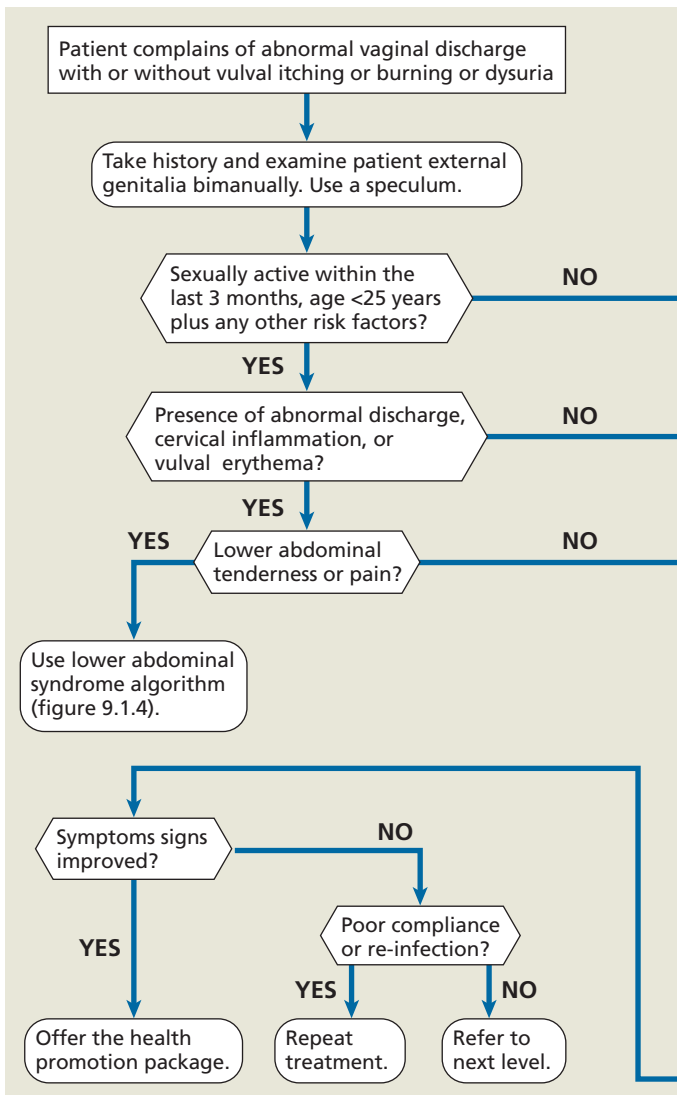
- Instruct to take full course of medication.
- Offer HIV testing; do RPR.
- Give condoms.
- Advise to abstain until healed.
- Remind about partner management.
- Ask patient to return after 7 days.

#### Figure 9.1.2 notes:

- For penicillin-allergic, nonpregnant, and nonlactating patients, treat with doxycycline 100 mg PO 2 times per day for 14 days.
- In penicillin-allergic pregnant and lactating patients, treat with azithromycin 500 mg PO daily for 10 days.
- Reports of macrolide resistance in the neonate have been reported, so newborns must be evaluated and treated with penicillin.

## 9.1 Sexually Transmitted Infections

FIGURE 9.1.3 Algorithm for VDS



Treat for vaginal candidiasis and bacterial vaginosis:

- Metronidazole 2 g PO immediately as a single dose
- Plus clotrimazole vaginal pessary 500 mg inserted immediately as a single stat dose
- Plus clotrimazole topical cream locally 2 times per day for 7 days

Offer the health promotion package.

Presence of any other genital disease?

Use appropriate STI algorithm, and manage.

Offer the health promotion package.

Treatment:

- Cefixime PO 400 mg single dose
- OR —
- Ceftriaxone 250 mg IM stat
- Plus azithromycin 1 g PO stat
- Plus metronidazole 2 g immediately as a single dose

If patient has vulval oedema, curd-like discharge, or erythema excoriations, add:

- Clotrimazole vaginal pessary 500 mg stat inserted or 100 mg every 12 hours for 3 days inserted or 200 mg at night for 3 days
- Plus clotrimazole cream locally
- Clotrimazole topical cream applied thinly to vulva 2 times per day for 7 days after symptoms resolve (maximum 2 weeks)

Ask patient to return in 7 days.

## 9.1 Sexually Transmitted Infections

- New partner within last 3 months?
  - Any inter-menstrual bleeding?
  - Bleeding during or after sex?
  - Pain on deep penetration during intercourse?
3. Prescribe medications:
- Cefixime 400 mg PO single dose  
 — OR —
  - Ceftriaxone 250 mg IM stat  
 — PLUS —
  - Azithromycin 1 g PO single dose  
 — PLUS —
  - Metronidazole 2 g PO single dose
    - ◆ Patient taking metronidazole should be cautioned to avoid alcohol.
    - ◆ Use of metronidazole in the first trimester is not recommended. If treatment must be given at that time, lower doses are recommended: give metronidazole 400 mg every 12 hours for 7 days.
  - If the patient has vulval oedema or a curd-like discharge, erythema (reddish), or excoriations present, add clotrimazole vaginal pessary 500 mg single dose inserted or 100 mg every 12 hours for 3 days inserted or 200 mg at night for 3 days, plus clotrimazole cream locally, applied thinly to vulva 2 times per day for 7 days after symptoms resolve (maximum 2 weeks). Ask patient to return in 7 days.



### 9.1.4 Lower Abdominal Pain Syndrome

Pelvic inflammatory disease (PID) is one of the most common causes of lower abdominal pain. In PID, one of the following is infected:

- Uterus
- Fallopian tubes (salpingitis)
- Ovaries (oophoritis)
- Parametrium

#### Causes

- Sexually transmitted: *N. gonorrhoea* and *C. trachomatis* (*Trichomonas vaginalis* and candida cause vaginal infection, not PID as such.)
- Not sexually transmitted: mycoplasma, bacteroides, streptococcus, *E. coli*, or *H. influenzae*

---

**Note:** Appendicitis can present as lower abdominal pain syndrome. See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of acute abdomen.

---

#### Symptoms and signs

- Lower abdominal pain
- Pelvic pain
- Vaginal discharge
- Fever and chills
- Dysuria
- Pain with sexual intercourse
- Nausea and vomiting (sometimes)
- Abnormal menstrual cycle (sometimes)
- Abdominal examination:
  - Tenderness with palpation of the lower abdomen
  - Rebound tenderness if the disease is quite advanced (peritonitis)
- Vaginal examination:
  - Tenderness of the cervix
  - Purulent vaginal discharge
  - Mass lateral to the cervix
  - Cervical excitation
  - Adnexal tenderness


## 9.1 Sexually Transmitted Infections

### Investigations

- Pregnancy test
- U-dipsticks, urinalysis
- Cervical swab

### Management

- See [figure 9.1.4](#).
- In the clinic, health centre, or hospital—
  1. If the patient is not very sick and has—
    - No upper abdomen peritonitis
    - No pelvic mass
    - No pelvic peritonitisThen prescribe antibiotics.
  2. Treatment with antibiotics—
    - Ceftriaxone 250 mg IM injection stat or cefixime 400 mg stat PO
    - **PLUS** ——
    - Metronidazole 400 mg every 12 hours for 7 days
    - **PLUS** ——
    - Doxycycline 100 mg PO every 12 hours for 14 days
    - **OR** ——
    - Azithromycin 1g stat, then 1 g PO for 7 days later in pregnant women

**Notes:** Patients taking metronidazole should be cautioned to avoid alcohol. Doxycycline is contraindicated during pregnancy.
  3. Always **refer** patient to hospital if— 
    - Very ill
    - Cannot walk
    - Temperature >38.5 °C
    - Severe abdominal pain
    - Pelvic mass
    - Pregnant or recent delivery
    - Abnormal vaginal bleeding
    - Missed or overdue periods

### Health education

See [9.1](#) above.

### 9.1.5 Scrotal Swelling

See 9.4 “Testicular Disorders.”

### 9.1.6 Inguinal Bubo

*Inguinal bubo* is defined as a swelling of lymph nodes in the groin area. Inguinal and femoral buboes are localised enlargements of the lymph nodes in the groin area, which are painful and may be fluctuant.

#### Causes

Inguinal buboes are commonly due to STIs. These are usually associated with—

- Current or history of genital ulcers
  - *C. trachomatis*
  - *Haemophilus ducreyi* (chancroid)
  - *C. granulomatis*
- Other STIs (such as *T. pallidum*), herpes simplex, and other causes of genital ulcer, which are managed as per GUD protocol
- Non-sexually transmitted local and systemic infections; infections of the lower limbs; infections of skin; trauma to legs, feet, or perineum; TB; and inguinal hernia, which also cause lymph node swelling but is generally *not* treated as an inguinal bubo

#### Symptoms and signs

- Unilateral, bilateral swelling
- Painful or painless
- Sometimes not seen by patient (in LGV)

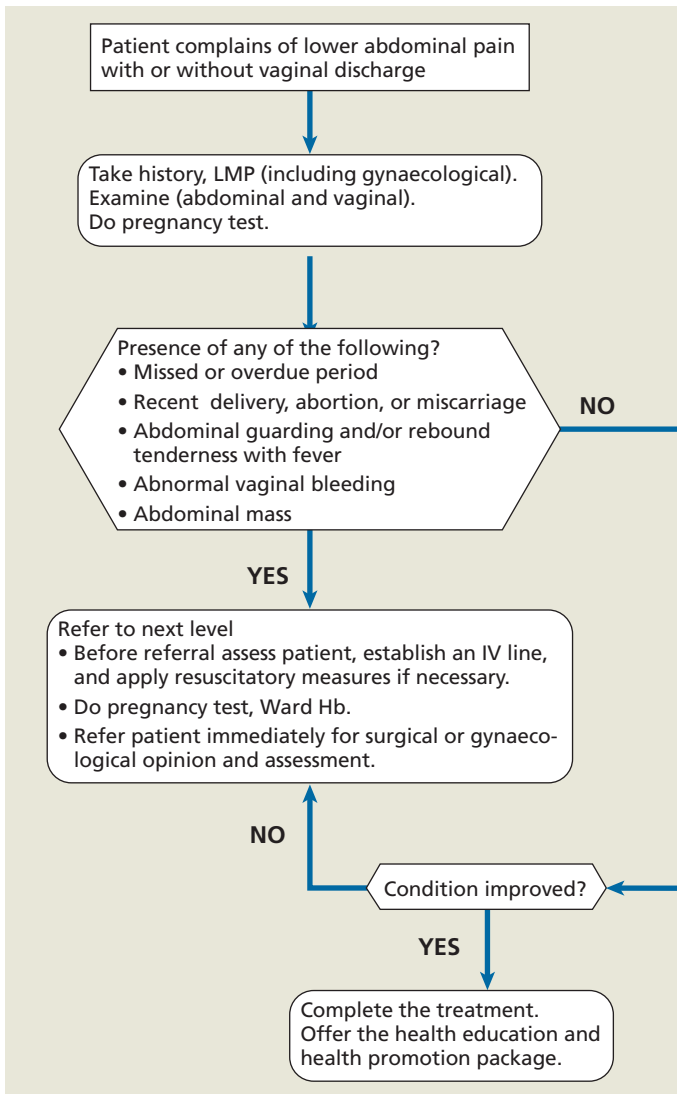
#### Management

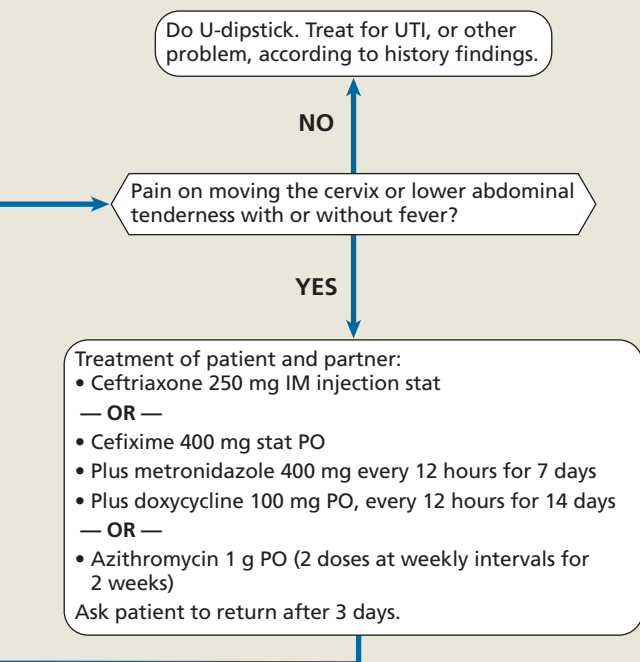
**Note:** See figure 9.1.6.

1. Aspirate fluctuant lymph nodes in a sterile manner.
2. Do *not* incise and drain or excise nodes. Doing so may delay healing.
3. Treat both patient and partner:
  - Azithromycin 1 g PO once a week for 3 weeks (also in pregnancy) **Note:** Give erythromycin if azithromycin is not available.

## 9.1 Sexually Transmitted Infections

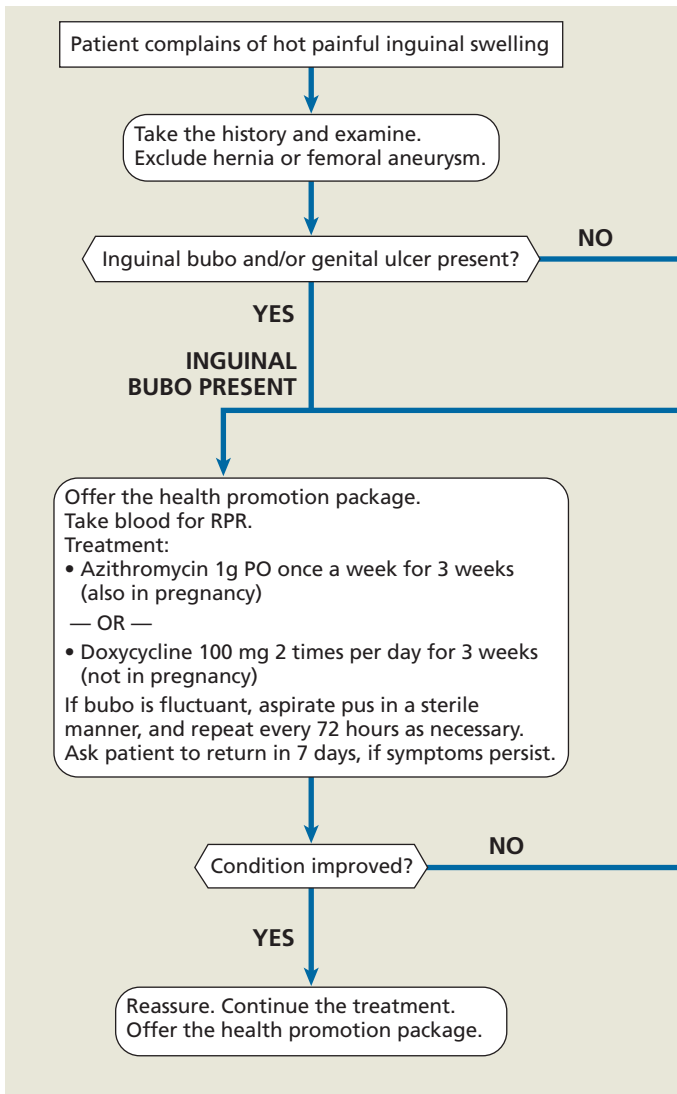
FIGURE 9.1.4 Algorithm for lower abdominal pain

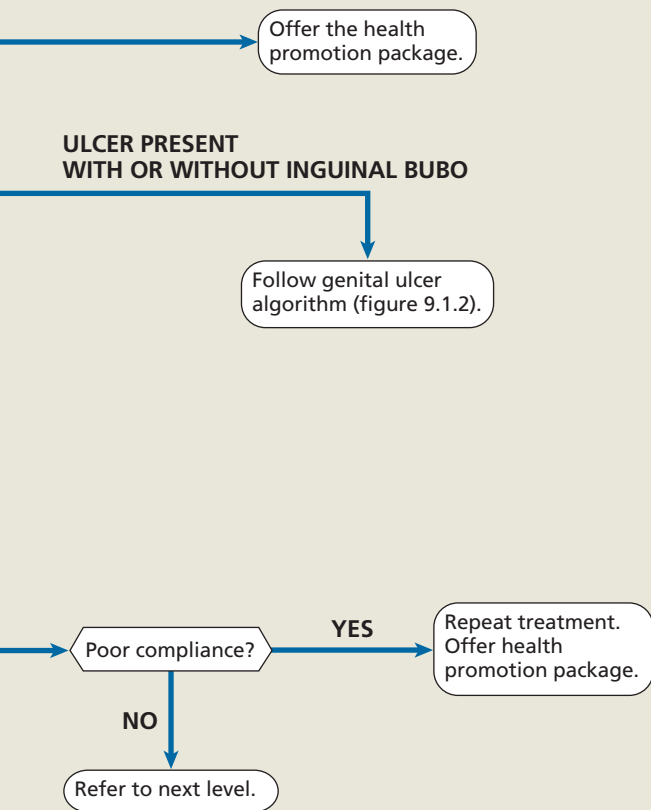




## 9.1 Sexually Transmitted Infections

FIGURE 9.1.6 Algorithm for inguinal bubo syndrome





## 9.1 Sexually Transmitted Infections

— OR —

- Doxycycline 100 mg PO 2 times per day PO for 21 days **Note:** Do not give doxycycline in pregnancy.
4. Manage persistent cases accordingly.
- Some cases may require longer treatment than 14 days.
  - Fluctuant lymph nodes should be aspirated through healthy skin. Never incise a bubo.
  - Use azithromycin or erythromycin for patients who are pregnant or lactating.

### Health education

See [9.1](#) above.



## 9.2 Urinary Tract Infection

A urinary tract infection (UTI) is caused by bacteria that spread upwards from the urethra or via the bloodstream from another septic focus or injury. There are two categories of UTI:

- Infection of the lower part of the urinary tract (e.g., cystitis or infection of the bladder and urethritis or infection of the urethra)
- Infections of the upper part of the urinary tract (e.g., pyelonephritis or kidney infection).

### Causes

- Organisms: enterobacteria (e.g., *E. coli*, *Klebsiella*, *Proteus*), anaerobic bacteria, STIs, chlamydia, trichomonas, candida
- Incomplete emptying of bladder, reflux
- Kidney, ureteric, or bladder stones
- Multiple UTIs: DM, menopause with low oestrogen, constipation or diarrhoea, medicines (e.g., analgesics), pregnancy (causes increased risk of exacerbation)

### Symptoms and signs

**Note:** See [table 9.2](#).

- Dysuria, abnormal smell, cloudy urine
- Frequency
- Sometimes fever
- Sometimes low-back pain
- In young children, vomiting and poor appetite may be the only symptom.
- Suprapubic tenderness (pain above symphysis)
- Sometimes no symptoms

### Investigations

- Urine dipsticks plus blood, WBC, nitrites, and proteins
- Urine MCS. Take midstream sample before prescribing antibiotics.
- If severe, FBC and diff. WCC, U + E
- In complicated cases urethrogram, cystoscopy, and IVP

TABLE 9.2 Symptoms and Signs of UTIs

Symptoms and Signs	Urethritis	Cystitis	Pyelonephritis	Prostatitis
Symptoms	Dysuria and frequency	<ul style="list-style-type: none"> <li>Dysuria and frequency</li> <li>Lower abdominal pain</li> </ul>	<ul style="list-style-type: none"> <li>Fever and rigors (chills)</li> <li>Back pain and pain in the flanks</li> <li>Patient looks very ill</li> <li>Nausea</li> </ul>	<ul style="list-style-type: none"> <li>Fever, rigor</li> <li>Pain on defecation</li> <li>Sacral or permeal pain</li> <li>Abnormal urination</li> </ul>
Signs	Pain at the start of urination	<ul style="list-style-type: none"> <li>Tenderness over the lower abdomen</li> <li>Usually pain at the end of urination</li> </ul>	<ul style="list-style-type: none"> <li>Fever (usually &gt;38 °C)</li> <li>Tenderness over the flanks</li> <li>Renal angle tenderness (i.e., flank punch tenderness, uni- or bilateral)</li> </ul>	<ul style="list-style-type: none"> <li>Fever acute</li> <li>Tenderness on rectal examination</li> <li>Abnormal urine-dipsticks</li> <li>Urination painful whole night</li> <li>Ejaculation painful</li> </ul>

**Management****Lower UTIs in clinic, health centre, and hospital—**

1. Prescribe medication.
  - Adults: nitrofurantoin 100 mg 4 times per day for 5 days
  - Children: nalidixic acid (250 mg/5 mL) 5 mL 4 times per day for 5 days. Give 50 mg/kg per day into 4 divided doses.
2. Change antibiotic according to urine MCS sensitivity.
  - Nalidixic acid 500 mg 4 times per day for 5 days

— OR —

  - Cefuroxime 500 mg 2 times per day for 5 days
3. Refer to hospital any patient who shows no improvement within 48 hours

**Upper UTIs or prostatitis—**

1. If patient has a fever  $>38.0^{\circ}\text{C}$  or visible blood in urine, refer to next level.
2. Refer patient to hospital for IV treatment. Treatment may require up to 3 weeks.
  - Cefuroxime 750 IV 3 times per day

— OR —

  - Gentamicin 80 mg IV 3 times per day
  - If no improvement in 24 hours, check U+E regularly and look for an obstruction.
3. Rehydrate orally or with an IV drip with normal saline.
4. Control the fever using tepid sponging, or give paracetamol 1 g (2 tablets) every 4 to 6 hours.
  - Refer to hospital any female who has had more than 2 episodes of proven UTI
  - Do a full work-up on any male with a proven UTI.

**Health education**

- Instruct females to wipe to the back after defecation.
- Advise a fibre-rich diet to avoid constipation.

### 9.3 Prostate Disorders

#### 9.3.1 Enlargement of the Prostate Gland

Enlargement of the prostate gland occurs usually in men over 50 years of age and is the result of the gradual increase of the prostate gland.

##### Causes

- Benign prostatic hypertrophy (BPH)—over years
- Prostate cancer—over months

##### Symptoms and signs

- Irritative—
  - Frequency
  - Nocturia (urination during the night)
  - Urgency and urge incontinence
- Obstructive: feeling of incomplete emptying—
  - Stream of urine is weak and slow
  - Post-void dribbling
  - Hesitancy (has to relax before able to urinate)
  - Nocturia
  - If patient often has to apply abdominal pressure to urinate, probably urethral stricture
- On examination—
  - Enlarged prostate gland
  - Palpable bladder
  - If urinary retention present, bladder and lower abdomen usually painful
  - If patient shows signs of cancer (e.g., emaciation, weight loss, night pain, bone pain), make an emergency referral for specialist care.
  - Rule out complications (e.g., obstruction, sudden onset of prostatism over weeks, urethra or rectum paralysis); refer immediately to specialist.
  - Dysuria (always rule out infection: urine MCS)

## Investigations

- Digital prostate examination (BPH = large smooth rubbery; cancer = hard)
- FBC, ESR
- PSA total, U+E
- Dipsticks and U-MCS
- Pass 16 Foley catheter to rule to rule out stricture
- Sonar or ultrasound
- Cystoscopy and TVR prostate, urethrography

## Management


### General—

1. Catheterise patient with 16G catheter.
2. Refer complicated cases such as renal failure, proven infection, retention, haematuria, medication not working, and cancer (i.e., abnormal DRE, increased PSA).
3. Treat with doxazosin 4 mg per day for 14 days if symptomatic, and re-evaluate after 1 month.
4. If catheterisation failed, try again to catheterise after 1 week of doxazosin therapy.

### UTI—

1. Treat with—
  - Nitrofurantoin 100 mg 4 times a day for 5 days
  - OR —
  - Nalidixic acid 500 mg 4 times a day for 5 days
2. If poor response, refer to UTI management protocol in 9.2 above.

### Acute urinary retention—

1. See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of acute urinary retention.
2. **Refer** to hospital immediately. 
3. If referral is delayed more than 1 hour, catheterise the patient.
4. If catheterisation is not possible, drain bladder with suprapubic catheter. If a suprapubic catheter is not available, insert IV administration set suprapubically.

### 9.3.2 Prostatitis

Prostatitis is an inflammation of the prostate gland.

#### Causes

- Urethral instrumentation, urinary catheter
- Urethral stricture
- Infective agents: bacteria, viruses, UTIs (*E. coli*, *Klebsiella*, *Enterobacter*, *Proteus*, *Pseudomonas*)
- Unprotected penetrative anal sex, perineal trauma, haemorrhoids

#### Symptoms and signs

- Flu-like symptoms: muscle aches, malaise
- Fever, rigors, and chills
- Frequent urination and dysuria
- Poor, weak stream
- Minimal perineal discomfort
- Problems with defecation
- Occasional acute retention
- Backache
- Occasional discharge

#### Investigations

- Urine dipsticks
- Urine MCS
- Digital rectal examination (very tender with soft enlarged prostate)

#### Management

1. Always rule out STIs and UTIs.
2. Treat accordingly (See STI and UTI management protocols, in [9.1](#) and [9.2](#) above.)
3. Probe urethra with 16 Foley catheter.
4. Refer patient to the next level.

## 9.4 Testicular Disorders

### 9.4.1 Swelling and Tumours of the Testis

Scrotal swelling is usually caused by inflammation of the epididymis and/or testicle. Swelling of the scrotum and testis can be with or without pain, acute or longstanding, and can vary in size.

#### Causes

- STIs
- Hydrocele (i.e., a fluid collection around the testis commonly due to congenital hernia)
- Testicular cancer (common in young men, often painless lump)
- Inguinal hernia (an opening or weakness in the abdominal wall that permits intestinal or bladder tissue to protrude through resulting in a palpable swelling in the inguinal area, and sometimes even in the scrotum. More often a GIT problem.)
- Trauma: usually with directive history and pain
- Epididymo-orchitis, ascending or haematogenous spreading (e.g., BPH complication)
- Urogenital TB

#### Symptoms and signs

- Gradual swelling around the scrotum (with or without pain)
- The scrotum feels cystic or rubbery on palpation
- Reducible and non-transilluminating = hernia
- Not reducible swelling and transilluminating by torch light = hydrocele
- Occasional urethral discharge
- Occasional dysuria

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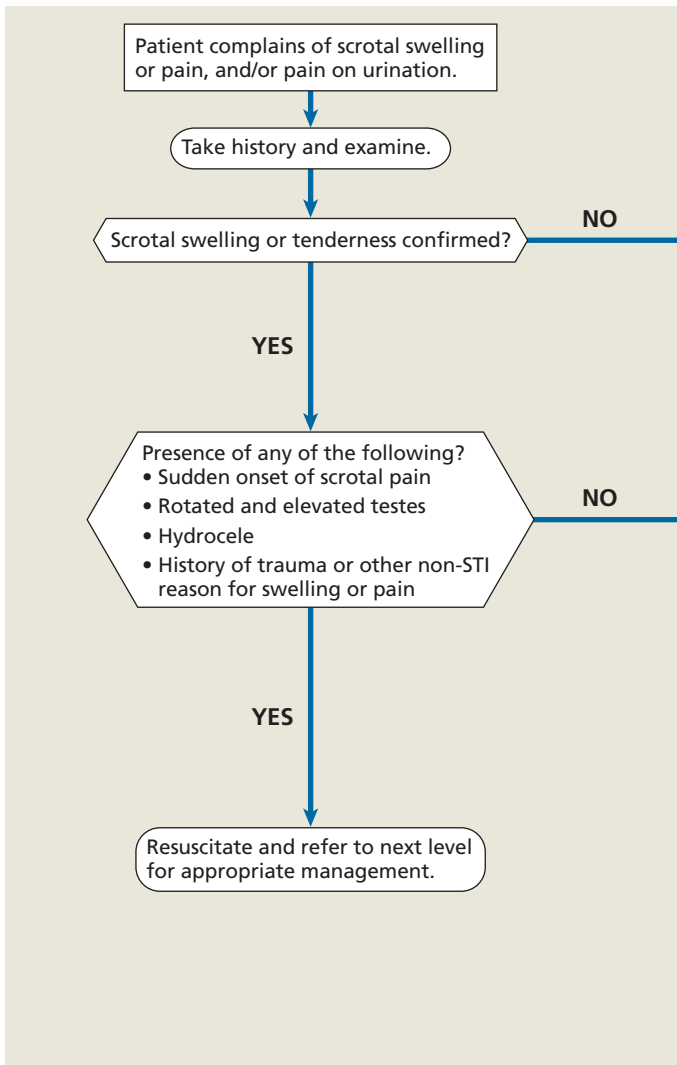
**Note:** Acute onset testicular swelling in puberty is torsion until proven otherwise and needs **urgent referral**. 

---

## 9.4 Testicular Disorders

FIGURE 9.4.1

### Algorithm for the management of scrotal swelling





Treat for UDS or refer to next level for further investigation if not sure

Treat patient for epididymitis and partner for STI:

- Ceftriaxone 250 mg IM stat
  - Plus azithromycin 1g PO weekly for 2 weeks
  - OR —
  - Doxycycline 100 mg PO every 12 hours for 14 days
- Prescribe scrotal support and bed rest.  
Counsel patient on—
- Completion of medication course
  - Use of condoms (offer condoms)
  - HIV and RPR testing (offer testing and take blood for RPR and VDRL)
  - Abstinence until healed
  - Partner management
- Follow-up after 3 days

NO

Refer to next level.

Condition improved?

YES

Complete the treatment. Offer the health education and promotion package.

## 9.4 Testicular Disorders

### Investigations

- Testes sonar or ultrasound
- Tumour markers: alpha-fetoprotein (AFP); only after ultrasound confirms testis tumour
- FBC, ESR (if epididymo-orchitis or urogenital TB is suspected)

### Management

1. Take history and examine patient.
2. Determine cause for swelling.
3. Treat according to the algorithm below (figure 9.4.1).
4. Refer the patient to the next level for operation and cancer chemotherapy.

### Health education

See STIs, 9.1 above.

### 9.4.2 Torsion of the Testis

Torsion of the testis is usually caused by a spontaneous twisting of the testes on its own stalk, resulting in cutting off its own blood supply.

#### Cause

- Unknown, spontaneous

#### Symptoms and signs

- Severely painful and swollen scrotum of sudden onset
- Abdominal pain, nausea, and vomiting
- More painful when elevated by hand
- *No fever*

#### Investigation

- *Important:* differentiate between epididymitis and torsion
- Testes ultrasound and Doppler

#### Management

1. This is an *emergency*.
2. **Refer** immediately to the next level for surgical intervention. 

### 9.4.3 Trauma of the Testis

Trauma to the testis is very common in boys. It usually happens during play, sports, or fights.

#### Cause

- Direct force to the testis or perineal region

#### Symptoms and signs

- Severe pain in testis
- Minimal swelling

#### Management

1. Usually pain subsides with rest.
2. If pain does not subside, refer.
3. For analgesics, refer to “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of pain.

### 9.5 Renal Disorders

#### 9.5.1 Renal Diseases

Four types of renal diseases that are managed in a similar manner are—

- *Nephrotic syndrome*: The kidney is losing proteins excessively. This disease presents as a trilogy of low blood albumin, proteinuria, and oedema caused by primary kidney disease, infections, systemic diseases, or some medications.
- *Nephritic syndrome* (e.g., glomerulonephritis): This syndrome is an inflammation of kidney tissue due to infections (e.g., streptococci, viruses, malaria parasites) or autoimmune disease such as systemic lupus erythematosus (SLE).
- *Acute renal failure*: Acute renal failure is the sudden reduction of renal function with oliguria (<400 mL per day) or anuria (<100 mL per day) and increased serum creatinine levels. It can be due to obstetric, gynaecological, medical, or surgical causes.
- *Chronic renal failure*: Chronic renal failure is diminished renal function due to parenchymal renal damage over time. It can be caused by renal or other medical diseases.

#### Other causes of proteinuria and/or generalised oedema

- CVS: hypertension, heart failure, constrictive pericarditis
- Kidneys: nephrotic syndrome, acute glomerulonephritis
- Liver: cirrhosis
- Malnutrition: kwashiorkor, protein deficiency
- Endocrine: Cushing's syndrome or steroid overuse, hypothyroidism, diabetes mellitus
- Pregnancy
- Allergy

## Symptoms and signs

See [table 9.5.1](#).

Other symptoms and signs include anuria, oliguria, muscle pains, shock, seizures, or signs of electrolyte imbalances.

**TABLE 9.5.1 Symptoms and Signs of Renal Diseases**


History, Symptoms, and Signs	Nephritic Syndrome	Nephrotic Syndrome
Previous ENT or skin group A beta-haemolytic streptococcus infection	Severe (fever sometimes)	Nil
Fluid retention (oedema)	Nil to mild Face and feet	Severe anasarca Generalised oedema
Urine output	Oliguria	Normal
Proteinuria (>3.5 g per 24 hours)	Mild	Severe
Haematuria	Moderate	Nil
Hypoalbuminaemia (<3.5 g/dL)	Nil	Severe
Hypertension	Moderate	Nil
Hypercholesterolemia	Nil	Moderate

## Investigations

- Urine dipsticks, MCS
- FBC, ESR
- U+E and s-creatinine
- s-Total protein, s-Albumin
- ASOT, C3, C4, ANF
- Creatinine clearance, 24-hour urine protein
- Skin or throat swab for MCS
- Abdominal or renal sonar
- Renal biopsy

### Management

#### In clinic, health centre, and hospital—

1. If neglected or dehydrated (aged), consider rehydration.
2. Resuscitate, and **refer** all renal patients to the hospital immediately. 

#### In hospital—

1. Investigate to determine the cause.
2. Administer diuretics. Keep strict input and output charts.
3. Correct fluid losses and electrolyte imbalances.
4. Treat hypercoagulable state with anticoagulants (first heparin, then warfarin).
5. Treat complications (e.g., infections, cholesterol, hypertension).
6. Refer patient to a registered dietician and medical specialist.

### 9.5.2 Kidney Stones, Calculi, and Haematuria

Kidney stones present as sudden, excruciating, colicky pain that may be localised or may radiate as the stone progresses through the renal pathways. The types of kidney stones are—

- Calcium
- Uric acid
- Cystine
- Struvite

#### Causes

- Genetic predisposition (racial, family history)
- Anatomical abnormalities
- Infections (proteus, *Klebsiella*, pseudomonas)
- Dietary imbalance, metabolic disturbance
- Dehydration

## Symptoms and signs

- Can be asymptomatic
- Loin pain, flank pain, or kidney pain radiating to lower urinary areas
- Renal colicky pain: intermittent, within minutes
- Nausea and vomiting
- Frequency and dysuria (bladder stone or distal ureteric calculus)
- Haematuria
- Occasional urinary retention
- Recurrent UTI
- Terminal haematuria: consider *Bilharzia* or hepatitis

## Investigations

- Urine dipsticks: haematuria, blood,  $\pm$ WBCs, and nitrites
- U-MCS
- U+E, albumin, blood calcium, uric acid, phosphate, magnesium
- Sonar or ultrasound and AXR (calcium calculi)
- Intravenous pyelogram (IVP)
- CT uncontrasted and AXR
- When patient is stone-free for 6 weeks, metabolic analysis

## Management

### In clinic, health centre, or hospital—

1. Most stones pass spontaneously if they are  $<5 \times 5$  mm.
2. Provide pain relief—
  - Pethidine 50 mg IM stat and hyoscine 20 mg IM stat
  - OR —
  - Diclofenac 75 mg IM only if U+E is normal
3. Prescribe doxazosin 2 to 4 mg PO for 1 to 4 weeks.
4. Order empirical mist potassium citrate 15 mL 3 times per day diluted with water.
5. Refer to hospital if—
  - Severe
  - No improvement

## 9.5 Renal Disorders

- Acute urinary retention
- Pain unremitting
- One-day duration of fever
- Positive family history
- Record of former stones

### In hospital—

1. Administer medications to prevent stone formation. Proper diagnosis and etiological workup by a specialist is required if patient—
  - Is <20 years
  - Has had more than one stone episode
  - Has a positive family history
2. In appropriate cases, prepare for surgical or nonsurgical interventions (i.e., ureteroscopy or manipulation, lithotripsy by shockwaves).

### Health education

- Advise the patient to drink plenty water and fluids.
- Advise the patient to prevent infections (e.g., by using good toilet and personal hygiene).
- Refer the patient to a dietician for dietary counselling. Dietary treatment varies because it depends on the composition of the stone.

### 9.5.3 Stress Incontinence

See “Section VI. Diseases and Disorders According to Age Groups. Chapter 28. Geriatrics” for a discussion of urogenital system changes.



## 9.6 Fournier Gangrene (Necrotising Fasciitis)

Fournier gangrene is necrosis (death of tissue) of the fascia surrounding the genitalia. The condition has approximately 80% mortality. It usually occurs in immunocompromised patients (e.g., patients with diabetes mellitus or HIV).

### Causes

- Type 1 caused by a mixture of aerobic and anaerobic bacteria
- Type 2 caused by Group A streptococci
- Perianal abscess
- Urethral strictures

### Symptoms and signs

- Smell
- Pain
- Gangrene

### Investigations

- FBC, U+E
- Swab

### Management

1. Admit and resuscitate patient.
2. Order sitz baths.
3. For type 1, prescribe ceftriaxone 250 to 500 mg IV 4 times per day and metronidazole 500 mg IV 3 times per day.
4. For type 2, prescribe benzylpenicillin<sup>1</sup> 5 Mill. IU 4 times per day for 5 days and clindamycin 600 mg IV 3 times per day.
5. Divert urine if the patient has a stricture.
6. Order surgical debridement on urgent basis.
7. Debride again after 48 hours.
8. Reconstruct.
9. Resolve cause.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 10.1 Back Pain

Lower back pain (lumbosacral) is a very common presenting complaint which is often found in the elderly, but can present in the young person as well. It can be inflammatory, mechanical, neurological, traumatic, or due to other disease. It can be acute or chronic.

#### Causes

- Mechanical—
  - Over straining
    - ◆ Carrying heavy objects
    - ◆ Pregnancy
    - ◆ Physical training
    - ◆ Bending down, dragging, or pulling heavy goods
  - Posture problems (at work, at school, standing, sitting)
  - Muscles and ligaments lesions (e.g., sprains or trauma)
- Neurological—
  - Acute nerve involvement (e.g., pinching in sciatica)
  - Protrusion or rupture of intervertebral discs
  - Slipping of vertebrae or spondylolisthesis
- Other—
  - Fractures
  - Infections: abscesses, TB, HIV/AIDS
  - Malignancies: primary or secondary, metastasis
  - Psychogenic pain: stress, tension, or depression

#### Symptoms and signs

- Pain and tenderness in the lumbosacral area
- Localised to just one area in the backbone
- Increases if heavy goods are lifted or carried
- Worsens when bending down or sitting for long periods
- Spreads (radiates) into the legs
- Pain in the flank or side
- Pain when passing urine
- Abdominal pain
- Purulent vaginal discharge

- Fever
- Tenderness of the abdomen when touched
- Neurological changes or disorders, weakness or loss of sensitivity in the legs
- Little, no, or severe pain with straight leg raising test
- Bladder or bowel dysfunction or incontinence


### Investigations

- Clinical examination
  - Straight leg raising test: patient lies on back with straight legs lifted up
    - ◆ No pain = muscle and ligament strain, postural problems, infections
    - ◆ Pain = nerve involvement, sciatic nerve compression
  - Testing of range of movements
  - Testing and evaluation of all myotomes and dermatomes (motor, sensory reflexes)
- FBC, ESR (to rule out underlying disease)
- X-ray if no improvement after 3 to 4 weeks of treatment

### Management

#### In clinic, health centre, or hospital—

1. Provide pain relief.
  - Paracetamol 1 g PO 3 times per day  
— OR —
  - Aspirin 600 mg PO 4 times per day, dependent on the severity of the pain. This dosage is for adults only.
2. If pain persists, prescribe the following:
  - Diclophenac injection 50 mg stat, then every 12 hours for 3 days  
— OR —
  - Ibuprofen 200 to 400 mg 3 times per day for 5 days
3. Provide health education (see below) to avoid future injury.

4. **Refer** to hospital if patient has— 
- No improvement after 2 to 4 weeks
  - Any neurological or nerve involvement
  - Weakness of limb
  - Localised vertebra involvement
  - Bladder or bowel fallout
  - Severe, continuous neurological pain

### In hospital—

1. Rule out underlying disease.
2. Provide physiotherapy.
3. Provide pain relief: anti-inflammatories, corticosteroids.
4. Prescribe muscle relaxants if necessary.
5. Order surgery if necessary.
6. Refer patient to specialist if no improvement.

### Health education

#### Advise patient to—

- Lose weight.
- Rest as much as possible.
- Use warm compresses on the affected area 3 times a day.
- Not carry, lift, or pull heavy goods until the complaints are gone.
- Be cautious in future—back pain can come back at any time.
- Exercise carefully when better.
- Rehabilitate trunk muscles (abdominals).
- Lift objects with straight back.
- Sleep on firm mattress using good pillows.
- Use correct posture. Sit and stand correctly (e.g., properly adjust chair, height of desk, position of computer).
- Do not turn or rotate the back too much.

## 10.2 Joint Pain

Joint pains are a common complaint in the clinic. For a full diagnosis, establish which joints are affected, characterise the pains (symmetrical, chronic or acute), and ascertain—

- The history of trauma
- Whether the patient overuses food or alcohol
- Family history

Always establish—

- Disease activity
  - Degree of tenderness
  - Degree of swelling
- Functional impairment (normal movements and functions)
- Physical damage (assess joints)

### Causes

- Single joint—
  - Trauma (e.g., sprained ankle)
  - Acute septic arthritis
  - Gout
  - Osteoarthritis
  - Haemophilia with acute joint bleeding
  - Penetrating injury
  - Osteomyelitis
  - Rheumatoid arthritis (seldom)
- Multiple joints—
  - Rheumatoid arthritis
  - Osteoarthritis
  - Psoriasis
  - Juvenile rheumatoid arthritis
  - Systemic lupus erythematosus (SLE)
  - Reactive arthritis

### 10.2.1 Osteoarthritis

Osteoarthritis (OA) is a degenerative joint disease with damage to articular cartilage usually caused by inorganic calcium deposits (abnormal bone formation). It frequently occurs in the elderly, both men and women.

#### Risk factors

- Elderly
- Obesity and overweight

#### Symptoms and signs

- Pain in any of the following: limbs, neck, back, hips, knees, and fingers
- Usually not symmetrical
- Stiffness of joints (especially mornings)
- Less joint movement
- Joint deformation
- Improvement with rest
- Deterioration with physical activity, cold, and wet weather conditions
- Pain can radiate to other parts of the body (e.g., neck will affect arms and cause weakness)
- Moderate tenderness
- Nodular thickening of the finger joints, especially the end joints, called *Heberden's nodes*
- The joints are not warm or swollen

#### Investigations

- ESR, FBC
- X-ray of affected joint

#### Management

**In clinic, health centre, or hospital—**

1. Provide pain relief using the following:
  - Paracetamol 1 g PO 3 times per day
  - Aspirin 600 mg (2 tablets) 4 times per day, if necessary
  - Methyl salicylate ointment
  - Oral NSAIDs or injection: ibuprofen 200 to 400 mg 3 times per day

## — OR —

- Diclophenac 50 mg IM stat
- 2. Dietary measures (see “Health education” below)
- 3. Refer to hospital if the patient does not improve or has nerve involvement.

**In hospital—**

1. Rule out rheumatoid arthritis or other causes.
2. Use anti-rheumatic medicines (see 10.2.2 below).

**Health education**

- OA is not curable. Treatment improves the condition, alleviates pain, but does not cure.
- Advise patients to—
  - Rest as much as possible (every day) to relieve joints of weight.
  - Not carry heavy goods on head, especially if the neck is affected.
  - Apply warm compresses 3 times per day on the affected limb to alleviate the pain.
  - Take medication with or right after meals and *not* on an empty stomach because doing so can cause gastritis.
  - Come to the clinic for medication or if symptoms recur.
- Refer the patient to a dietician and stress the following dietary measures by urging the patient to—
  - Follow a healthy diet. See “[Section III. Nutrition and Lifestyle](#)” for a discussion of a healthy diet throughout the life cycle.
  - Emphasise an adequate intake of calcium and vitamin D (e.g., consume milk, omaere, oshikandela, and yoghurt; eat pilchards with bones, tuna, soft margarine, and egg yolk; and get some daily exposure to sunshine.
  - Eat fatty fish (e.g., herring, mackerel, snoek, tuna, pilchards, salmon) more often than meat to obtain omega-3 fatty acids.

## 10.2 Joint Pains

- Ensure a good intake of vegetables and fruit.
- Use spices such as turmeric, red pepper, cloves, ginger, cumin, anise, fennel, basil, rosemary, and garlic regularly for their phytochemical content.
- Lose weight if overweight or obese. See “[Section III. Nutrition and Lifestyle](#)” for a discussion of obesity and overweight.

### 10.2.2 Rheumatoid Arthritis

Rheumatoid arthritis (RA) is an inflammatory disease of the connective tissue, which can involve the whole body especially the joints, heart, lungs, and spleen. Usually, symmetrical joints are affected commonly in young women, and the causes are multifactorial.

#### Symptoms and signs

- Stiffness and pain in the joints, usually more than 3 joints
- Symmetrical
- Worse in the morning
- Joints are swollen, inflamed, and sensitive to touch
- Fingers most affected with spindle-shaped, meta-carpal-phalangeal, or proximal interphalangeal joint swelling
- Nodules over the bony parts of the body (e.g., the elbows)
- Deformation of the joints (occurs later)
- Muscles and skin can become atrophic (wasting)
- Episodic appearance: flare-up, remission, and exacerbations
- Moderate fever
- Weakness, lethargy, depression
- Loss of weight
- The spleen may be enlarged (juvenile RA)
- Occasional generalised lymphadenopathy



## Investigations

- FBC, ESR, CRP
- Rheumatoid factor
- ANF
- Uric acid
- X-rays

## Management

### In clinic, health centre, or hospital—

1. Rest
2. Provide pain relief using—
  - Paracetamol
  - Diclophenac injection
  - Ibuprofen
3. Teach the patient how to perform range-of-motion exercises, but urge him or her to flex and extend with care.
4. Instruct the patient to start dietary measures (see “Health education” below) and, if needed, to lose weight.
5. If no response, refer to hospital for laboratory confirmation and exclusion of connective tissue diseases.
6. Continue treatment as prescribed by the hospital.

---

**Note:** Intensive treatment at an early stage might prevent later deformation.

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### In hospital—

1. Confirm the diagnosis and take the following steps:
  - Provide pain relief (see above).
  - Corticosteroids (oral or injected) may be necessary in all steps
2. Refer to specialist, who will prescribe the following:
  - Methotrexate 10 mg per week plus folic acid 5 mg per week
  - Sulphasalazine 500 to 2000 mg PO daily

— OR —

  - If available, chloroquine tablets 200 to 400 mg per day until symptoms subside then reduced to 5 days per week

### Health education

- Explain to the patient that RA could be a chronic condition of varying severity.
- Advise daily rest, but urge the patient not to spend all day in bed because the joints will then stiffen permanently.
- Inform the patient that daily movement of the joints will keep them mobile.
- When joints are acutely red and swollen joints, advise absolute rest.
- Urge the patient to take treatment regularly and return to clinic monthly.
- Refer to a dietician and provide the following dietary measures. **Note:** Dietary measures help prevent deterioration. Urge the patient to—
  - Follow a healthy diet (see “[Section III. Nutrition and Lifestyle](#)” for a discussion of a healthy diet throughout the life cycle) to obtain adequate intake of all nutrients.
  - Have an adequate intake of omega-3 fatty acids (e.g., pilchards, sardines, tuna, mackerel, herring, and fish oils); eat more fish and less meat.
  - Include nuts, sunflower seeds, avocado pear, and whole wheat cereals, starches, and bread regularly in his or her diet.
  - Prefer soya oil, canola oil, and olive oil
  - Drink 6 to 8 glasses of water per day.
- Urge patient to lose weight if overweight or obese. See “[Section III. Nutrition and Lifestyle](#)” for a discussion of obesity and overweight.

### 10.2.3 Gout

Gout is caused by high levels of uric acid in the blood that result in deposit of uric acid crystals in the joint spaces, leading to destruction of articular cartilage. It is most common in men.

#### Causes

- Primary gout: genetically high uric acid levels
- Secondary gout:
  - Haematological diseases (e.g., malignancies such as leukaemia)
  - Chronic kidney diseases
  - Medicines: thiazide diuretics, cytotoxics, TB medications (e.g., pyrazinamide)

#### Symptoms and signs

- Severe joint pain usually large toe, knee, or ankle
- Acute onset
- Swelling
- Red inflamed joint
- Tenderness
- Restricted movement
- Often history of alcohol intake, binge eating

#### Investigations

- Serum uric acid
- U+E, creatinine
- FBC, ESR
- LFT

#### Management

##### Acute attack—

1. Relieve pain and reduce joint inflammation using the following:
  - Diclophenac 50 to 100 mg IM stat
  - Ibuprofen 400 to 800 mg 3 times per day
  - OR ——
  - Indomethacin 50 mg 3 to 4 times per day
2. In peptic ulcer disease and renal impaired patients, prescribe—

## 10.2 Joint Pains

- Colchicine: 1 mg stat, then 0.5 mg every 1 to 3 hours until pain is relieved or vomiting or diarrhoea occurs to a maximum 10 mg.

### — IF NO RESPONSE —

- Prednisone: 40 mg PO daily for 3 to 5 days
3. Advise the patient to rest the joint.
  4. Drink plenty water and fluids.
  5. Do not start treatment with allopurinol or probenecid within 1 month of the acute attack.
  6. Refer the patient to a registered dietician, and provide the follow dietary measures. **Note:** These guidelines are general; the patient will need individual dietary counselling. Urge the patient to—
    - Avoid alcohol intake.
    - Drink 2 to 3 litres of water and other fluids (e.g., roibos tea, low fat or skim milk, much-diluted fruit juices) daily. Avoid drinking excessive amounts of fruit juice; they can worsen gout.
    - Avoid or strictly limit the intake of foods that have a high purine content such as anchovies, sardines, herring, kidney, liver; offal, foods with a high yeast content, broth or bouillon; crackling and skin of fish.
    - Eat less fat.
    - Follow a healthy diet. See “[Section III. Nutrition and Lifestyle](#)” for a discussion of a healthy diet throughout the lifecycle.
    - Ensure an adequate intake of milk products (e.g., low fat or skim milk, low fat or fat-free yoghurt or omaere).
    - Lose weight (if overweight or obese), but not more than 0.5 kg per week. Do not fast. See “[Section III. Nutrition and Lifestyle](#)” for a discussion of obesity and overweight.

**Chronic recurrent gout—Prevent recurring attacks by following this procedure:**

1. Recommend lifestyle changes and nonpharmacological measures:
  - Emphasise dietary adherence. (See management of acute attack above.)
  - Refer patient to a registered dietician for dietary counselling.
  - Urge the patient exercise regularly, but not intensively.
2. Use first-line treatment:
  - Allopurinol 150 mg once per day initially
  - Increase by 150 mg each week according to response
  - Usual maintenance dosage: 150 to 600 mg daily
  - Maximum dosage: 900 mg daily (If the daily dose is >300 mg, then give in 2 to 3 divided doses.)
3. Use second-line treatment, if first-line treatment does not produce a response or stops working:
  - Probenecid 250 mg 2 times per day for 1 week
  - Then 500 mg 2 times per day to a maximum of 2 g daily

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**Note:** The initiation of treatment with these medications may precipitate an acute attack.

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4. Give an NSAID or colchicine as a prophylactic and continue until at least 1 month after the hyperuricaemia has been corrected (usually about 3 months of prophylaxis).
  - Indomethacin 25 to 50 mg 3 times per day
  - Ibuprofen 200 to 400 mg 3 times per day
  - Colchicine 0.5 mg 1 to 2 times per day

### Health education

Urge the patient to—

- Drink 2 to 3 litres of water and fluids daily, but not excessive amounts of fruit juice.

## 10.2 Joint Pains

- Discuss basic dietary guidelines and refer patient to dietician.
- Prevent risk factors (see above).
- Exercise regularly, but only moderately (i.e., *no* intensive or heavy exercising).

### 10.2.4 Osteoporosis

See “Section VI. Diseases and Disorders According to Age Groups. Chapter 28. Geriatrics” for a discussion of musculoskeletal changes.

## 10.3 Monoarticular Joint Conditions

Monoarticular joint conditions involve just one joint in contrast to the polyarticular (i.e., involving several joints) conditions covered in [10.2](#).

### Causes

- Adult
  - Acute joint sprain or trauma
  - Intra-articular fractures
  - Septic arthritis
  - Osteomyelitis
  - Gouty arthritis
  - Reactive arthritis
  - Sickle cell anaemia
  - Haemophilia
- Children (as above)
  - Rheumatoid arthritis
  - Irritable hip syndrome
  - Perthes' disease
  - Slipped capital femoral epiphysis

### 10.3.1 Ligament Injuries and Fractures

See “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of fractures, sprains, and dislocations.

### 10.3.2 Acute Septic Arthritis

Acute septic arthritis is usually an acute infection of a single joint (usually a large joint). There is not always preceding history of trauma or penetrating injury or wound.

### Causes

- Bacterial infection: staphylococcus (majority), streptococcus, *Haemophilus influenza*, salmonella
- Gonococcal infection

### Symptoms and signs

- Sudden onset
- Large joint

## 10.3 Monoarticular Joint Conditions

- Pain severe
- Restricted movement of joint or limb
- Fever
- Redness
- Swelling
- Warm joint

### Investigations

- Aspiration of joint (MCS and culture)
- FBC and diff WCC, ESR, CRP
- Blood culture

### Management

#### In clinic, health centre, or hospital—

1. Provide pain and fever relief using paracetamol or ibuprofen.
2. Advise patient to rest the affected joint. Try splinting.
3. Refer to hospital urgently.
4. Do not prescribe an antibiotic without a definite diagnosis.

#### In hospital—

1. Make diagnosis.
2. Aspirate or swab pus for MCS before prescribing antibiotic treatment.
3. Start IV fluids.
4. Provide prompt surgical drainage. **Note:** Joint damage will occur within 6 hours of infection.
5. Prescribe cloxacillin<sup>1</sup> IV every 6 hours for 72 hours, then PO 4 times per day for 14 days at the following dosages:
  - Adult: 1 to 2 g IV, then 500 mg to 1 g every 6 hours PO
  - Children: Use high doses in severe infection (i.e., double the dose to 50 to 100 mg/kg per day in 4 divided doses). Normal dosages are (by child's weight)—
    - Up to 5 kg: 62.5 mg 4 times per day

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy



- 6 to 10 kg: 125 mg 4 times per day
  - 11 to 20 kg: 250 mg 4 times per day
  - >20 kg: 250 or 500 mg 4 times per day
6. For staphylococcal infections, prescribe—
- Fusidic acid
    - PO: 25 to 40 mg/kg per day in 3 divided doses
    - IV: 20 mg/kg per day in 3 divided doses by infusion over 4 hours
- PLUS ——
- Clindamycin
    - PO: 8 to 25 mg/kg per day in 3 to 4 divided doses
    - IV or IM: 15 to 40 mg/kg per day in 3 to 4 divided doses
7. Add ciprofloxacin if salmonella or gonococcus is cultured.
8. Add doxycycline if chlamydia is cultured.
9. Change antibiotics according to MCS results.

### 10.3.3 Osteomyelitis

Osteomyelitis (infection of the bone marrow) is an acute or chronic infection of bone. It is a blood-borne disease that often affects children.

#### Causes

- Haematogenic
- Open bone fracture
- Trauma
- A septic skin focus
- Septic arthritis
- Organisms: staphylococcus, streptococcus, *E. coli*, proteus, pseudomonas, *H. influenza*

#### Symptoms and signs

- Fever >38° C
- Shaking chill, rigors
- Weakness
- Pain when moving the affected limb
- Limited voluntary movement in child

## 10.3 Monoarticular Joint Conditions


- Red and very sensitive to touch
- Swelling of the affected limb
- Abscess can develop, fluctuating mass

### Investigations

- FBC and diff WCC, ESR, CRP
- Aspiration of pus and MCS and culture
- Blood culture
- X-ray of affected bone or area

### Management

#### In clinic, health centre, and hospital—

1. Immobilize the affected or infected limb.
2. Give no antibiotics. Antibiotics will be given in the hospital after microscopic preparation.
3. Provide pain and fever relief.
4. Splint or immobilise the affected limb (e.g., use a back slab).
5. Sponge with tepid water.
6. **Refer** to hospital urgently for surgical drainage. 
7. Ask the patient to return to the clinic after discharge from hospital.

#### In hospital—

1. Start IV fluids.
2. Administer antipyretics and analgesics.
3. Based on culture findings, start antibiotics:
  - Cloxacillin IV (see 10.3.2 above) for 2 weeks, then PO for 4 weeks after

— OR —

  - Clindamycin 600 mg IV every 5 hours or 900 mg IV every 8 hours and ciprofloxacin 400 mg IV or PO every 12 hours or levofloxacin 750 mg IV or PO once per day

### 10.4 Disorders Affecting Peripheral Nerves

Peripheral nerve involvement usually manifests in a specific area or areas of the body according to the affected muscles or dermatomes. (See [figure 10.4](#).) Any loss of motor or change in sensory function needs to be urgently diagnosed and treated.

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**Note:** Know your myotomes, dermatomes, and reflexes.

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#### Causes

Different sites of the nerve can be affected.

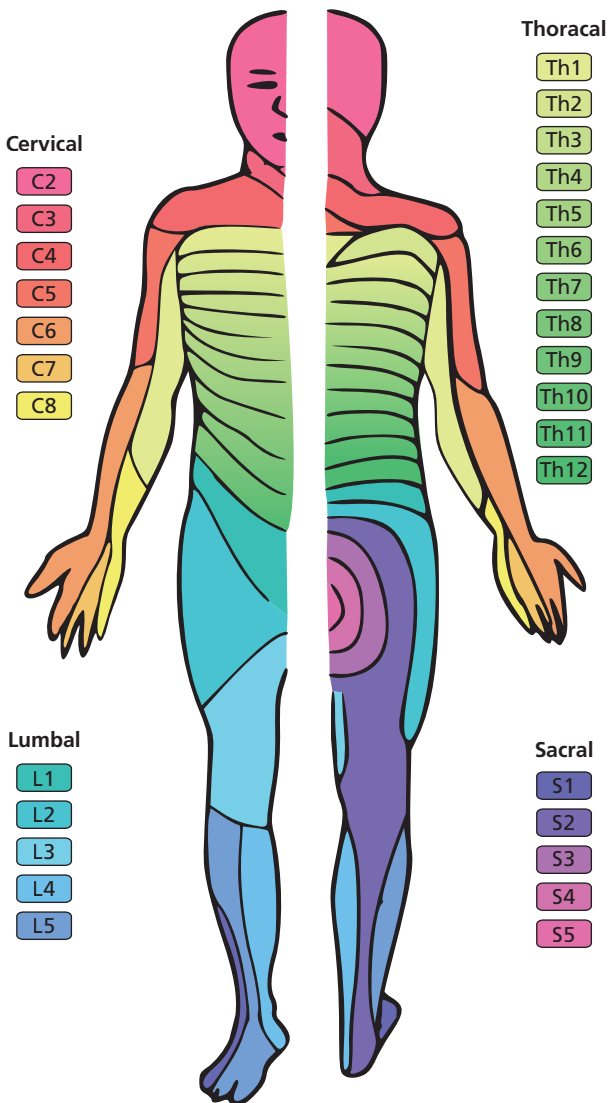
- Peripheral
  - Trauma (i.e., direct damage of nerve or indirect effect on area)
  - Nerve compression syndromes such as sciatic nerve, ulnar or median nerve compression
  - Infection of a nerve (e.g., from HIV, herpes simplex, herpes zoster, TB)
  - Medication (e.g., ARV and anti-TB therapies)
  - Traumatic injection injury (e.g., sciatic nerve)
- Dorsal root and spinal cord
  - Spinal cord compression—large area below this level is affected (paraplegia)
  - Spinal root compression—dermatome is affected (disc or vertebral lesions)
- Others
  - Infections in area around nerve (e.g., abscess)
  - Malignancies such as primary cord neoplasms or secondary metastasis

#### Symptoms and signs

- Loss of movement; muscle weakness or paralysis
- Loss of sensation
- Paralysis (spastic or flaccid)
- Localised pain
- Radiating pain
- Tingling; sense of pins and needles
- Numbness, loss of sensation

## 10.4 Disorders Affecting Peripheral Nerves

FIGURE 10.4 Diagram of dermatomes




## 10.4 Disorders Affecting Peripheral Nerves

- Clumsy movements, lack of coordination
- Muscle wasting
- Fasciculations of muscles (i.e., shivering)
- Reflexes increased (hyper-) or decreased (hypo-)
- Bladder and bowel dysfunction

### Investigations

- Detailed neurological examination
- FBC, ESR, blood glucose
- X-rays, MRI, or CT scan, depending on suspected cause

### Management

1. Urgently **refer** the patient to hospital if he or she has severe loss of sensation or motor function or if the circumstances involve trauma. 
2. For sciatic nerve compression, treat with rest and NSAIDs.
3. For herpes zoster, see “Section II. Diseases and Disorders According to Body Systems. [Chapter 12. Dermatology](#)” for a discussion of viral infections of the skin.
4. For a diabetic foot, see “Section II. Diseases and Disorders According to Body Systems. [Chapter 14. Endocrine System](#)” for a discussion of diabetes mellitus.

### 11.1 Coma or Unconsciousness

See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#),” for a discussion of coma and unconsciousness.

### 11.2 Dizziness, Faints, and 'Funny Turns'

Dizziness is a feeling described by the patient ranging from being unwell or unsteady to real balance disturbance and vertigo. Light-headedness during anxiety or panic attacks can also be inferred as dizziness. Faints or syncope can range from altered consciousness, falling, and visual disturbances to loss of consciousness. Sometimes patients describe having ‘funny turns’ or near-fainting episodes—called *presyncope*—that may include light-headedness, dizziness, severe weakness, and blurred vision.

#### Causes

- Circulatory
  - Vasovagal (e.g., fainting with stress, tension, prolonged standing)
  - Postural hypotension (i.e., dizziness with standing up quickly)
  - Effort such as sudden coughing, strenuous micturition
  - Carotid sinus massage
  - Acute bleeding or loss of blood volume (e.g., from trauma, wounds, internal bleeding, blood donations)
  - Cardiac arrhythmias (e.g., atrial and ventricular tachycardia, bradycardia)
  - Myocardial infarction
  - Anaemia
- Cerebral
  - Transient ischaemic attack (TIA) (See [11.8](#) for a discussion of stroke.)
  - Hysteria, emotional panic; no changes in BP or pulse

## 11.2 Dizziness, Faints, and 'Funny Turns'

- Hyperventilation
- Tumour in cerebellum
- Narcolepsy (i.e., sleep attacks)
- Epilepsy
- Metabolic
  - Hypoglycaemia

### Symptoms and signs

- Sudden loss of consciousness
- Fainting
- No confusion afterwards
- No tonic-clonic seizures
- Often history of prolonged standing, blood donation, getting up suddenly after sitting or lying

### Management

1. Lay patient down with legs raised.
2. Loosen tight clothing.
3. Give glucose water to drink.
4. Refer if attack lasts a long time, if confusion is present, or if an underlying potentially dangerous cause is suspected.

### 11.3 Headache

Headaches are common medical problems and a frequent cause of disability among both men and women. The pain may be situated in several areas of the head. (See also [appendix 1](#) and the IMAI documents.)

#### 11.3.1 General

Determining the cause and type of headache is important. [Table 11.3.1](#) provides indicators of serious headache and some possible causes to eliminate before treating a patient for headache. Taking a complete history is vital.

#### Causes and types of headache

- Facial and frontal headache—
  - Sinusitis (e.g., maxilla, frontal, ethmoidal)
  - Eye problems (e.g., glaucoma, visual impairment)
  - Oropharyngeal disorders (i.e., affecting teeth, gums, and throat)
- Temporal headache—
  - Severe hypertension
  - Stress
  - Temporal arteritis (especially in the elderly)
  - Ear disorders (e.g., otitis media, externa, mastoiditis)
  - Subarachnoid haemorrhage
- Top of the head (vertex)—
  - Tension
  - Stress
- Unilateral (one-sided)—Migraine
- Whole head—
  - Meningitis
  - Malaria
  - Hypertension (severe)
- Back of the head (occiput) or neck—
  - Meningitis
  - Malaria
  - Often refractive eye problems
  - Neck injury or strain (sports, stress)



TABLE 11.3.1 Indicators of Serious Headache

**Note:** Always rule out the possible causes listed below before starting treatment.

Symptom	Possible Cause
Recent trauma to the head	<ul style="list-style-type: none"> <li>• Intracranial bleeding</li> <li>• Head injury</li> </ul>
High fever	<ul style="list-style-type: none"> <li>• Meningitis</li> <li>• Malaria</li> </ul>
Vomiting and nausea	<ul style="list-style-type: none"> <li>• Migraine</li> <li>• Brain tumour (raised intracranial pressure)</li> </ul>
Acute onset (i.e., within minutes to hours)	<ul style="list-style-type: none"> <li>• Tumour</li> <li>• Hypertension</li> </ul>
Chronic or worsening headaches	<ul style="list-style-type: none"> <li>• Tumour</li> <li>• Hypertension</li> </ul>
Altered mental state or neurological symptoms or signs	<ul style="list-style-type: none"> <li>• Subarachnoid haemorrhage</li> <li>• Abscess</li> <li>• Brain tumour</li> <li>• Subdural haematoma</li> </ul>

### History

- When did the headache begin?
- Has the patient had any trauma to the head?
- Does the patient have fever? Has he or she had a fever recently?
- Has the patient had nausea and vomiting?
- Does the patient have difficulty in walking or talking? Has he or she had these difficulties recently?

### Examination


- BP
- Heart rate
- Temperature
- Neck stiffness
- Ophthalmologic investigation (i.e., vision and refraction)
- Neurological signs (e.g., can the patient move the limbs and speak properly?)

## 11.3 Headache

### Investigations

- Sinus X-rays
- MRI or CT

### Management

1. In the case of serious disease, **refer** urgently. 
2. If the patient shows no signs of serious disease, give paracetamol.
3. Treat underlying cause.
4. In the case of long-lasting headache, refer.

### 11.3.2 Migraine Headache

A migraine is headache of varying severity with sudden onset that lasts from 4 to 72 hours and is often unilateral.

#### Symptoms and signs

- Unilateral headache, worse with physical activity
- Pulsating
- Severe
- Nausea, vomiting
- Photophobia and phonophobia (patient wants to lie in a dark, quiet room)
- Sometimes an aura is experienced before onset.

#### Management

1. Order bed rest in quiet area.
2. For an acute attack, prescribe the following:
  - Paracetamol and/or codeine
  - Ergotamine + caffeine + cyclizine
    - 1 tablet stat (when aura appears or first signs)
    - Then 1/2 to 1 tablet every 2 hours (maximum 4 in 24 hours)
3. For prophylaxis, prescribe the following:
  - Amitriptyline 25 mg at night
  - OR ——
  - Propranolol 20 mg 2 times per day

### 11.4 HIV and Neurological Conditions

One of the main clinical signs in HIV/AIDS patients is headache pain, with or without other neurological signs or symptoms. Although headaches are quite common and often associated with stress, tension, and illness, in some incidences, headache pain may be cause for concern.

Causes of fever and headache with or without confusion include the following—

- Meningitis
- Viral encephalitis (e.g., toxoplasma, herpes simplex)
- Cerebral malaria
- Any acute infection (Infections can cause a confused state.)

Other causes can include—

- Metabolic (e.g., severe dehydration, hypoglycaemia)
- Chronic neurological conditions (e.g., HIV-dementia)
- Psychiatric illness (e.g., depression or psychosis can present as confusion and is common in HIV.)

The algorithm in [figure 11.4](#) is a step-by-step guide for the clinical management of HIV/AIDS patients with headache and neurological signs.

#### Health education

See “Section IV. Infectious Diseases. [Chapter 18. HIV/AIDS](#)” for a discussion of health education for adults with HIV.

#### 11.4.1 Confusion or Delirium

Find the organic causes.

#### 11.4.2 Dementia

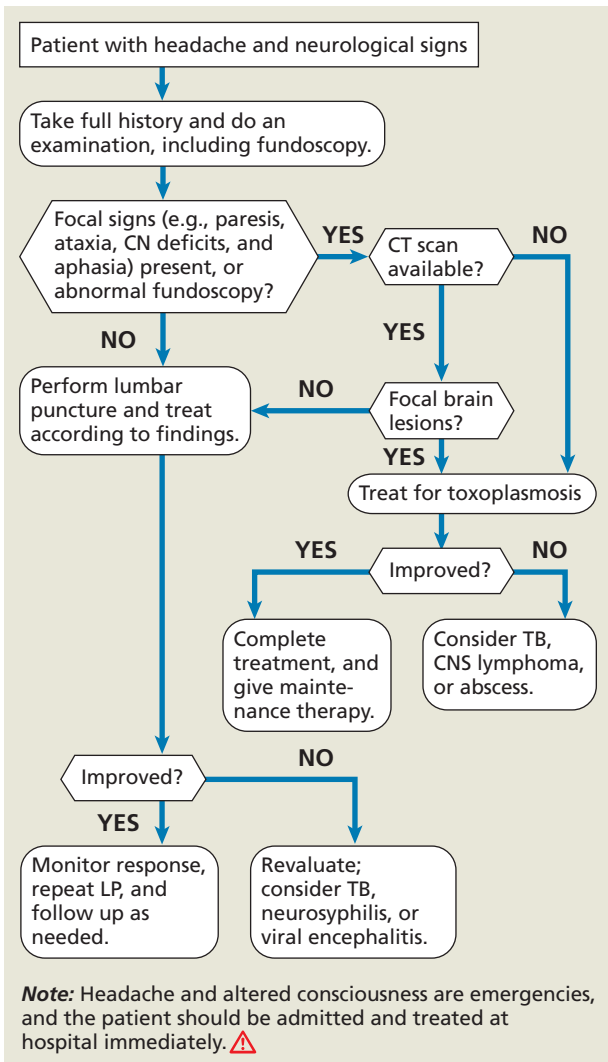
Dementia with no other cause (e.g., HIV encephalopathy) is an AIDS-defining condition and is an indication for ART.

CNS and other infections must be excluded.

## 11.4 HIV and Neurological Conditions

FIGURE 11.4

### Algorithm for headache and neurological signs



### 11.4.3 Meningitis

See 11.5 for a discussion of meningitis.

### 11.4.4 Painful Peripheral Neuropathy

Peripheral nerve disorders are frequent complications of HIV disease. There are several causes of nerve damage that result in peripheral neuropathy. The primary manifestations of polyneuropathy are slowly progressive numbness and paraesthesia, with burning sensations in the feet.

#### Causes

- Medicine-induced (e.g., from stavudine, didanosine, isoniazid, vincristine)—Medicine-related neuropathy is more common when CD4 is very low, and especially if the patient has pre-existing HIV neuropathy.
- HIV—Up to 30% of pre-ART patients in some settings suffer from peripheral neuropathy. The condition is related to very low CD4 counts and often quite painful.
- Nutritional deficiencies (e.g., vitamin B12 deficiency, folate deficiency, pyridoxine, or thiamine deficiency)
- Syphilis
- Diabetes
- Liver and kidney disease
- CMV (i.e., mononeuritis multiplex or progressive paraplegia; sphincter and sensory loss; often white blood cells in CSF)
- Malignancy
- Spinal cord compression
- Spinal root pathologies, radiculopathy, poliomyelitis
- Neuropathy (e.g., Guillain-Barré, Bell's palsy, HIV drug toxicity)

#### Symptoms and signs

- Burning or numbness in feet (usually) or hands
- Motor symptoms rare, unless condition is quite severe
- Often worse at night

## 11.4 HIV and Neurological Conditions

### Investigations

- Careful medication history especially relation of symptoms to starting ARV or TB medicines
- Alcohol and nutritional history
- Assess for malnutrition
- Blood film—signs of B12 or folate deficiency (see “Section II. Diseases and Disorders According to Body Systems. Chapter 4. Blood System” for a discussion of anaemia)
- CD4 count
- U+E
- Syphilis serology
- Glucose, glycosuria

### Management

1. Treat the cause (e.g., withdraw causative medicines if possible or give vitamin supplement when a deficiency is suspected). Make sure patients on isoniazid are taking pyridoxine. Patients who are not suspected of having pyridoxine deficiency will not respond to pyridoxine, so it should not be empirically prescribed.
2. Provide simple analgesia.
3. Prescribe amitriptyline 25 to 100 mg once each evening until controlled.
4. Prescribe carbamazepine, but watch for medicine interactions.
5. Lignocaine is used in some centres.
6. Prescribe morphine if the patient’s symptoms are severe.
7. Provide psychological support.

### 11.4.5 Seizures and Convulsions

See [11.7](#) for a discussion of convulsions and epilepsy.

### 11.4.6 Toxoplasma Encephalitis

Toxoplasmosis is caused by *Toxoplasma gondii*, an obligate intracellular protozoan of worldwide distribution. Transmission to humans occurs primarily by ingestion of undercooked meat that contains tissue cysts or by exposure to oocysts either through ingestion of contaminated vegetables or direct contact with cat faeces. Other modes of transmission are transplacental route, blood product transfusion, and organ transplantation.<sup>1</sup>

#### Symptoms and signs

- CD4 usually <100
- Focal signs and impaired level of consciousness
- Seizures or convulsions

#### Investigations

- Urgent CT scan (multiple ring enhancing lesions)
- Serological testing for toxoplasmosis is usually IgG positive.

#### Management

1. Prescribe co-trimoxazole 1920 mg (4 single strength or 2 double strength) 2 times per day for 1 month; then co-trimoxazole 960 mg 2 times per day for 3 months. Provide prophylaxis of co-trimoxazole 960 mg daily.
2. In SE, bone marrow depression is not uncommon; order FBC 2 times per week.
3. Prescribe folic acid 15 mg daily.
4. Prescribe anticonvulsants. (See 11.7 for a discussion of convulsions and epilepsy. Beware of interactions with ARV.)
5. If no response, investigate for tuberculoma, cryptococcoma, and lymphoma.

<sup>1</sup> Montoya, J.G., and J.S. Remington. 2000. *Toxoplasma Gondii*. In G.L. Mandell, J.E. Bennett, and R. Dolin, eds., *Principles and Practice of Infectious Diseases*. Philadelphia: Churchill Livingstone.

### 11.5 Meningitis

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Meningitis is an inflammation or infection of the meninges (i.e., membranes around the brain tissue). Meningitis is a major international health problem; explosive and widely fatal outbreaks may occur.

#### Causes

- Bacteria—
  - *Neisseria meningitides* or *meningococcus* (often occurs in epidemics)
  - *Streptococcus pneumonia*
  - *Haemophilus influenza* (accounts for most cases in children under 6 years)
  - *Staphylococcus aureus*
  - Gram-negative bacilli
  - *Mycobacterium tuberculosis* (TB)
- Virus—
  - Enterovirus (e.g., coxsackie, polio)
  - Mumps
  - Herpes simplex
  - HIV
- Fungi—
  - *Cryptococcus neoformans*
  - *Candida* spp.

---

**Note:** Meningitis usually follows nasopharyngeal acquisition of a virulent organism with subsequent systemic invasion.

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#### Causes in HIV

- Bacterial: pneumococcal or meningococcal
- Viral meningitis
- TB
- Syphilitic or neurosyphilis
- Cryptococcal
- 'Aseptic' meningitis
- HIV-specific meningitis—primary HIV infection syndrome



### Predisposing conditions

- Skull-base fracture
- Ear disease (especially in children)
- HIV/AIDS

### Symptoms and signs

- Infants—
  - Very ill and irritable
  - Weak cry
  - High fever ( $>39^{\circ}\text{C}$ ) but may be normal
  - Bulging fontanel, separation of skull sutures
  - Neck and back arched backwards
  - Occasionally convulsions, sleepy child
  - Poor sucking, refuses to eat
  - Hypotonic, floppy baby
- Older children and adults—
  - High fever ( $> 38^{\circ}\text{C}$ ) of sudden onset or rigors
  - Headache
  - Vomiting and nausea
  - Stiff neck (plus Kernig's and Brudzinski's signs)
  - Convulsions (occasionally)
  - General weakness and malaise; loss of appetite
  - Photophobia
  - Change in behaviour
  - Altered level of consciousness or delirium
  - Symptoms of a respiratory infection, cough and sore throat
  - Petechiae, bleeding in skin—this symptom indicates an emergency
  - Papilloedema
  - Cerebral spinal fluid (CSF) comes out under pressure if lumbar puncture (LP) is done.

---

**Note:** Fundoscopy must be done before the LP if possible (unreliable in children).

---

### Investigations

- CSF for culture and microscopy before starting antibiotics. (See [table 11.5A](#))
- FBC, diff WCC
- Malaria smear
- Blood cultures (take blood sample before starting antibiotics)
- Blood glucose
- In HIV—
  - Urine culture for cryptococcus
  - Serum cryptococcus Ag, VDRL/RPR
  - CXR
- CT scan to rule out space-occupying lesions if there are seizures, focal signs, and depressed level of consciousness

### Contraindications to LP in children

- Prolonged (>30-minute) or focal seizures
- Focal neurological signs (e.g., asymmetry of limb movement and reflexes, ocular palsies)
- Purpuric rash on an ill child
- GCS of less than 13
- Pupillary dilatation
- Impaired oculocephalic reflexes
- Abnormal posture or movement; decerebrate or decorticate posturing
- Thrombocytopenia or a bleeding tendency
- Papilloedema
- Hypertension
- Inappropriately low pulse, elevated blood pressure, and irregular respiration (i.e., signs of impending brain herniation)

### Management

#### In clinic, health centre, or hospital—


1. If in doubt or if a LP is contraindicated or cannot be done for any reason, refer the patient to hospital or a specialist. **Refer** to hospital *immediately* if the diagnosis of meningitis is suspected. 

TABLE 11.5A Interpretation of CSF Results

Parameter	Normal	Pyogenic or Bacterial	Viral	TB
Appearance	Clear	Turbid/purulent	Clear/turbid	Turbid/viscous
WBC: Mononuclear or lymphocytes cells/mm <sup>3</sup>	<5	<50	10 to 100	100 to 300
WBC: Polymorphs/mm <sup>3</sup> (neutrophils)	Nil	200 to 300	Nil	0 to 200
Protein (g/L)	0.2 to 0.4	Moderately high (0.4 to 2.0)	Slightly high (0.4 to 0.8)	High (a marked increase) (0.5 to 3.0)
Glucose (% blood glucose)	>1/2 blood glucose	Low <1/2 blood glucose	Normal	Very low <1/3 blood glucose
Chloride	116 to 130	Slightly low to normal	Normal	Very low

## 11.5 Meningitis

### In hospital—

See tables [11.5B](#) and [11.5C](#).

1. Enforce strict bed rest.
2. Provide symptomatic management: control convulsions with diazepam, and manage fever with antipyretics.
3. Start a drip of 5% dextrose and maintain hydration.
4. Insert an NGT for feedings.
5. Perform a LP. **Note:** *Never* give antibiotics before performing the LP.
6. Start treatment as soon as possible.
7. List close contacts for chemoprophylaxis.

### Health education

- Emphasize the importance of personal hygiene.
- Urge the patient to avoid overcrowding in living quarters and workplaces.
- Explain how the infection spreads (i.e., by droplets).

TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup>**Cause: Bacterial****Symptoms and Signs**

- Meningism
- High fever
- Shock
- Rash

**CSF**

- Turbid appearance
- Raised neutrophils 200 to 300
- Protein: Moderately high (0.4 to 2.0)
- Low  $< \frac{1}{2}$  blood glucose

**Treatment**

- Empirical: ceftriaxone 2 g IV stat, followed by 1g IV 2 times per day for 5 days. Modify treatment on basis of culture results.
- Continue oral cefuroxime for 10 days  
— OR —
- Benzylpenicillin 4 million IU every 4 hours  
— OR —
- Ampicillin 2 g IV every 4 hours

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 11.5 Meningitis

TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup> (cont.)

**Cause:** Cryptococcal

### Symptoms and Signs

- Fluctuating confusion (common)
- Fever
- Headache
- Nausea and vomiting
- Malaise
- Papilloedema
- Less common: stiff neck, focal and cranial nerve deficits, seizures
- Common in advanced AIDS: CD4 <100

### CSF

- Clear or turbid appearance
- Pressure commonly raised
- Protein: Normal or raised
- WBC: 0 to 20 (monocytes)
- Glucose may be low
- Culture positive: 95 to 100%
- India ink positive: 60 to 80%
- Crypt Ag (antigen) nearly 100% sensitive and specific

### Treatment

Initiation:

- Amphotericin B 1 mg/kg IV for 2 weeks  
— OR —
- Fluconazole 800 mg/day PO for 2 weeks.

Consolidation:

- Fluconazole 400 mg/day for 10 to 12 weeks.
- LP should be repeated after 2 weeks and thereafter weekly

Maintenance:

- Fluconazole 200 mg/day until CD4 is >200 for 6 months
- Prophylaxis: fluconazole 100 mg daily for life

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup> (cont.)**Cause:** Toxoplasmosis**Symptoms and Signs**

- Focal neurological deficits
- Seizures
- Fever
- Reduced alertness
- Headache
- Papilloedema
- Common in advanced AIDS: CD4 <100

**CSF**

- Normal in 20 to 30% of cases
- Protein: Normal or raised
- WBC: 0 to 40 (monocytes)
- Consider CT scan or MRI

**Treatment**

## Initiation:

- Pyrimethamine 5 mg/kg every 12 hours
- In combination with sulphadiazine 25 mg/kg every 12 hours  
— OR —
- Azithromycin or clindamycin or clarithromycin for 6 to 8 weeks
- Steroids for raised ICP: dexamethasone 4 to 8 mg 4 times per day until clinical improvement, then slowly reduce.
- Anticonvulsant while needed

**Note:** Response to empiric therapy: >85% respond by day 7.

Maintenance or prophylaxis: co-trimoxazole 960 mg once daily

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 11.5 Meningitis

TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup> (cont.)

### Cause: Tuberculosis

#### Symptoms and Signs

- Fever
- Reduced alertness
- Confusion
- Headache
- Meningismus
- Focal deficits
- In HIV/AIDS: can occur at any CD4 count

#### CSF

- Turbid or viscous appearance (normal in 5 to 10% of cases)
- Protein: Normal (40%) - 0.5 to 3.0 g/L
- Lymphocytes: 100 to 300
- Neutrophils: 0 to 200
- Glucose: <1/3 blood glucose
- AFB sputum smear positive: 20% of cases
- Chest X-ray: active TB in 50% of cases
- Definitive diagnosis: positive culture CSF

#### Treatment

Refer to current national TB guidelines.

### Cause: Herpes simplex encephalitis

#### Symptoms and Signs

- Fever
- Altered consciousness
- Seizures (particularly temporal lobe)
- History of oral or genital herpes

#### CSF

- Clear appearance
- Lymphocytes: 10 to 100
- Polymorphs: none
- Protein: 0.4 to 0.8 g/L

#### Treatment

If strongly suspected, consider—

- IV acyclovir 800 mg 5 times per day for 7 days  
— PLUS —
- Anticonvulsants

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy



TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup> (cont.)**Cause:** Neurosyphilis**Symptoms and Signs**

- Sometimes asymptomatic
- Meningism
- Tabes dorsalis—sharp pains, paraesthesia in legs
- Memory loss, dementia, personality changes
- Meningovascular syphilis—strokes, myelitis
- Ocular syphilis—iritis, uveitis, optic neuritis
- In HIV/AIDS: can occur at any CD4 count

**CSF**

- Protein: mildly elevated
- WBC: 5 to 100 (monocytes)
- VDRL positive: sensitivity—65%, specificity—100%

**Treatment**

- Benzylpenicillin 4 Mill. IU IV every 4 to 6 hours for 14 days  
— OR —
- Procaine benzylpenicillin 2.4 Mill. IU IM injection once per day  
— **PLUS** —
- Probenecid 500 mg 4 times per day for 14 days  
— OR —
- Doxycycline (200 mg twice a day) for 21 days (for patients with penicillin allergy)

**Note:** Benzathine penicillin is ineffective because it does not reach the CSF.

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 11.5 Meningitis

TABLE 11.5B Treatment of Meningitis in Adults<sup>a</sup> (cont.)

**Cause:** CMV (cytomegalovirus)

### Symptoms and Signs

- Fever, with or without delirium
- Lethargy
- Disorientation
- Malaise and headache most common
- Stiff neck
- Photophobia
- Cranial nerve deficits less common
- No focal neurological deficits
- Evolution: <2 weeks
- Common in advanced AIDS: CD4 <100

### CSF

- Clear appearance
- May be normal or—
  - Protein: 0.1 to 1.0 g/dl
  - WBC: 10 to 1,000 (monocytes)/mL
  - Glucose usually decreased
  - CMV PCR positive
  - CSF cultures usually negative for CMV

### Treatment

No specific treatment available.

<sup>a</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

TABLE 11.5C Treatment of Bacterial Meningitis in Children<sup>a</sup>

Age of Child	First Choice Treatment	Alternative Treatment
>3 months	<ul style="list-style-type: none"> <li>• IV antibiotics for 10 days, then PO for 7 days</li> <li>• Ceftriaxone: 100 mg/kg per day in single or 2 divided doses (IV or IM)</li> <li>• Duration of treatment:               <ul style="list-style-type: none"> <li>- Meningococcus: 7 days</li> <li>- Pneumococcus: 10 to 14 days</li> <li>- <i>H. influenzae</i>: 10 to 14 days</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• IV antibiotics for 10 days, then PO for 7 days</li> <li>• Benzylpenicillin: 400,000 IU/kg per day every 6 hours (maximum dose = 20 Mill. IU/24 hours)</li> <li>— PLUS—</li> <li>• Chloramphenicol: 25 mg/kg every 6 hours IV (maximum dose = 2 g/24 hours)—i.e., 100 mg/kg per day IV in 4 divided doses</li> </ul>
<3 months	<ul style="list-style-type: none"> <li>• Ampicillin (IV by slow injection or infusion in normal saline or dextrose 5% over 30 to 60 minutes)               <ul style="list-style-type: none"> <li>- &lt;7 days old: 200 mg/kg per 24 hours; give every 12 hours</li> <li>- &gt;7 days old: 400 mg/kg per 24 hours; give every six hours</li> </ul> </li> <li>— PLUS—</li> <li>• Gentamicin: 5 mg/kg IV daily for 10 to 14 days</li> </ul>	<ul style="list-style-type: none"> <li>• Ceftriaxone: 75 mg/kg daily IV (infuse over 30 minutes)</li> <li>• Duration of treatment—               <ul style="list-style-type: none"> <li>- Gram-positive organisms: 14 days</li> <li>- Gram-negative organisms: 21 days</li> </ul> </li> </ul>

**Note:** Treatment should be tailored according to the result of culture and sensitivity once available.

<sup>a</sup> Refer to appendix 5 for treating patients with a history of penicillin allergy

### 11.6 Paralysis (Acute Muscle Weakness)

Paralysis is a decrease or inability to move muscle groups and therefore limbs. It can be sudden or develop over a long time, transient or permanent, total or sparing some muscle groups.

#### Causes

- Brain—
  - Stroke or CVA
  - Transient ischaemic attack (TIA)
  - Subdural haematoma
  - Multiple sclerosis
  - Hypertensive crises
- Spine—
  - Spinal cord lesions or compression
  - Transverse myelitis
- Nerves—
  - Poliomyelitis (See “Section VI. Diseases and Disorders According to Age Group. [Chapter 26. Paediatrics](#)” for a discussion of immunisation-preventable diseases.)
  - Guillain-Barré syndrome
  - Vitamin A, B12, or folate deficiency
  - Diabetes mellitus
  - TB
  - HIV
- Muscular—muscular dystrophy

#### Symptoms and signs

See [table 11.6](#).

#### Investigations


- FBC, U+E, glucose, LFT, TFT
- Viral investigations
- Poison and porphyria screen
- LP
- X-rays (spine)
- CT or MRI
- Nerve conduction studies, muscle biopsy, Tensilon test

## 11.6 Paralysis (Acute Muscle Weakness)

TABLE 11.6 Symptoms and Signs of Paralysis

Parameter	Spastic (e.g., Stroke)	Flaccid (e.g., Polio)
Movements	Occasionally total paralysis	Total paralysis (but not always)
Paralysis	<ul style="list-style-type: none"> <li>• Unilateral</li> <li>• Hemiparesis and facial fall-out:               <ul style="list-style-type: none"> <li>- Contralateral (brainstem)</li> <li>- Ipsilateral (capsula interna)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Bilateral (i.e., both sides affected)</li> <li>• Asymmetric (sometimes)</li> </ul>
Motor neuron lesion	Upper	Lower
Reflexes	<ul style="list-style-type: none"> <li>• Hyper-reactive</li> <li>• Extensor or upwards plantar</li> </ul>	<ul style="list-style-type: none"> <li>• Low or absent reflexes</li> </ul>
Muscles tonus	<ul style="list-style-type: none"> <li>• Spasticity or hypertonia</li> <li>• No fasciculations</li> <li>• No muscle wasting</li> </ul>	<ul style="list-style-type: none"> <li>• Flaccid, hypotonia (floppy)</li> <li>• Fasciculations</li> <li>• Muscle wasting</li> </ul>

### Management

1. Use ABC resuscitation, if necessary.
2. Inquire about polio immunisations.
3. Rule out causes.
4. **Refer** to hospital immediately. 

### 11.7 Convulsions and Epilepsy

Convulsion (or seizure) is an involuntary contraction or series of contractions of the voluntary muscles. Epilepsy is a disorder characterized by the occurrence of at least two unprovoked seizures 24 hours apart.

**Note:** This definition implies that a person with a single seizure, or recurrent seizures due to correctable or avoidable circumstances, does not necessarily have epilepsy. *Epilepsy* refers to a clinical phenomenon rather than a single disease entity, since epilepsy has many forms and causes.

#### Causes of convulsions

- In neonates—
  - Hypoxic ischaemic encephalopathy, birth asphyxia
  - Intracranial haemorrhage
  - CNS infection
  - Metabolic disease
- In children—
  - Epileptic attack
  - Fever convulsions. See “Section VI. Diseases and Disorders According to Age Groups. [Chapter 26. Paediatrics](#)” for a discussion of fever convulsions.
  - Cerebral insult
    - ◆ Poisoning
    - ◆ Trauma (accidental and nonaccidental)
    - ◆ Hypertensive encephalopathy
    - ◆ Infections
      - Meningitis (e.g., bacterial, TB, viral)
      - Cerebral malaria
      - Neurocysticercosis
    - ◆ Metabolic
      - Hypoglycaemia
      - Hyper- or hyponatraemia
      - Hypocalcaemia

- Brain tumour
- Hydrocephalus
- In adults—
  - Alcohol abuse, intoxication, or withdrawal
  - Stroke
  - Trauma or head injury
  - Epilepsy
  - Eclampsia during pregnancy
  - Malignant hypertension
  - Drugs and medicines
  - Brain tumour
- In HIV—
  - Space-occupying lesions (SOL); toxoplasmosis
  - Cryptococcus or other meningitis
  - Tuberculoma
  - Brain abscess
  - Lymphoma
  - Metabolic disturbances such as sodium and magnesium
  - Any organ failure (e.g., liver, kidney)
  - Stroke (haemorrhagic or infarct)
  - Progressive multifocal leucoencephalopathy (PML)

---

**Note:** Most antiepileptic medicines interfere with the plasma levels of ARV medicines.

---

Abnormal CNS activity can have various manifestations, ranging from dramatic convulsive activity to experiential phenomena not readily discernible by an observer. Based on the symptoms, seizures are classified as shown in [table 11.7A](#).

### Symptoms and signs of generalized seizures

- Aura (i.e., foreboding of an attack) combined with a peculiar taste in the mouth and dizziness
- Loss of consciousness
- Muscular contractions of all four limbs
- Chewing movements of mouth

## 11.7 Convulsions and Epilepsy

TABLE 11.7A Nomenclature of the International Classification of Epileptic Seizures

I. <b>Partial seizures</b> (i.e., seizures beginning locally)	A. Simple partial seizures (without impaired consciousness)	1. With motor symptoms 2. With somatosensory or special sensory symptoms 3. With autonomic symptoms 4. With psychic symptoms
	B. Complex partial seizures (with impaired consciousness)	1. With impaired consciousness only 2. With automatisms
	C. Partial seizures	1. Secondarily generalized
II. <b>Generalized seizures</b>	A. Absence seizures B. Generalized tonic-clonic seizures C. Myoclonic seizures D. Akinetic seizures E. Atonic seizures F. Tonic seizures G. Clonic seizures	

### III. Unclassified seizures

- Bite marks of tongue or lips
- No control over sphincter muscles with consequent passing of urine and/or stool
- Rarely vomiting or cyanosis during an attack
- The following post-attack signs are possible—
  - Sleepy and confused
  - Muscular pain
  - Severe headache
  - Weakness or loss of sensitivity in one part of the body
  - Fever and stiffness of the neck



### Investigations

- Blood glucose
- U+E
- Malaria smear
- EEG
- CT

---

**Note:** Seizures are a manifestation of neurological or metabolic diseases and effort should be made to diagnose the underlying disease.

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### Management

**Follow the mnemonic acronym: A-B-C-D-E –**

- *Airway:* A patent airway is the first requisite. Place the patient in a stable lateral position. The oropharynx may need gentle suction to clear secretions.
- *Breathing:* Ensure that the patient is breathing. Give high-flow oxygen through a face mask. If a child is hypoventilating, respiration should be supported with oxygen via a bag-valve-device.
- *Circulation:* Support circulation with intravenous fluids. If signs of shock are present, give 20 mL/kg of normal saline over 1 hour for adults and children.
- *Drugs:* Administer diazepam and dextrose.
- *Evaluation:* Evaluate the management, seizure control, and environment. Examine and evaluate the patient. Remove the patient's clothing and examine the whole patient, front and back, but do not allow the patient to get cold. Examining the whole patient is the only way to be sure that you have not missed other injuries.


**In clinic, health centre, or hospital—**

1. Turn patient on his or her side.
2. Ensure adequate airway. Give oxygen if patient has breathing difficulty. Remove secretions or vomitus, if necessary.

TABLE 11.7B Choice of Medicine

Focal Onset Seizures	Generalised Tonic-Clonic Seizures	Absence	Myoclonic	Atonic
Carbamazepine Valproic acid Phenytoin	Carbamazepine Valproic acid Phenytoin	Ethosuximide Valproic acid	Valproic acid	Valproic acid
Alternative Treatment				
Phenobarbital	Phenobarbital	Phenobarbital		

3. Inject diazepam:
  - Adults: 10 mg intravenously or intramuscularly
  - Children: 300 mcg/kg intravenously or 500 mcg/kg per rectum

Dose can be given again after 2–3 minutes if needed.
4. **Refer** all types of convulsions to hospital. 

### In hospital—

1. Take a complete history, including family history and any possible precipitating factors.
2. Rule out underlying causes.
3. Start anticonvulsive therapy (see tables 11.7B and 11.7C). **Note:** Do not start anticonvulsive therapy after just one episode.

### In pregnancy

- The risk of teratogenicity is increased.
- Uncontrolled epilepsy poses a serious threat to both mother and foetus.
- Carbamazepine is the agent of choice.
- Avoid valproate, if possible.
- Give folic acid 5 mg once daily (reduces the risk of neural tube defects).
- Prophylactic phytomenadione (vitamin K) is recommended for the mother before delivery (as well as for the neonate; risk of neonatal bleeding).

TABLE 11.7C Dosages for Medicines

Medicine	Dosage
Carbamazepine	800–1200 mg/day (in two divided doses)
Valproic acid	750–1000 mg/day (in two divided doses)
Phenytoin	300–400 mg/day (in one dose or two divided doses)
Phenobarbital	90–120 mg/day (in one dose)
Ethosuximide	750–1000 mg/day (in one dose)

## 11.7 Convulsions and Epilepsy

### Health education

- Discuss the type of convulsion with the patient.
- Stress that regular treatment is a must to suppress further attacks.
- Remind the patient that his or her medication (drugs) must be taken as prescribed to prevent future attacks.
- Urge the patient to return to the clinic for medication. Remind him or her not to stop medication, and especially not to stop it abruptly. Emphasise that only doctors can make decision about reducing or stopping medication.
- A confirmed epileptic patient must not drive a car, handle dangerous goods, or electric equipment, climb trees, swim alone, sit close to an open fire, or perform any activity that might be dangerous if a seizure occurred. Urge the patient to obtain advice from a specialist.
- Advise the patient not to work in the building and construction industry.
- Inform the patient that he or she must abstain from drinking alcohol.
- Remind the patient to eat regular meals.

### 11.8 Stroke or Cerebrovascular Accident

Acute severe cerebrovascular accident (CVA) or stroke is a focal neurological deficit lasting longer than 24 hours. A stroke occurs if the flow of blood in one part of the brain is interrupted (i.e., by a blood clot or haemorrhage). The affected parts of the brain will be without oxygen and will die, resulting in neurological impairment or death.

A transient ischaemic attack (TIA) occurs if the clot dissolves with complete neurological recovery within 24 hours.

#### Causes

- Thrombus or blood clot
- Microemboli (from other areas in the circulation)
- Haemorrhage or bleeding from ruptured artery or vein
- ‘Berry’ aneurysm
- Trauma
- Space-occupying lesion or tumour

#### Risk factors

- Hypertension, arrhythmias (e.g., atrial fibrillation), polycythemia (high haematocrit), atherosclerosis, cardiomyopathy, or rheumatic or ischaemic heart disease
- Diabetes mellitus
- Smoking
- Alcohol use
- Obesity
- High cholesterol
- Oestrogen-containing contraceptives

#### Symptoms and signs

- Sudden, severe headache
- Confusion or disorientation
- Dizziness
- Vertigo and vomiting
- Sudden loss of vision (TIA)
- Inability to speak, aphasia, dysphasia
- Incontinence of stools and urine

## 11.8 Stroke or Cerebrovascular Accident


- Hemiplegia, weakness (inability to move limbs) usually unilateral
- Problems with swallowing
- Convulsions
- Coma
- Occasionally, loss of memory

### Investigations

- Blood glucose
- Cholesterol
- U+E, FBC, ESR
- INR (bleeding profile)
- ECG, BP
- Doppler or ultrasound (carotid vessels)
- MRI or CT scan

### Management

#### In clinic, health centre, and hospital—

1. Use ABC resuscitation if needed. Provide emergency treatment.
2. In the case of a hypertensive crisis, treat according to the MoHSS 2008 *National Guidelines for Integrated Disease Surveillance and Response*.
3. **Refer** the patient to hospital immediately. 

#### In hospital—

1. Determine the cause (e.g., embolic, thrombotic, or haemorrhagic stroke).
2. Start intravenous infusion and insert nasogastric tube if patient is dysphagic.
3. If patient is unconscious, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of coma and the unconscious patient.
4. Conduct a neurological examination to determine area of infarct.
5. Start aspirin 300 mg daily immediately *except in the case of haemorrhagic stroke*. Reduce to 150 mg after a few days.

6. In the case of thrombolysis in thrombotic stroke, start fibrinolytics if available.
7. In the case of a thrombotic stroke, start heparin, subcutaneous or IV. Adults: 10,000–12,500 IU stat, then 10,000 IU every 4 hours IV or 1,000 IU every hour IV.
8. Treat hypertension if necessary.
9. Prescribe for long-term care—
  - Warfarin 5 mg daily (regular INR blood monitoring and adapt dosage)—only after CT or MRI.
  - Aspirin 150 mg daily *only* in thrombotic or embolic strokes.

### Health education

- Urge the patient to return for a follow-up visit after discharge from hospital.
- Involve the family and physiotherapist in the rehabilitation of the patient.
- Inform the patient that—
  - His or her condition might improve gradually with physiotherapy and exercise.
  - Aspirin may prevent further thrombotic or embolic strokes.
  - No medications will cure the paralysis.
- Provide dietary measures as for cholesterolaemia (see “Section II. Diseases and Disorders According to Body Systems. Chapter 14. Endocrine System” for a discussion of cholesterolaemia), and advise patient to lose weight if he or she is overweight or obese (see “Section III. Nutrition and Lifestyle” for a discussion of obesity). Refer the patient to a registered dietician.

### 12.1 Acne

Acne is a multifactorial inflammatory disease of the sebaceous glands that involves follicular plugging. It is a common skin disease occurring in puberty and adolescence and in early adulthood.

#### Causes and aggravating factors

- Sebum overproduction during puberty (adolescence)
- Altered hormonal status in adolescence with increased androgens in males
- Increased androgenic properties of progesterone in premenstrual females or those who are taking progesterone-containing contraceptives
- Family history
- Some medicines (e.g., steroids) and cosmetics
- Follicular keratinisation
- Colonisation of follicles by propionibacterium acnes, resulting in inflammation

#### Symptoms and signs

- Blackheads and whiteheads (comedones)
- Different types and grades of severity—
  - Comedogenic: noninflammatory
  - Papulopustular: inflammatory
  - Nodulocystic: scarring
- Papules
- Pustules, nodules, and cysts
- Commonly in face, chest, back, and shoulders
- Infected parts may be painful
- Itching skin (rare)
- Psychological problems may occur because of the small wounds or foci
- Cysts and scars may be observed in severe cases
- Psychological depression in persistent acne
- Acne may worsen during menstruation



## Management

1. Reassure the patient. Inform him or her that diet plays no role in acne. Recommend the following:
  - Drink water regularly.
  - Clean face regularly (2 times per day) with mild soap and water. Do not use a strong soap.
  - Use commercial face wash and antibacterial cleansers to decrease skin oiliness.
  - Do not use oil, cream, or petroleum jelly.
  - Do not touch or press the foci.
  - Sunshine is helpful, but avoid sunburn.
  - If acne is severe (pustular) or getting worse, see a dermatologist.
2. Treat the acne topically. Prescribe—
  - Benzoyl peroxide 2.5% to 10% (typically used overnight)
  - Tretinoin cream 0.01% to 0.1% (typically used in the morning)
3. Treat the acne systemically. The duration of treatment depends on response. It may require 6 months to 1 year.
  - Prescribe systemic oral antibiotics in severe cases or where creams are unavailable—
    - Doxycycline 100 mg daily  
—— OR ——
    - Co-trimoxazole 480 mg 2 times per day  
—— OR ——
    - Erythromycin (during pregnancy or breastfeeding) 250 to 500 mg 2 times per day
 For females, prescribe antiandrogens (hormonal). Use pills with high estrogen content in patients who also require oral contraception containing cyproterone acetate 2 mg + ethinylestradiol 0.035 mg.
4. If no response, refer the patient to a dermatologist.

### 12.2 Bacterial Skin Infections

Bacterial infections can present in many different ways.

- As a localised lesion as in—
  - Folliculitis (hair follicles), which is quite small
  - Furuncle, which is small to medium-sized, or carbuncle
  - Abscess, which is large
- As multiple lesions as in impetigo (usually on the scalp, head, face, arms, and legs; mainly children)
- Over a large skin area as in—
  - Cellulitis
  - Subcutaneous infections involving the lymphatic system (i.e., staphylococcal scalded skin syndrome)

#### Causes

- Streptococcus (often with or after throat infections)
- Staphylococcus
- Corynebacteria
- Borrelia
- Treponemes
- Mycobacteria
- Gram-negative bacteria
- Secondary wound infection

#### Symptoms and signs

- Pain, redness, inflammation
- Multiple or single, small or large lesions that vary from red small knots to large red nodules
- Initially lesions are hard, inflamed, and red; later, they are softer with a yellow central part and contain pus.
- Occasionally, blisters filled with clear fluid that rupture spontaneously
- Lesions covered by a yellow crust
- Rarely pruritus
- Regional lymphadenopathy
- Sometimes fever (i.e., in abscess)
- Painful hard or fluctuating nodule (i.e., in abscess)
- Large undemarcated area (i.e., in cellulitis)
- Toxically ill, fever, malaise (i.e., in cellulitis)

### Health education for all bacterial skin infections

- Urge the patient to do the following:
  - Wash the affected area gently with soap and clean (or boiled) water daily, to get rid of the crusts.
  - Never re-use water from others.
  - Always use clean towels.
  - Change the dressings daily if possible, otherwise every second day at the clinic.
  - Do not press the infected area.
  - Avoid direct contact with patients who have furuncles or impetigo because they are highly contagious.
  - Come back immediately if the body swells or the urine turns to red or brown colour.
  - If the head or scalp is affected, shave.
- Look for possible infected family members and treat them as well.
- If the furunculosis relapses or cellulitis incidence is high, search for underlying conditions (e.g., HIV/AIDS or diabetes mellitus).

#### 12.2.1 Folliculitis or Furunculosis

Folliculitis is an acute infection of hair follicles usually occurring in hairy (hirsute) parts of the body. One focus (infected area) is a furuncle; many foci form furunculosis. The management described here is for single or multiple superficial furuncles.

#### Management

1. Treat with antibiotics.
  - Cloxacillin:<sup>1</sup> 50 to 100 mg/kg per day in 4 divided doses for 5 days; best to take on empty stomach or 1 hour before meals
    - Children
      - ◆ ≤5 kg: 62.5 mg 4 times per day
      - ◆ 6 to 10 kg: 125 mg 4 times per day

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 12.2 Bacterial Skin Infections

- Adults and children >20 kg: 250 to 500 mg 4 times per day  
— OR —
- Azithromycin
  - Children over six months: 10 mg/kg per day to a maximum of 500 mg/day
  - Adults: 1g stat PO or 500 mg daily PO for 3 days
- 2. Always treat any nasal infection.
- 3. For recurrent furunculosis—
  - Use systemic antibiotics (e.g., clindamycin).
  - Search for predisposing factors such as diabetes or HIV.

### 12.2.2 Abscess

An abscess is a single, deep boil.

#### Management

1. Cover with moist dressing.
2. Prescribe antibiotics for 7 to 10 days.
  - Cloxacillin<sup>1</sup> (See dosage under management of folliculitis, [12.2.1.](#))  
— OR —
  - Erythromycin 50 mg/kg per day in 4 divided doses  
— OR —
  - Azithromycin 500 mg PO per day for 3 days
  - Amoxicillin 500 mg 3 times per day for adults and 40 mg/kg PO 3 times per day for children may also be effective.
3. Evaluate after 2 days.
4. If the abscess has not drained spontaneously, refer patient for drainage.
5. Perform surgical drainage.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 12.2.3 Impetigo

For management of multiple, superficial lesions, see below.

#### Management

1. Local lesion care—
  - Clean with water and soap.
  - Apply povidone–iodine on the lesions.
2. In severe cases, treat with oral antibiotics for 5 to 10 days. (See abscess above, 12.2.2.)
3. Treat with aureomycin or chlortetracycline ointment (if available).


### 12.2.4 Cellulitis and Erysipelas

Cellulitis is an inflammation of the skin at a deeper level, involving the subcutaneous tissue and might become disseminated (i.e., it can extend to muscles and bone). It occurs more often in adults than in children and often follows injury.

Erysipelas is a skin infection with a sharply defined edge (usually on the legs), caused by a beta-haemolytic streptococcus, with fever and pain. It tends to recur and destroy the lymph system with resulting elephantiasis-like leg.

#### Management

**In clinic, health centre, or hospital—**

1. Apply a cool, clean cloth soaked in salt water to the affected area.
2. Apply povidone–iodine dressings.
3. Elevate the limb.
4. Provide pain relief.
5. **Refer** to hospital urgently. 

**In hospital—**

1. Start IV fluids.
2. Start antibiotics,<sup>1</sup> following these steps
  - Step 1. Prescribe—
    - Cloxacillin 500 mg IV every 4 to 6 hours
    - OR —

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 12.2 Bacterial Skin Infections

- Erythromycin
    - ◆ Adults: 500 mg every 6 to 8 hours for 7 to 10 days
    - ◆ Children: 30 to 50 mg/kg per day every 6 to 8 hours for 7 to 10 days
  - OR ——
  - Amoxicillin/clavulanic acid (if available)
    - ◆ Adults: 500 mg/125 mg every 8 hours PO or IV for 10 to 14 days
    - ◆ Children—
      - <3 months: 125 mg/5 mL PO suspension; 30 mg/kg per day (based on amoxicillin component) divided 2 times per day for 7 to 10 days
      - >3 months: if using 200 mg/5 mL or 400 mg/5 mL suspension, give 45 mg/kg per day PO divided every 12 hours; if using 125 mg/5 mL or 250 mg/5 mL suspension, give 40 mg/kg per day PO divided 2 times per day for 7 to 10 days
      - >40 kg: administer as in adults
  - Step 2. Prescribe (if available, but use prudently only with sensitivity tests)—
    - Ceftriaxone IV
      - ◆ Adults (>50 kg): 1 to 2 g once per day
      - ◆ Children (<50 kg): 20 to 80 mg/kg once per day
      - ◆ Neonates (>7 days age) 20 to 50 mg/kg once per day
    - OR ——
    - Cephalothin IV
      - ◆ Neonates <7 days age: 20 mg/kg every 8 to 12 hours
      - ◆ Infants >7 days age: 75 to 125 mg/kg per day in 4 to 6 divided doses
  - Step 3. Prescribe gentamicin 2 to 3 mg/kg per day in 3 divided doses.
3. Surgical debridement may be needed.

## 12.3 Viral Skin infections

Viral skin infections can present in different forms:

- Blisters and pain
- Red, non-painful rash
- Warts

See [appendix 1](#) (IMAI document).

### Causes

- Herpes simplex (e.g., fever blister, cold sore, herpes labialis)
- Varicella zoster (shingles)—reactivation of chicken pox
- Chicken pox
- Human papilloma virus (warts)
- Molluscum contagiosum
- Immunisation-preventable viruses: measles, rubella
- HIV/AIDS

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**Note:** Risk factors are immune suppression and malignancies.

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### 12.3.1 Blisters and Pain

#### Symptoms and signs

- Blisters: few (cold sores); many (shingles)
- Superficial sores
- Cold sores around mouth and lips or genitals
- Can be a large area or dermatome on one side of body (e.g., shingles)
- Painful
- Itchy
- Fever (seldom)
- Often malaise, headache, flu-like symptoms 2 to 3 days before rash or sores appear
- Development stages of infection—
  1. Macules
  2. Papules
  3. Blisters

## 12.3 Viral Skin Infections

4. Burst lesions
5. Sores
6. Crusts

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**Note:** Suspect HIV/AIDS or herpes zoster if the blisters and pain are recurrent.

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### Management

#### Management of cold sores (orolabial)

- In clinic, health centre, or hospital—
  1. Recommend a saltwater mouthwash (1/2 teaspoon of salt in 8 ounces of lukewarm water). Instruct the patient to gargle for 1 minute 2 times per day.
  2. Recommend a fluid diet. Advise patient to avoid acidic foods.
  3. Clean lesions regularly with povidone–iodine or a local antiseptic (e.g., gentian violet or mercurochrome).
  4. Provide pain relief with analgesics:
    - Paracetamol 1 g PO 3 times per day
    - 2% lignocaine jelly every 3 to 4 hours for extensive oral herpes
  5. Refer patient to hospital if—
    - The lesions are large or persistent. Lesions >1 month strongly suggest HIV.
    - The patient requires VCT and HIV testing.
    - The patient has severe, persistent lesions in advanced HIV. Such lesions may require treatment with acyclovir 200 to 400 mg 5 times per day for 7 to 10 days.
    - Secondary bacterial infections are present.
    - The patient shows signs of dehydration.
- Management of genital herpes infections, see “Section II. Diseases and Disorders According to Body Systems. Chapter 9. Urogenital System” for a discussion of STIs.



**Management of chicken pox (varicella)**

1. Apply calamine lotion to prevent itching and to keep the patient from scratching.
2. Give paracetamol for fever and pain.
3. Give antihistamines (e.g., promethazine).
4. Prescribe antibiotics<sup>1</sup> if lesions are infected.
5. Advise patient or caregiver that chicken pox should be managed at home or as an outpatient.

**Management of varicella zoster or herpes zoster**

- In clinic, health centre, or hospital—
  1. Keep the patient's skin clean and dry.
  2. Apply local antiseptics.
  3. Refer to hospital if the patient has—
    - Herpes zoster on a large area
    - Secondary bacterial infection
    - Involvement of eyes
    - Severe pain
- In hospital (**Note:** Lesions take up to 4 weeks to heal)—
  1. Apply a local antiseptic. Clean the area regularly with—
    - Povidone–iodine, gentian violet, and/or mercurochrome
    - Zinc oxide or calamine lotion is sometimes helpful.
  2. Provide analgesia—
    - Paracetamol 500 mg 4 times per day or codeine phosphate 60 mg every 4 hours
    - Amitriptyline 12.5 to 25 mg at night

— PLUS —

Ibuprofen 400 mg 3 times per day can be added to the amitriptyline.

    - Local application of lignocaine gel 2% may help some patients.
  3. Provide analgesia for post-herpetic neuralgia—
    - Amitriptyline 25 to 100 mg at night

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 12.3 Viral Skin Infections

— OR —

- Carbamazepine 200 to 400 mg 2 times per day increasing as necessary to a maximum of 600 mg daily
4. Treat secondary skin infection, if present.
  5. Provide oral antiviral treatment, if needed. This treatment is licensed only for ophthalmic herpes zoster or severe zoster in HIV. Acyclovir (800 mg 5 times per day for 7 days) can be started within 1 to 3 days of onset of symptoms. Start treatment as soon as possible or within 72 hours to prevent post-infection neuralgia and pain.
  6. Refer if—
    - The eyes are involved
    - The blisters are extensive or severe (especially if within the first 72 hours for IV or oral acyclovir in selected patients)
    - The patient has extremely painful or non-healing lesions
  7. Always refer patients for VCT (i.e., HIV testing).

### 12.3.2 Red Papular or Macular Rash

See “Section VI. Diseases and Disorders According to Age Group. [Chapter 26. Paediatrics](#)” for a discussion of immunisation.

### 12.3.3 Warts

#### Management

- Management of seborrhoeic warts (i.e., soft, greasy warts; benign tumour in elderly; hyperpigmented)—No treatment is required.
- Management of genital warts (condylomata acuminata)
  1. Podophyllin paint—podophyllin 15% should be applied only to the tips of the warts and washed away no later than 6 hours after application because

it is corrosive to normal skin. For warts on the genital mucosa and mouth, a lower concentration of podophyllin (10%) may be applied. Alternative treatments include cryotherapy with liquid nitrogen, curettage, electro-cauterisation, and surgical removal.

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**Note:** Podophyllin is contraindicated in pregnancy.

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2. Refer for VCT (i.e., HIV testing).

- Management of skin warts—Use liquid nitrogen cauterisation.
- Management of molluscum contagiosum. These lesions are painless, but may be extensive and disfiguring in HIV.
  1. Prick out the central core with a sterile needle.
  2. Use liquid nitrogen cauterisation.
  3. Perform surgical excision, curettage, or electrocautery.

## 12.4 Fungal Infections

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Fungal infections are often seen as ‘ringworm’ or scaly, dry areas in flexure sites of the body. Any body part can be affected: scalp, in between fingers and toes, trunk, under breasts, on arms and legs, nails. The infections are not highly contagious, but are often recurrent.

### Symptoms and signs

- Fungal infection of the nails (onychomycosis) is caused by a fungus or mould, destroying one or more fingernails.
  - Often present in adult diabetics
  - Discoloured nails (can be yellow or white, sometimes green or black)
  - Brittle nails that break easily
  - Thickened (more so in adults)

## 12.4 Fungal Infections

- Fungal infection of the scalp or head (*tinea capitis*) is often found in children.
  - Itchy scalp
  - Hair breaks off; bald patches (i.e., reversible hair loss)
  - Dry, flaky areas
  - Sometimes pustular (kerion)
- Fungal infection of the body or trunk (*tinea corporis*) is also called *ringworm*. Fungal infections can occur on the face (*tinea facialis*) and arms (*tinea brachium*). Usually hairless parts of body, anywhere from lower jaw to knees, are affected.
  - Pruritus (itchiness)
  - Slow-growing, round lesion
  - Central normal skin; ring itself is red with dryness and scaling
- Fungal infection of the foot (*tinea pedis*) is also called *athlete's foot*.
  - Often present in adult diabetics
  - Intense burning or itching between toes and under the foot
  - Vesicles, cracks, and bursts
  - Scaling, pustules
  - Secondary infection
- A chronic fungal infection of large areas of the skin is called *spread fungal infection* (pityriasis versicolor). It never occurs in children; onset is usually around puberty.
  - Well-circumscribed patches (i.e., round or oval, demarcated, fine-scaling macules)
  - Pale or discoloured spots on the skin (e.g., on the chest, back, and face)
  - Not scaly, but peeling off when scratched
  - Usually recurs in summer when sweating

## Management

### Management of tinea corporis or topical candidiasis

- First-line treatment—
  1. Apply benzoic acid compound thinly 2 or 3 times per day. **Note:** Often not useful due to poor sensitivity.
  2. Apply topical antifungal lotion and cream, and advise patient to continue for 2 weeks after lesions have resolved.
    - Clotrimazole: 2 or 3 times per day on lesions for 2 to 4 weeks
    - Nystatin cream (candida): 3 to 4 times per day for 2 weeks
- Second-line treatment—
  1. Itraconazole: 100 mg once daily for 15 days or 200 mg once daily for 7 days
  2. For dermatophyte infections (tinea) where topical treatment failed or is inappropriate, prescribe griseofulvin: 10 mg/kg per day in single or divided doses for 3 weeks.
    - For infection of the hair and skin, treat for 2 to 6 weeks.
    - For infections of the palms or soles, treat 4 to 8 weeks.
    - For infections of the nails, treat for 6 to 12 months.
    - Advise the patient to take the medication with a fatty meal or milk.
    - Avoid use of this medication in pregnancy.

### Management of tinea capitis

1. Recommend that the patient use selenium sulphide or ketoconazole shampoo (if available).
2. Prescribe benzoic acid ointment or clotrimazole cream.
3. Prescribe griseofulvin (dose as above).
4. Treat secondary infection, if any.

## 12.4 Fungal Infections

### Management of fungal infection of nails

1. Prescribe griseofulvin 125 to 500 mg daily for 3 months.
2. Prescribe itraconazole 200 to 400 mg 2 times per day for 7 days. Repeat the cycle for 2 months for fingernails, and for 3 months for toenails.

### Health education

- Advise the patient to follow these instructions—
  - Wash with soap and clean water daily.
  - Do *not* share combs or hats with others.
  - Keep toes dry (i.e., prevent wet toes).
  - Avoid closed footwear; minimise sweating (especially with tinea pedis).
  - Wash socks daily.
  - Complete the full treatment even after signs and symptoms have disappeared. Treatment takes a long time, sometimes months.
  - Come back to the clinic after 10 days for assessment of progress.
- If the patient has repeat fungal infections, refer him or her for VCT.

## 12.5 Parasitic Skin Infections

### 12.5.1 Scabies

Scabies is a contagious skin condition caused by a mite (*Sarcoptes scabiei*), which burrows in the outer layer of the skin and deposits its eggs there.

#### Symptoms and signs

- Intense itching (usually at night, when warm)
- Usually between the fingers, on the wrists, on the buttocks, around genitals
- Signs of scratching and or widespread excoriations
- Crusting due to secondary bacterial infection or eczema due to scratching
- Often tunnels (burrows) made by mites may be seen
- Papules or nodules on elbows or buttock folds
- Often more than one member of the family is affected

#### Management

##### Initial treatment—

1. Prescribe benzyl benzoate emulsion (BBE).
  - Dosage for 3 consecutive nights:
    - Children <6 years: dilute 1:1 (BBE with equal parts of water); undiluted BBE may burn the skin.
    - Infants: 1:3 dilution.
    - Adult: use undiluted
  - Apply in the evening. Cover the whole body from the neck down, especially in the flexures.
  - Let it dry on the skin overnight, and wash in the morning.
  - A side effect of BBE treatment is burning or irritation to the skin.
2. Treat all members of the household. Scabies is highly contagious.
3. Wash all clothes and bed linen in *hot* water.
4. Repeat BBE treatment after 10 days.

## 12.5 Parasitic Skin Infections

**Note:** Itching starts to reduce after one week; rash starts to reduce after 3 weeks.

### Next stage of treatment—

1. Refer to next level if no improvement.
2. Apply a single application of permethrin 5% cream.  
Permethrin 5% is for children < 2 months.  
— OR —
3. Apply malathion 0.5% lotion. Leave on for a day and repeat 3 days later.  
— OR —
4. Use ivermectin (if available) for hyperkeratotic scabies in HIV-positive patients.
5. Treat persistent pruritus with 0.5% to 1% hydrocortisone cream and antihistamines.

### Health education

- Inform the patient that scabies occurs when people live closely together (especially in humid areas).
- Advise the patient on space, light, and hygiene.
- Provide education on causation, prevention, and treatment of scabies
- Conduct education sessions and group discussions in schools, hostels, and other locations where people congregate.



### 12.5.2 Lice or Pediculosis

Lice are parasites that prefer to live in the hairy parts of the body. They are usually found on the scalp (i.e., head louse or lice), in the axillas (i.e., armpits), on the chest, or in the pubic area. Lice are a common problem amongst people who live close together.

#### Symptoms and signs

- Intense itching in the affected areas
- Nits (white eggs) attached to the hairs
- Direct observation of lice
- Continued itching and scratching, which leads to secondary eczema and irritation of the skin
- Cervical lymphadenopathy (sometimes)

#### Management

1. Treat lice by applying BBE to the hair and leaving it in overnight. Wash hair in the morning.
2. Comb hair with a fine-toothed comb until all nits are out, or shave head.
3. Treat pruritus (i.e., itching) with calamine lotion and an antihistamine.
4. Apply pyrethrin, permethrin, or malathion. (See [12.5.1](#), scabies, above.) **Note:** Pyrethrin can only kill live lice, not unhatched eggs (nits). A second treatment is recommended in 9 to 10 days to kill any newly hatched lice before they can produce new eggs.

#### Health education

- Wash daily with soap and clean water.
- Wash hair regularly with shampoo.
- Avoid sharing combs.
- Follow the health education advice for scabies. (See [12.5.1](#) above.)

### 12.6 Pruritus

Pruritus is a sensation of itchiness that the patient wants to relieve by scratching. (See [appendix 1](#), IMAI.)

#### Causes

- Dermatological (i.e., pruritus with rash)
  - Atopic eczema
  - Contact dermatitis: chemicals, creams
  - Infections or infestations: scabies, body lice, fungal skin infections
  - Bites and stings: fleas
  - Allergies: urticaria, atopic eczema
  - Psoriasis
  - Xeroderma or dry skin: age, season of the year
  - Heat rash or miliaria (often in babies or children)
- Systemic (i.e., pruritus usually without rash)
  - Worm infestations
  - Medicines
  - Iron deficiency
  - Diabetes mellitus
  - Liver disease (e.g., obstructive jaundice, cirrhosis)
  - Uraemia (i.e., renal failure)
  - Thyroid disorders
  - Psychogenic: stress, tension, depression
  - Malignancies (e.g., lymphomas, leukaemias, polycythemia)
  - Pregnancy

#### 12.6.1 Eczema or Dermatitis

Eczema is a superficial inflammatory process involving primarily the epidermis with a characteristic itch. It can be acute or chronic.

#### Causes

- Atopic eczema—often a family history of asthma, hay fever.

- Contact eczema—allergic (e.g., distinct food sorts, washing preparations, chemical detergents, clothing) or irritant
- Napkin (or diaper area) eczema in infants
- Seborrhoeic (fungal, adolescents, HIV/AIDS)
  - Neurodermatitis
  - Nummular (discoid eczema)
- Photodermatitis

### Aggravating factors

- Dry skin (seasonal)
- Specific foods, detergents, perfumed soaps, perfumes, chemicals, clothing
- Emotional tension (psychosomatic causation)
- Sweating, exudation, and transpiration
- Excessive exposure to the sun

### Symptoms and signs for atopic eczema

- Presentation in children, adolescents, and adults: especially face, flexures (folds) of elbows and knees, but also neck, chest, feet, and hands
  - Pruritus (itch)
  - Erythema (redness)
  - Swelling, oedema
  - Signs of scratching
  - Dry, scaly, thickened parts of the skin
  - Hyperpigmentation
  - Secondary infection (vesicles, crusts and fluid leakage, oozing)
- Babies: (>2 months, scalp, cheeks, neck, knee, elbows, skin folds)
  - The baby scratches a lot and is irritable
  - Dry, rough, red, papular rash
  - Sometimes vesicular, exudating fluid
  - Crusts

### Investigations

- Search for the underlying cause
- FBC, glucose, U+E

### Management

- Objectives—
  - Identify and treat underlying cause or disease (e.g., infections or atopic causes).
  - Provide education and support.
  - Relieve symptoms of itching.
- Steps—
  1. Provide symptomatic relief for itching. Advise the patient to—
    - Avoid exposure to dry weather.
    - Use soothing lotions or creams such as calamine, petroleum jelly, or aqueous cream.
    - Use bath oil and pat skin after bath with a soft towel.
    - Apply body oil or cream after bathing.
    - Cut a cucumber and rub it over the itchy areas as a good home remedy for dry, itchy skin.
  2. Recommend emollients such as—
    - Aqueous cream
    - Emulsifying ointment
  3. Give antihistamines such as —
    - Chlorpheniramine 4 mg at night  
—— OR ——
    - Promethazine 10 mg at night  
—— OR ——
    - Hydroxyzine 25 mg at bedtime
  4. Prescribe topical corticosteroids, but only for the short term and under doctor's supervision. Local corticoids may be useful if inflammation is present over small area in absence of any bacterial, fungal, or viral infection.
    - Betamethasone cream 3 times per day  
—— OR ——
    - Hydrocortisone cream 3 times per day
  5. If the patient has a secondary infection, order a topical antiseptic (e.g., povidone-iodine soaks) and prescribe an oral antibiotic.

6. Follow up—
  - A patient who has leaking vesicular eczema must come back to the clinic for follow-up.
  - Dry, chronic stage eczema can be treated at the clinic.
7. If no response, refer the patient to a dermatologist.

### Health education

- Advise the patient to—
  - Search for the cause and avoid.
  - Avoid contact with triggers such as heat, soap, detergents, and woollen and synthetic clothing.
  - Avoid irritation of the skin through sunburn or scratching.
  - Use a fat or oil after bath, or melt 1 tablespoon in 1 litre of hot water and add to bath.
  - Relieve and avoid stress.
- Emphasise the importance of liberal use of emollients such as aqueous cream to keep skin moisturised.

### 12.6.2 Seborrhoeic Dermatitis

Seborrhoeic dermatitis, also known as *seborrhoeic eczema*, is a fine scaly rash on hairy areas of the face and nasolabial folds due to excessive secretion of sebum. It is often found in HIV/AIDS patients.

#### Management

1. Apply coal tar ointment.
2. Prescribe clotrimazole cream 2 times per day for 10 days.
3. Prescribe itraconazole 100 mg 2 times per day PO for 1 week.
4. Refer patient to a dermatologist.

### 12.6.3 Urticaria

Urticaria or allergic skin reactions are vascular reactions of the skin marked by the transient appearance of smooth elevated wheals due to acute or inflammatory allergic reactions.

#### Causes

- Food
- Chemical agents
- Medicines (e.g., penicillin and sulphonamides)
- Stress
- Heat and cold
- Aquagenic urticaria (severe itching after bathing)
- Often specific cause is unknown

#### Symptoms and signs

- Itchy skin after intake of the medicine, often transient
- Burning feeling (rare)
- Loss of sensitivity
- Redness, wheals or swelling of skin, well-demarcated areas
- Asthma and wheezing
- Oedema of vocal cords (See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of acute airway obstruction.)
- Severe cases: anaphylactic shock (See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion anaphylactic shock.)

#### Management

1. For management of anaphylaxis, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of anaphylactic shock.
2. For management of oedema of vocal cords, see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of acute airway obstruction.
3. For local skin reactions, use—
  - Topical calamine lotion

- Antihistamine
  - Chlorpheniramine: 4 mg 3 times per day for 5 days
    - OR —
  - Promethazine: 2 times per day
    - ◆ Adults: 25 to 50 mg
    - ◆ Children: 12.5 to 25.0 mg
    - OR —
  - Hydroxyzine: adults: 25 mg
- 4. Often there is no satisfactory treatment for aquagenic urticaria.

### Health education

- Advise the patient to—
  - Drink a lot of water (a glass every 2 hours).
  - Avoid the agent causing allergic reactions.

### 12.6.4 Psoriasis

Psoriasis is commonly an inherited condition associated with joint and nail disorders. It may develop in sites of trauma, but infection, medicines, metabolic, and endocrine disorders are also implicated.

#### Symptoms and signs

- Well-defined erythematous plaques with silvery scales
- Mostly on extensor surfaces but can involve scalp, nails, or any part of body

#### Management

##### In clinic, health centre, or hospital—

1. Use emollients (emulsifying ointment).
2. Use salicylic acid in emulsifying ointment.
3. Apply coal tar ointment.
4. If no improvement, refer the patient to a dermatologist.

##### In hospital—

1. Apply topical steroids of mild to moderate potency.
2. Refer to specialist if no improvement.

### 12.7 Skin Pigmentation Disorders

#### 12.7.1 Hypopigmentation

In hypopigmentation skin pigmentation is reduced or missing.

- *Albinism*: A recessive genetic disease in which lack of melanin in skin, hair, and eyes causes typical problems of sunburn, chronic solar skin damage, and skin cancers
- *Vitiligo*: A localised loss of melanocytes with well-defined, often symmetrical edges of hypopigmented areas with a normal skin consistency
- *Postinflammatory hypopigmentation*: Skin is lighter or hypopigmented at areas of previous inflammation

#### Management

- Objectives—
  - Provide preventive education.
  - Remove the underlying cause.
  - Provide counselling.
- Steps—
  1. Advise the patient to—
    - Avoid direct sunlight
    - Use sunscreen and umbrellas
    - Wear hats and scarves to cover light areas
  2. Investigate for DM, anaemia, and hypothyroidism.
  3. Refer the patient to the next level.
  4. In the case of vitiligo, there is no successful treatment as yet; provide counselling.

#### 12.7.2 Hyperpigmentation

Skin pigmentation is darker than the surrounding skin.

- *Mole or naevi*: Usually appear around puberty, dark, flat or raised, well-defined edges, and without symptoms
- *Facial chloasma or melasma*: Butterfly-like pigmentation over the nasal bridge and cheeks (after direct sun exposure) often due to contraceptive pill



## 12.8 Skin Ulcers and Chronic Wounds

- *Ochronosis*: Leathery, thickened, dark pigmented areas on face in people who used hydroquinone-containing skin lighteners
- *Postinflammatory hyperpigmentation*: Skin is darker at areas of previous inflammation due to any skin condition

### Management

- Objectives—
  - Provide preventive education.
  - Remove the underlying cause.
  - Provide counselling.
- Steps—
  1. If there is increase in size or pigmentation, refer the patient to the next level.
  2. Advise the patient to—
    - Stop using skin lighteners and cosmetics.
    - Use sunscreens and UV lotions as for hypopigmentation
  3. Determine the underlying cause, and advise patient to stop any activity that contributes to the hyperpigmentation.

## 12.8 Skin Ulcers and Chronic Wounds

A skin ulcer is a break in the continuity of the skin.

Chronic wounds are those that do not heal within a normal amount of time with normal dressings and care.

### Causes

- Infections (e.g., HIV/AIDS, TB, syphilis, fungal infections)
- Trauma
- Pressure sores
- Neuropathic ulcers (e.g., so-called *diabetic foot*, leprosy)
- Venous or varicose vein ulcers (most common cause)

## 12.8 Skin Ulcers and Chronic Wounds

- Ischaemic or arterial ulcers
- Spider bite
- Connective tissue diseases (e.g., rheumatoid arthritis, arteritis, SLE)
- Haematological disorders (e.g., sickle cell disease, spherocytosis)
- Malignant hypertension

### Symptoms and signs

- Ulcer in skin
- Brownish pigmentation
- Scarring around the ulcer
- Redness and swelling around the ulcer
- Round edges
- History of trauma or bite (frequently)
- Lesions usually on feet, legs, hands, genitalia, mouth
- Varicose veins

### Investigations

- FBC, U+E, glucose
- HCT (HIV counselling and testing)
- Arterial and venous examination

### Management

1. Find the cause.
2. Keep the ulcer or wound clean.
3. Apply pressure bandages for venous ulcers to aid in venous return. **Note:** Do *not* use pressure bandages for arterial ulcers.
4. Elevate limbs for venous ulcers.
5. Ensure adequate nutrition and fluids.
6. Provide pain relief if necessary.
7. Apply regular dressings according to the type of ulcer or wound—
  - Chronic:
    - Use protease modulating matrix Promogran® (it is haemostatic and keeps wound moist) for 6 to 10 weeks; re-dress every 2 to 3 days.

- Use a hydropolymer dressing Tielle® (for exudating wounds, bacteria impermeable and moisture permeable, waterproof) for 6 to 10 weeks.
- Infected:
  - Use Actisorb Silver 220® (antibacterial, anti-toxic, to reduce exudates and wound odour); re-dress every 7 days.
- Necrotic, sloughy, or dry:
  - Apply Nu-Gel® directly on wound.
  - Dress with Tielle® dressing; re-dress every 1 to 3 days
- Burns:
  - Apply Nu-Gel® or Inadine® (iodine dressings).
- Skin donor sites:
  - Apply Tielle® dressings.

### Health education

- Urge the patient to take his or her medication for underlying cause or disease.
- Schedule regular follow-up (depending on type of dressing).
- Educate the patient on the factors that affect wound healing:
  - Age
  - Poor nutrition
  - Obesity
  - Dehydration
  - DM
  - CVS disease
  - Immobility
  - Impaired sensation and circulation
  - Smoking
  - Medications (chemotherapy, radiation)
  - Foreign bodies, infection
- Remind the patient to come back if there is no improvement or a recurrence.

### 12.9 Skin Tumours

#### Causes

- Benign—
  - Solar keratosis: superficial, hyperkeratotic (rough and hard) pigmentations in sun-exposed areas (e.g., hands, arms, and face)
  - Seborrhoeic keratosis
  - Dermatitis papulosa nigra
  - Keratoacanthoma
  - Chondrodermatitis nodularis
- Malignant—
  - Melanoma: often develop in areas of previous normal skin or naevi (i.e., changes occur)
  - Basal cell carcinoma
  - Squamous cell carcinoma

#### Symptoms and signs of danger in any skin lesion

- Change of colour
- Change of size (i.e., growth, extension)
- Borders change becoming irregular or vague
- Bleeding
- Ulceration
- Itching or crust formation
- Patient is worried
- Pigmentation in soles or hands or nails

#### Management

##### Management of benign skin tumours—

1. Use cryotherapy with nitrous oxide (liquid nitrogen).
2. Perform curettage and cauterisation.
3. Excise tumour.
4. If unsure, refer patient to the next level or to a specialist.

##### Management of malignant melanoma—

1. Perform an excision biopsy.
2. Excise the melanoma (i.e., perform surgery).
3. Treat with chemotherapy or radiation.

## 12.10 HIV/AIDS Skin Disorders

Skin lesions in HIV often present with bizarre, giant lesions that are difficult to treat.

Itching and dry skin, in the absence of any other treatable cause, are common in persons with HIV. This problem can severely affect the well-being of the patient and deserves the necessary attention and treatment. (See 12.6 for a discussion of pruritus and eczema.)

Table 12.10 lists the causes of skin disorders in persons with HIV/AIDS. Figure 12.10 provides an algorithm for managing the disorders.

TABLE 12.10

### Causes of Skin Disorders in HIV/AIDS Patients

Bacterial Infections	Fungal Infections	Malignancies
<ul style="list-style-type: none"> <li>• Furunculosis or folliculitis</li> <li>• Impetigo and pyoderma (staphylococci or streptococci)</li> <li>• Hidradenitis suppurativa</li> <li>• Bacillary angiomatosis</li> </ul>	<ul style="list-style-type: none"> <li>• Candidiasis</li> <li>• Dermatophytosis</li> <li>• Seborrhoeic dermatitis</li> </ul>	<ul style="list-style-type: none"> <li>• Kaposi's sarcoma</li> <li>• Cutaneous malignancies</li> <li>• Lymphoma</li> </ul>
Viral Infections		Other
<ul style="list-style-type: none"> <li>• Herpes simplex</li> <li>• Herpes zoster</li> <li>• Molluscum contagiosum</li> <li>• Condylomata acuminata</li> </ul>		<ul style="list-style-type: none"> <li>• Seborrhoeic dermatitis</li> <li>• Eosinophilic folliculitis</li> <li>• Scabies</li> <li>• Psoriasis</li> <li>• Papular pruritic eruption</li> <li>• Medicine reactions</li> </ul>

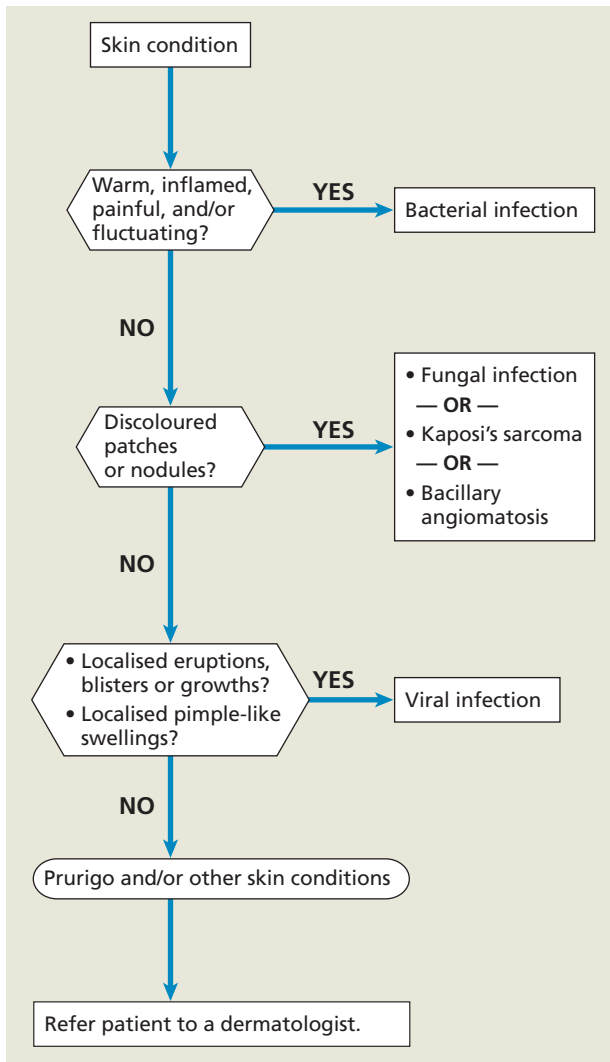
### 12.10.1 Kaposi's Sarcoma

#### Management

1. Kaposi's sarcoma (KS) is a WHO stage 4 disease requiring rapid HAART initiation. **Note:** The majority of patients improve with HAART and do not require chemotherapy.

## 12.10 HIV/AIDS Skin Disorders

FIGURE 12.10 Algorithm for identification of HIV-related skin disorders



2. Oncology referral is only indicated if—
  - KS fails to improve in 6 to 12 months
  - KS worsens severely after starting ARV due to immune reconstitution syndrome
  - Life threatening or severely disabling disease

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**Note:** Cytotoxic treatment for KS is in itself immunosuppressive. Before considering referral of a patient with KS, weigh the benefits and the disadvantages and, if necessary, discuss them with the patient and the caregivers. If the condition of the patient requires immediate referral, the biopsy number (obtained from the Department of Pathology) should be sent with the patient.

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### 12.10.2 Bacillary Angiomatosis

#### Management

1. Prescribe erythromycin 500 mg PO 4 times per day for 3 months.
2. In severe cases of the disease, use a combination of doxycycline 100 mg PO 4 times per day plus erythromycin 500 mg 4 times per day for 3 months.
3. If no improvement, refer to dermatology for biopsy.

### 12.10.3 Fungal Lesions

Fungal lesions can be hypo- or hyperpigmented. They are treated topically.

#### Management

1. Prescribe clotrimazole cream 1% daily for up to 3 weeks. **Note:** This treatment may not be effective especially for large areas, or may take a long time (i.e., months).
2. For widespread dermatophytosis, treat as follows:
  - Prescribe—
    - Griseofulvin 500 mg once daily for 3 weeks for skin lesions and for 6 months for nail lesions

— OR —

## 12.10 HIV/AIDS Skin Disorders

- Itraconazole 200 to 400 mg daily for 7 days repeated monthly for 2 months for severe infections.
- If there is no response, prescribe ketoconazole 200 mg tablets 2 times per day for 10 days.
- Use symptomatic relief for itching (e.g., antihistamines, emollients).

### 12.10.4 Medicine Reactions

#### Management

1. Mild reactions to nevirapine (or other medicine) may be self limiting or require oral antihistamines.
2. Severe reactions involving mucous membrane (e.g., Stevens-Johnson syndrome) can be life threatening and must be referred to hospital. **Note:** The most common causes are nevirapine, co-trimoxazole, and TB medications.
3. Treat the medicine reaction.
  - Pay careful attention to mouth and eye care and fluid balance.
  - All medications should be discontinued until patient has fully recovered.
  - For further management of ARV or TB regimes, refer to the national guidelines.

### 12.10.5 Eosinophilic Folliculitis

#### Management

1. This generalised pruritic maculopapular skin rash is common in HIV. **Note:** The cause is unknown, but it may improve on ART.
2. Treat the eosinophilic folliculitis.
  - Prescribe antihistamines (e.g., chlorpheniramine 4 mg every 8 hours or promethazine 10 mg 2 times per day).
  - Order ultraviolet light.
  - Use topical steroids, emollients, and calamine lotion.



## 13.1 Decreased or Weak Vision

Decreased or weak vision might present as or be referred to as loss of vision (LOV), poor vision, or deteriorating vision. The patient's symptoms may be any of the following:

- Weak vision
- Decreased vision
- Cannot see as well as they had seen previously
- Blurred vision
- Distorted vision
- Double vision—distorted vision may be called double vision but needs to be differentiated from true diplopia (double vision)
- Red eye or history of red eye (see 13.3 for a discussion of red eye)—red eye may also indicate trauma

From the history, establish the following:

- The period over which the vision has changed
- If the change was sudden or gradual
- Whether it has progressed or not
- If the visual loss is in one eye or both eyes
- If the visual loss is total or partial
- If the visual loss is associated with any pain in or around the eye or with headache
- Whether systemic medical disease are present such as—
  - CVS (e.g., hypertension or occlusive disease [emboli or atherosclerosis])
  - Diabetes
  - Infections
  - Immunological disorders (e.g., HIV)
  - Multiple sclerosis
  - Malignancies—either primary (e.g., melanoma) or metastases to the eye

### Causes

#### Acute onset

- Sudden onset—Sudden onset of decreased or weak vision is an *emergency*, **refer** to next level. 

## 13.1 Decreased or Weak Vision

- Trauma related to immediate injuries (see [13.3](#) for a discussion of red eye)
- Acute glaucoma—angle closure (see [13.3](#) for a discussion of red eye), generally associated with eye pain with or without headache
- Ischaemia to the optic nerve or retina—vascular disease or emboli can cause sudden visual loss (e.g., central retinal artery occlusion [CRAO] or central retinal vein occlusion [CRVO])
- Bleeding into the eye (i.e., vitreous haemorrhage) may be spontaneous or related to trauma or diabetes
- Rapid onset—The causes of rapid onset can also cause a progressive, slow visual loss.
  - Corneal ulcers or keratitis (see [13.3](#) for a discussion of red eye)—usually painful, and usually examiner can see a spot or white area on the cornea
  - Acute uveitis—red eye, pain around eye, and sensitivity to light
  - Retinal detachment—usually presents with painless LOV and a shadow
  - Papilloedema (acute brain oedema)—usually presents with CNS signs and symptoms
  - Reduced blood flow to the nerve in ischaemic optic neuropathy—always consider temporal arteritis in older patients
  - Inflammation to the nerve as in optic neuritis with or without multiple sclerosis

### Slow onset or gradual progression

- Refraction error—commonly presbyopia, causing poor close vision in people older than 40
- Chronic glaucoma—gradual LOV and visual fields
- Cataract—gradual increasing hazy vision or disturbed vision
- Diabetes mellitus eye problems (see “Section II. Diseases and Disorders According to Body System. [Chapter 14. Endocrine System](#)” for a discussion of DM)

- HIV/AIDS—CMV, herpes, TB, HIV retinitis, and various other opportunistic infections
- Squinting (eyes can deviate inwards, outwards or up or down)—a cause of reduced vision if present from birth or at a young age
- In older patients it may be a result of aging.
- Macular degeneration—often the cause of gradual visual loss in older white patients

### Symptoms and signs

- Patient cannot see far objects and, on testing, cannot read smaller letters on the Snellen chart—short- or nearsightedness (myopia)
- Patient complains that he or she cannot read well, sees better if the book is held farther away from the eyes—presbyopia (sometimes incorrectly referred to as long- or farsightedness)
- Patient sees everything double—squinting
- Patient can virtually see nothing with one eye or both eyes—cataracts
- The pupil area is white or grey, without a red reflex, if looked at through ophthalmoscope—cataracts
- The eyes do not look, in the same direction—squinting  
— OR —  
On testing eye movements, eyes do not move parallel—squinting  
— OR —  
The light reflexes on cornea on different place—squinting

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**Note:** Squinting or strabismus can either cause poor vision (i.e., in young children) or be caused as a result of poor vision (i.e., in adults).

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### Investigation

Determine if the visual loss is in one eye or both eyes, and the degree of visual loss by checking one eye at a time.

- Test for normal distance vision.

## 13.1 Decreased or Weak Vision

- Test the visual field; a constricted field is a positive finding.
- Test the direct pupil reflexes with a torch (flashlight).
- If possible, always look into the eye with an ophthalmoscope.
- Examine for increased eye pressure using a Schiøtz tonometer or feel the hardness of the eye by palpation.

### Indications for referral

- Sudden total LOV in one eye, which may be caused by—
  - Arterial occlusion—often with painless LOV plus CVS disease
  - Acute glaucoma—patient will have pain and a red eye
  - Vitreous haemorrhage—usually painless, and no view of the retina with an ophthalmoscope
- Partial LOV in one eye, over hours to days—optic neuritis and retinal detachment
- Sudden and partial LOV in both eyes—bilateral optic neuritis
- Partial LOV in one eye gradually increasing—extending retinal detachment, cataract, or degenerative disease
- Partial and gradual LOV in both eyes—cataract, glaucoma, age-related macular degeneration (ARMD), or diabetic retinopathy
- Trauma or obvious infections affecting the vision

### 13.1.1 Refraction Errors

Refraction errors include the following:

- Short- or nearsightedness (myopia)—patient cannot see far anymore.
  - Presbyopia (incorrectly called long-sightedness)—patient cannot read well, usually starts over age 40
  - Long- or farsightedness (hyperopia)—vision is generally poor or blurred at all distances
- Astigmatism (irregular curvature of the cornea)—round objects look oval, haloes around lights, generally blurred or poor vision at all distances

### Management

1. Diagnose and differentiate from pathology.
2. Refer to an optometrist or ophthalmologist for corrective or prescription glasses.

### 13.1.2 Squinting (Strabismus)

Strabismus is a condition in which the patient has eye position deviations. Correct diagnosis is very important in young patients.

#### Symptoms and signs

- Adult patient sees everything double—young children will not have double vision.
- Eyes not parallel when examined
- Light reflexes not equal in both eyes
- If you suspect squinting, but it is not obvious from the above signs, try cover-test or cover-uncover test:
  - Ask the patient to fixate both eyes on an object (e.g., a letter in the Snellen chart).
  - Cover one eye.
  - Move the cover to and fro between the eyes
  - If the eye that has been uncovered moves, then there is a latent squint.

#### Investigations

In adults investigate for secondary causes (e.g., intracranial tumours or ischaemia as a result of diabetes mellitus).

#### Management

1. All children under 6 years must be referred to hospital.
2. Special examinations and correction can be done which include—
  - Occlusion
  - Corrective glasses
  - Surgery
3. An adult who has acute onset of squinting or strabismus should be assessed for circulatory disorders or intracranial disorders preferably by an ophthalmologist or physician-neurologist.

## 13.1 Decreased or Weak Vision

4. Treat the underlying condition.
5. Refer the patient to an ophthalmologist.

### 13.1.3 Cataracts

A cataract is an opacification of the lens (i.e., the crystalline lens within the eye).

#### Causes

- Senile cataracts in the elderly
- Congenital (in the newborn) or developmental
- Metabolic: DM, hypothyroidism
- Inflammation: uveitis
- Trauma (e.g., blunt or penetrating injuries)
- Medications: ophthalmic or topical steroids, systemic steroids
- Connective tissue disorders (e.g., Marfan's syndrome)
- Malignancies

#### Symptoms and signs

- White opacity in lens
- Vision in one or both eyes decreases gradually over time
- Often reported as hazy vision or blurry vision
- Squinting with one eye (long-standing reduced vision in one eye may result in eye deviating)
- 'Patches' in front of the eyes
- Refraction errors or changes in refraction
- 'White' when papillary reflex checked
- Difficulty in reading
- Increased symptoms of glare

#### Management

1. Refer to the ophthalmology department, an ophthalmic nurse, or an eye specialist.
2. Cataract surgery is a cure and is generally completely successful.

### 13.1.4 Glaucoma

Glaucoma is generally caused by a higher than normal intraocular pressure. It can be acute or chronic, and it can present as open-angle or angle-closure (narrow) glaucoma.

#### Causes

- Generally acute glaucoma is due to angle closure
- Related to conditions such as rubeotic glaucoma via diabetes or CRVO

#### Symptoms and signs

- Acute glaucoma—see [13.3.4](#) for a discussion of symptoms and signs of acute glaucoma
- Chronic glaucoma
  - The best management is early detection and early treatment to prevent permanent optic nerve damage and possible subsequent blindness.
  - Everyone older than 40 should have his or her eye pressure checked and the optic nerve examined.
  - Anyone with a family history of glaucoma should be checked regularly.
  - Anyone with an acute onset of a painful eye with no apparent cause should be considered to have glaucoma.

#### Management

1. For treatment of acute glaucoma, see [13.3.4](#).
2. For treatment of chronic glaucoma, refer the patient to an ophthalmology unit.

### 13.1.5 HIV/AIDS-Related Eye Conditions

HIV/AIDS-related eye conditions include various opportunistic infections, including CMV, retinitis, herpes zoster and simplex, HIV, TB, toxoplasmosis, and tumours such as Kaposi's sarcomas or squamous carcinoma.

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**Note:** All of the above conditions are indications for ART as well as specific treatment.

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## 13.1 Decreased or Weak Vision

### 13.1.6 Retinal Detachment (with or without Vitreous Haemorrhage)

Retinal detachment is the separation of the retina from the underlying pigment layer. Acute detachments result from tears in the retina usually with myopic degeneration, allowing fluid to enter through the tear, and separate the retina from the rest of ocular layers.


#### Symptoms and signs

- The patient will usually complain of a curtain-like shadow across the vision
- The patient may see a shower of floaters or flashes.
- Sudden, significantly reduced vision may occur because of accompanying vitreous haemorrhage if the tear goes through a blood vessel.


#### Investigation

Ophthalmoscopy—areas of pale retina indicate the location of the detachment

#### Management

1. The condition is urgent because the longer the retina is separated, the less likely the chance of complete visual recovery.
2. **Refer urgently** to an ophthalmologist. 

### 13.1.7 Retinal Arterial Occlusion

Retinal arterial occlusion is a blockage of the blood supply in the arteries to the retina. It is an *emergency*, **refer** to the next level. 

#### Symptoms and signs

- Unilateral, sudden LOV
- Pale retina with loss of arteriolar outline and cherry red macula appearance

#### Management

Try to reduce the eye pressure and dislodge an embolus in the following ways.



1. Digitally massage the globe between two fingers intermittently over 3 to 5 minutes.
2. Give the patient—
  - Acetazolamide: 250 mg tablet immediately  
— OR —
  - Acetazolamide: IV 250 mg  
— OR —
  - A slow of IV infusion of 20% mannitol (200 to 500 mL over 30 to 60 minutes)
3. Refer the patient to the hospital eye specialist as soon as possible after this emergency treatment.

### 13.1.8 Ischaemic Optic Neuropathy


Ischaemic optic neuropathy is an infarction of the optic disk.

#### Symptoms and signs

- Sudden unilateral LOV
- Often no obvious signs on examination
- Possible optic nerve pallor
- In any older patients (usually over 65 years of age), sudden visual loss with minimal signs may indicate temporal arteritis.
  - There may be tenderness over the temporal artery.
  - Check the ESR (very high in this condition).

#### Management

**Note:** Ischaemic optic neuropathy is an *urgent* condition. The risk of *bilateral blindness* is high if treatment is not started early.

1. Refer the patient to hospital. 
2. Refer to an ophthalmologist.
3. If referral is delayed, perform a diagnostic temporal artery biopsy.
4. Start on high doses of cortisone. Initiate prednisone 80 mg PO, and refer urgently.

## 13.1 Decreased or Weak Vision

### 13.1.9 Optic Neuritis

Optic neuritis, the inflammation of the optic nerve, may cause a complete or partial LOV. It is commonly associated with multiple sclerosis (MS). In general, lost vision will return without specific treatment, but returns more rapidly with steroid treatment.

#### Symptoms and signs

- Relatively rapid onset visual loss (over hours to days) in one or both eyes
- Minimal or mild ocular pain on movement
- Sometimes optic nerve swelling on ophthalmoscopy, but often no obvious signs

#### Management

1. Referral is semi-urgent, mostly to confirm the diagnosis and check for MS.
2. Specific steroid treatment is given by an ophthalmologist or a neurologist: methylprednisolone IV 250 mg in every 6 hours for 72 hours, then prednisolone PO 1 mg/kg per day for 11 days.

### 13.1.10 Diabetes and Related Eye Disease

Cataracts and diabetic retinopathy are the major causes of LOV in people with diabetes. All diabetics should be seen at least annually by an eye care specialist because LOV can be prevented. Prevention of complications is far better than treating complications. Ophthalmic examination of the retina is a good indicator of overall diabetic involvement in the body.

#### Signs and symptoms

Often the first symptoms or sign of eye disease is when the diabetic retinopathy has progressed to proliferative disease or severe macular disease.

#### Management

1. Refer to an ophthalmologist.
2. Remind the patient that general diabetes and blood

pressure control are essential for success of any specific treatment.

## 13.2 Eyelid Infections

Eyelid infections include the following:

- Stye (external hordeolum)
- Meibomian cyst (chalazion)
- Meibomian abscess (internal hordeolum)
- Orbital cellulitis
- Chronic blepharitis
- White pupil (leukocoria)

### 13.2.1 Stye

A stye (or external hordeolum) is an acute staphylococcal abscess of a lash follicle and its associated gland. This abscess is found on the edge of the eyelid with a hair follicle in the middle of the swelling.

#### Management

1. Remove the lash.
2. Apply warm compresses to the eye.
3. Prescribe chloramphenicol ointment 3 times per day.

### 13.2.2 Meibomian Cyst (Chalazion)

A meibomian cyst (or chalazion) is a chronic sterile inflammation of the meibomian gland higher up in the eyelid. The lid has a localized swelling and at times some redness. The exact site can be seen if the lid is everted (turned inside out). A nodule can be felt in the eyelid.

#### Management

1. Instruct the patient to apply warm compresses for 15 minutes 3 times per day.
2. If the cyst does not clear up after 3 or 4 weeks, instruct the patient to return. The cyst will need incision and curettage.

## 13.2 Eyelid Infections

- Local antibiotics will not treat the cyst, but are necessary for a week after incision and drainage.
- Systemic antibiotics (e.g., oral tetracyclines) are useful in patients with recurrent chalazia. **Note:** Do not prescribe for children under 8 years of age or pregnant women.

### 13.2.3 Meibomian Abscess (Internal Hordeolum)

A meibomian abscess (or internal hordeolum) is an abscess of a meibomian gland caused by an acute staphylococcal infection. The eyelid is painful and swollen.

#### Management

- Incision and curettage may be necessary if a residual nodule remains after the acute infection has subsided.
- Oral antibiotics (against staphylococcus) are useful in the acute stage.
- Apply local antibiotics such as 1% chloramphenicol drops or ointment.

### 13.2.4 Preseptal Cellulitis

Preseptal cellulitis is a swollen, red, inflamed eyelid as a result of staphylococcal, streptococcal, or *Haemophilus influenzae* infection (the last in children under 5 years of age).

#### Symptoms and signs

- No proptosis
- No restriction of eye movements
- No pain with eye movements
- No meibomian abscess

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**Note:** Exclude trauma such as an animal or human bite. Exclude skin rash (e.g., herpes simplex or herpes zoster).

---

#### Investigation

CT scan if patient—

- Has severe cellulitis
- Has shown no improvement on previous treatment

- Is a child  $\leq 5$  years
- Is toxic

### Management

1. Prescribe oral antibiotics<sup>1</sup> such as amoxicillin plus cloxacillin for 10 days. If the patient is allergic to penicillin, use erythromycin for 10 days.
  - Adult: 250 to 500 mg PO 3 times per day
  - Paediatric:
    - $<3$  months: 30 mg/kg PO divided every 12 hours
    - $>3$  months: 45 mg/kg PO divided every 12 hours or 40 mg/kg, divided, 3 times per day
2. Refer to hospital for IV treatment.
3. Order a CT scan if patient shows no improvement.

### 13.2.5 Orbital Cellulitis

Orbital cellulitis is a more serious condition of a swollen eyelid.

#### Causes

- Often occurs together with sinusitis (typically an ethmoid sinusitis).
- Other causes include trauma, such as blow-out fracture or penetrating trauma


#### Symptoms and signs

- Proptosis
- Double vision
- Reduced eye movements
- Pain on attempted eye movements
- Chemosis and fever

#### Investigation

CT scan or X-ray

#### Management

1. **Refer** patient to hospital for admission. 
2. Start IV antibiotics.<sup>1</sup>
3. Patient may need referral to an ENT surgeon.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 13.2.6 Chronic Blepharitis

Blepharitis, an inflammation of the eyelash follicles along the edge of the eyelid, can be anterior (on the lid margin involving the eyelashes) or posterior (involving the meibomian glands).

#### Symptoms and signs

- Burning of eyes
- Grittiness
- Red lid margin
- Crusts on lid margin

#### Management

1. Instruct the patient on how to perform lid scrubs with 1:3 diluted baby shampoo 2 times per day.
2. Prescribe 1% chloramphenicol eye ointment, and instruct the patient to apply it 2 times per day, after cleaning, to the lid margins.

### 13.2.7 White Pupil (Leukocoria)

A white pupillary reflex in a child should be referred to an ophthalmologist urgently.

#### Causes

- Retinoblastoma—a malignant tumour of the retina (usually diagnosed between 12 and 24 months of age)
- Toxocariasis—a nematode infection (usually diagnosed between 6 months and 10 years)
- Congenital cataract—may be unilateral or bilateral
- Retinopathy of prematurity—especially if birth weight under 1.5 kg
- Other causes—retinal detachment, other congenital abnormalities of the retinal vessels or vitreous humour, other tumours

## 13.3 Red, Inflamed Eye

Figure 13.3 provides an algorithm for diagnosing the cause of a red, inflamed eye.

### Causes

- Conjunctivitis
- Keratitis or corneal ulcer
- Uveitis or iridocyclitis
- Acute glaucoma
- Scleritis

### Management

- Examine all red eyes with a bright light.
- Always look at cornea and pupil and check vision (see [13.1](#) for a discussion of decreased or weak vision).

### 13.3.1 Conjunctivitis

Conjunctivitis, the inflammation of the membrane covering the eyeball and inner eyelids, is the most common cause of red eyes. Vision is usually not affected. Conjunctivitis can be allergic, infective, or as a result of a chemical burn.

#### Causes

- Allergy—acute or chronic
- Infections—viral or bacterial
- Chemicals—alkaline or acid substances
- Autoimmune diseases (very rare)

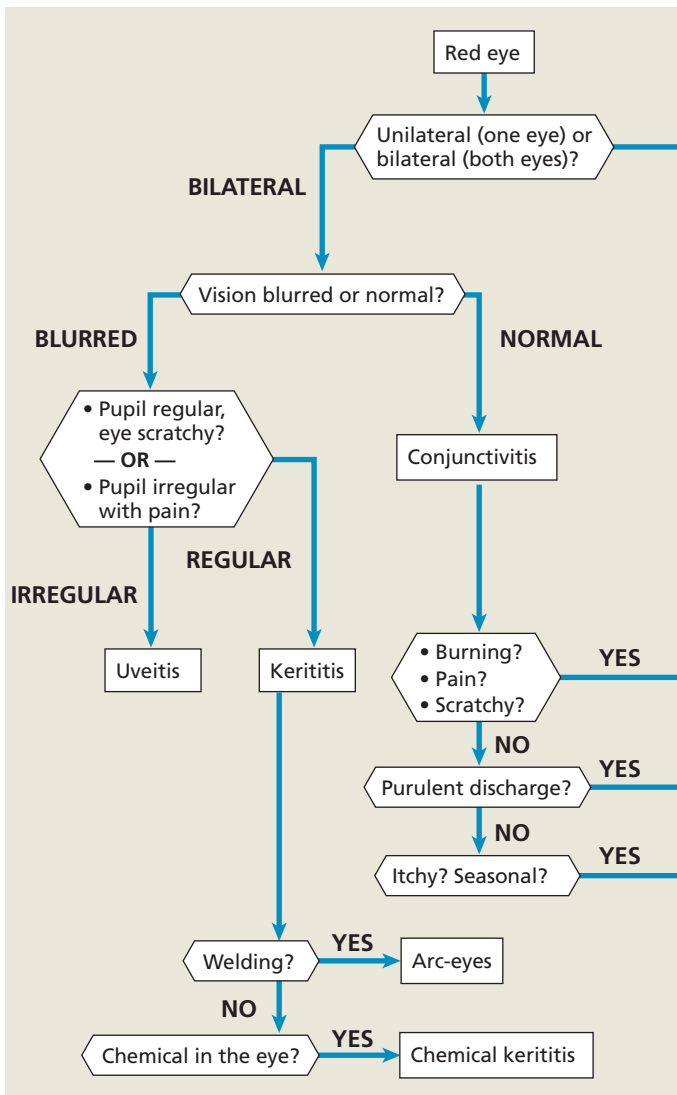
#### 13.3.1.1 Allergic Conjunctivitis

##### Symptoms and signs

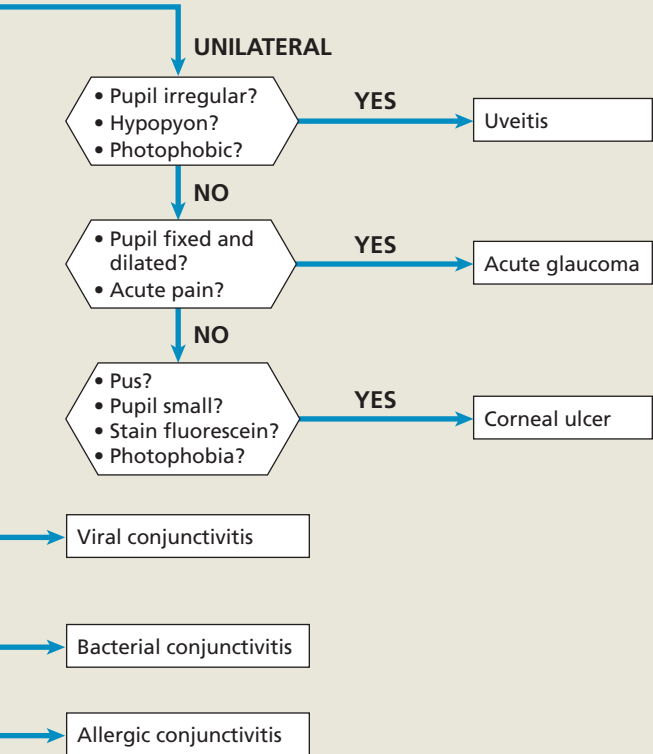
- Acute or chronic
- Usually bilateral
- Often seasonal
- Irritated eyes with itchiness (a prominent symptom)
- Watery discharge
- Irregular red or brown conjunctiva around the cornea (in chronic conjunctivitis)
- Fine papillae under eyelids

## 13.3 Red, Inflamed Eye

FIGURE 13.3 Algorithm for red, inflamed eye







## 13.3 Red, Inflamed Eye

### Management

**Note:** Advise patient to try to identify allergens and avoid them.

#### Management of acute allergic conjunctivitis—

1. Give decongestants (e.g., 0.025% oxymetazoline eye-drops 3 times per day as needed).
2. Give systemic antihistamines if severe.
3. Recommend cold compresses (i.e., ice-packs on lids) when there is swelling of eyelids.
4. Refer if patient is not improved after 3 days.

#### Management of chronic conjunctivitis—

1. Refer to doctor.
2. Give topical eye steroids and mast cell stabilizers (e.g., sodium chromoglycate). The latter is a prophylactic for long-term use.
3. This disease can lead to permanent eye damage if not controlled.

### 13.3.1.2 Infective Conjunctivitis

#### Causes

- Viral causes of infective conjunctivitis include, among others—
  - Adenoviruses
  - Influenza
  - Measles
  - Herpes viruses
- Bacterial causes are—
  - Staphylococci
  - Streptococci
  - Gonococci
  - Chlamydia

Trachoma, which is managed in the same manner as infective conjunctivitis, is caused by an organism called *Chlamydia trachomatis*. Through the discharge from an infected person's eyes, trachoma is passed on by hands, on clothing, or by flies that land on the face.

### Symptoms and signs

- Usually bilateral
- Scratchy, burning, painful, red
- Watery discharge (in viral infections) pus discharge (in bacterial infections)
- Pre-auricular lymph nodes in viral disease
- Epidemic in adenoviral strains—so-called pink eye. Highly contagious; isolate patients.

### Management

#### Management of viral infective conjunctivitis—

1. Treat symptomatically with 0.025% oxymetazoline eyedrops 3 times per day as needed.
2. If associated with measles, treat systemically with vitamin A to prevent keratitis.
3. Isolate patients if epidemic.
4. If no improvement after 3 days, refer the patient to a specialist.

#### Management of bacterial (i.e., with pus discharge) infective conjunctivitis—

1. Clean eyelids with wet cloth.
2. Prescribe 1% chloramphenicol eyedrops or ointment 4 times per day for 5 days.
3. For a severe infection, prescribe 0.3% ofloxacin eye-drops 6 times per day for 5 days.
4. If no improvement after 3 days, refer the patient to a specialist.

#### Management of trachoma infection—

1. Prescribe 1% tetracycline eye ointment 2 times per day for 6 weeks and systemic doxycycline 100 mg 2 times per day for 7 days.
2. Refer the patient to a specialist.

#### Management of neonatal conjunctivitis—

See “Section VI. Diseases and Disorders According to Age Group. [Chapter 26. Paediatrics](#)” for a discussion of neonatal conjunctivitis.

### 13.3.1.3 Chemical Burn Conjunctivitis

Chemical burns to the eye constitute an emergency. See [13.3.2](#) below for management.

### 13.3.2 Keratitis or Corneal Ulcer

Keratitis is inflammation of the cornea. Corneal ulcers are epithelial defects (i.e., outer cell layer defects). Keratitis is a serious disease and causes corneal scarring with permanent visual loss or even perforation of the eyeball with the loss of the eye.

#### Causes

- Infective—
  - Viral, especially herpes simplex (dendritic ulcer)
  - Bacterial
  - Acanthamoeba
  - Fungal (especially after injuries with plant materials)
- Trauma—foreign bodies from grinders, plant material, sand, or other substances
- Arc-eyes—actinic injury or ultraviolet exposure (e.g., from welding without protective glasses)
- Autoimmune diseases—rheumatoid arthritis, SLE (rare)

#### Symptoms and signs

- Usually only one eye
- History of injury
- History of contact lens wear
- Red eye and conjunctiva
- Pain
- Photophobia (i.e., sensitivity to light)
- Watery discharge; pus if bacterial
- Vision decreased
- Cornea unclear, dull, grey
- Cornea stain yellow with fluorescein. **Note:** Test. Always examine each red and painful eye with fluorescein.
- Herpes ulcer has dendritic fluorescein staining pattern (diagnostic sign)

## Management

### General management of keratitis or corneal ulcer—

1. **Refer** to hospital immediately. ⚠️
2. Do *not* use steroids when the eye is stained with fluorescein.

### Management of infective keratitis or corneal ulcer—

1. If the infection is bacterial, prescribe broad spectrum antibiotics drops: instil 0.3% ofloxacin eyedrops every hour for 2 days, then taper off to 4 times per day. If no response, add 0.3% gentamicin eyedrops.
2. If the infection is fungal, refer to a specialist who will prescribe 5% natamycin eyedrops.
3. In the case of a dendritic ulcer (herpes virus), treat with acyclovir eye ointment 5 times per day for 7 days.
4. Dilate pupil with cycloplegics (instil cyclopentolate 2% eyedrops 3 times per day) when very painful or photophobic.
5. Order systemic analgesics as needed.
6. If the patient's condition has not improved in 2 days or if patient has severe vision loss, consult a specialist.
7. Systemic antibiotics are not necessary.

### Management of foreign body in eye (e.g., sand or gravel) —

1. Instil topical anaesthetic drop into eye.
2. Rinse out with saline solution.
3. Evert eyelids and wipe clean with cotton bud.
4. Gently lift corneal foreign body out with 21-gauge needle. (Doctors only)
5. Prescribe 1% chloramphenicol ointment 3 times per day for 3 days.

### Management of arc eyes—

1. Instil topical chloramphenicol eyedrops 4 times per day for 3 days.
2. Instruct the patient to use lubricating eyedrops (e.g., hydroxypropyl methylcellulose [Tears Naturale®]).

## 13.3 Red, Inflamed Eye

3. Instil topical non-steroidal anti-inflammatory eye-drops (e.g., ketorolac 0.5%).
4. Order systemic analgesics as needed.
5. Remind patient that arc-eyes can be prevented by wearing protective UV-glasses.

### Management of chemical burns—

**Note:** Chemical burns to the eye constitute an emergency; treat immediately. Alkaline chemicals are most dangerous.

1. Instil a topical anaesthetic drop stat.
2. Remove all foreign matter. Check under upper eyelid.
3. Rinse eyes with saline solution for *at least 30 minutes*.  
The amount time of rinsing is more important than volume. If no saline solution is available, use clean water.
4. Give steroid or antibiotic drops 4 times per day.
5. Order systemic analgesics.
6. Refer patient to an eye specialist as soon as possible.
7. Never give the patient topical anaesthetics to take home.

### 13.3.3 Acute Uveitis and Iritis

Uveitis is intraocular inflammation of the uvea (i.e., iris, ciliary body, and choroids). It can be classified as follows:

- Anterior uveitis (most common)
- Intermediate uveitis
- Posterior uveitis
- Panuveitis
- Granulomatous or non-granulomatous
- Endophthalmitis (infective cause, e.g., after eye surgery or in immunocompromised patients)


#### Causes

- Idiopathic (most common)
- Post-trauma
- Systemic diseases (e.g., TB, sarcoidosis, lymphoma, autoimmune diseases, HLA-B27 positive)

### Symptoms and signs

- Usually only one eye
- Red conjunctiva
- Severe deep pain
- Photophobia (sensitivity to light)
- Painful reading
- Watery discharge
- Dull vision
- Pupil small, irregular; reacts sluggishly to light
- Dull red reflex with ophthalmoscope.

### Management

1. Refer *urgently* to hospital. 
2. If uveitis occurs after eye surgery, it is an *emergency*.
3. Dilate pupil with—
  - 2% cyclopentolate drops
  - OR ——
  - Cyclopentolate
  - PLUS ——
  - Phenylephrine eyedrops
4. Prescribe corticosteroid eyedrops (dosage depends on severity).
5. Prescribe topical and systemic nonsteroidal medicines.
6. If patient has recurrent episodes of uveitis, investigate systemic cause with serology and X-rays.

#### 13.3.4 Acute Glaucoma

See also [13.1](#) above, “Decreased or Weak Vision.”

Acute glaucoma is the sudden increase in eye pressure causing a painful red eye and can cause blindness in hours if not treated immediately. Chronic glaucoma (the most common) usually does not cause a painful and red eye by itself. Acute glaucoma can be classified as follows:

- Acute primary closed-angle glaucoma
- Acute secondary open-angle glaucoma
- Acute secondary closed-angle glaucoma

## 13.3 Red, Inflamed Eye


### Causes

- Genetic factors
- Trauma
- Uveitis
- Medicines (e.g., systemic or topical pupil dilators in people with narrow angles)
- Mature cataracts
- Neovascular disease (e.g., severe diabetes or retinal vascular occlusions)

### Symptoms and signs

- Rapid onset of blurred vision; visual loss
- Usually one eye
- Red eye
- Pain varying from mild to extreme with nausea and vomiting
- Mid-dilated and fixed pupil with often an afferent pupil defect
- Shallow anterior chamber (i.e., eclipse test positive)
- Hazy cornea
- Hard eyeball (i.e., increased eye-pressure)
- Dull red reflex

### Management

**Note:** Acute glaucoma is an emergency. Immediately refer the patient to hospital and, once stabilized, to an eye specialist. 

1. Aim at reducing the intraocular pressure (IOP) as soon as possible—
  - Instil 1 or 2 drops of 0.5% levobunolol eyedrops into the affected eye(s) 1 to 2 times per day.

—— OR ——

  - Instil 1 drop of 0.2% brimonidine eyedrops into the affected eye(s) 3 times per day.

—— PLUS ——

  - Give oral acetazolamide 250 to 500 mg 3 to 4 times per day until IOP <40 mm Hg.



2. Start IV of systemic mannitol.
3. Give analgesics.
4. Give antiemetics.
5. Refer to a specialist for a possible iridectomy.
6. If the cause is acute angle closure, the pupil can be constricted with 2% pilocarpine eyedrops. Instil 1 drop every 6 hours after or at the same time as reducing the eye pressure.
7. If the cause is secondary glaucoma, treat the underlying cause.

### 13.3.5 Scleritis

Scleritis, a rare condition, is a localised inflammation of the sclera sometimes associated with systemic disease (e.g., autoimmune disorders). It responds well to topical and systemic nonsteroidal medicines.

## 13.4 Trauma to the Eye

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See “Section I. Common Emergencies and Trauma. [Chapter 2. Trauma](#)” for a discussion of trauma to the eye.

### 13.5 Eyelid and Orbital Conditions

#### 13.5.1 Orbital Disease

Orbital disease is defined as an abnormal position of the eye. It may take the form of exophthalmos, enophthalmos, or strabismus.

A number of differential diagnosis conditions may be confused with orbital disease:

- Enlarged globe (e.g., in myopia)
- Enophthalmos of fellow eye (i.e., small sunken eye)
- Cranial nerve palsy
- Cavernous sinus thrombosis (pathology behind the orbit)

#### Causes and conditions

- Thyroid disease—often bilateral, painless, lid retraction, lid lag
- Orbital tumours in adults—cause mostly metastatic disease, mucocoele, lymphoid tumours, meningioma
- Lacrimal gland tumours
- Orbital tumours in children (e.g., dermoid or epidermoid cysts, neuroblastoma)
- Orbital cellulitis—patient is ill with fever
- Orbital inflammatory pseudotumour—often painful, bilateral in children, usually unilateral in adults
- Trauma (e.g., intraorbital foreign body, retrobulbar haemorrhage)

#### Symptoms and signs

##### Symptoms—


- Eyelid swelling,
- Bulging eyes (proptosis)
- Double vision
- Pain
- Decreased vision

##### Signs—

- Proptosis
- Restriction of eye movements

- Lid swelling
- Chemosis (swelling of the conjunctiva)
- Dystopia (one eye lower than the other)
- Reduced vision

### Management

1. Look down from over the patient's forehead to examine the most anterior (i.e., forward) position of the eyeballs (globes); for proptosis, there is no more than 2 mm difference between the 2 eyes.
2. Urgently **refer** patients with other signs and symptoms such as— 
  - Fever
  - Reduced consciousness
  - Pupil abnormalities
  - Loss of vision (e.g., as in compressive optic neuropathy in thyroid disease)
  - Children who have rapid development of symptoms and signs
3. Watch out for exposure keratopathy (i.e., eyelids not closing well); chloramphenicol ointment may be needed to prevent corneal ulceration.
4. The patient usually needs a CT scan to make a definite diagnosis.

### 13.5.2 Ptosis

Ptosis is an abnormally low position of the upper eyelid. It may be congenital (from birth) or acquired later. If congenital, ptosis is severe; the eyelid will block vision and the child will become amblyopic. Refer to an eye clinic.

In third nerve palsy, a type of ptosis, the patient has reduced eye movements (eye cannot look in, up, or down) and the eye faces out (exotropia). Note the size of the pupil; if enlarged, it is a medical emergency (particularly if there is pain) because the cause may be an aneurysm below the brain.

### Causes

- Neurogenic (nerve) ptosis—from third cranial nerve palsy or Horner syndrome
- Myogenic (muscle) ptosis (e.g., myasthenia gravis, simple congenital, ocular myopathy, myotonic dystrophy)
- Aponeurotic—droopy lid from thinning of the aponeurosis in old age, postoperative
- Mechanical—oedema, tumours, dermatochalasis (excess eyelid skin in old age)

### Management

Almost all cases of ptosis need referral for management especially third nerve palsy. Ptosis in neonates should be attended to before 4 months of age, or earlier if the eyelid covers the pupil in the neonatal period.

### 13.5.3 Eyelid Tumours

#### 13.5.3.1 Benign Eyelid Tumours

Benign eyelid tumours are of two types. See [table 13.5.3.1](#).

TABLE 13.5.3.1 Benign Eyelid Tumours

Type of Tumour	Description	Management
Viral wart (squamous cell papilloma)	<ul style="list-style-type: none"> <li>• Very common</li> <li>• Has a raspberry-like surface</li> </ul>	Excision
Naevus	<ul style="list-style-type: none"> <li>• Pigmented lesion</li> <li>• Can grow on the lid margin</li> <li>• Is brown, brown-black, or even unpigmented at times</li> </ul>	Can be removed for cosmetic reasons or if changes occur as in moles (i.e., rapid growth, change in colour, bleeding)

#### 13.5.3.2 Malignant Eyelid Tumours

Malignant eyelid tumours are of three types. See [table 13.5.3.2](#).

TABLE 13.5.3.2 Malignant Eyelid Tumours

Type of Tumour	Description	Management
Basal cell carcinoma	<ul style="list-style-type: none"> <li>• The most common human malignancy</li> <li>• Risk factors: fair skin, inability to tan, and chronic exposure to sunlight</li> <li>• Most frequently occur on the lower lid</li> <li>• Slow-growing and locally invasive but non-metastasising</li> <li>• May recur if not removed completely; more aggressive on recurrence</li> <li>• May invade the orbit and sinuses, particularly ones located near the medial canthus</li> <li>• Appearance: pearly nodules or small ulcers with rounded edges; may mimic chronic blepharitis</li> </ul>	Urgent referral for specialist treatment (e.g., wide excision and eyelid reconstruction)

TABLE 13.5.3.2 Malignant Eyelid Tumours (cont.)

Type of Tumour	Description	Management
Squamous cell carcinoma	<ul style="list-style-type: none"> <li>• Less common, but potentially more aggressive than basal cell carcinoma</li> <li>• Will eventually spread to regional lymph nodes</li> <li>• Patients with HIV infection at increased risk</li> <li>• Clinically, may resemble basal cell carcinoma but grows more rapidly</li> <li>• May form plaques, nodules, or ulcers</li> </ul>	Urgent referral for specialist treatment (e.g., wide excision and eyelid reconstruction)
Kaposi's sarcoma	<ul style="list-style-type: none"> <li>• A vascular tumour common in AIDS patients</li> <li>• May be brown and may mimic a haematoma</li> </ul>	Radiotherapy or excision

## 13.5.4 Other Eyelid Conditions

### 13.5.4.1 Ectropion

Ectropion is the turning out of the eyelid. The consequences of ectropion are watery eye and possible exposure of cornea with ulceration.

#### Causes

- Involutional (with old age)
- Cicatricial (due to scarring)
- Paralytic (caused by seventh cranial nerve palsy)
- Mechanical (tumours on or near the eyelid margin)

#### Management

1. Use lubricants (e.g., chloramphenicol eye ointment).
2. Refer for surgical repair.

### 13.5.4.2 Entropion

Entropion is the turning in of the eyelid so that the lashes rub on the eyeball.

#### Causes

- Old age (involutional)
- Cicatricial (from trauma, trachoma, or chemical injuries)
- Congenital

#### Management

1. Initially, use lubricants or taping.
2. Patient often needs to be referred for surgery.

## 13.5.5 Conjunctival Tumours

## 13.5.5.1 Benign Conjunctival Tumours

Benign conjunctival tumours are of three types. See [table 13.5.5.1](#).

TABLE 13.5.5.1 Benign Conjunctival Tumours

Type of Tumour	Description	Management
Pingueculum	<ul style="list-style-type: none"> <li>• Extremely common</li> <li>• Harmless</li> <li>• Usually bilateral</li> <li>• Yellow-white deposit on the bulbar conjunctiva next to the cornea</li> </ul>	Unnecessary unless large, particularly unsightly, or irritating the patient
Pterygium	<ul style="list-style-type: none"> <li>• A red triangular fibrovascular growth that can grow over the cornea</li> </ul>	<ul style="list-style-type: none"> <li>• Should be removed once it grows onto the cornea</li> <li>• Refer for surgery</li> </ul>
Conjunctival papilloma	<ul style="list-style-type: none"> <li>• A wart-like lesion in the conjunctiva</li> <li>• May occur at birth or years later</li> <li>• Caused by the human papilloma virus</li> </ul>	<ul style="list-style-type: none"> <li>• Small lesions may disappear spontaneously</li> <li>• Large lesions will need excision</li> </ul>



### 13.5.5.2 Pigmented Conjunctival Tumours

Pigmented conjunctival tumours are of two types. See [table 13.5.5.2](#)

TABLE 13.5.5.2 Pigmented Conjunctival Tumours

Type of Tumour	Description	Management
Conjunctival naevus	<ul style="list-style-type: none"> <li>• A benign, usually unilateral condition</li> <li>• Consists of a solitary, well-demarcated, flat, or elevated lesion that can be moved freely over the sclera</li> <li>• Pigmentation can vary.</li> </ul>	Refer if the amount of pigmentation or size changes, the naevus becomes vascular, or it starts growing across the cornea.
Conjunctival melanoma	<ul style="list-style-type: none"> <li>• A neoplastic lesion (cancer)</li> <li>• Usually a tumour of older people</li> <li>• Can start as a new tumour or develop from a pre-existing pigmented lesion</li> <li>• Signs: A solitary black or grey nodule with dilated feeder vessels and fixed to the eye</li> <li>• Often on the limbus</li> </ul>	Refer immediately to an eye centre.

## 13.5 Eyelid and Orbital Conditions

### 13.5.5.3 Neoplastic Tumours

Neoplastic tumours are of four types. See [table 13.5.5.3](#).

TABLE 13.5.5.3 Neoplastic Tumours

Type of Tumour	Description	Management
Conjunctival melanoma	See <a href="#">table 13.5.5.2</a>	See <a href="#">table 13.5.5.2</a>
Conjunctival and corneal intra-epithelial neoplasia (CCIN)	<ul style="list-style-type: none"><li>• Condition becoming more common because infection with the HIV virus is a risk factor</li><li>• Clinically, fast-growing, irregular, wart-like mass on the limbus, often with large feeder vessels</li></ul>	Needs urgent referral for excision and mitomycin C application
Squamous cell carcinoma	<ul style="list-style-type: none"><li>• May start as a new lesion or develop from pre-existing CCIN</li><li>• Is more common in HIV-positive patients</li><li>• Looks similar to CCIN</li></ul>	Refer immediately to an eye centre for further treatment (e.g., excision, topical chemotherapy, enucleation if intraocular invasion)
Kaposi's sarcoma	<ul style="list-style-type: none"><li>• A flat, bright-red lesion, which may be mistaken for a chronic subconjunctival haemorrhage</li><li>• Occurs commonly in patients with AIDS</li></ul>	<ul style="list-style-type: none"><li>• Refer the patient to specialised eye centre.</li><li>• Treatment is required for bleeding, cosmetic reasons, or infection.</li></ul>

## 14.1 Hypercholesterolaemia and Dyslipidaemia

*Dyslipidaemia* means abnormal lipid content in the blood. In hypercholesterolaemia, too much cholesterol is produced in liver and/or absorbed from the gastrointestinal tract, which increases the risk of complications such as strokes and coronary artery disease.

### Causes

- Genetic risk factors and family history
- Familial hypercholesterolaemia
- Lipoprotein dysfunctions
- Diabetes mellitus (DM)
- Obesity
- Renal and liver impairment
- Some medicines: oral contraceptives, corticosteroids, thiazide diuretics, antiretrovirals

### Risk factors

- Obesity (body mass index [BMI] >25 kg/m<sup>2</sup>)
- Poor nutrition or incorrect diet
- Lack of exercise
- Smoking

### Symptoms and signs

- General symptoms and signs
  - Most often, no signs and symptoms
  - Routine blood cholesterol is high
  - Skin and ligament changes (xanthomas over extensor tendons of fingers)
  - Sudden blindness (retinal vein thrombosis, corneal opacities)
  - Pancreatitis
  - Hepatosplenomegaly
  - Thickening of the Achilles tendon
- Signs of complications
  - Ischaemic heart disease, angina, myocardial infarctions
  - CVA, strokes

## 14.1 Cholesterol Disorders

- Peripheral arterial disease
- Acute pancreatitis (high triglyceride)
- Critical signs (see “Investigations” below)
  - High total cholesterol
  - High triglycerides
  - High LDL
  - Low HDL

### Investigations

Lipogram—

- Total cholesterol = <5.0 mmol/L (<4.5 in DM and CVS patients)
- Triglycerides = <1.7 mmol/L
- LDL-C = <3.0 mmol/L (<2.5 mmol/L in DM or CVS patients)
- HDL-C = >1.3 mmol/L (females); >1.0 mmol/L (males)

### Management

**For primary intervention, take the following steps.**

1. Perform a laboratory diagnosis (very important).
2. Advise the patient to adopt the following dietary measures. **Note:** The following are basic dietary guidelines only. Specific dietary treatment depends on lipogram results. Refer the patient to a registered dietician for individualized dietary counselling. Advise the patient to—
  - Reduce total fat intake (especially saturated and trans-fatty acids such as animal fat, streaky bacon, butter, cream, full-cream dairy products, red meat, skin and fat of chicken or poultry, brick or hardened margarine, fried foods, palm oil, coconut oil, pastries, biscuits).
  - Reduce cholesterol intake. The main sources of cholesterol-rich foods are animal products such as meat, organ meat (e.g. liver, ‘offal’, kidneys, tongue), duck, goose, eggs, butter, and full-cream milk products. Fish and chicken also contain cholesterol.
  - Use sunflower oil margarine, soya oil, canola oil margarine, or olive oil margarine (and use only the soft

tub margarines); peanut butter; avocado pear; nuts (not macadamia)—but use only small quantities of these items because the total fat content of the diet must be reduced.

- Eat a moderate portion of lean meat or skinless chicken or fish only once a day. Eat fish and lean chicken more often than meat because they provide much less saturated fats. Saturated fats increase cholesterol levels more than cholesterol in food.
  - Include legumes such as dried beans, peas, lentils, and soya beans often in your diet (e.g., mix cooked lentils with rice or porridge, add dried beans or baked beans to stews or meat dishes).
  - Use only low-fat or fat-free dairy products (e.g., low-fat milk, skim milk, fat-free or low-fat yoghurt, low-fat cheese, low-fat cottage cheese, low-fat sour milk).
  - Eat vegetables and fruit daily.
  - Use whole grain or whole wheat cereals, breads, and starches (e.g., oats, high-fibre cereals, whole wheat bread, brown bread, pearled wheat, yellow maize, barley, brown rice, wild rice).
  - Use low-fat cooking methods such as oven baking, grilling, roasting, and boiling.
  - Use salt sparingly and only use iodised salt.
  - Ensure an adequate omega-3 intake by including fish often (2 or 3 times per week) in your diet.
  - Limit alcohol intake.
3. Advise the patient to exercise at least 3 times per week.
  4. Advise the patient to lose weight if overweight or obese (see “Section III. Nutrition and Lifestyle” for a discussion of obesity and overweight). If the patient’s normal BMI is 18 to 25 kg/m<sup>2</sup>, advise the patient to maintain it.
  5. Look for indications that treatment is required—
    - Genetic dyslipidaemia
    - Secondary prevention on DM, HPT, stroke, or CVA patients

## 14.2 Diabetes Mellitus

6. If treatment is required, start patient on statin medication: simvastatin 20 to 40 mg daily.

If no response, refer the patient for specialist care.

### Health education

Advise the patient to—

- Stop smoking.
- Lose weight if overweight or obese (see “Section III. Nutrition and Lifestyle” for a discussion of obesity and overweight).
- Adhere to the dietary measures listed above, and see a dietician for individualized counseling.
- Take medication, if prescribed.
- Come back to the clinic or see the doctor regularly for reevaluation.

## 14.2 Diabetes Mellitus

### 14.2.1 Type I and Type II Diabetes Mellitus

*Diabetes mellitus* (DM) refers to persistent hyperglycaemia (i.e., high blood sugar levels) due to relative insulin deficiency, resistance, or both. If uncontrolled, DM will eventually negatively affect the eyes, blood vessels, kidneys, and nerves and will lead to infections, especially of the skin. DM is of two types:

- Type I DM
  - Usually found in children and young adults
  - Often called insulin-dependent DM (IDDM)
- Type II DM
  - Usually found in the elderly or overweight individuals
  - Often called non-insulin-dependent DM (NIDDM)

Complications of DM can include the following:

- Hypoglycaemia (see “Section I. Common Emergencies

and Trauma. [Chapter 1. Emergencies](#)” for a discussion of diabetic emergencies)

- Hyperglycaemic ketoacidosis (see [14.2.2](#), below, and “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of diabetic emergencies)
- Eye problems: retinopathy with visual impairment, blindness, cataracts
- Skin problems: skin infections and furuncles, foot ulcers
- Vascular problems: gangrene of toes or fingers, stroke, myocardial infarction, leg amputations
- Infertility: miscarriages, impotence, large babies
- Kidney problems: proteinuria, renal failure, kidney infections (pyelonephritis)
- Nerve damage or neuropathy: sensation loss in hands and feet (‘stocking and glove’, ‘pins and needles’ sensation), single nerve involvement, carpal tunnel syndrome
- Diabetic foot

### Causes

- Family history (both type I and type II)
- Autoimmunity (auto-antibodies to islets of Langerhans in the pancreas) in children
- Environmental factors (excess weight or obesity, nutrition, lifestyle)
- Insulin resistance
- Deficient insulin secretion

### Symptoms and signs

- Early DM—
  - Polyuria (increased urine volume and frequency)
  - Polydipsia (patient drinks a lot of water, always thirsty)
  - Polyphagia (the patient eats a lot)
  - Weight loss (type I)
  - Often the patient is overweight (type II)

## 14.2 Diabetes Mellitus

- Weakness and malaise, fatigue
- Pruritus (itchiness) of vulva and vagina
- Children often wet the bed, difficult waking in morning (type I)
- Hypertension (type II)
- Late DM—
  - Decreased vision (blurred vision) (type II)
  - Recurrent infections (skin, UTIs, vulvovaginitis)
  - Delayed wound healing
  - Acidotic breathing (prolonged expiration)
  - Acetone (fruity) smell of breath or urine
  - Glucose in urine, with or without ketones
  - Coma (low blood sugar or high blood sugar). See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of coma.

### Investigations

- Tests at every clinic visit—
  - Weight, BMI, BP
  - Urine testing and dipsticks: glucose, protein, blood, ketones
  - Glucose: random blood glucose
  - Always check feet

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**Note:** *Never* use urine glucose for evaluation of treatment.

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- Annual tests—
  - Glycated haemoglobin (HbA1C)
  - U+E, creatinine
  - Cholesterol and blood lipids
  - ECG
  - Eye examination (corneal and retinal investigation)
- More specific tests for diagnosis—
  - Fasting blood glucose (no eating 8 hours before, fasting)
  - 2 hours postprandial (2 hours after a meal)
  - Glucose tolerance test (GTT): 75 g glucose PO stat and then 2-hour value



- Diagnose DM if—
  - ◆ Random  $\geq 11.1$  mmol/L
  - ◆ Fasting  $\geq 7$  mmol/L
  - ◆ Postprandial  $\geq 11.1$  mmol/L
  - ◆ GTT (2 hours)  $\geq 11.1$  mmol/L
- Patient can test own glucose levels
  - Fasting (aim for 4 to 6 mmol/L)
  - 2 hours after meal (aim for  $< 8$  mmol/L)

## Management

### In clinic, health centre, and hospital—

1. Refer the patient to the hospital for diagnosis and start of treatment.
2. Advise patient that he or she must be followed up regularly for the rest of his or her life.
3. At every visit, check weight, BP, and urine for glucose and ketones.
4. Ask patient about symptoms of hypoglycaemia: palpitations, headache, hunger, nervousness, or confusion.
5. Explain to the patient and caretakers what to do if hypoglycaemia occurs (i.e., drink a ‘cool drink’ containing sugar or drink sugar water, eat sugar-containing sweets, jam, or honey).
6. Advise the patient to adopt the following dietary measures. **Note:** The following are only temporary guidelines. Dietary treatment depends on factors such as insulin therapy, medication, the patient’s weight, and blood results. Refer the patient to a registered dietician for individualized dietary counselling. Advise the patient to—
  - Avoid sugar, sweets, chocolates, biscuits, cakes, fruit juice, sugar-containing drinks (all types until counselled by a dietician), and alcohol.
  - Eat very little fat. Try to avoid animal fat. Use soft margarine and sunflower oil or canola oil as fat, but use even those sparingly.
  - Eat high-fibre foods often (e.g., coarse or seed bread, All Bran cereal, Bokomo oats, Provita, lentils, beans,

## 14.2 Diabetes Mellitus

vegetables, fruit, brown or wild rice or rice mixed with lentils, barley, pearly wheat).

- Eat breakfast, lunch, and dinner regularly every day. Try to eat these meals at more or less the same time, and keep portion sizes moderate (i.e., not too big). If overweight, then eat only small portions to lose weight.
- Eat high-fibre, low-calorie snacks until counselled by the dietician (e.g., fresh fruit—preferably only apples, oranges pears, peaches, naartjies, plums, apricots). Choose only one of the following as a snack per time (e.g., one apple as mid-morning snack, one slice of bread with margarine and Marmite as mid-afternoon snack, and yoghurt as evening snack). Choose from among—
  - Coarse bread or bread with seeds or Provita spread thinly with soft margarine or peanut butter and some Marmite, low-fat cottage cheese, vegetable slices, diabetic jam
  - Low-fat popcorn
  - Fat-free or low-fat yoghurt
- Make starchy foods (e.g., coarse bread or bread with seeds, All Bran cereal, cooled maize porridge, Provita, macaroni, rice mixed with lentils, sweet potato, baby potato, barley, pearly wheat) the basis of most meals and combine them with a small amount of lean meat or fish or chicken or dried beans or milk or sour milk, a good portion of vegetables, and a very small amount of margarine or oil or nuts.
- If hungry, snack on the following vegetables: tomatoes, green peppers, cucumber, cabbage, cauliflower, broccoli, lettuce, and mushrooms.
- Use very little salt.
- If thirsty, drink clean water primarily. Some tea and coffee may be taken too. A diet cool drink may be taken occasionally (i.e., not daily).

7. Determine the causes of the patient's hyperglycaemia. It may be any of the following:
  - Insufficient treatment (i.e., oral agents or insulin)
  - Ineffective medicines (i.e., oral agents)
  - Incorrect diet or patient not keeping to the diet
  - High sugar intake
  - Infections, especially urinary and chest
  - Psychological stress
  - Alcohol consumption
8. Refer the patient to a specialist if—
  - The DM is not controlled with present treatment
  - Blood sugar is high (>15 mmol/L)
  - Glucose or proteins are high; urine contains ketones
  - He or she shows signs of infection
  - Complications are evident (e.g., visual impairment, foot ulcers, gangrene)
  - He or she exhibits mental or neurological problems

**In hospital—**

1. Make a final diagnosis (i.e., determine type of diabetes, check for infection and complications).
2. Decide on either oral or insulin treatment for the patient. If oral treatment is an option, proceed according to the steps in [table 14.2A](#) and the protocol outlined in [figure 14.2](#). If insulin treatment is required, skip to step 3 (below [table 14.2A](#)). If a child or pregnant woman is being treated, skip to step 4 or 5 (below [table 14.2B](#)).

TABLE 14.2A Steps for Oral Treatment of DM

Step	Dosage	Comment
	<b>Step 1A. Oral treatment of DM—Obese patient only</b>	
<ul style="list-style-type: none"> <li>• Start an obese patient with biguanide (metformin)</li> <li>• Skip to step 1B for non-obese patients</li> </ul>	<p>Children: Do <i>not</i> use</p> <p>Adults (take after meals):</p> <ul style="list-style-type: none"> <li>• Starting dose: 500 mg daily</li> <li>• Increase to 500 mg 2 times per day (i.e., every 12 hours)</li> <li>• Increase to 500 mg 3 times per day</li> </ul> <p>— OR —</p> <ul style="list-style-type: none"> <li>• Increase to 1000 mg every morning, 500 mg at night</li> <li>• Maximum dose: 1000 mg 2 times per day</li> </ul>	<p><b>Note:</b> Use in obesity.</p> <ul style="list-style-type: none"> <li>• Do <i>not</i> use in patients with liver or kidney impairment or with cardiac failure.</li> <li>• Do <i>not</i> use in pregnancy.</li> <li>• May cause anorexia, epigastric discomfort, and diarrhoea</li> </ul>

TABLE 14.2A Steps for Oral Treatment of DM (cont.)

Step	Dosage	Comment
	<b>Step 1B. Oral treatment of DM—Non-obese patient</b>	
<ul style="list-style-type: none"> <li>• Start a <i>non-obese patient</i> with sulphonylurea (<i>either</i> glibenclamide or gliclazide).</li> <li>• If inadequate response to step 1A or 1B, go to step 2.</li> </ul>	<p>Children: Do <i>not</i> use  <b>Glibenclamide (long-acting) 5 mg tablets</b>            Adults: 2.5 to 15.0 mg (½ to 3 tablets) daily, in 1 to 2 divided doses</p> <ul style="list-style-type: none"> <li>• Take with meals or 30 minutes before meals</li> <li>• Starting dose: 2.5 to 5.0 mg daily</li> <li>• Increase by 5 mg at every step</li> <li>• Increase to 10 mg every morning</li> </ul> <p style="text-align: center;">— OR —</p> <ul style="list-style-type: none"> <li>• Increase to 5 mg 2 times per day</li> <li>• Maximum dose: 10 mg every morning and 5 mg at night</li> </ul>	<p><b>Note:</b> Use in non-obese patients.</p> <ul style="list-style-type: none"> <li>• Use in liver impairment.</li> <li>• Do not use in pregnant or breastfeeding women; insulin should be used instead.</li> <li>• Do not use in severe renal impairment; use gliclazide instead.</li> <li>• May cause headache, dizziness, gastrointestinal disturbances, hypoglycaemia, and rash.</li> </ul>

TABLE 14.2A Steps for Oral Treatment of DM (cont.)

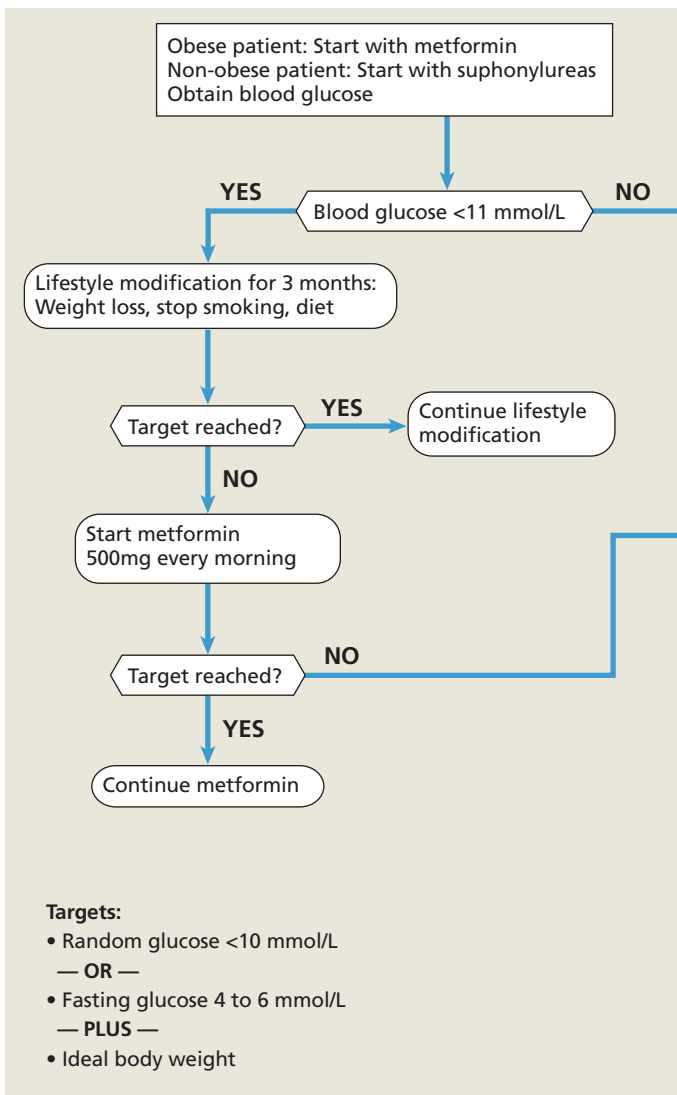
Step	Dosage	Comment
<b>Step 1B. Oral treatment of DM—Non-obese patient (continued)</b>		
	<p>— OR —</p> <p><b>Gliclazide (short-acting) 80 mg tablets</b></p> <p>Children: Do <i>not</i> use</p> <p>Adults:</p> <ul style="list-style-type: none"> <li>• Starting dose: 40 to 80 mg daily</li> <li>• Increase by 80 mg at each step</li> <li>• Increase to 80 mg 2 times per day</li> <li>• Increase to 160 mg every morning</li> </ul> <p>— PLUS —</p> <ul style="list-style-type: none"> <li>• 80 mg at night</li> <li>• Increase to 160 mg 2 times per day</li> <li>• Maximum 320 mg daily</li> </ul>	<ul style="list-style-type: none"> <li>• Use in renal impairment</li> <li>• Do not use in liver impairment.</li> <li>• Do not use in pregnancy.</li> </ul>
<b>Step 2. Oral treatment of DM</b>		
<ul style="list-style-type: none"> <li>• Review risk factors; review adherence and management.</li> <li>• If no adequate response, go to step 3.</li> </ul>	Not applicable.	<ul style="list-style-type: none"> <li>• Always treat hypertension and high cholesterol.</li> <li>• Check patient's compliance to treatment protocol.</li> <li>• Re-evaluate medications.</li> </ul>

TABLE 14.2A Steps for Oral Treatment of DM (cont.)

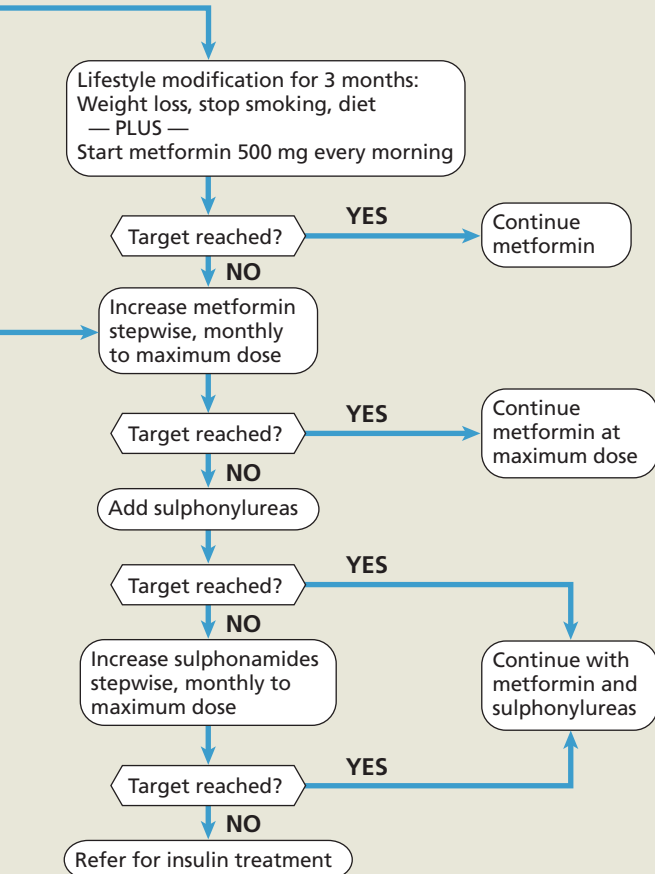
Step	Dosage	Comment
<b>Step 3. Oral treatment of DM</b>		
Start a combination of biguanide <i>and</i> sulphonylurea	<ul style="list-style-type: none"> <li>• Start maximum dose of <i>either</i> biguanide or sulphonylurea.</li> <li>• Add lowest dose of the <i>other</i> medicine in the morning.</li> <li>• Increase in stepwise fashion, if necessary.</li> </ul>	
<b>Step 4. Oral treatment of DM</b>		
Review response.	Not applicable	<ul style="list-style-type: none"> <li>• If DM is <b>well-controlled</b> for &gt;3 months, try to reduce treatment dosages. Use a stepwise decrease.</li> <li>• If DM is <b>poorly controlled</b>, start insulin treatment. <b>Note:</b> Stop oral sulphonylurea only after adequate control has been achieved.</li> </ul>

## 14.2 Diabetes Mellitus

FIGURE 14.2 Protocol for type 2 diabetes patients







## 14.2 Diabetes Mellitus

3. Begin insulin treatment—
  - Choose among the types of insulin:
    - Short acting: clear fluid (soluble)
    - Intermediate acting: cloudy fluid (isophane)
    - Long acting: (insulin zinc)
    - Biphasic: cloudy fluid (soluble + isophane 30/70)
  - Determine the insulin dosages. See [table 14.2B](#).
    - Starting dose: 0.3 to 0.6 units/kg per day; adjust according to response
    - Maintenance dose: 0.2 to 1.2 units/kg per day

TABLE 14.2B Insulin Dosages

Starting Dose	Incremental Increase	Maximum Daily Dose
Total daily dose: (0.6 units/kg per 24 hours) <ul style="list-style-type: none"><li>● Inject 2/3 total daily dose 30 minutes before breakfast.</li><li>● Inject 1/3 total daily dose 30 minutes before supper.</li><li>● Stop oral sulphonylurea only after adequate control has been achieved.</li></ul>	Two units daily: <ul style="list-style-type: none"><li>● First increment is added to the morning dose</li><li>● Second increment is added to the evening dose</li><li>● Subsequent increment(s) to follow same pattern</li></ul>	40 units: <ul style="list-style-type: none"><li>● Refer for specialist care if more than 40 units are needed.</li></ul>

4. Insulin as substitution (for pregnancy, type II with contraindications to oral Rx, children)
  - Use biphasic insulin (soluble + isophane)
  - Morning (am) injection—ratio of medium-to-short-acting insulin should be 2:1
  - Evening (pm) injection—ratio of medium-to-short-acting insulin should be 1:1
  - Easier to prescribe the combination product even though this means that the ratio of medium-to-short-acting insulin is 2:1 at all times

5. For insulin treatment in children, follow these steps:
  - Total daily dose: 0.6 units/kg per 24 hours
  - In severe DM—
    - Give short-acting insulin: 20% before every meal (20% breakfast, 20% lunch, 20% supper)
    - Give intermediate-acting insulin: 40% at 21h00 or 22h00 (lente insulin)
  - In controlled DM—
    - As above (2/3 in morning, 1/3 in evening)
6. Educate patient on proper insulin use.
  - Demonstrate injection technique (subcutaneous).
  - Recommend a site of injection (thigh or abdomen; abdomen better)
  - Tell the patient how to recognise emergency situations such as hypo- and hyperglycaemia.
  - Make sure the patient understands the need to seek treatment in emergency situations.
  - Teach the patient how to self check with aid of blood glucose monitoring device; urine testing only for ketones.
7. Always rule out TB in coughing patient.

### Health education

- Explain DM.
- Educate the patient about symptoms and signs of hypo- and hyperglycaemia.
- Advise the patient to—
  - Follow the treatment plan.
  - Adhere to appropriate dietary measures, and consult a dietician.
  - Never miss a meal because blood sugar levels may fall too low and cause hypoglycaemia.
  - Always carry sweets or sugar in pocket or handbag.
  - Return to the clinic or doctor regularly for check-ups and medication.
  - Exercise daily for about 30 minutes (e.g., brisk walking, cycling, going to the gym), but not to exercise if blood sugar level is too low or too high.

## 14.2 Diabetes Mellitus

- Stop smoking.
- Avoid alcohol.
- Check feet regularly, wear shoes that are comfortable, and dry feet well after washing.
- Come to clinic whenever there is an infection.

### 14.2.2 Diabetic Ketoacidosis

Severe hyperglycaemia is called *diabetic ketoacidosis*. It is a potentially life-threatening complication of DM.

#### Symptoms and signs

- Volume depletion
- Acidosis
- Marked ketonaemia
- Depressed consciousness
- Potassium depletion with elevated serum levels

#### Investigations

- Glucose
- Electrolytes
- Urea
- Creatinine

#### Management

1. Give fluids—
  - Normal saline 2 L in the first 2 hours then individualize
  - Change to IV 5% dextrose in water when sugar level drops to 14 mmol/L or less
2. Give insulin: 10 units of regular insulin as IV bolus then 0.1 unit/kg per hour.
3. Give potassium chloride—
  - $K^+ \leq 3.5$  mmol/L, add 40 mmol to each litre of fluid
  - $K^+$  3.5 to 5.5 mmol/L, add 20 mmol to each litre of fluid
  - $K^+ > 5.5$  mmol, do not add
4. Give bicarbonate sodium carbonate if acidosis is severe.
5. Keep the patient warm.

6. Insert urinary catheter.
7. Insert an NGT.
8. Monitor electrolytes.

### 14.3 Metabolic Syndrome

Metabolic syndrome is the combined presence of obesity, high blood pressure, high blood glucose, and an abnormal cholesterol profile. When these risk factors are clustered together, the risk of developing stroke, coronary artery disease, and diabetes mellitus are much higher (see [table 14.3](#)).

#### Health education

Advise the patient to—

- Make the necessary lifestyle changes even though doing so will be very difficult.
- Start gradually.
- Not expect immediate results.
- Exercise because any exercise helps (e.g., walking, running, playing sports).
- Stop smoking.
- Reduce alcohol consumption.

## 14.3 Metabolic Syndrome

TABLE 14.3 Summary of Metabolic Syndrome

Obesity or Overweight	High Cholesterol	Hypertension	Diabetes Mellitus
<p>Body mass index (BMI) is calculated by the formula <math>\text{weight (kg)} \div [\text{height (m)}]^2</math>.</p> <ul style="list-style-type: none"> <li>• &lt;18 = normal</li> <li>• 18 to 25 = healthy</li> <li>• 25 to 30 = overweight</li> <li>• 30 to 40 = obese</li> <li>• 40 to 60 = very obese</li> </ul>	<p>Measured in mmol/L</p> <ul style="list-style-type: none"> <li>• Total cholesterol = &lt;5</li> <li>• Triglycerides = &lt;1.7</li> <li>• LDL = &lt;3.0</li> <li>• HDL = &gt;1.3 (female), &gt;1.0 (male)</li> </ul>	<p>Blood pressure (BP) measured in mmHg</p> <ul style="list-style-type: none"> <li>• Normal = &lt;140/90</li> <li>• Mild hypertension = 140 to 180 over 90 to 105</li> <li>• Moderate hypertension = 180 to 210 over 105 to 120</li> <li>• Severe hypertension = &gt;210 / &gt;120</li> </ul>	<p>Measured in mmol/L</p> <ul style="list-style-type: none"> <li>• Random glucose = 4 to 8</li> <li>• Fasting glucose = 4 to 6</li> <li>• HbA1c &lt; 7% (long-term control)</li> </ul>
Special Investigations			
Risk Factors			
<ul style="list-style-type: none"> <li>• Incorrect diet or poor nutrition</li> <li>• Alcohol abuse</li> <li>• No exercise</li> <li>• Family history</li> <li>• Age</li> </ul>	<ul style="list-style-type: none"> <li>• Overweight or obesity</li> <li>• Incorrect diet or poor nutrition</li> <li>• No exercise</li> <li>• Smoking</li> <li>• Family history</li> </ul>	<ul style="list-style-type: none"> <li>• Overweight or obesity</li> <li>• High salt intake</li> <li>• No exercise</li> <li>• Smoking</li> <li>• Family history</li> <li>• Medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Overweight or obesity</li> <li>• Incorrect diet or poor nutrition</li> <li>• No exercise</li> <li>• Family history</li> </ul>

TABLE 14.3 Summary of Metabolic Syndrome (cont.)

Obesity or Overweight	High Cholesterol	Hypertension	Diabetes Mellitus
<b>Effects on Body Organs</b>			
<ul style="list-style-type: none"> <li>• Fatty deposits</li> <li>• CVS: hypertension, heart failure</li> <li>• High cholesterol</li> <li>• Respiratory: shortness of breath, exercise intolerance</li> <li>• Musculoskeletal problems: pains in joints, OA</li> </ul>	<ul style="list-style-type: none"> <li>• Blocked arteries</li> <li>• CVS: angina, MI</li> <li>• CNS: stroke</li> <li>• Eyes: retinal damage, visual impairment</li> <li>• Kidneys: filtration problems, renal failure</li> </ul>	<ul style="list-style-type: none"> <li>• Rupture of arteries</li> <li>• CVS: coronary heart</li> <li>• CNS: stroke</li> <li>• Eyes: retinal damage</li> <li>• Kidney damage</li> <li>• Diabetes mellitus</li> </ul>	<ul style="list-style-type: none"> <li>• Metabolic disorder</li> <li>• CNS: coma (glucose too high or low)</li> <li>• Nerve damage: loss of sensation, ulcers, amputations</li> <li>• Eyes: retinal damage</li> <li>• Kidney damage</li> <li>• Skin changes: infections</li> </ul>

## 14.3 Metabolic Syndrome

TABLE 14.3 Summary of Metabolic Syndrome (cont.)

Obesity or Overweight	High Cholesterol	Hypertension	Diabetes Mellitus
<b>Management—Advise the patient to do the following</b>			
<ul style="list-style-type: none"> <li>• Eat an energy-reduced, healthy diet.<sup>a</sup></li> <li>• Achieve a weight loss of ½ kg per week.</li> <li>• Exercise daily (e.g., walk, cycle, go to the gym).</li> <li>• Avoid alcohol.</li> <li>• Consult a registered dietician.</li> </ul>	<ul style="list-style-type: none"> <li>• Eat a healthy, energy-reduced, low fat, low cholesterol diet.<sup>a,b</sup></li> <li>• Achieve a weight loss of ½ kg per week.</li> <li>• Exercise daily (e.g., walk, cycle, go to the gym).</li> <li>• Stop smoking.</li> <li>• Avoid alcohol.</li> <li>• Take medications as prescribed.</li> <li>• Consult a registered dietician.</li> </ul>	<ul style="list-style-type: none"> <li>• Eat a healthy, energy-reduced, low-salt diet.<sup>a,c</sup></li> <li>• Achieve a weight loss of ½ kg per week.</li> <li>• Exercise daily (e.g., walk, cycle, go to the gym).</li> <li>• Stop smoking.</li> <li>• Avoid alcohol.</li> <li>• Relax; de-stress.</li> <li>• Take medications as prescribed.</li> <li>• Consult a registered dietician.</li> </ul>	<ul style="list-style-type: none"> <li>• Eat a healthy, energy-reduced, diabetic diet.<sup>a,d</sup></li> <li>• Achieve weight loss of ½ kg per week.</li> <li>• Exercise daily (e.g., walk, cycle, go to the gym).</li> <li>• Stop smoking.</li> <li>• Avoid alcohol.</li> <li>• Take medications as prescribed.</li> <li>• Consult a registered dietician.</li> </ul>

a See "Section III. Nutrition and Lifestyle" for a discussion of obesity.

b See 14.1 above for a discussion of cholesterol.

c See "Section II. Diseases and Disorders According to Body System. Chapter 3. Cardiovascular System" for a discussion of hypertension.

d See 14.2 above for a discussion of DM.



## 14.4 Thyroid Gland Disorders

### 14.4.1 Hypothyroidism

Hypothyroidism is under-activity of the thyroid gland (i.e., low thyroid hormone levels).

- Onset is gradual and often mistaken for ageing or for depression.
- Its diagnosis is easily missed.
- It primarily affects middle-aged females.

#### Causes

- Congenital (usually gene mutations)
- Iodine deficiency
- Autoimmune
- Post-thyroidectomy
- Post-thyroiditis (infection)
- Post-radiotherapy for thyrotoxicosis
- Pituitary or hypothalamic malfunction
- Medicines—
  - Iodine excess (e.g., amiodarone)
  - Lithium
  - Antithyroid medicines

#### Investigations

- Thyroid functions tests (TFTs) (T3 and T4)
- Thyroid stimulating hormone (TSH)
- FBC
- AST
- Cholesterol

#### Symptoms and signs

- The symptoms are often vague, multiple, and chronic.
- Symptoms of decreased metabolic activity—
  - Sensitivity to cold
  - Menorrhagia (later oligomenorrhoea and amenorrhoea)
  - Loss of appetite
  - Constipation

## 14.4 Thyroid Gland Disorders

- Weight gain (moderate)
- Tiredness and weakness
- Symptoms of slowing of mental and sensory activity—
  - Forgetfulness
  - Slow, slightly hoarse speech
  - Depression
  - Decreases libido
  - Delayed reaction of tendon reflexes
  - Tingling in the fingers—carpal tunnel syndrome
  - Psychosis
  - Coma
- Symptoms of decreased physical activity—
  - Stiff, aching muscles
  - Slow pulse rate (bradycardia)
  - Low temperature
- Signs of hypothyroidism (myxoedema)—
  - Dull, expressionless face
  - Sparse hair (dry, brittle, alopecia)
  - Periorbital puffiness
  - Large tongue (macroglossia)
  - Pale, cool skin that feels rough and like dough
  - Dry skin that flakes easily on rubbing
  - Anaemia (normochromic, normocytic)
  - Pericardial effusion or plural effusions

### Management

#### In clinic, health centre—

1. Refer to hospital for diagnosis and starting treatment—
  - If hypothyroidism is suspected
  - If the patient has a thyroidectomy scar and is not taking thyroid replacement hormones regularly
  - To check the thyroid levels

#### In hospital—

1. Start patient on levothyroxine (thyroxine) at the following dosages—
  - Young, fit adult: 100 mcg daily
  - Old, frail adult: 50 mcg daily
  - Adult with ischaemic heart disease: 25 mcg daily

2. Check the patient after 3 to 4 weeks.
3. Increase by 50 mcg increments, if needed.
4. Perform annual TFTs.
5. Ensure adequate iodine intake (see “Section III. Nutrition and Lifestyle” for a discussion of iodine deficiency).

### 14.4.2 Hyperthyroidism

Hyperthyroidism is over-activity of the thyroid gland (i.e., high thyroid hormone levels).

- The symptoms are a result of overproduction of T3 and T4.
- It is more common in females (ages 20 to 60).

#### Causes

- Excess secretion of TSH (pituitary tumour)
- Abnormal thyroid stimulator (Grave’s disease)
- Autonomous hyper function within the gland (adenoma or toxic multinodular goitre)
- Acute thyroiditis (infection)
- Post-irradiation (rare)
- Postpartum (rare)
- Medicines (e.g., amiodarone)

#### Symptoms and signs

- Symptoms of increased metabolic activity—
  - Weight loss, but *increased* appetite
  - Preference for cold weather
  - Sweating, heat intolerance
  - Increased frequency of bowel action or diarrhoea
  - Polyuria
  - Menorrhagia or amenorrhoea; reduced fertility
  - Looks thin or wasted
  - Fine tremors of the fingers
  - Warm, sweaty hands
  - Skin warm, moist, and soft

## 14.4 Thyroid Gland Disorders

- Symptoms of increased mental or sensory activity—
  - Mood changes (e.g., irritability, patient cries easily, is emotional)
  - Nervousness
  - Hyperactivity (restlessness)
  - Rapid speech
  - Anxious
  - Hyperreflexia
- Symptoms of increased physical activity—
  - Palpitations with or without symptoms of cardiac failure
  - Tachycardia
  - Arrhythmias (e.g., atrial fibrillation, ectopic beats)
  - Bounding pulse, high pulse pressure
- Signs of hyperthyroidism—
  - Clinically detectable goitre may or may not be present
  - Muscle weakness
  - Muscle wasting (proximal myopathy)
  - Retraction of the upper eyelids (the patient appears to stare)
  - Failure to wrinkle the brow on upward gaze
  - Lid lag
  - Infrequent blinking
  - Onycholysis
  - Exophthalmos (proptosis)
  - Pretibial myxoedema (thyroid dermopathy of the shins)
  - Hair is fine and silky

### Investigations

- TSH, T4 (T3 if suspicion of toxicity)
- FBC, ESR, U+E, serum calcium (s-Ca)
- $\beta$ -HCG or sonar of uterus
- ECG
- CXR

## Management

### In clinic or health centre—

1. Refer immediately. 
2. If thyrotoxicosis (i.e., high fever, rapid pulse, restlessness) is suspected, refer urgently.

### In hospital—

1. For acute crisis—
  - Start propranolol 1 to 5 mg IV  
— OR —  
40 to 80 mg PO
  - Prescribe carbimazole PO or by NGT 0.5 mg/kg per day in 3 divided doses.
  - Ensure IV fluid replacement to maintain BP.
  - Prescribe dexamethasone 8 mg every 8 hours IV or PO.
  - Use Lugol's iodine (10% aqueous solution): 10 drops 3 times per day PO or by NGT.
  - Start oxygen.
  - Treat infections.
  - Start 125 mg dextrose per hour  
— PLUS —  
Thiamine 100 mg/day
2. For hyperthyroidism—
  - Prescribe carbimazole (5 mg tablets) 30 to 60 mg daily or in divided doses every 8 hours until euthyroid, then 5 to 15 mg per day for 18 to 24 months.  
— PLUS —  
Propranolol 40 mg 3 times per day
3. Refer patient for specialist care if no improvement.
4. Order regular TFTs and TSH test.
5. Order a thyroidectomy, if necessary.
6. Refer to oncologist for radioactive iodine therapy, if necessary.

## 14.4 Thyroid Gland Disorders

### 14.4.3 Goitre

A goitre is an enlarged thyroid gland.

#### Cause

- Dietary iodine deficiency
- Malfunction of the gland (sometimes)

#### Symptoms and signs

- Visible anterior neck swelling (on one or both sides of the midline)
- Swelling—
  - May be diffuse (Grave's Disease) or nodular (multi-nodular goitre)
  - Moves upwards on swallowing
  - Is not painful and it does not pulsate
- Difficulty with swallowing
- Breathing may be difficult and snoring is present
- If the thyroid gland is small, there are usually no symptoms

#### Management

##### In clinic and health centre—

1. Refer unless previously investigated.
2. Always refer if—
  - Nodular
  - Patient has trouble breathing
  - Size of the thyroid gland suddenly increases
  - Eyes become more prominent and pulse rate increases
  - Voice becomes harsh; hair and skin become very dry and brittle
  - Patient shows signs of hyperthyroidism
3. Ensure adequate iodine intake (see [“Section III. Nutrition and Lifestyle”](#) for a discussion of iodine deficiency).

**In hospital—**

1. Differentiate between—
  - Solitary thyroid nodule (could be malignant)
  - Thyroglossal cyst (fluid-filled mid-line swelling, genetic remnant)

**Health education**

- Instruct the patient to make monthly follow-up visits initially, then every three months.
- Advise the patient that if he or she notices further increases in size of the thyroid gland or any of the above-mentioned symptoms occur, to return to the doctor.
- Discuss adequate iodine intake (see “[Section III. Nutrition and Lifestyle](#)” for a discussion of iodine deficiency).

**14.5 Andropause**

Andropause occurs in men and is analogous to the menopausal process in the female.

**Symptoms and signs**

- Listlessness
- Depression
- Loss of libido plus erectile dysfunction (ED)
- Poor concentration and productivity

**Investigations**

Testosterone (measured early in the morning before 10 a.m.)

**Management**

1. Address lifestyle factors such as—
  - Overweight (especially abdominal obesity)
  - Alcohol and tobacco abuse
  - Other substance abuse (i.e., medications)
  - Exhaustion, poor sleep, and stress
  - Metabolic syndrome: abnormalities of lipids, BP,

## 14.5 Andropause

glucose and abdominal obesity (see 14.3 above for a discussion of metabolic syndrome)

2. Testosterone supplementation (tablets, injections, and implants)—
  - Is indicated if the factors above and prostate cancer have been excluded
  - Will cause reduced fertility
  - Constitutes long-term treatment

### 14.5.1 Erectile Dysfunction

ED is a symptom, not a diagnosis. The metabolic syndrome must be ruled out as well as hypogonadism and premature ejaculation.

#### Management

Recommend the following (if available)—

1. Occlusion devices
2. Vacuum devices
3. Intracavernosal injections
4. Oral preparations

### 14.5.2 Premature Ejaculation

Premature ejaculation means is reaching climax within 3 minutes during sexual intercourse with partner dissatisfaction.

#### Management

1. Prescribe an antidepressant (e.g., imipramine or fluoxetine) for 3 to 6 months taken daily.
2. Consider a referral to an urologist.



## 15.1 Anxiety

Anxiety can be divided into—

- Panic disorder
- Generalised anxiety disorder (GAD)

### 15.1.1 Panic Disorder

Panic disorder is an episode of sudden onset of extreme anxiety with intense physical symptoms. The first attack comes typically out of the blue and suddenly, often without a trigger. Attacks typically peak in 10 minutes and last 20 minutes. After first attack, anticipatory anxiety triggers subsequent attacks, leading to avoidance of the place or situation of attack.

#### Causes

- Cerebral dysregulation of serotonin and noradrenaline transmitter systems
- Excessive sympathetic response to stress
- Genetic predisposition
- Conditioning—parental modelling
- Inappropriate coping skills

#### Symptoms and signs

- Anxiety, panic
- Sweating
- Tachycardia
- Tremors
- Feeling of tightness in chest

#### Differential diagnosis and investigations

- Fever—signs of intoxication and infection
- Hyperactive thyroid gland

#### Management

1. Patient counselling is very important.
2. Provide stress management counselling
3. Suggest lifestyle changes.
4. Urge the patient to avoid stimulants (e.g., caffeine).
5. Urge the patient to avoid alcohol.

## 15.1 Anxiety

6. Recommend psychotherapy and counselling to help the patient achieve the following:
  - Learn breathing techniques
  - Learn relaxation techniques
  - Prevent negative thinking
  - Be exposed to difficult situations
7. Provide the patient with information about local support groups.
8. Prescribe medications.
  - For an acute situation—
    - Lorazepam: 4 mg sublingual or IM injection
    - Alprazolam (if available): 0.25 mg PO 3 times per day for 2 weeks to control anticipatory anxiety
  - For long-term care—
    - Treat the patient for a minimum of 9 months. Patients with genetic predisposition need lifelong treatment.
    - Be vigilant for comorbid depression (see [15.3](#) below for a discussion of major depressive disorder). Prescribe the following—
      - ◆ Fluoxetine: 20 to 60 mg daily. Start with 20 mg daily, and increase every 2 weeks up to the maximum effective dose.  
—— OR ——
      - ◆ Paroxetine: 20 to 40 mg daily. Start with 10 mg and increase weekly. **Note:** Do not start with high doses; high doses will trigger panic attacks.  
—— OR ——
      - ◆ Sertraline: 50 mg daily. Start with half tablet. Can increase to 150 mg daily. **Note:** In patients with SE, this medicine can cause insomnia or diarrhoea.  
—— OR ——
      - ◆ Imipramine. Start with 50 mg daily; increase to 150 mg daily. Unwanted effects of this medicine can include problems with somnolence,

constipation, urinary retention, dry mouth, or uncomfortable palpitations with dysrhythmias in some. Do *not* give to children.

9. Refer to hospital—
  - If another medical diagnosis is suspected
  - For assessment and medications

### Health education

- Explain the disorder to patient (i.e., nervous tension and mental exhaustion).
- Try to elicit the reasons the patient may be experiencing panic disorder and help him or her overcome it.
- Reassure the patient.
- Refer to hospital for further investigation and treatment.
- Ask patient to come back to the clinic after 2 weeks.
- Search for signs of depression and treat accordingly.

### 15.1.2 Generalized Anxiety Disorder

GAD is excessive anxiety lasting longer than 6 months where chronic worry is the typical, central symptom. The patient cannot control his anxiety, and it often occurs in combination with physical symptoms without a readily identifiable life-event or situation. GAD is the most common psychiatric disorder (8%) and more prevalent in females (occurs twice as often). Differentiate from—

- *Situational anxiety*: Normal anxiety in times of stress, forthcoming examinations, specific environments, or situations
- *Hysteria*: Anxiety state in which the patient shows theatrical behaviour (like an actor on the stage)
- *Social anxiety disorder or social phobia*: Fear of specific social situations; fear of public embarrassment and focus of attention that leads to avoidance and impairment of normal life

### Causes

- Genetic load (30%)
- Gamma-aminobutyric acid (GABA) system
- Ineffective defence mechanisms
- Lack or loss of sense of control
- Distortion of information processing
- Faulty perception of own ability

### Symptoms and signs

- Severe anxiety syndrome (chronic worry about minor problems and inability to relax)
  - Nervousness, restlessness
  - Tension and unease
  - Preoccupation with worries, cannot control worrying
  - Feelings of unreality (i.e., derealization)
  - Depersonalization
  - Syncope (20%)
  - Difficulty in concentrating, in fulfilling normal daily tasks
  - Insomnia and other sleep problems (difficulty in falling asleep)
  - Avoidance of feared situations
- Physical or somatic symptoms (mostly autonomic); at least 3 of the following:
  - Pulmonary discomfort (e.g., shortness of breath, choking)
  - Cardiovascular symptoms (e.g., palpitation of the heart, chest pains, pains between the shoulders)
  - Muscle aches
  - Chronic fatigue or insomnia
  - Loss of concentration
  - Irritability
  - Tension headaches, especially in times of stress
  - Autonomic symptoms (e.g., cold moist hands, sweating, trembling, blushing)
  - Irritable bowel syndrome or digestive problems (e.g., diarrhoea, constipation, nausea, vomiting)

- Panic attacks (see 15.1.1, above)
- Frequent urination
- Impairment of work, personal, or social functioning

## Management

1. Exclude substances, medical conditions, mood disorders, or psychotic disorders.
2. Psychotherapy is essential to help the patient—
  - Change insight
  - Improve ego strength
  - Change to effective defence mechanisms
  - Address internal conflicts
  - Learn assertiveness, improve self-image, and manage conflict
3. Recommend or provide lifestyle counselling as well as time management and relaxation techniques.
4. Remind the patient that self medication is dangerous.
5. Prescribe medications.
  - First-line treatment—
    - Paroxetine (if available). Start with 10 mg daily; increase weekly to 20 to 30 mg daily or 40 mg if no response. Treatment trial must be at least 6 weeks. Patient must be followed up weekly to check treatment response and to provide supportive counselling. Make sure that the patient understands that medicine response can take up to 10 weeks. If response is good, continue for 9 months.

— OR —

  - Benzodiazepines. If anxiety is severe, add a short-acting anxiolytic for the first 2 to 4 weeks.
  - Alprazolam: 0.25 mg 4 times per day. Make sure patient does not skip doses; skipping can precipitate panic attack or rebound anxiety.

- Second-line treatment—
  - If the patient's response is poor on selective serotonin reuptake inhibitor (SSRI), switch to selective noradrenaline reuptake inhibitor (SNRI)
    - ◆ Start with venlafaxine 37.5 mg daily, switch to venlafaxine (modified release) 75 mg daily after 1 week and increase again after 1 week to venlafaxine (modified release) 150 mg daily. **Note:** Check weekly for akathisia or restless leg syndrome and monitor BP; this medicine can increase BP in some patients.
  - OR —
  - ◆ Tricyclic antidepressant (TCA): Imipramine. Start with 50 mg daily. Increase in 50 mg increments as single dose at night. This medicine is also a sedative, especially for patients with insomnia. Increase to 150 mg daily as needed. **Note:** Check patient weekly for side effects. If problems with micturition, discontinue.


### Health education

- Avoid long-term benzodiazepines.
- Without therapy these patients will always relapse.
- Weekly follow-up during the titration phase of medicine therapy is essential.
- Patient must be well informed on expected side effects.
- Treatment should continue for minimum of 9 months after remission is achieved.
- Discontinuation of medicine treatment must be slow; taper dose by 50% every 4 weeks and re-evaluate for signs of relapse.
- Condition tends to be chronic and run a waxing and waning course.

## 15.2 Delirium or Confusion

Delirium is a metabolic disruption of brain function as a result of a specific organic cause.

### Notes:

- Delirium is a **medical emergency** and must be treated as such. It carries a mortality of 30%. 
- Delirium is *not* a diagnosis, but a symptom complex for which an organic cause must be found.
- Delirium is traditionally not treated by the psychiatrist, but by the internist, neurologist, neurosurgeon, or senior medical officer.
- Psychiatric assessment is necessary to distinguish delirium from psychosis.
- Timely referral and medical work-up reduces mortality; the mortality increases dramatically after 24 hours.

### Causes

The acronym DIMTOP defines the possible causes of delirium or confusion

- **D = Drugs or medicines**—the most common cause; includes an extensive variety of social drugs (e.g., alcohol, cannabis, ecstasy, cocaine, methaqualone [mandrax]) and medicines (e.g., antibiotics, antihistamines, anticholinergic medicines, corticosteroids, tetracyclines, mefloquine, metoclopramide, tricyclic antidepressants, antivirals) **Note:** Delirium can be due to—
  - The direct effect of the chemical
  - Intoxication
  - Withdrawal from a drug or medication (e.g., benzodiazepine withdrawal)
- **I = Infection**—viral including HIV, bacterial, protozoal
- **M = Metabolic**—dehydration, hypo- or hyperglycaemia, acidosis, hyponatraemia (i.e., electrolyte disturbances), sequelae of systemic failure (i.e., kidney, liver, pulmonary, CVS), DIC, and all the anaemias

## 15.2 Delirium or Confusion

- **T = Trauma**—chronic subarachnoidal haemorrhage especially in the geriatric patient. **Note:** Trauma is often missed; typically, the patient exhibits low-grade clouding without dramatic symptoms.
- **O = Oxygen**—all pulmonary and CVS conditions (e.g., chronic obstructive airway disease and asthma, lobular pneumonia in the elderly); often silent with no or little signs of infection, delirium often first sign; also silent MI, asphyxiation, TIA, CVA
- **P = Psychiatric**—Alzheimer's, Parkinson's, Huntington's chorea, multi-infarct dementia, AIDS-associated dementia, or extreme psychological trauma (rarely)

### Symptoms and signs

- Clouding of consciousness that leads to an inability to process sensory input correctly, which in turn leads to disorientation and inappropriate behaviour (primary sign) **Note:** The psychotic patient never has clouding or attention deficit, is seldom aggressive, and is never disoriented.
- Gross disorientation
- Sometimes subtle with little or no disorientation
- Fluctuating attention deficit
- Visual or somatic illusions
- Carphology (picking as if at bugs on the skin) is pathognomonic of alcohol withdrawal delirium
- Anxiety and agitation due to inability to orient him- or herself leading to injury to self or others **Note:** Approaching delirious patients calmly is important; do *not* respond with aggression.

### Investigations

- Most important—extensive family history and *full* physical examination
- Then—
  - U+E
  - FBC
  - LFT



- TFT
  - Serum glucose
  - Urine screen and MCS
  - Blood MCS and slide
  - CXR, AXR, and CT of brain, if indicated
- If no clear cause is indicated, refer the patient to a specialist.

## Management

### Acute management—

1. Ensure patient's safety and that of others; restrain patient if necessary. **Note:** Use one person for each limb; assure patient that you are helping him or her; tie all four limbs to bedrails; watch for vomiting and aspiration; *never* leave the patient alone.
2. Insert an IV line, and start sedation immediately. **Note:** Ineffective and incomplete sedation will aggravate patient's confusion and agitation. Avoid IM injections because of unpredictable absorption.
3. Start with haloperidol 5 mg IV injection every 10 minutes.
4. Simultaneously add side drip with 10 to 15 mg diazepam in 50 to 100 mL saline and run in over 15 to 20 minutes. **Note:** *As soon as possible*, start treatment of the causal illness or problem (i.e., within hours after admission).

### Maintenance management—

1. Calculate the total haloperidol given to achieve full sedation, and give that amount in divided doses every 2 to 4 hours over the next 12 hours.
2. If the patient is calm after the first 12 hours, increase dose intervals to 8 hours, and taper over next 4 to 5 days.
3. Diazepam can be repeated every 8 hours if necessary.

### 15.3 Depression

#### 15.3.1 Depressive Disorder

Depression is a condition characterised by severe sadness lasting for longer than 2 months, with consequent diminished interest in other activities, social impairment, and physical symptoms that are not due to bereavement. Reactive depression occurs after the death of a beloved person, personal disappointments, social problems, or postpartum. It is an understandable excessive reaction to an event and usually does not last long. It can go together with anxiety. Endogenous depression is a long-lasting disease for which a cause often cannot be found. The sadness is more serious with tendency to commit suicide.

Major depressive disorder (MDD) is a chronic debilitating illness.

#### Causes

- Genetic predisposition
  - Viral theory
  - Dysregulation of neurotransmitter function in limbic system and frontal cortex (i.e., a complex interaction between various transmitter systems: serotonin, dopamine, noradrenaline); pre- and post-synaptic receptor dysfunction or damage
- Psychodynamic causes include—
  - Unexpressed childhood anger
  - Losses with projective negative emotions towards the own ego by the superego
- In family depression—modelled depressive responses towards stressors
- Environmental factors—
  - Medical conditions: any serious illness, terminal illness (e.g., HIV/AIDS, cancer)
  - Medications (e.g., HAART)
  - Hormonal changes (e.g., postpartum, hypothyroidism)

### Symptoms and signs

At least 4 of the following symptoms are consistently present for 4 weeks—

- Melancholic features, psychotic features with mood congruent symptoms, catatonic features
- In adolescents and children—depressed mood mostly expressed in behaviour; oppositional and aggressive episodes
- Loss of interest in most things, inability to experience pleasure
  - Decreased motor activity
  - Fatigue, loss of energy
  - Unable to fulfil normal activities, work
  - Decreased interest in people and social commitments, withdrawal
  - Sadness, unhappiness, feelings of hopelessness and worthlessness
- Depressed mood (i.e., lethargic, slowness of speech and thought)
- Loss of concentration, forgetfulness
- Feelings of guilt
- Insomnia, typically mid-type (i.e., patient falls asleep easily, but wakes up at 2:00 to 3:00 a.m. and cannot sleep after that)
- Sleeplessness or sleeping too much
- Change in appetite (increase or decrease); weight loss
- Loss of libido
- Thoughts of death, suicide
- Restlessness, agitation
- Unexplained somatic symptoms and physical complaints—
  - Headache
  - Abdominal pain, nausea and vomiting, diarrhoea
  - Chest pains
  - Difficulty in breathing, swallowing
  - Pain disseminated all over the body and muscle aches

## 15.3 Depression

- Lower back ache
- Frequent urination
- Skin rashes, itching

### Differential diagnosis and special investigations

The following conditions should be excluded—


- Bereavement process, adjustment disorder (“reactive depression”), depressive episode in bipolar mood disorder, substance-associated mood disorder
- Thyroid disorders (use TFTs), corticosteroid medications, Cushing’s syndrome, Parkinson’s disease, brain tumour, neurological disorders, recreational drugs and medications, dementia, delirium, and schizophrenia

### Management

#### Notes:

- High relapse rates cause poor treatment response due to receptor damage.
- Full remission is achieved only with up-regulation of receptor population across synapses, which takes minimum of 6 months after initial remission of symptoms.
- 70% of MDD patients respond well to modern medicines.
- Some antidepressants are associated with an increased suicide risk in the first 8 to 12 weeks of treatment. Continued clinician involvement (i.e., regular monitoring of patient’s mood response) is essential.
- Most antidepressants activate the cytochrome P450 system, a source of interactions with other medicines (e.g., antibiotics, anti-hypertensives, antiviral, and anti-diabetic medicines).
- Treatment trial must be minimum 6 weeks, with 2 weeks of washout between medicines.

#### In clinic or health centre—

1. Refer the patient to hospital for treatment.
2. Urgent **referral** is indicated, if the patient exhibits signs of concrete suicidal intentions. 

**In hospital—**

1. Confirm diagnosis by psychological assessment.
2. Identify precipitating stressor or stressors.
3. Identify maintaining stressor or stressors.
4. Help the patient work through personal losses.
5. Identify and establish a social support system (i.e., friends, family, work).
6. Help the patient develop effective coping strategies.
7. Start antidepressant medication if necessary.

**Notes on antidepressant medications:**

- Avoid tricyclic antidepressants (TCAs) in children.
- The basic effectiveness of antidepressants does not differ much among the available medicines. They differ mainly in terms of their side-effect profiles, which can mean, for example, that some medicines are more sedative, some suppress appetite, and some may increase appetite. Most antidepressants tend to affect libido negatively and some patients may develop anorgasmia.
- Medicines are chosen according to their ability to enhance or influence serotonin, noradrenaline, dopamine, anti-histaminic, muscarinic, or beta-adrenergic neurotransmission in the limbic and related systems.

■ **First-line treatment—**

- TCAs are as effective as SSRI's but anticholinergic side effects in therapeutic doses cause discomfort (e.g., dry mouth, palpitations, constipation) that may negatively affect treatment compliance. TCAs are also not safe in overdoses; they can cause irreversible tachyarrhythmia.
  - ◆ Amitriptyline (25 mg tablets): 75 to 150 mg daily at night

— OR —

## 15.3 Depression

- ◆ Imipramine (10 mg tablets): 50 to 150 mg daily at night
  - ◆ Always start lower dose and increase if no response
- Note:** Warn the patient *not* to drink alcohol.

— OR —

- SSRIs: Most patients will respond well on these medicines and, combined with psychotherapy, they should achieve full remission within 10 weeks. Prescribe fluoxetine for adults and children >8 years: 20 to 60 mg daily for the acute phase for 12 weeks and for the continuation phase 6 to 12 months.

— OR —

- SNRIs: These medicines are often more anxiolytic and due to the enhanced noradrenaline function, some patients respond within a few days. High doses early in treatment can cause agitation or psychomotor restlessness.
- Second-line treatment (only by specialist psychiatrist)
    - Combination of SSRI and TCA
    - Combination SNRI and SSRI
    - Combination SSRI and mood stabilizer (i.e., carbamazepine or valproic acid).
    - These combinations should only be applied by a clinician with experience in this field.
  - Third-line treatment, refer to psychiatry specialist for alternative treatment.
8. The patient must come back to the clinic after 2 weeks.
  9. If there is no improvement after 4 weeks, refer back to hospital for increased dosage.
  10. If there is still no improvement, refer back to hospital for another treatment scheme and intense supervision of the patient.

### Health education

- Medication must be taken daily for at least 6 months to 1 year; otherwise, the patient's depression will return.
- Inform the patient that the tablets prescribed in the hospital will improve his or her condition, but not before roughly 2 to 3 weeks.
- Urge the patient to find the cause of the problem, and try to help him or her to overcome it.
- Recommend counselling on negative thinking, exaggeration, taking the blame, and problem solving.
- Involve family and friends, so that they can understand and assist better.

### 15.3.2 Bipolar Mood Disorder and Manic Depression

Bipolar mood disorder (BPMD) is defined as a history of depression (however, only 70% of patients start with depressive episode) with at least one episode of mania. It is a lifelong, chronic, debilitating illness with high rate of relapse episodes, typically associated with high incidence of alcohol and drug abuse/misuse of medicine (i.e., self-medication).

- Usually, the first episode occurs in the early to mid-twenties, and affects males and females equally
- Patients are more sensitive to stressful events than normal people, and such events can precipitate a manic or depressive episode.
- More than half of patients have 10 or more episodes in a lifetime.
- Full recovery from manic episode takes 6 to 9 months.
- Treatment response deteriorates with relapse episodes.
- 30% patients deteriorate despite appropriate treatment.

There are different episodes, and there can be rapid cycling:

- BPMD I: mania and depression
- BPMD II: hypomania and depression
- Mania and depression occurring simultaneously

### Symptoms and signs

- Manic episode
  - Pressure of mood (i.e., severe mood swings, highly manic, 'hyper')
  - Pressure of speech (i.e., talkative, phoning in middle of the night)
  - Pressure of movement (i.e., highly active, working or cleaning more than usual)
  - Mood can be euphoric, irritable, explosive, or aggressive
  - Speech often with clanging (rhyming), loose association
  - Thoughts pre-occupied with religion, sex, or persecution
  - Behaviour impulsive, agitated
  - High incidence of aggression (75%)
  - Delusions and hallucinations possible
  - Often wears bright-coloured clothing, make-up, jewellery
  - Insight typically poor (e.g., foolish, spending money, trouble-making)
  - Severe insomnia with nocturnal restlessness; episode often preceded by 2 to 3 days insomnia
  - Often precipitated by stressful event
- Depression (see [15.3.1](#) above, MDD)

### Management

#### Notes:

- Continuous lifelong prophylactic treatment is *essential*.
- The mainstay of treatment is mood stabilizing medication.
- Treatment of acute mania, with or without psychosis is needed.
- Treatment of depressive episodes is needed.
- Management of prophylaxis and long-term mood control are needed.



- Change and fine tune maintenance doses to lowest possible effective dose and/or combination.
- Patient *and family* education are needed.

### Management of a manic episode in clinic, health centre, or hospital—

1. Prescribe initial sedation—
  - Haloperidol 15 to 20 mg IM injection stat  
— PLUS —  
A benzodiazepine:
  - Lorazepam 4 mg IM injection stat  
— OR —
    - Diazepam 10 to 15 mg PO or slowly by IV injection; do not give by IM injection.
  - OR —
  - Clopenthixol 150 mg IM injection; this medicine will sedate the patient for 48 hours.
2. Maintain the sedation for 3 to 4 days—
  - Haloperidol 5 to 10 mg every 6 to 8 hours PO PLUS diazepam 5 to 10 mg every 8 hours PO  
— OR —
  - Clotiapine 40 to 80 mg every 8 hours PO or IM injection PLUS diazepam 5 to 10 mg every 8 hours PO
3. Prescribe first-line mood treatment—
  - Clozapine 50 to 100 mg PO 3 times per day  
— PLUS —
  - Lithium 400 to 500 mg 2 times per day. **Note:** Lithium levels must be titrated against blood level whether used alone or in combination.  
— OR —  
Lithium plus valproate 1000 to 1500 mg daily; minimum effective dose 1000 mg.  
— OR —  
Lithium plus topiramate 100 to 200 mg daily; titrate slowly from 50 mg daily.  
— OR —

## 15.3 Depression

Lithium plus lamotrigine titrate slowly from 25 mg per day; increase in 2-week increments to 100 mg 2 times per day. **Note:** This combination carries a risk of severe skin allergy, Stevens-Johnson syndrome, and DIC. If the patient has any sign of skin rash or lymph-adenopathy, discontinue the medicines.

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### *Notes on first-line mood treatment:*

- Carbamazepine cannot be combined with clozapine because of possible agranulocytosis.
- Lithium toxicity can cause neuropathy, acute renal failure, and death. Regular blood levels are essential—titrate to therapeutic window of 0.6 to 1.2 mcg/mL. Also do regular TFT because lithium causes hypothyroidism. Always check for coarse tremors; they can be first sign of toxicity. Do not combine with digoxin, tetracycline, diuretics, phenylbutazone, indomethazine, or methyldopa.

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#### 4. Move to second-line treatment for depression in BPMD.

- Lithium is preferred medicine

#### — OR —

Citalopram (20 mg), paroxetine (20 mg), venlafaxine (75 mg), one at a time. Start with a low dose and adjust as necessary.

- Use careful titration to avoid a manic episode.
- Check for rapid cycling, which may be induced by regular antidepressants or SSRI's.

#### 5. Ensure long-term maintenance (see health education).

### Health education

- Stress to the patients that the medications must be taken.
- Bipolar disorder will start again if medications are suddenly stopped.

- Patient information and motivation are very important for a good result.
- Prevention of relapse episodes is the goal. **Note:** Teach patient to recognize early signs of relapse (e.g., insomnia, irritability, euphoria).
- Regular follow-up is essential.

## 15.4 Insomnia

Sleep is a physiological function important in the regeneration of cell structures, maintenance of homeostasis, and energy saving. Normal sleep follows a specific pattern of two types namely: slow wave sleep and rapid eye movement sleep.

Insomnia, the commonest sleep disorder, is the difficulty or inability to fall asleep or to remain asleep consistently each night over a period of more than 1 month. Normal sleep duration is 6 to 9 hours. Sleep deprivation leads to ego disintegration, hallucinations, and delusional thinking. One third of adults are afflicted.

Insomnia can be persistent or transient.

### Causes

- Psycho-physiological (e.g., stress and tension, jet-lag)
- Psychiatric—mood (e.g., depression, bipolar disorders), personality, or psychotic disorders (e.g., anxiety disorders)
- Substance related—alcohol, stimulants (e.g., caffeine, nicotine), medications (e.g., antihistamines, hypnotics, benzodiazepines), or recreational drugs (e.g., ecstasy, amphetamines)
- Respiratory (e.g., sleep apnoea)
- Childhood onset
- Nocturnal myoclonus (i.e., restless legs syndrome)
- Medical problems—
  - Pain (e.g., from cancers, bone pain)

- Nocturia (e.g., from DM, UTI, prostate problems)
- Sleep apnoea (e.g., from severe URTIs, narcolepsy, and apnoea)

### Symptoms and signs

- Sleeplessness—
  - Difficulty falling asleep (e.g., because of stress, tension, anxiety)
  - Middle of the night waking (e.g., because of depression)
  - Early morning waking (e.g., because of stress, tension, overwork)
  - Frequent waking during the night (e.g., because of nocturia)
- Chronic tiredness and fatigue
- Anxiety
- Stress and tension
- Depression
- Loss of concentration
- Symptoms and signs of underlying medical conditions

### Management

1. Tell the patient how to practice good sleep hygiene.  
**Note:** This is the treatment of choice.
  - Avoid the following shortly before bedtime—
    - Caffeine (coffee, cola)
    - Alcohol
    - Smoking
    - Large meals
    - Stimulating activities (e.g., physical exercises, computer)
    - Eating, drinking, or reading in bed
  - Consider doing the following—
    - Winding down before sleep
    - Creating an atmosphere in the bedroom that is more conducive to sleep (i.e., dark and quiet)
    - Finding a comfortable and quiet sleep environment if possible

- Setting a regular sleep routine
  - Striving to get 7 to 8 hours in bed every night
  - These efforts at good sleep hygiene must be practiced by the patient for 7 days a week for several months with regular review by the health worker.
2. Find cause of insomnia. Most important, make the correct diagnosis.
  3. Provide the patient with the following information—
    - Patients must accept that it takes months to repair poor sleeping habits.
    - Patients must understand that long-term use of benzodiazepines aggravates insomnia and causes depression. They do *not* improve the sleep architecture, but rather induce tolerance and cause daytime somnolence.
  4. Teach the patient specific relaxation techniques. Patients must be trained by therapist to achieve full relaxation. Relaxing is often not easy for anxiety sufferers, and it may take months for them to master the technique.
  5. Use pharmacotherapy.
    - For use of hypnotics, refer to specialist psychiatrist.
    - If a benzodiazepine is prescribed, it must be a high-potency, short-acting medicine used for a maximum of 14 days (e.g., triazolam).
    - New hypnotics for long-term use include zolpidem 10 mg and zopiclone 7.5 mg.

### Health education

- Educate the patient on good sleep hygiene and relaxation techniques.
- Encourage regular exercise.
- Encourage the patient to eat a healthy diet.

### 15.5 The Psychotic Patient—Schizophrenia

A number of disorders can cause a patient to have psychotic break (i.e., a state in which perception of reality is grossly impaired). There are different types of psychotic disorders characterised by derangement of personality and loss of contact with reality, often with delusions, hallucinations, or illusions. This section focuses on schizophrenia.

Schizophrenia is a debilitating mental illness with dissociation or splitting between thoughts, emotion, and behaviour. It is a complex clinical syndrome, heterogenic in its causes, clinical presentation, and course.

#### Causes

- Toxic psychosis or drug/substance abuse: drug intoxication and/or withdrawal (i.e., from alcohol, marijuana or cannabis, amphetamines, cocaine, LSD)
- Primarily neural developmental problem
- Birth trauma
- Viral infections
- Genetic predisposition (prominent cause)
- Stressful life events often a precipitant
- Families who have high expressed emotion in their interaction are particularly prone to this illness
- Mania in bipolar disorder (see [15.3.2](#) above)
- Delirium (see [15.3.1](#) above)

#### Symptoms and signs of schizophrenia


- Symptoms must be for >6 months.
- Symptoms must not be medicine induced.
- Symptoms must not be due to a medical condition.
- Notable functional loss
- Must have 2 or more of the signs or symptoms:
  - Delusions
    - ◆ Sense of persecution; fears of being attacked
    - ◆ Misidentification of self; thinks of being somebody else or God
    - ◆ Feels controlled by something, someone

## 15.5 The Psychotic Patient—Schizophrenia

- Hallucinations (often auditory or visual)
- Disorganized speech
- Disorganized behaviour (i.e., sudden change in moods, aggressiveness, withdrawal, personal neglect, refusal to eat or drink)
- Negative symptoms (e.g., anhedonia, alogia, avolition)
- Disorientation as to time, place, and date

### Management

#### In clinic or health centre—

1. **Refer** the patient to hospital. 
2. Restrain the patient by binding him or her, if absolutely necessary, to prevent injury.
3. In case of emergency, administer diazepam 10 mg by IV injection.
4. Treat the patient calmly, and talk to him or her nicely. Do not argue.

#### In hospital—

- General management
  1. Make the correct diagnosis.
  2. Treatment involves acute phase treatment, stabilization, maintenance treatment, family counselling, and support.
  3. Prescribe antipsychotic medication (as outlined below).
- Management of the acute phase
  1. Start—
    - Haloperidol 15 to 20 mg IM injection stat and daily as needed  
—— OR ——
    - Clotiapine 10 to 80 mg IM injection every 8 hours  
—— OR ——
    - Fluphenazine 2.5 mg IM injection every 8 hours
  2. Add a benzodiazepine for sedation if necessary (i.e., lorazepam 4 to 5 mg at night).

3. Monitor closely for side effects (e.g., acute dystonia, oculogyric crisis, extra pyramidal symptoms, neuroleptic malignant syndrome with excessive sweating, fever, muscle stiffness, dystonia). Side effects can be dangerous and require ICU treatment. **Note:** If extra-pyramidal side effects occur, add biperidin 2 to 4 mg 3 times per day or trihexyphenidyl (benzhexol) 5 to 15 mg daily in 3 to 4 divided doses. In the case of acute dystonia, also add diazepam.

- Management of the maintenance phase (start as soon as possible)

1. Start depot injection: fluphenazine depot 25mg or flupenthixol depot 40 mg. Titrate dosing against clinical response and extra-pyramidal side effects (EPSE). Can give depot injections weekly and then reduce to 2-week or 4-week dosing.

— OR —

Start flupentixol PO 10 to 20 mg daily, haloperidol 4 to 10 mg daily, and risperidone 2 to 6 mg daily.

2. More than 50% of schizophrenia patients also have concomitant depression. If the patient has depression, add an antidepressant (i.e., imipramine 75 to 150 mg or paroxetine 20 mg or fluoxetine 20 mg).
3. When the patient is stable and has regained insight, taper and titrate dosing to minimum required dose to control symptoms.
4. Insight therapy is essential. The patient must be well informed about his illness, accept his illness, and learn to identify early symptoms of relapse.

- If none of the above is available, follow these steps in this order:

1. Prescribe phenothiazines.

- Chlorpromazine (25 mg/mL): 100 mg stat
- Then 150 to 250 mg BD PO. **Note:** Monitor BP.

— OR —

- Pimozide—
  - ◆ Long-acting, oral



## 15.5 The Psychotic Patient—Schizophrenia

- ◆ Initial: 2 to 4 mg daily
  - ◆ Maintenance: 2 to 12 mg per week (to a maximum of 20 mg)
2. Prescribe butyrophenones.
    - Haloperidol (1 mg/mL): 5 to 10 mg stat IM
    - Then 1.5 to 5.0 mg BD
  3. Prescribe sulpiride.
    - Initial: 200 to 400 mg
    - Maintenance: 400 to 600 mg in 2 divided doses (to a maximum of 1.2 g)
    - Rule out other medical disorders or medications

### Health education

- Brief the caregiver(s) about the illness.
- Discuss the possible outcomes.
- Teach the family to recognize early signs of relapse.
- Discuss the importance of treatment compliance.
- Stress to the patient and family that regular follow-up is essential.
  - Follow-up in the clinic monthly should involve the patient and one family member. Find out from both how the patient is feeling
  - Supportive and structured routine in the ward and at home is helpful to these patients.
  - At clinic visits evaluate—
    - ◆ Psychological well being
    - ◆ General appearance
    - ◆ Weight
    - ◆ Compliance

### 15.6 Mental Illnesses That Should Be Referred for Specialist Treatment

#### **Acute Oropharyngeal Dystonia**

Acute oropharyngeal dystonia is a relatively rare neuroleptic-induced dystonic contraction of the muscles of the oropharynx and the tongue. It is fairly easy to treat (with biperidin and diazepam), but can cause respiratory distress and asphyxiation.

#### **Anorexia Nervosa**

Anorexia nervosa, a body dysmorphic disorder with a high mortality rate, requires treatment by a specialist. The metabolic sequelae of their anabolic state make these patients particularly susceptible to multiple organ failure and sub-acute electrolyte disturbances. Treatment requires a multidisciplinary approach that includes a psychiatrist, internist, dietician, and psychologist.

#### **Benzodiazepine Addiction**

Detoxification and weaning of patients addicted to these medicines are fraught with complications and should not be attempted without specialist supervision.

#### **Borderline Personality Disorder**

These patients often present with major depressive episodes. The condition is typified by self-destructive behaviour and repeated interpersonal and interactional crises. They require long-term psychodynamic therapy which should not be attempted without extensive experience in this field. These patients carry a high risk for suicide.

#### **Central Serotonin Syndrome**

Central serotonin syndrome is the result of overdosing with antidepressants which increase central (brain) serotonin activity. The clinical features resemble malignant hyperthermia and patients need admission to ICU.

#### **Neuroleptic Malignant Syndrome**

Also a neuroleptic-induced adverse effect, neuroleptic malignant syndrome is characterized by muscle rigidity,

severe hydrosis, and hyperthermia. It is a medical emergency and immediate referral is essential.

### **Obsessive Compulsive Disorder**

The psychodynamics, pathophysiology, and phenomenology of obsessive compulsive disorder (OCD) are fairly complex and current treatment includes combinations of antidepressant and atypical antipsychotic medicines as well as cognitive behaviour therapy. This illness has a high index of chronicity and is best treated by a therapist with experience in this particular field.

### **Postictal, Interictal Psychosis, and Automatism; Temporal Lobe Epilepsy**

Partial complex epilepsy with interictal or postictal psychosis is often referred to in broad terms as *temporal lobe epilepsy*. The duration of postictal psychosis can vary from a few minutes to 2 weeks. The patient may display automatic and bizarre behaviour (automatism) without being aware of what he or she is doing. Treatment of this condition requires combining antiepileptics and antipsychotic medicines (which lower the epileptic threshold) and should be attended to by a specialist.

### **Posttraumatic Stress Disorder**

Posttraumatic stress disorder (PTSD) follows exposure to extreme emotional or physical trauma, tends to have a delayed onset, and frequently develops into a chronic disorder with a high risk for suicide and social and work-related dysfunction. Early referral is essential for a good treatment outcome.

### **Schizophrenia with Catatonic Furor**

This rare condition is difficult to diagnose. It can resemble a manic episode. It often follows a catatonic stupor, and the switch can be sudden. These are virtually the only schizophrenic patients who are aggressive. They can be extremely violent, and the violence is unprovoked and random.

### Social Phobia

Social phobia is underestimated in terms of its morbidity and is often considered a minor symptom, but it carries a suicide rate similar to MDD. It requires specific behaviour therapeutic intervention and should be referred for specialist attention.

## 15.7 Abuse

Types of abuse include the following:

- **Psychological abuse:** Any act or omission that damages the self-esteem, identity, or development of the individual. It includes, but is not limited to, humiliation, threats, intimidation, loss of custody of children, forced isolation from friends or family, controlling behaviour, and destruction of possessions.
- **Verbal abuse:** The use of language to manipulate, control, ridicule, insult, humiliate, belittle, vilify, and show disrespect and disdain to another; often a component of other types of abuse
- **Emotional abuse:** The systematic tearing down of a child's self esteem; interfering with a child's positive development; attacking the child's psychological development, self image, and sense of self worth
- **Physical abuse:** Physical force or violence that results in bodily injury, pain, or impairment
- **Child abuse:** Inflicting directly or allowing injury upon a child by means other than accidental, and which causes or creates substantial risk of death, disfigurement, physical, or emotional impairment
- **Sexual abuse:** A violation perpetrated by a person who holds, or is perceived to hold, power over someone who is vulnerable
  - *Incest:* Sex with a family member
  - *Child sexual abuse:* Any sexual contact with a child

(defined as a person under age 14, the age of legal consent) or any use of a child for sexual pleasure

- *Defilement*: Any form of sexual contact with a minor
- **Rape**: Intentional commission of a sexual act under coercive circumstances; a crime of power that uses sex as a weapon.
  - *Marital rape*: One spouse forces the other to have sexual intercourse
  - *Acquaintance rape*: The victim knows the perpetrator
  - *Stranger rape*: The person who is attacked does not know the attacker
  - *Gang rape*: When two or more people sexually assault another person
- **Violence**: An unjust or unwarranted exertion of force or power
  - *Intimate partner violence*: Any act or omission by a current or former partner that negatively affects the well-being, physical or psychological integrity, freedom, or right to full development of a the abused intimate partner woman
  - *Domestic violence*: The physical, sexual, and/or psychological abuse to an individual perpetrated by a current or former intimate partner. Although this term is gender-neutral, women are more likely to experience physical injuries and incur psychological consequences of intimate partner abuse.

### Risk groups

- Women and children
- Adolescents who live in poverty, live alone, or have a family member who abuses substances
- Youth with physical or mental disabilities
- Children living on the street
- Young people who abuse substances, and/or are engaged in sex for money or favours
- Orphans
- Displaced adolescents and refugees

### Management

1. Find help in family, friends, counsellor.
2. Make a case report to the police (even if embarrassing).
3. Protect the victim from the abuser.
4. Involve social services (e.g., the Women and Child Protection Unit [WACPU], Ministry of Gender, Women and Child Welfare).
5. Consider contacting the Legal Assistance Centre (LAC) for help.

## 15.8 Drugs and Substance Abuse

Drug addiction is always a serious problem. Addition to drugs, whether legal or illegal, means that a person has compulsive drug seeking and use despite harmful effects to the addicted individual and those around him or her.

### Causes

- Peer pressure
- Escape from problems
- Desire to alter an image or perception
- Desire to become courageous or fearless
- Boredom
- Feeling of hopelessness
- Idolising icons
- Experimentation
- Enhancement of self worth

### Symptoms and signs

- Constantly red-rimmed, bloodshot eyes combined with any or all of the other symptoms
- Obvious yellow-brown stains on the palms of the hands and often the fingers
- A sudden change in appetite or an unexplained loss of weight
- Neglecting personal hygiene and losing interest in appearance

- Lack of motivation and sudden deterioration in scholastic work
- Dramatic mood changes, rapid, rambling, and repetitive speech
- Sleeping unnaturally long hours and finding it difficult to wake up
- Disappearance
- New friends
- Secretive behaviour
- Need for more and more money
- General deterioration in health

### Common withdrawal symptoms

- Shivering
- Sweating
- Headaches
- Pain
- Aggression
- Nausea
- Vomiting
- Sleeping and eating problems

### Specific effects on the body

- Solvent abuse—
  - Death due to asphyxiation
  - Sudden sniffing death syndrome due to cardiac failure
  - Fatal spasms of the larynx
  - Damage to the kidneys, liver, heart, and lungs
  - Damage to the mucous membrane of the respiratory tract
  - Damage to the central and peripheral nervous system
  - Abnormal heart rhythms
  - Severe drop in blood pressure
- Alcohol abuse and alcoholism (see [15.9](#))—
  - Severe dependence
  - Loss of brain tissue
  - Neuropathy (a progressive disease of the nerves)

- Peptic ulcers
- Kidney failure
- General malnutrition
- Vitamin deficiency
- High blood pressure
- Damage to the heart
- Hepatitis
- Cirrhosis of the liver
- Ecstasy abuse—
  - Heart failure
  - Respiratory collapse
  - Liver damage
  - Fatal heart attack or stroke
  - Paralysis
  - Brain haemorrhages
  - Psychiatric problems
    - ◆ Anxiety
    - ◆ Depression
    - ◆ Paranoia
- Dagga or marijuana abuse—
  - Brain cell malfunction (particularly the area controlling memory and behaviour)
  - Acute anxiety and panic attacks
  - Schizophrenia
  - Loss of drive and initiative
  - Mental and emotional problems
  - Emphysema
  - Lung cancer
  - Loss of fertility
  - Lowered resistance to infection
  - Foetal abnormalities
  - Increased pulse rate

### Management

Refer to an addiction specialist or counsellor.



### Health education

- Stress the following to the patient:
  - Adolescents do not need to use drugs to be liked by other people.
  - They do not need to start taking drugs to make other people feel better.
  - They do not need drugs to feel brave and courageous.
  - They do not need drugs to cope with sorrow and disappointment.
  - They have all the strength in themselves; they need to believe in themselves.
- Advise the patient to be clear and confident when telling friends that he or she does not want to take drugs. Remind the patient that he or she knows what drugs can do to the body and that he or she does not want that.
- Urge the patient to get active; hobbies will help them to keep out of trouble.
- Tell the patient not to try to cope with problems alone but to seek help, speak to a counsellor.

### 15.9 Alcohol Abuse and Alcoholism

The recommended maximum amount of alcohol per week is 21 units for males and 14 units for females. A rough unit is one measure of spirits, one glass of wine, or one ‘dumpy’ of beer. Anything more than that on a regular basis would be called abuse. (See <http://www.drinking.nhs.uk/questions/unit-calculator>.)

Alcohol intoxication can be seen in various forms such as acute, chronic, or episodic (e.g., every three months). In chronic alcoholism, the patient becomes or is psychologically and physically dependent on alcohol, which interferes with social, professional, and family life.

#### Causes

- Peer pressure
- Family history
- Drug abuse
- Stress and tension
- Representatives or people working in alcohol producing industry or bars or *shebeens*
- Unemployment and boredom

#### Symptoms and signs

- Compulsive need for an alcoholic drink
- Regular drinking, every day
- Early morning drinking
- Drinking takes priority over work, other tasks, family life
- Tolerance to alcohol (i.e., more and more is needed to experience the same effect)
- Repeated withdrawal symptoms (especially in morning): nausea, sweating, agitation
- Craving (i.e., strong feeling of ‘must have a drink’)
- Interference with normal life
- Aggressiveness and social withdrawal
- Concealing the drinking and alcohol
- Feeling guilty about drinking, desirous to reduce intake
- Confesses criticism from others about drinking habits

## Complications

Direct tissue damage due to excessive drinking over a long time:

- General—malnutrition, vitamin deficiencies (e.g., vitamin B12)
- CVS—cardiomyopathy, arrhythmias
- Neurological—
  - Ataxia, falls with consequent injury
  - Polyneuropathy (i.e., numbness, loss of sensation in feet)
  - Myopathy (weak and wasted muscles)
  - Cerebellar degeneration (balance problems)
  - Dementia
  - Wernicke-Korsakoff syndrome (vitamin B12 deficiency: ataxia, confusion, squinting, nystagmus, coma, death)
  - Impotence
- GIT—
  - Liver damage (e.g., jaundice, cirrhosis)
  - Oesophagitis, GORD, gastritis
  - Pancreatitis
  - Carcinoma
- Blood—
  - Thrombocytopenia (low platelet function)
  - Macrocytic anaemia (too few large red cells)
  - Folate deficiency, vitamin B12 deficiency
- Psychological and social—
  - Depression
  - Suicide
  - Marital or sexual problems
  - Employment and financial difficulties
  - Homelessness

## Investigations

- LFT (especially GGT)
- FBC (raised MCV)
- Blood, urine alcohol levels

### Management

1. Treat acute intoxication and/or withdrawal. See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of alcohol abuse emergencies.
2. Patient must be helped to realise that he or she has a problem.
3. Patient must be committed to seeking help.
4. ‘Detox’ or ‘dry-out’ is the first step.
5. Encourage the patient to find the way forward by joining Alcoholics Anonymous or Nova Vita or by consulting a psychologist.

### Health education

- Advise the patient to—
  - Stop drinking alcohol completely
  - Seek psychological help
  - Join Nova Vita or Alcoholics Anonymous
  - Start exercising; participate in sport
  - Stop smoking
- Discuss the following with the patient:
  - Problems at home or work, with personal friends, or any other obstacle in his or her life
  - Work-related issues
  - Complications of alcohol
- Work to provide community education about the effects of alcohol abuse.

## 15.10 Smoking

Smoking is addictive just as other drugs. Nicotine is the addictive substance in tobacco smoke that causes the craving. Nicotine lets smokers 'feel normal.' This craving needs replenishment after half an hour. Nicotine controls the mood (you think you feel better, cool, and relaxed).

In addition to nicotine, smokers also inhale 4,000 to 4,800 other chemicals. Tobacco smoke contains dangerous chemicals such as—

- Carbon monoxide (exhaust gases), which has a higher affinity for the haemoglobin in red blood cells than does oxygen and, thus, decreases the oxygen supply to the brain, heart, muscles, and other organs
- Carbon dioxide (smoke and fire pollution)
- Tar (sticky, brown; stains teeth, fingernails, and lung tissue)
- More than 60 cancer-causing substances (e.g., formaldehyde, benzyl)
- Hydrogen cyanide, which damages tiny hairs (cilia) that clean the lungs by removing foreign substances; poisonous chemicals thus accumulate in the lungs
- Acetone (i.e., nail polish remover)
- Ammonia (i.e., toilet cleaner)
- Arsenic (i.e., rat poison)
- Naphthalene (i.e., moth powder)
- Metals (e.g., lead, cadmium, aluminium)
- Free radicals, which damage heart muscles and blood vessels
- Radioactive substances (e.g., polonium, radium)

### Notes:

- Tobacco contains active ingredients that cause damage to the body.
- Tobacco smoke affects almost every organ in the body.
- Tobacco smoke is the cause of various diseases.
- The general health of a smoker is affected.

### **Tobacco has the following effects on the body.**

- Respiratory system
  - Teeth and gums—periodontitis, teeth staining and decay, mouth cancer
  - Irritation of the trachea (windpipe) and larynx (voice box)—cancer of larynx or trachea, bronchitis
  - Reduced lung function and breathlessness (swelling and narrowing of the airways and excess mucus in the lung passages)—asthma, allergic wheeze, sinus or nose cancer
  - Impairment of the lungs' clearance system and accumulation of poisonous substances—chronic obstructive airway disease (COAD), chronic bronchitis (cough), emphysema (difficult breathing due to permanent damage to the air sacs of the lungs)
  - Increased risk of lung infection
  - Lung cancer (the number 1 killer)
- Circulatory system
  - Raised blood pressure and heart rate—hypertension, cardiac arrhythmias, heart failure
  - Less oxygen carried by the blood (i.e., ischaemia in heart, brain, skin; stroke, myocardial infarction, ischaemic heart disease)
  - Stickier blood, which is more prone to clotting—thrombosis
  - Damage to the lining of the arteries—atherosclerosis (the build-up of fatty deposits on the artery walls), aorta aneurysms
  - Reduced blood flow to extremities such as fingers and toes—gangrene
- Immune system
  - The immune system does not work well
  - The person is more prone to infection such as pneumonia and influenza
  - Recovery from illness is prolonged
- Musculoskeletal system
  - Tightening of certain muscles

- Less blood flow to muscles (decreases exercise tolerance and energy)
- Reduced bone density—osteoporosis, hip fractures
- Malignancies—bone marrow cancer
- Gastrointestinal tract
  - Irritation and inflammation of the stomach and intestines—oesophagus or stomach cancer
  - Increased peptic acid secretion—peptic ulcer, duodenal ulcers
  - Pancreas cancer
- Skin
  - Constriction (tightening) of blood vessels in the skin—pain, low blood flow, gangrene, amputation
  - Premature wrinkling of the skin
  - Leathery thickening of skin
- Eyes
  - Cataracts
  - Retinal artery changes and damage—blindness
- Brain
  - Strokes
  - Mood effects, depression
- Kidney and bladder
  - Cancer
- The male body
  - Lower sperm count—infertility
  - Higher percentage of deformed sperm
  - Reduced sperm motility
  - Changed levels of male sex hormones
  - Impotence, which may be due to the effects of smoking on blood flow and damage to the blood vessels of the penis
- The female body
  - Reduced fertility
  - Menstrual cycle irregularities or absence of menstruation
  - Menopause reached one or two years earlier
  - Increased risk of cancer of the cervix

## 15.10 Smoking

- Greatly increased risk of stroke and heart attack if the smoker is over 35 years and on oral contraceptives
- The unborn baby
  - Increased risk of miscarriage, stillbirth, and premature birth (placenta previa or abruptio)
  - Low birth weight due to constricting arteries with often lasting effect of the growth and development of children (i.e., early puberty and increased risk for heart disease, stroke, high blood pressure, and diabetes)
  - Increased risk of cleft palate and cleft lip
  - Paternal smoking can also harm the foetus if the nonsmoking mother is exposed to second-hand smoke
  - Child has an increased risk of ear infections; respiratory illnesses such as pneumonia, croup, and bronchitis; sudden infant death syndrome (SIDS); and meningococcal disease.

### Health education


- Inform the patient that—
  - Smoking is addictive: the body continues to crave nicotine
  - Stopping is difficult
  - Smoking is prohibited in public places
- Advise the patient to—
  - Find a support group or person to help with quitting
  - Learn to cope with peer pressure
  - Not smoke to enhance the mood
  - Get regular exercise
- Advise the patient on the many different methods to help him or her quit smoking: acupuncture, nicotine skin patches, nicotine chewing gum, and tablets to help stop smoking. **Note:** None of these will work without commitment of the patient to quit.



## 16 Oncology

Cancer is the unregulated growth of formerly normal body cells. Oncology is the study, diagnosis, and management of cancers (tumours). **Note:** Any organ or system and any person can be affected by cancer.

### Symptoms and signs

- Suspect cancer in any individual who presents with the following symptoms and signs for longer than 2 weeks:
  - Sudden weight loss
  - Painless or painful swelling, lump, or thickening
  - Unusual bleeding or discharge
  - A sore that does not heal
  - Chronic ulcers
  - Chronic pain
  - Change in normal bowel or bladder habits
  - Hoarseness or cough
  - Indigestion or difficulty in swallowing
  - Change in a skin wart or mole
- **Urgent referral** of possible malignancy might be necessary in patients with the following. 
  - Haematological signs—neutropaenia, anaemia, infection, bleeding, and hyperviscosity
  - Lung—haemoptysis (TB excluded), superior vena cava obstruction
  - Upper GI tract—chronic GI bleeding, dysphagia, persistent vomiting, unexplained pain and weight loss, abdominal mass without dyspepsia, obstructive jaundice
  - Lower GI tract—bleeding and bowel habit changes, palpable rectal mass, unexplained iron deficiency anaemia
  - Breast—discrete hard lump with fixation, eczematous skin and nipple changes, unilateral nipple discharge
  - Gynaecology—postmenopausal bleeding, vulval lump and bleeding, persistent intramenstrual bleeding

## 16. Oncology

- Urology—hard irregular prostate, urinary symptoms, macroscopic haematuria, swelling or mass in testis, or any abdominal mass along urological tract
- Central nervous system (CNS)—progressive neurological deficit, new onset seizures, headaches, mental changes, unilateral deafness, and signs of raised intracranial pressure: vomiting, drowsiness, posture-related headache, tinnitus, and other CNS symptoms

### Special groups at increased risk of cancer

- HIV-positive patients
- Albinos
- Age group >65 years
- Women (breast and cervical)
- Smokers
- Occupational exposure to toxins, radioactive material (mines)


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**Note:** Routine screening is recommended in these groups

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### Management

#### In clinic, health centre, or hospital—

1. **Refer** all suspected cancer cases to hospital. 
2. Start pain management and palliative care if necessary. (See “Section IV: Infectious Diseases. Chapter 18. HIV/AIDS.”)

#### In hospital—

1. Oncology requires the workup outlined in [table 16](#) for cancer patients. If service is not available, make arrangements for these tests to be performed at the intermediate and central hospitals before referral.
2. Initiate palliative care at time of diagnosis.

TABLE 16. Required Tests for Cancer Patients

Type of Cancer	Histology			X-ray		CT/MRI	Endoscopy		Performance Status	Surgical Findings	Ultrasound	Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other	
	x			Barium enema		Sigmoidoscopy														
Anal	x			Barium enema			Sigmoidoscopy						x							
Brain tumour				SXR CXR	x															
Bladder	x						Cytoscopy						x						Bilharzia	
Breast	x			CXR						x	Liver		x				x	CA15-3		
Cervix	x			IVP CXR			EUA/ Cystoscopy				x		x	x						
Colorectal	x			Barium enema			Colonoscopy						x				x	CEA		

TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Endometrial	x	IVP CXR				x	x							
Eye tumour	x	Eye	x											
ENT, neck, head	x	Sinus CXR	x	x				x	x					
Gastric	x	Barium meal CXR		Gastro- copy		Radio clips	x	x				x		
Gestational trophoblastic disease	x	CXR						x					bHCG	
Kaposi's sarcoma	x	CXR								x	x			

TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Leukaemias	Bone marrow biopsy	CXR						x		x	x	x		WCC+diff/ ESR, LD Cytogenetics Flow cytometry
Lung	Sputum cytology	CXR	x		x			x						
Lymphoma or Hodgkin's disease	Bone marrow biopsy	CXR	x			x	x	x		x	x	x		ESR, LD Flow - cytometry on bone marrow

TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Metastatic	(FNA) Cytology histology	CXR Barium studies mammo- gram					x						CA125 CA15-3 CEA CA19-9 PSA	
Multiple myeloma	Bone marrow biopsy	x	x					x	x					ESR Protein electroph. Bence Jones prot Immuno- globulins calcium

TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound	Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Neuro-endocrine	x	CXR				Radio clips	x	x	x	x			x	VMA/5-HIAA	Amylase
Ovarian	x	CXR				x	x							CA125 Alpha-feto-protein (AFP) bHCG	
Oesophagus	x	Barium swallow CXR		Oesoph- agoscopy	x										
Prostate	x	x	Bone scan					x	x					PSA	Prostate size

TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Pancreas	x		x				x	x				x	CA19-9	
Penis	x	CXR						x						
Renal	x	IVP				x	x	x	x					
Sarcomas	x	CXR	Bone scan			Radio clips		x	x			x		
Skin or melanoma	x	CXR												
Suspected node metastasis														
Testicular	x	CXR					x	x	x				AFP/ bHCG	



TABLE 16. Required Tests for Cancer Patients (cont.)

Type of Cancer	Histology	X-ray	CT/MRI	Endoscopy	Performance Status	Surgical Findings	Ultrasound Abdomen	FBC	U+E	HIV	CD4	LFT	Tumour Marker	Other
Thyroid	x	CXR				x								T4/TSH
Vulva or vagina	x	CXR						x						Gynae. exam



# Nutrition and Lifestyle

17. Nutrition and Lifestyle

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### 17.1 Healthy Diet throughout the Lifecycle

The guidelines below are basic guidelines only, to be used in the clinical setting. For individualized dietary counseling, please refer patients to a registered dietician.

#### 17.1.1 General Nutrition

Nutrition is the process of consuming food and the body using the food to maintain life, for growth, for organ and tissue functions and repair, and for the production of energy.

Optimal nutrition is necessary to—

- Prevent malnutrition and wasting
- Enhance the body's ability to fight opportunistic infections
- Delay the progression of HIV to AIDS
- Achieve and maintain optimal body weight and strength
- Relieve HIV-related conditions, such as chronic diarrhoea, nausea, vomiting, and thrush
- Improve the effectiveness and tolerance of medications
- Improve quality of life and productivity
- Encourage maintenance of good overall health

Achieving optimal nutrition means obtaining a balance of macronutrients (i.e., carbohydrates, proteins, and fats) and micronutrients (i.e., vitamins and minerals) from the diet.

- Macronutrients primarily provide energy for organ and tissue functions and for growth.
- Micronutrients are needed in small amounts for chemical processes in the body such as metabolism and growth and for protection.

Five nutrients are needed for a balanced diet—

**Carbohydrates:** Carbohydrates should be the basis of each meal because they provide the body with energy. Examples include maize, mahangu, oats, cereals, rice, potatoes, sweet potatoes, macaroni, bread, Provita, pearly wheat, and barley.

**Proteins:** Proteins are the building blocks of muscles, organs, and cells. They are also needed for immune system functions to prevent and fight infections. Examples of animal sources include meat, fish, seafood, chicken, mopane worms, eggs, milk, cheese, yoghurt, omaere, oshikandela, cottage cheese, and other milk products (coffee creamer is not milk). Examples of plant sources include dried beans, lentils, peas, nuts, seeds, and soy mince.

**Fats:** This group should be used sparingly. Fats provide energy for body building and for absorption and utilization of micronutrients. Examples of major sources include butter, margarine, cooking oil, peanut butter, avocado, and mayonnaise.

**Vitamins and minerals:** Vitamins and minerals are needed for protection against diseases. Main sources include fruits and vegetables. Examples include tomatoes, beetroot, pumpkin, carrots, spinach, cabbage, apples, grapes, paw-paw, and other locally available vegetables and fruit. Eating a wide variety often is important.

**Water:** Plenty of water is needed to build cells and to regulate body processes. To make water safe to drink, boil for 5 continuous minutes. Drink plenty of safe water and moderate amounts of tea, coffee, and juice.

### 17.1.2 General Food and Nutrition Guidelines for Namibia

- Eat a variety of foods.
- Eat vegetables and fruit every day.
- Eat fish, lean meat, chicken, eggs, and legumes (e.g., cooked dried beans, lentils, peas, soya) regularly. Try to eat fish at least 2 times per week.
- Use whole grain and whole wheat cereals, breads, and starches (e.g., yellow maize meal, oats, mahangu, samp, pearly wheat, barley, brown bread, coarse or seed bread), and make these foods the basis of most meals.

## 17.1 Healthy Diet throughout the Lifecycle

- Include dairy products (e.g., milk, yoghurt, cheese, cottage cheese, omaere, oshikandela) daily in your diet. Use low-fat or nonfat dairy products more often than high- or full-fat products.
- Eat fewer fats. Cut back especially on saturated and trans-fatty acids (e.g., solid fat on meat, hardened or brick margarine, fried foods, pastries, cookies), and use low-fat cooking methods (e.g., steaming, grilling, boiling, poaching, oven baking).
- Use salt sparingly (i.e., add as little as possible), and only use iodised salt.
- Eat and drink foods containing sugar sparingly (e.g., cool drinks, fruit juices, sweets, chocolates, biscuits).
- Avoid or at least limit alcohol consumption.
- Drink plenty of clean, safe water (6 to 8 cups per day), and eat uncontaminated food.
- Eat regularly at least 3 meals per day.
- Be active, exercise regularly, and achieve or maintain a healthy body weight.

### 17.1.3 Eating during Pregnancy

- Eat a variety of foods (see [17.1.2](#) above).
- Eat small meals more often rather than a few large meals.
- Eat plenty of vegetables and fruits every day.
- Drink 2 to 3 glasses of milk, omaere, oshikandela, or yoghurt daily.
- Take supplements (e.g., iron, folic acid) as prescribed by your doctor.
- Choose healthy food products such as maize meal that has vitamins added to it.
- Eat fish or seafood 2 to 3 times per week.
- Avoid fried foods with lots of spices, oil, or fat.
- Drink lots of clean, safe water. Take liquids between meals and not with meals.
- Use salt sparingly, and use only iodised salt.
- Resist consuming things that are harmful and that are

not good for your body or the health of the baby (e.g., alcohol, drugs, soil, and charcoal).

### 17.1.4 Breastfeeding

Advise the mother as follows—

- Breast milk is ideal (all infants should be breastfed) and should be given exclusively to the infant for the first 6 months of life (WHO, 2003. *Global Strategy for Infant and Young Children Feeding*. Geneva: WHO and UNICEF. <http://whqlibdoc.who.int/publications/2003/9241562218.pdf>).
- Breast milk provides all the nutrients and water the baby needs for the first 6 months of life (WHO, 2001).
- Start skin-to-skin contact with your baby, and start breastfeeding within the first 60 minutes after delivery.
- Breastfeed the baby whenever the baby wants (on demand)—day and night.
- What the mother eats can make a difference to her and her baby's health. Thus, the mother must eat a healthy diet (see 17.1.8 below).
- Start giving your baby other foods at 6 months of age (see 17.1.5 below), but continue to breastfeed the baby.
- Breastfeed the baby first, then give other foods. Introduce one food at a time (see 17.1.5 below). Feed with a spoon.
- Take your baby to be weighed every month to see how he or she is growing.
- While breastfeeding, the mother must avoid all medicines, especially tetracyclines, sulphonamides, combined oral contraceptives, chloramphenicol, and alcohol and caffeine.

#### 17.1.4.1 Advantages of Breastfeeding

Breast milk—

- Is the most natural and nutritious food for babies
- Is easily digested
- Is hygienic and prevents the baby from being exposed to unsafe water and food

## 17.1 Healthy Diet throughout the Lifecycle

- Contains substances that protect infants against infection

Breastfeeding—

- Helps to contract the uterus after birth
- Promotes the mother–infant relationship
- Reduces the mother’s risk of breast cancer

### 17.1.4.2 Breastfeeding under Special Circumstances

- For information about feeding of infants in HIV-positive mothers see [17.5](#) below.
- All children 0 to 5 years with a TB-sputum–positive mother should—
  - Continue breastfeeding if possible
  - Be given isoniazid preventive therapy (IPT) 5 mg/kg
  - Be given pyridoxine 5 mg daily for 6 months
- Breastfeeding can be difficult for weak, ill, or very premature infants, or infants with malformations around the mouth. These infants can often be fed expressed breast milk.

### 17.1.4.3 Contraindications to Breastfeeding


- Cancer of the breast
- Cancer treatment with chemotherapy

### 17.1.5 Infant Feeding

- If the infant is <6 months, advise on exclusive breastfeeding (see [17.1.4](#) above) or replacement (i.e., formula) feeding if breastfeeding is not possible.
- At 6 months, begin slow introduction of solid foods (e.g., small portions of soft porridge or infant cereals; pureed vegetables, mashed potato, or sweet potato; meat, chicken, or fish purees; well-cooked mashed beans; yoghurt; pureed fruit) in addition to breastfeeding or replacement feeding. Add small amounts of milk, oil, or egg to porridge or meals. Feed boiled, cooled water, diluted fruit juice, and tea. As baby gets older and



has teeth to chew better, introduce coarse foods such as diced (chopped) vegetables, fruit, meat, chicken, fish, crackers, bread.

- Frequency of feeding—
  - 6 to 8 months: 2 to 3 times per day plus breastfeeding or replacement feeding
  - 9 to 11 months: 3 to 4 times per day plus breastfeeding or replacement feeding
  - 12 to 24 months: 4 to 5 times per day plus breastfeeding or replacement feeding
- Monitor weight and height monthly. Use IMCI growth chart (and weight for height chart). If the child does not gain weight, **refer** to hospital. If baby is severely malnourished, refer to hospital *immediately*. 
- Treat diseases such as diarrhoea, measles, TB, HIV, and parasites because they contribute to malnutrition. Children with any of these diseases should be weighed weekly, and the weight should be plotted on the growth chart.

### 17.1.6 Feeding the Young Child

Advise the parents as follows—

- From 2 years of age, give 3 daily meals of nutritious food, chopped or mashed if necessary, as well as healthy snacks in-between meals (see [17.1.1](#) above for a discussion of the nutrients needed for a balanced diet).
- Serve the child's food on a separate plate (i.e., not from your plate).
- Breastfeed as often as the child wants up to 2 years of age or else provide sufficient milk or formula milk.
- If the child is sick, give more fluids (i.e., breastfeed a breastfed child more often), and encourage him or her to eat soft, nutritious food. After an illness, encourage the child to eat more food to catch up in weight and height.
- From the age of 2 years, take your child to be weighed every 3 months to see if he or she is growing well.

## 17.1 Healthy Diet throughout the Lifecycle

- Take your child to the clinic for immunisation and vitamin A supplementation (see [17.8](#) below).
- In TB patient with severe malnutrition—
  - Give TB treatment
  - Add pyridoxine (child >5 years): 5 mg per day for 6 months

### 17.1.7 Nutrition for Youth and Teenagers

Advise youth and teenagers as follows—

- Eat 3 nutritious meals per day (see [17.1.1](#) above).
- Never skip breakfast. It is the most important meal of the day.
- Eat healthy snacks such as a whole wheat sandwich with peanut butter and jam or Provita, yoghurt, fruit, low-fat popcorn, raw vegetable slices, or sticks instead of chips, chocolates, biscuits, and cake.
- Drink 2 to 3 glasses of milk, omaere, oshikandela, or yoghurt daily.
- Drink 6 to 8 glasses of water per day, and drink fewer cool drinks.
- Avoid fatty and sweet foods at school tuck shops (e.g., pies, pizza, burgers, cakes, tarts, chips, sweets). Bring a lunch box to school containing such items as a cheese and tomato sandwich or peanut butter and jam sandwich or Provita with avocado, pear, vegetable slices or sticks, and a fruit.
- Be physically active by walking or riding a bicycle to school, doing house chores, or working in the garden. You can also use skipping ropes and do sporting activities at school.

### 17.1.8 Nutrition for Adults and the Elderly

Advise adults and the elderly as follows—

- Maintain a healthy body weight and avoid weight gain during adult life.
- Follow the food and nutrition guidelines for Namibia in [17.1.1](#) above.

- If you do drink alcohol, drink sensibly and do not exceed 2 units per day.
- Be physically active for at least 30 minutes per day to help to maintain healthy body weight. Brisk walking, cycling, or swimming is a good form of activity.

In TB patient with severe malnutrition—

- Give TB treatment
- Add pyridoxine: 10 mg per day for 6 months

## 17.2 Malnutrition

Malnutrition is a physical state in which physical function of an individual is impaired to the point at which he or she can no longer maintain adequate bodily performance processes (growth, pregnancy, lactation, physical work, and resisting or recovering from disease).

### Symptoms and signs

The two types of acute malnutrition are protein-energy malnutrition (PEM) and micronutrient deficiency diseases (MDDs).

PEM results from deficiencies in macronutrients (i.e., fat and proteins) as well as some micronutrients (e.g., zinc and potassium).<sup>1</sup> Kwashiorkor, or nutritional oedema, and marasmus, or drastic wasting of muscle, or a combination of the two are seen in PEM (table 17.2A).

MDDs result from deficiency in specific micronutrients (i.e., vitamins and/or minerals). The most common vitamin and mineral deficiencies are vitamin A, iron, and iodine deficiencies (table 17.2B).

### Investigations

Chronic malnutrition or stunting (i.e., shortness) is a result of inadequate food intake over a long period. Acute malnutrition or wasting (i.e., thinness) results from a

<sup>1</sup> Golden, M.H.N. 1998. Oedematous Malnutrition. *The British Medical Journal* 54(12): 443–44

## 17.2 Malnutrition

TABLE 17.2A Symptoms and Signs of PEM

Clinical Signs of Marasmus	Clinical Signs of Kwashiorkor	Clinical Signs of Marasmus–Kwashiorkor
<ul style="list-style-type: none"> <li>• Thin ‘old man’ face</li> <li>• ‘Baggy pants’ loose skin around buttocks</li> <li>• No nutritional oedema</li> <li>• Prominent ribs</li> <li>• Children are usually active, may appear to be alert</li> </ul>	<ul style="list-style-type: none"> <li>• Bilateral nutritional oedema</li> <li>• Loss of appetite</li> <li>• Hair changes</li> <li>• Skin lesions, depigmentation</li> <li>• Children are usually apathetic, miserable, irritable</li> <li>• ‘Moon face’</li> </ul>	<p>Combination of marasmus and kwashiorkor signs</p>

TABLE 17.2B Symptoms and Signs of MDDs

Vitamin A Deficiency	Iron Deficiency or Anaemia	Iodine Deficiency
<ul style="list-style-type: none"> <li>• Affects the immune system and can facilitate disease such as measles</li> <li>• Can cause nocturnal blindness</li> <li>• Can lead to irreversible blindness</li> </ul>	<ul style="list-style-type: none"> <li>• Affects immune system</li> <li>• Causes general fatigue</li> <li>• Impairs concentration</li> <li>• Impairs capacity to learn and to work</li> </ul>	<ul style="list-style-type: none"> <li>• Impairs foetal and child growth</li> <li>• Causes apparition of goitre</li> <li>• Causes mental deficiency in children</li> </ul>

recent rapid weight loss. A child being underweight can result from a chronic and/or an acute situation. Different indicators are used to identify chronic and acute malnutrition in children younger than 5 years of age ([table 17.2.C](#)).

### Identification of WFH ratio using WHO reference table

When a child's weight for height (WFH) is assessed, the child's weight is compared to a reference weight for a child of the same height. The reference weights for each height are known as the WHO reference values. The reference values are used to assess or compare individual or population nutritional status.

The method by which a child or group of children is compared to the reference is known as *standard deviation (SD)* or *z-score*. The z-score or SD describes how far a child's weight is from the median weight of a child at the same height in the reference data.

For a given height, the median is the weight that divides a distribution of children in two halves where half the weights are above and half are below the median as pictured by a normal "bell" distribution. It is also called the 50th percentile. For example, for all boys measuring 87 cm, the median weight is 12.2 kg. So half the boys weigh more than 12.2 kg and half the boys weigh less than 12.2 kg. Notice that there are fewer boys on both extremes (under-nutrition or malnutrition on the left side of the bell and over-nutrition or obesity on the right side of the bell in [figure 17.2A](#)).

The z-score is a more sensitive descriptor than either percentiles or percentage of the median, so its use may mean that more children who are actually malnourished are identified. To assess malnutrition, z-score or SD are used. A child is considered moderately malnourished if the WFH is  $\geq -3SD$  and  $< -2SD$  and severely malnourished when the WFH is  $< -3SD$ . The farther the SD is from the median on the left side of the distribution in [figure 17.2A](#),

TABLE 17.2C Identifying Chronic and Acute Malnutrition in Children Younger than 5 Years

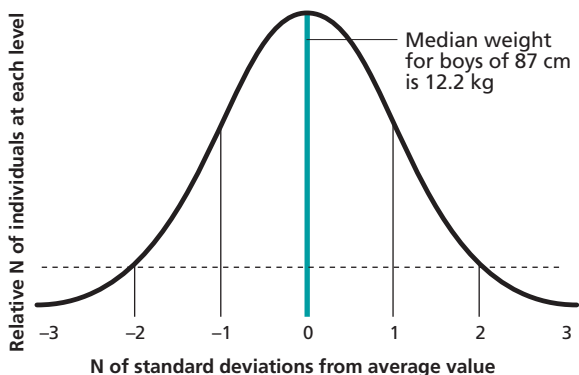
Type of Malnutrition			
	Acute Malnutrition (or Wasting)	Chronic Malnutrition (or Stunting)	Acute and/or Chronic Malnutrition (or Underweight)
Anthropometric measurement done for identification	WFH ratio Mid-upper arm circumference (MUAC)	Height-for-age ratio	Weight-for-age ratio
Level and key actors for screening of at-risk children	<ul style="list-style-type: none"> <li>• Active screening done by community health care providers in the communities with MUAC</li> <li>• Passive screening at the health facility done by the health care provider (i.e., nurse)</li> </ul>	<ul style="list-style-type: none"> <li>• Mainly assessed during surveys</li> </ul>	<ul style="list-style-type: none"> <li>• Monthly growth monitoring activities (passive screening) at the health facility done by the health care provider (i.e., nurse)</li> </ul>

TABLE 17.2C Identifying Chronic and Acute Malnutrition in Children Younger than 5 Years (cont.)

Type of Malnutrition			
	Acute Malnutrition (or Wasting)	Chronic Malnutrition (or Stunting)	Acute and/or Chronic Malnutrition (or Underweight)
Actions to be taken	Treatment of severe malnutrition with adequate therapeutic food and medication as outpatient (if appetite and no medical complications) or as inpatient (if no appetite or medical complications).	If the situation is chronic, determine why and assess with community how to change the situation and take action.	<ul style="list-style-type: none"> <li>If the situation is acute and children correspond to admission criteria for treatment of acute malnutrition, then treat as acute malnutrition.</li> <li>If the situation is chronic, determine why and assess with community how to change the situation and take action.</li> </ul>

## 17.2 Malnutrition

FIGURE 17.2A Sample WFH Ratio Bell Curve for Boys 87 cm Tall



the lower the weight is for 87 cm and the more malnourished the child is.

To help health workers quickly identify whether a child is acutely malnourished, reference tables for boys and girls are used. For a boy of 85 cm, the median weight is 11.5 kg. He is identified as moderately malnourished if his weight is  $\geq 9.1$  kg and  $< 9.8$  kg. He is severely malnourished if his weight is  $< 9.1$  kg. By contrast, if a girl of 87.5 cm weighs 10.7 kg, she is not malnourished since she is categorized  $\geq -1$  SD but  $< -2$  SD. For screening at health facility as well as monitoring during treatment of acute malnutrition, the WHO 2006 reference table (table 17.2D) will be used.

Standing height is about 0.7 cm less than recumbent length, and this difference must be considered when assessing the nutritional status of a child.

- If a child younger than 2 years old will not lie down for measurement of length, measure standing height, and add 0.7 cm to convert it to length.
- If a child age 2 years or older cannot stand, measure recumbent length, and subtract 0.7 cm to convert it to height.



TABLE 17.2D The WHO WFH table\*

	Boys' weight (kg)					Girls' weight (kg)				
	-4 SD	-3 SD	-2 SD	-1 SD	Median	Height (cm)	Median	-1SD	-2SD	-3 SD
8.4	9.1	9.8	10.6	11.5	85.0	11.2	10.3	9.4	8.7	8.0
8.5	9.2	9.9	10.7	11.6	85.5	11.3	10.4	9.6	8.8	8.0
8.6	9.3	10.0	10.8	11.7	86.0	11.5	10.5	9.7	8.9	8.1
8.7	9.4	10.1	11.0	11.9	86.5	11.6	10.6	9.8	9.0	8.2
8.9	9.6	10.4	11.2	12.2	87.0	11.9	10.9	10.0	9.2	8.4
9.0	9.7	10.5	11.3	12.3	87.5	12.0	11.0	10.1	9.3	8.5
9.1	9.8	10.6	11.5	12.4	88.0	12.1	11.1	10.2	9.4	8.6
9.2	9.9	10.7	11.6	12.5	88.5	12.3	11.2	10.3	9.5	8.7
9.3	10.0	10.8	11.7	12.7	89.0	12.4	11.4	10.4	9.6	8.8
9.3	10.1	10.9	11.8	12.8	89.5	12.5	11.5	10.5	9.7	8.9
9.4	10.2	11.0	11.9	12.9	90.0	12.6	11.6	10.6	9.8	9.0

\* WHO Multicentre Growth Reference Study Group. 2006. *WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height and Body Mass Index-for-Age: Methods and Development*. Geneva: World Health Organization.

### Management

Treatment of infants <6 months **OR** weighing <3 kg *with* the possibility of being breastfed

#### 1. Admission criteria—

- WFH < -3SD and/or bilateral oedema  
—— **OR** ——
- Infant is not gaining weight or is losing weight  
—— **OR** ——
- Infant is weak or feeble and not suckling well but not severely malnourished

#### 2. Diet—

- The aim is to stimulate breastfeeding and to supplement the infant until breast milk is sufficient to allow the infant to grow properly. Breast milk is stimulated by frequent breastfeeding and also using the supplemental suckling (SS) technique. It is important to put the infant to the breast as often as possible.
  - The supplemental milk Formula 100 (F100) diluted (D) is given by putting the milk in a cup, and using a tube the same size as no. 8 NGT, putting one end of the tube in the cup and the other on the breast at the nipple. The infant is offered the breast in the normal way.
- Breastfeed every 2 to 3 hours day and night for at least 20 minutes, more often if the infant cries or seems to want more, alternating the breast at each feed.
  - *Never* use F100 undiluted in infants <6 months or weighing <3 kg.
    - One hour after a normal breastfeeding, give maintenance amounts of F100-D using the supplementary suckling technique.
    - F100-D maintenance is 135 mL/kg per day (100 kcal/kg per day), divided into 8 feedings. The progress of the infant is monitored by the daily weight gain with a baby weighing scale

- graduated to within 10 g or 20 g.
- Preparation of F100-D—Dilute one sachet F100 in 2.7 L of cooled, boiled water, instead of 2 L.
  - To make small quantities of F100-D—Use F100 already prepared and take 100 mL of this milk and add 35 mL of cooled, boiled water to get 135 mL of F100-D. Do not make smaller quantities.

Treatment of infants <6 months **OR** weighing <3 kg *without* possibility of being breastfed. **Note:** Infants identified as malnourished with no opportunity of being breastfed are treated similarly to the older children but with some modifications.

1. Admission criteria—
  - Infant is not gaining weight or is losing weight
  - **OR** ——
  - WFH <-3SD and/or bilateral oedema
2. Diet—see [table 17.2E](#)

Treatment of all children 6 months to 14 years old. Use the admission criteria in [table 17.2F](#) and follow the steps outline in [17.2.1](#) below.

## 17.2 Malnutrition

TABLE 17.2E Diet for Infants <6 Months or Weighing <3 kg—Without Breastfeeding Possibility

Step	Instructions
Phase 1	<p>On admission, give the infant F75 (if available) at a rate of 100 kcal/kg/d.</p> <ul style="list-style-type: none"><li>• This supplement is <i>given by cup</i> at a quantity of 130 mL/kg per day in 2 or 3 hourly feedings day and night.</li><li>• The preparation is the same as for the older children. Constitute by adding 2 L of cooled, boiled water to a packet of F75, or use the recipe IMAM guidelines.</li></ul>
Transition	<p>When the infant is stabilised and appetite is regained, child can be moved to transition phase and given F100-D (F100 diluted) but increase the volume to the quantities proposed in IMAM guidelines. Infant should stay in transition phase for a minimum of 2 to 3 days or until oedema has completely subsided and appetite has returned.</p>
Phase 2	<p>Then move to phase 2 where the infant remains on F100-D; increase the volume by a further one-third. If the infant is completing all the feedings and is still hungry, then increase each feeding by 5 mL, and reassess.</p>

TABLE 17.2F Malnutrition Admission Criteria for Children 6 Months to 14 Years

Symptoms and Signs of Malnutrition	Complications
<p><b>Admit</b> a child with—</p> <ul style="list-style-type: none"> <li>• WFH <math>&lt;-4SD</math> — OR —</li> <li>• Bilateral, severe pitting oedema — OR —</li> <li>• Marasmic kwashiorkor— WFH <math>&lt;-3 SD</math> or MUAC <math>&lt;11</math> cm with any grade of oedema</li> </ul>	<p><b>Admit</b> a child <i>with or without</i>—</p> <ul style="list-style-type: none"> <li>• Complications and appetite — OR —</li> <li>• WFH <math>&lt;-3 SD</math> — OR —</li> <li>• MUAC <math>&lt;11</math> cm — OR —</li> <li>• Oedema moderate to severe</li> </ul>
	<p><b>Admit</b> a child <i>with</i> any of the following complications—</p> <ul style="list-style-type: none"> <li>• Hypoglycaemia</li> <li>• Anorexia, no appetite</li> <li>• Fever</li> <li>• Hypothermia</li> <li>• Vomiting</li> <li>• Dehydration</li> <li>• Severe anaemia</li> <li>• Very weak, lethargic, unconscious, convulsions</li> <li>• Moderate to severe skin lesions</li> <li>• Difficult or fast breathing</li> </ul>

## 17.2 Malnutrition

### 17.2.1 General Principles for Routine Medical Care for Malnourished Children (10 Steps)<sup>2</sup>

In all phases of treatment in the paediatric ward, only cup feeding is acceptable. Very weak children may be fed by spoon, dropper, or syringe. No bottle feeding is tolerated. This restriction applies for all patients, not only malnourished children.

#### 17.2.1.1 Step 1. Treat or Prevent Hypoglycaemia

See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of diabetic emergencies. Remember—

- Hypoglycaemia and hypothermia usually occur together and are signs of infection.
- Check for hypoglycaemia whenever hypothermia (axillary <35.0 °C; rectal <35.5 °C) is found.
- Frequent feeding is important in preventing both conditions.

#### Management

- If the child is conscious and dextrostix show less than 3 mmol/L or 54 mg/dL—
  1. Give 50 mL bolus of 10% glucose or 10% sucrose solution (1 rounded teaspoon of sugar in 3.5 tablespoons water), PO or by NGT. Then start milk feedings with starter F-75 (if available) every 30 minutes for 2 hours (giving one quarter of the feeding each time). See also step 7 ([17.2.1.7](#) below).
  2. Give oral amoxicillin 40 mg/kg per day.
  3. Give feedings every 2 hours, day and night. See also step 7 ([17.2.1.7](#) below).
- If the child is unconscious, lethargic, or convulsing—
  1. Give IV sterile 10% glucose (5 mL/kg), followed by 50 mL of 10% glucose or sucrose by NGT. Then give milk feeding (starter F-75) as above.

<sup>2</sup> Ann Ashworth, A., S. Khanum, A. Jackson, et al. 2003. WHO. *Guidelines for the Inpatient Treatment of Severely Malnourished Children*. Geneva: WHO.

2. Give IV amoxicillin 40 mg/kg per day.
  3. Give feedings every 2 hours, day and night.
- Monitor the following—
    1. Blood glucose. If low, repeat dextrosticks taking blood from finger or heel, after 2 hours. Once treated, most children stabilise within 30 minutes. If blood glucose falls to  $<3$  mmol/L, give further 50 mL bolus of 10% glucose or sucrose solution, and continue feeding every 30 minutes until stable.
    2. Rectal temperature. If it falls to  $<35.5$  °C, repeat dextrosticks.
    3. Level of consciousness. If it deteriorates, repeat dextrosticks.

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**Note:** If you are unable to test the blood glucose level, assume all severely malnourished children are hypoglycaemic and treat accordingly.

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### 17.2.1.2 Step 2. Treat or Prevent Hypothermia

#### Management

- If the axillary temperature is  $<35.0$  °C, take the rectal temperature using a low-reading thermometer. If a low-reading thermometer is unavailable and the child's temperature is too low to register on an ordinary thermometer, assume the child has hypothermia.
- If the rectal temperature is  $<35.5$  °C—
  - Feed immediately or start rehydration if needed.
  - Re-warm the child: clothe the child (including head), cover with a warmed blanket, and place a heater or lamp nearby (do not use a hot water bottle); or put the child on the mother's bare chest (skin to skin) and cover them both.
  - Give antibiotics. See step 5 (17.2.1.5 below).
- Monitor—
  - Body temperature; ensure the child is covered at all times, especially at night
  - Blood glucose level

## 17.2 Malnutrition

- For prevention—
  - Feed every 2 hours throughout day and night; start immediately. See step 7 (17.2.1.7 below).
  - Keep warm and dry.
  - Avoid exposure (e.g., bathing, prolonged medical examinations).
  - Let child sleep with mother or caregiver at night for warmth.

### 17.2.1.3 Step 3. Treat or Prevent Dehydration

Remember—

- Low blood volume can coexist with oedema.
- It is difficult to estimate dehydration status in severely malnourished children using clinical signs.
- Do *not* use the IV route for rehydration except in cases of shock (if necessary, infusing slowly to avoid flooding the circulation and overloading the heart).

See also “Section II. Diseases and Disorders According to Body System. Chapter 7. Gastrointestinal System” for a discussion of diarrhoea.

### Management

1. Give special rehydration solution for malnutrition (ReSoMal). The standard oral rehydration salts solution (90 mmol sodium/L) contains too much sodium and too little potassium for severely malnourished children. Use the following proportions:

Ingredient	Amount
Water (boiled and cooled)	2 litres
WHO-ORS	One 1-litre packet
Sugar	50 g
Electrolyte and mineral solution	40 mL

For the recipe, phone the registered dietician at the Ministry of Health and Social Services.

- Give ReSoMal 5mL/kg every 30 minute for 2 hours, PO or by NGT.
- Then give 5 to 10 mL/kg per hour for next 4 to



10 hours; the exact amount to be given should be determined by how much the child wants and by stool loss and vomiting. Replace the ReSoMal doses at 4, 6, 8, and 10 hours with milk feedings (starter F-75 is recommended by WHO but not available in Namibia at present).

- If rehydration is continuing at these times, then continue feeding with milk feedings (see step 7, [17.2.1.7](#) below), and give ReSoMal until rehydration is complete. Milk feedings must not be started later than 4 hours after starting ReSoMal.
2. Monitor progress of rehydration. Observe every half hour for 2 hours, then every hour for the next 6 to 12 hours, recording—
- Pulse rate
  - Respiratory rate
  - Urine frequency
  - Stool and vomit frequency
  - Return of tears, moist mouth, eyes; whether fontanel appears less sunken; if skin has improved turgor

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**Notes:**

- Many severely malnourished children will not show these changes even when fully rehydrated.
  - Continued rapid breathing and pulse during rehydration suggest coexisting infection or over-hydration.
  - Signs of excess fluid (over-hydration) are increasing respiratory rate and pulse rate, increasing oedema, and puffy eyelids. Stop fluids immediately and reassess after 1 hour.
- 
3. Take preventive steps, if patient has continual diarrhoea.
- Keep giving milk feedings (starter F-75, if available). See step 7 ([17.2.1.7](#) below)
  - Replace approximate volume of stool losses with ReSoMal. Give 50 to 100 mL after each watery stool.

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**Note:** Malnourished children commonly pass many small unformed stools; these should not be confused with profuse watery stools and do not require fluid replacement.

- Encourage continuation of breastfeeding.

### 17.2.1.4 Step 4. Correct Electrolyte Imbalance

Remember—

- All severely malnourished children have excess body sodium even though plasma sodium may be low, and giving high sodium loads will kill.
- Deficiencies of potassium and magnesium are also present and may take at least 2 weeks to correct.
- Oedema is due in part to these imbalances.
- Do *not* treat oedema with diuretic.

#### Management

1. Give extra potassium: 3 to 4 mmol/kg per day.
2. Give extra magnesium: 0.4 to 0.6 mmol/kg per day.
3. When rehydrating, give low-sodium rehydration fluid (e.g., ReSoMal).
4. Prepare the patient's food without salt.

### 17.2.1.5 Step 5. Treat or Prevent Infection

Remember: In severe malnutrition the usual signs of infection, such as fever, are often absent, and infections are often hidden. See also [17.2.2.3](#), [17.2.2.4](#), and [17.2.2.5](#) below.

#### Management

1. Give broad-spectrum antibiotic routinely on admission.
  - If the child appears to have no complications—
    - Give co-trimoxazole 5 mL paediatric suspension PO 2 times per day for 5 days (2.5 mL if weight <6 kg); 5 mL is equivalent to 40 mg trimethoprim plus 200 mg sulphamethoxazole.
  - If the child is severely ill (apathetic, lethargic) or has complications—

- Give ampicillin 50 mg/kg IM or IV every 6 hours for 2 days, then oral amoxicillin 15 mg/kg every 8 hours for 5 days

— OR —

- If amoxicillin is not available, continue with ampicillin but give PO 50 mg/kg every 6 hours

— PLUS —

- Gentamicin 7.5 mg/kg IM or IV stat then 5 mg/kg once per day for 7 days

- If the child fails to improve clinically within 48 hours—

- Add ceftriaxone 80 mg/kg per day IM or IV in 2 divided doses for 5 days

— OR —

- Chloramphenicol 25 mg/kg IM or IV every 8 hours for 5 days

- Where specific infections are identified—

- Add specific antibiotics, if appropriate.
- Add antimalarial treatment if the child has a positive blood film for malaria parasites.
- If anorexia persists after 5 days of antibiotic treatment, complete a full 10-day course.
- If anorexia still persists, reassess and check for sites of infection.

2. Give measles vaccine if child is >6 months and not immunised; delay if the child is in shock.

3. Give metronidazole 7.5 mg/kg every 8 hours for 7 days.

### 17.2.1.6 Step 6. Correct Micronutrient Deficiencies

Remember—

- All severely malnourished children have vitamin and mineral deficiencies.
- Do *not* give iron initially, but rather wait until the child has a good appetite and starts gaining weight (usually by the second week).

### Management

1. Give vitamin A PO on day 1 (for age >12 months, give 200,000 units; for age 6 to 12 months, give 100,000 units; for age 0 to 5 months, give 50,000 units unless there is definite evidence that a dose has been given in the last month). See also [table 17.2.2.1](#) below.
2. Give daily for at least 2 weeks—
  - Multivitamin supplement
  - Folic acid: 1 mg/kg per day; give 5 mg on day 1.
  - Zinc: 2 mg/kg per day
  - Copper: 0.3 mg/kg per day
  - Iron: 3 mg (elemental iron)/kg per day but only when gaining weight
    - Ferrous gluconate: 6 mg elemental iron/mL
    - Ferrous fumarate: 20 mg elemental iron/mL

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**Note:** A combined electrolyte, mineral, and vitamin mix for severe malnutrition is available commercially. This combination can replace the electrolyte and mineral solution and multivitamin and folic acid supplements mentioned in steps 4 and 6 ([17.2.1.4](#) and [17.2.1.6](#)), but still give the large single dose of vitamin A and folic acid on day 1, and iron daily after weight gain has started.

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#### 17.2.1.7 Step 7. Phase 1—Stabilisation. Start Cautious Feeding

The aim of phase 1 is to stabilise the complications in the child and to initiate feeding. The child is not expected to gain weight during the stabilisation phase. If the child has been transferred from the outpatient therapeutic programme (OTP), note any medications given during OTP treatment. Details of diet and medical treatment can be briefly summarized as follows—

- Give F75 based on the child's weight (130 mL/kg per day = 100 kcal/kg per day) at 3-hour intervals *only by cup feeding*.
- Give systematic treatment according to protocol.
- Treat any other existing medical complications.

Criteria to progress from phase 1 to the transition phase—

- Appetite (the child easily finishes feedings)
- Subsiding bilateral pitting oedema
- No serious medical problems such as vomiting, watery diarrhoea, dehydration, NGT feeding, respiratory distress, or any complication that requires IV infusion

Diet—

- *Only cup feeding is acceptable.*
- Give small, frequent feedings of low osmolarity and low lactose.
- Severely malnourished children need special feedings. Give therapeutic milk—F75 is used to stabilise children in phase 1:
  - 100 mL of this milk provides 75 kcal.
  - Dosage for the stabilisation phase should be of 130 mL/kg per day. In the case of severe oedema, give 100 ml/kg per day [100 kcal/kg/day, 0.9 g of protein/kg/d], then increase.
  - If the child is breastfed, always offer breast milk first.
- Give 8 feedings per day. Frequent feedings (every 3 hours) help prevent hypoglycaemia and hypothermia. Night feedings are important.
- Give F75 to all children except infants <6 months where breastfeeding is being re-established (except in known HIV cases where the mother chooses infant formula).
- Continue breastfeeding on demand as usual.

### 17.2.1.8 Step 8. Achieve Catch-up Growth

When a child regains an appetite, usually around 1 week after admission, he or she may be started on a rehabilitation phase of high intake of food which supports a corresponding weight gain of >10 g/kg per day. To do so—

- Replace starter F75 with F100 for 48 hours. Modified porridges or family foods can be used if they have similar energy and protein values.

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- Then increase each successive feeding by 5–10 mL until child does not consume all food at feeding (generally around 30 mL/kg per feeding).
  - There is a risk of heart failure when children with severe acute malnutrition (SAM) suddenly consume large amounts of food.
  - If the child's respirations increase by more than 5 breaths/minute and pulse by more than 25 beats/minute for 2 successive 4-hour readings, reduce the volume of food given
    - ◆ Feed F100 16 mL/kg every 4 hours for 24 hours, then 19 mL/kg for 24 hours, then 22 mL/kg for 2 days, and then increase by 5–10 mL as above
- After the child begins to consume 30 mL/kg, feed the child.
  - At least every 4 hours of unlimited amount of formula
  - 150–220 kcal/kg per day
  - 4–6 g protein/kg
  - If child is breastfed, encourage the mother to continue (but intake will need to be supplemented because breast milk does not have sufficient nutrients for energy and protein)
- Assess progress by weight gain.
  - Plot weight gain by calculating and recording in g/kg per day.
  - If weight gain is poor, child needs to be reassessed.
  - If weight gain is moderate, check to see if child is being given proper amounts or if an infection has been overlooked.

### 17.2.1.9 Step 9. Provide Sensory Stimulation and Emotional Support

Provide—

- Tender loving care
- A cheerful, stimulating environment
- Structured play therapy 15 to 30 minutes per day

- Physical activity as soon as the child is well enough
- Maternal involvement when possible (e.g., comforting, feeding, bathing, play)

### 17.2.1.10 Step 10. Prepare for Follow-Up after Recovery

A child who is 90% weight-for-length (i.e., equivalent to  $-1$  standard deviation [SD]) can be considered to have recovered. The child is still likely to have a low weight-for-age because of stunting. Good feeding practices and sensory stimulation should be continued at home.

- Feed frequently with energy- and nutrient-dense foods.
- Give structured play therapy.
- Bring child back for regular follow-up checks.
- Ensure booster immunizations are given.
- Ensure vitamin A is given every six months.

## 17.2.2 Standard Medicines

### 17.2.2.1 Vitamin A

Vitamin A deficiency is thought to be common among severely malnourished children, and because clinical signs may be difficult to detect, 3 doses are given on day 1. For more information, see below.

TABLE 17.2.1 Vitamin A Dosages on Day 1

Age	Vitamin A PO
<6 months	50,000 IU—2 drops or one-third of red capsule
6 to 12 months	100,000 IU—3 drops or half one red capsule
>12 months	200,000 IU—one red capsule

### 17.2.2.2 Albendazole

Give albendazole only at discharge to the outpatient therapeutic programme (OTP) or at discharge from the paediatric ward (PW).

- 12 to 23 months: 200 mg in single dose
- ≥24 months: 400 mg in single dose

### 17.2.2.3 Antibiotics

Infections are common in severely malnourished children, but the usual signs such as fever are often absent. In high HIV-positive settings, doubling the dosage of amoxicillin in severely malnourished children compared to standard IMCI guidelines is recommended. Assume all severely malnourished children have an infection, and treat with antibiotics immediately. Hypoglycaemia and hypothermia are danger signs of severe infection. For children who look sickly or have complications, give the antibiotic IM (or IV if no risk of fluid overload). It works faster.

### 17.2.2.4 Malaria Medicines

If possible, always confirm malaria before giving treatment as described in the National Malaria Protocol. **Note:** Insecticide-treated bednets should be used in all wards for all patients.

### 17.2.2.5 Measles Vaccine

If there is no active epidemic in the area, give one dose of measles vaccine on discharge to all children over 9 months of age unless the child has a vaccination card that certifies that measles vaccine has already been given.

If there is an active measles epidemic in the area, give all children >6 months measles vaccine on admission. Give children older than 9 months a second dose on discharge.



### 17.2.3 Admission to Outpatient Therapeutic Programme

- Admission criteria—
  - SAM with appetite and no complication
  - Passes appetite test (can eat the amount specified for weight)
    - AND —
  - Has no bilateral pitting severe oedema
    - AND —
  - Has WFH (for children <5 years old) or body mass index (BMI) for-age (for children 5 to 14 years old) <-3 z-scores
    - OR —
  - Has MUAC based on age—
    - ◆ 6 months to 5 years: <11.5 cm
    - ◆ 6 to 9 years: <13.5 cm
    - ◆ 10 to 17 years: <16.0 cm
    - AND —
  - A caregiver is able and willing to provide home management of SAM and attend clinic every 14 days. See [table 17.2.3A](#).
- Diet
  - Give ready-to-use therapeutic food (RUTF) depending on weight (see [table 17.2.3B](#)) and instruct caregiver how to provide the RUTF at home.
  - Refer caregiver for HIV testing of the child, if not done.
  - Make appointment for review after 2 weeks

TABLE 17.2.3A Outpatient Treatment

Standard OTP medicines for severe malnutrition

Name of Product	On Admission?	Age	Prescription	Dose	Length of Treatment
<b>First-line antibiotics</b>					
Amoxicillin	Yes	0 to 5 months or 4 kg up to <10 kg	250 mg (10 mL if syrup 125 mg/5 mL)	2 times / day	5 days
		6 months up to 5 years 10 kg to 19 kg	375 mg (15 mL if syrup 125 mg/5 mL)		
<b>Standard medicines</b>					
Vitamin A	Yes	<6 month	50 000 IU	Single dose (1.5 drops or ¼ capsule)	OTP: one dose on admission
		6 month to <1year	100 000 IU	Single dose (3 drops or ½ capsule)	
		≥ 1 year	200 000 IU	Single dose (6 drops or 1 capsule)	

**TABLE 17.2.3A Outpatient Treatment (cont.)**  
Standard OTP medicines for severe malnutrition

Name of Product	On Admission?	Age	Prescription	Dose	Length of Treatment
<b>Standard medicines (cont.)</b>					
Artemether (A) 20 mg + Lumefantrine (L) 120 mg	Yes if in malaria area	All beneficiaries >6 months old (5–20 kg)	See protocol	See protocol	See protocol
		< 1 year	DO NOT USE	—	—
Albendazole	NO (On discharge from PW or on 2nd visit in OTP)	1 to <2 year	200 mg	Single dose	Single dose on discharge from PW or on 2nd visit in OTP if direct admission
		≥2 year	400 mg	Single dose	Single dose

Source: Namibia Ministry of Health and Social Services Standard OTP medicines for severe malnutrition

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TABLE 17.2.3B RUTF Schedule

Weight (kg)	Number of Sachets per Day	Number of Sachets per Week
3.5 to 3.9	1.5	10
4.0 to 5.4	2	14
5.5 to 6.9	2.5	17
7.0 to 8.4	3	21
8.5 to 9.4	3.5	24.5
9.5 to 10.4	4	28
10.5 to 11.9	4.5	33.5
12.0 to 13.5	5	35
15.0 to 19.9	5	35
20.0 to 29.9	6	42
30.0 to 39.9	7	49

### 17.2.4 Adult Clients

#### 17.2.4.1 SAM with Complications or No Appetite

##### Admission criteria

- Fever, hypothermia, severe anaemia or dehydration, vomiting, bilateral oedema  
— AND —
- Bilateral severe pitting oedema  
— OR —
- BMI <16 kg/m<sup>2</sup>  
— OR —
- MUAC <19 cm (for adults unable to stand straight for height and for pregnant and postpartum women)
- Admit for inpatient treatment of SAM

##### Management

1. Treat all medical complications.
2. Give all medications for management of SAM.

3. Encourage client to modify home diet to improve appetite.
4. Give F-75 or F-100 (70 to 80 mL/kg per day) if no tolerance for other food (and especially for adult patients with oedema).
5. Introduce 3 sachets of RUTF and 300 g of fortified blended foods (FBF) per day along with hospital diet.
6. At discharge, do an appetite test for RUTF, and provide 3 sachets of RUTF and 300 g of FBF per day for 2 weeks
7. Make an appointment for review after 2 weeks.

### 17.2.4.2 SAM with Appetite and No Complications

#### Assessment criteria

- No serious medical complications  
— AND —
- Appetite for RUTF  
— AND —
- Bilateral oedema (but not severe)  
— OR —
- BMI <16 kg/m<sup>2</sup> for nonpregnant or nonlactating women  
— OR —
- MUAC <19 cm (for adults unable to stand straight for height and for all pregnant and lactating women)

#### Management

1. Provide medicines for management of SAM.
2. If patient has appetite for RUTF but not for other foods, encourage food modification to improve appetite.
3. Provide 3 sachets of RUTF, and 300 g of FBF per day enough supplies for 14 days.
4. Assess for antiretroviral therapy (ART) (or refer for assessment for ARV start if not on ART).
5. Make appointment for review after 2 weeks.

### 17.3 Growth Monitoring and Nutrition Promotion

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The Growth Monitoring and Nutrition Promotion program aims to identify individual infants who are not gaining weight at an acceptable rate, so their families can change child care practices to improve the infant's nutrition.

Refer to the MoHSS *Official National Primary Health Care/Community Based Health Care Guidelines* (February 1992) on how to use the child growth card to promote growth.

#### Management

1. Understand the child's growth card.
2. Check the weighing scale in advance for accuracy.
3. Prepare the child for weighing.
4. Weigh the child.
5. Plot the weight of the child on the weight chart.
6. Record and notice important information on the card.
7. Interpret the growth card.
8. Identify the cause of the problem.
9. Help mothers, families, and communities take action based on the investigation.
10. Provide examples of possible actions to support growth monitoring and promotion.

## 17.4 Baby- and Mother-Friendly Initiative

The MoHSS *National Policy on Infant and Young Child Feeding* was developed to create an environment that promotes, protects, and supports sound infant and young child feeding practices. The policy emphasizes the need to promote, protect, and support breastfeeding for the majority of infants whose mothers are HIV negative, and for whom breastfeeding is a lifesaver. The policy ensures that infants whose mothers are HIV positive, or who are unable to breastfeed for whatever reason, are cared for and nourished to the best possible standards and are protected from the disadvantages that arise from inability to breastfeed. For more information, refer to the MoHSS *National Policy on Infant and Young Child Feeding*.

### Management

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers to initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Practice rooming-in. Allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called *dummies* or *soothers*) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups, and refer mothers to them on discharge from hospital or clinic.

### 17.5 Nutrition in HIV/AIDS

See [figure 17.5](#) for a summary of nutritional services for HIV-positive and/or ART adult patients (including breast-feeding mothers and pregnant women).

#### 17.5.1 Why Optimal Nutrition?

Good nutrition in HIV/AIDS is important because it can help to—

- Prevent malnutrition and wasting
- Enhance the body's ability to fight opportunistic infections
- Delay the progression of HIV to AIDS
- Achieve and maintain optimal body weight and strength
- Relieve complications such as diarrhoea, nausea and vomiting, and thrush
- Improve the effectiveness and tolerance of medications
- Improve the quality of life
- Encourage good general health

#### Causes of malnutrition

- Reduced food intake, loss of appetite
- Persistent diarrhoea
- Nausea and vomiting
- Mouth sores and thrush
- Recurrent infections (e.g., HIV, malaria, TB, bacterial infections)
- Poor socioeconomic circumstances

#### Complications of malnutrition

- Reduced absorption of nutrients
- Increased susceptibility to diarrhoea and other infections
- Reduced tolerance and effectiveness of medications
- Slower wound healing and infection healing
- Progression of HIV/AIDS hastened



## Signs and symptoms showing nutritional deficiencies

- Diarrhoea (acute and chronic)
- Nausea and vomiting
- Critical loss of body weight (slow and progressive or rapid, episodic)
- Muscle wasting
- Wasting syndrome (i.e., chronic diarrhoea plus loss of more than 10% of body weight, chronic weakness, and fever)
- Metabolic changes (i.e., body breaks down proteins from muscles and organs for energy)
- Nutrient deficiencies (especially micronutrients)
- Malabsorption (especially fat absorption and fat-soluble vitamins A, D, E, and K)
- Lactose intolerance (i.e., when ingesting milk products, the patient gets cramps, abdominal pain, and diarrhoea)
- Fat intolerance (i.e., when ingesting fatty food, the patient gets stomach cramps and pains and fatty diarrhoea)
- Oedema (bilateral pitting and generalised oedema is a danger sign)

## Management

### Assess the patient's nutrition status.

1. Take weight, height, and BMI (or MUAC if unable to measure weight and height).
2. Record nutrition symptoms.

### If the patient looks severely malnourished—

1. Determine if the patient meets the criteria for being severely malnourished:
  - BMI <16 kg/m<sup>2</sup>
  - Weight loss >10% in past 2 months
  - MUAC <185 mm (<210 mm if pregnant or post-partum)
  - Persistent diarrhoea and fever with or without other symptoms
2. Admit or refer for inpatient care and therapeutic rehabilitation.

3. Treat infections.
4. Rehydrate.
5. If the patient has no medical complications (including infection and dehydration), treat him or her on outpatient basis.
6. Promote weight gain with high-energy foods.
7. Supplement the patient's diet with multivitamins and minerals, 1 to 2 per day.
8. Follow up in 2 weeks and monthly thereafter.

### **If the patient looks moderately malnourished—**

1. Determine if the patient meets the criteria for being moderately malnourished:
  - BMI  $>16$  to  $18.5 \text{ kg/m}^2$
  - MUAC 185 to 210 mm (210 to 230 mm if pregnant or postpartum)
  - Weight loss  $>5\%$  since last visit
  - Mild symptoms
2. Treat symptoms and infection.
3. Prevent further weight loss and infections with high-energy, -protein, -vitamin, and -mineral foods.
4. Supplement the patient's diet with multivitamins and minerals, 1 to 2 per day.
5. Follow up in 1 month and every 2 months thereafter.

### **If the patient looks well-nourished—**

1. Determine if the patient meets the criteria for being well-nourished:
  - BMI  $>18.5 \text{ kg/m}^2$
  - MUAC  $>210 \text{ mm}$  ( $>230$  if pregnant or postpartum)
  - No weight loss or symptoms
2. Praise the patient's good eating behaviours.
3. Encourage continued healthy eating and weight maintenance.
4. Supplement the patient's diet with multivitamins and minerals, 1 to 2 per day.
5. Follow up regularly.

## Health education

- Advise the patient to—
  - Use locally available foods, fruits, and vegetables.
  - Start his or her own vegetable garden, or refer to community gardening projects.
  - Avoid empty-calorie and junk food and drinks (i.e., cool drinks, crisps and chips, sweets, alcohol).
  - Eat at least 3 to 5 meals per day; eating many small meals is preferred.
  - Choose healthy snacks (e.g., nuts, seeds, dried and fresh fruit, oshikunde, omaere).
  - Maintain healthy body weight according to BMI charts.
  - Prepare food hygienically and use clean utensils only.
  - Drink plenty of safe and fresh water.
  - Exercise, but favour gentle, not tiring, exercise.
- Discuss interactions of medications and food with the patient (e.g., didanosine to be taken 1 hour before or 2 hours after meals).
- Refer the patient to a registered dietician for individualized dietary counselling.

## 17.5.2 Nutrition Management in Special Circumstances

In many special circumstances, providing the patient, and if possible the caregiver as well, with health education about good nutrition is the most effective nutrition management option.

### 17.5.2.1 Weight Loss and Wasting Syndrome

#### Health education

- Advise a high-calorie intake.
  - Eat from the carbohydrate food group 3 to 5 times per day.
  - Eat 2 or 3 snacks in-between meals.

- Add as many of the following as possible to the diet: peanut butter, cheese, avocado, sauces, or oil to foods such as vegetables, bread, noodles, rice, mahangu, pasta.
- Maintain adequate protein intake.
  - Consume protein-containing foods (e.g., milk and milk products, beans, meat, chicken, eggs, fish, nuts).
  - Add hard-boiled eggs to the diet.
  - Combine beans or peas with rice, maize, or other grains.
  - Add milk powder or fresh milk to foods.
  - Eat protein-rich snacks (e.g., yoghurt with nuts, crackers with peanut butter).
  - Prepare powdered soups with milk instead of water.
  - Drink sour milk, omaere, or oshikandela; eat fermented cereals (e.g., mageu, oshikunde).

### 17.5.2.2 Loss of Appetite

#### Health education

- Eat many small meals each day at regular times.
- Choose a variety of foods.
- Take advantage of every time the appetite is good and eat as much as possible during these times.
- Eat favourite foods as often as desired.
- Eat high-energy foods, starchy foods, and high-protein foods.
- Eat nutritious snacks between the meals.
- Drink fluids frequently between meals, but do not drink during or just before meals as this will fill up the stomach.
- Add more flavour to foods with sauces, relishes, and herbs and spices such as ginger or cinnamon. Food that smells delicious and looks attractive is more appetising.
- Take a 15-minute walk before eating; mild exercise and fresh air can stimulate the appetite.

- Make eating a social event and eat with family or friends; avoid staying in bed alone with the food.

### 17.5.2.3 Nausea and Vomiting

#### Health education

- Eat small frequent meals.
- Avoid spicy, high-fat foods.
- Eat easily digested foods, soups, fruits, and porridge.
- Colder foods are often better tolerated.
- Avoid caffeine; drink herbal teas and juices.
- Drink slowly.
- Favour minimally seasoned or spiced chicken, vegetable soups, sour porridge, mageu, fruits (e.g., bananas), jelly, and hard candy.
- Consume dry salty biscuits, dry toast; they may help calm the stomach.
- Sit straight when eating.
- Avoid lying down after meals for 20 to 30 minutes.
- Rest between meals.

### 17.5.2.4 Diarrhoea

#### Health education

- Seek medical care.
- Drink lots of fluids, including oral rehydration fluid (ORS).
- Eat many small meals (i.e., >5) per day.
- Favour easily digested foods (e.g., porridge, oatmeal, white rice).
- Eat soft fruits and vegetables (e.g. pumpkin, squash, bananas).
- Consume yoghurt and cultured milk.

### 17.5.2.5 Children

#### Health education

- Be much more aware of under-nutrition and acute malnutrition.

- Keep regular follow-up appointments.
- Monitor the child's growth (i.e., weight, height, general appearance).
- Ask the child to discuss his or her eating habits with parents.
- Advise on many small meals (>5) per day.
- Discuss feeding difficulties (thrush in mouth, swallowing/suckling problems)
- Treat complications (e.g., nausea, vomiting, diarrhoea, mouth sores, stomach pain)
- Discuss medication side effects and advise.
- Supplement the child's diet with multivitamins.
- In diarrhoea, be strict about fluid intake (i.e., water, ORS, fermented milk products, or porridge).

### 17.5.2.6 Breastfeeding Mothers

#### Health education

- Breast milk is ideal.
- All infants should be breastfed exclusively from birth until six months of age, at which time complementary foods are introduced with continued breastfeeding until 2 years and beyond. (See WHO. 2003. *Global Strategy for Infant and Young Child Feeding*. Geneva. WHO and UNICEF. [whqlibdoc.who.int/publications/2003/9241562218.pdf](http://whqlibdoc.who.int/publications/2003/9241562218.pdf).)

### 17.5.2.7 Infant Feeding in Difficult Circumstances

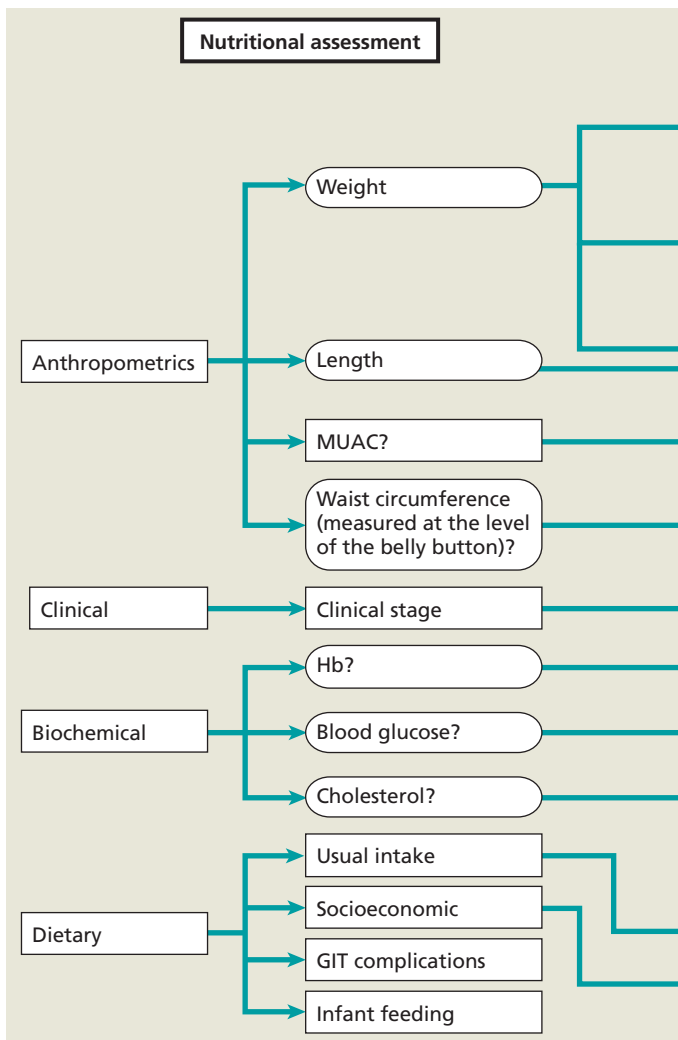
Feeding of infants exposed to HIV—

1. Decide between the two feeding options:
  - Exclusive breastfeeding (from birth to 4 months)
  - OR —
  - Replacement feeding with a cup using formula milk or modified animal (i.e., cow or goat) milk, if replacement milk is acceptable, feasible, affordable, sustainable, and safe (AFASS).

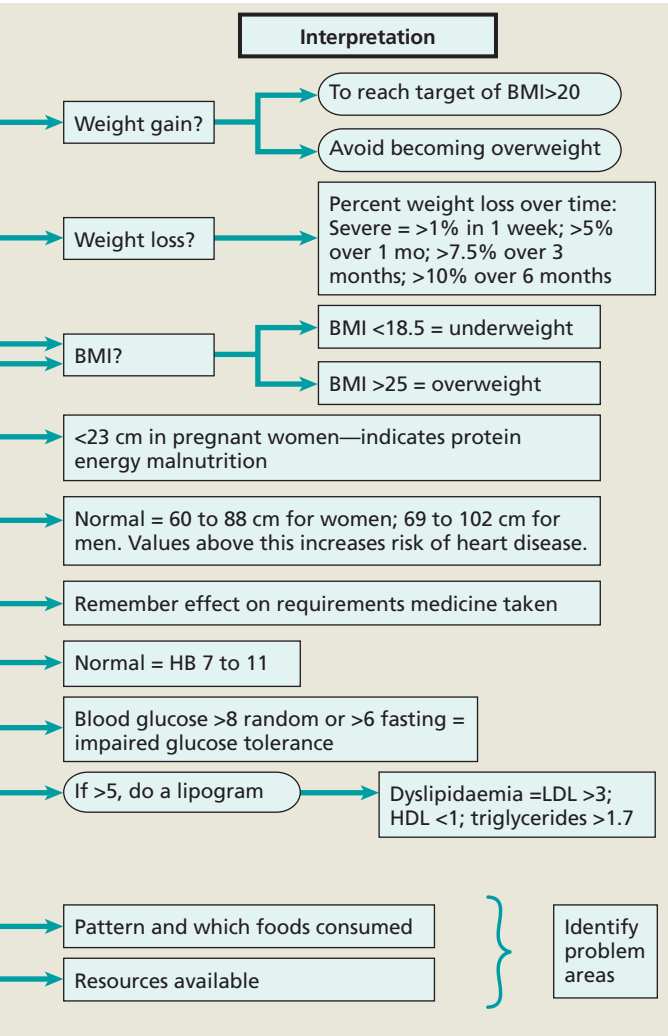
2. If the exclusive breastfeeding option is chosen, follow these stipulations:
  - Feed only breast milk for 4 months (per Namibia recommendation) or 6 months (per WHO recommendations)
  - Breastfeed on demand, day and night (8 to 12 times per 24 hours).
  - Provide no other liquids, water, or replacement feedings.
  - Provide no pacifiers or dummies.
  - Start replacement feeding and complimentary food at age 6 months.
  - Care of breasts important.
3. If the replacement feeding option is chosen, follow these stipulations:
  - Feed infant formula or, at 6 months, introduce whole cow's or goat's milk.
  - Always think AFASS.
4. Counsel on abrupt stopping at 4 months.
  - Assess the following before stopping—
    - Will the mother have acceptance and support from partner, family, and community?
    - Is a regular and appropriate supply of a breast milk substitute available?
    - Will the mother be able to safely prepare breast milk substitute?
    - Is the infant able to cup feed?
  - Stress the importance of continued physical contact with baby.
  - Discuss strategies to prevent engorgement.
5. Help the mother transition from expressed breast milk to replacement milk.
  - Instruct the mother to follow these steps for successful transition from breastfeeding to replacement milk:
    - Express breast milk and provide feedings by cup between regular feedings.

## 17.5 Nutrition in HIV/AIDS

**FIGURE 17.5** Flow diagram for nutritional services for HIV-positive and/or ART adult patients (including breastfeeding mothers and pregnant women)

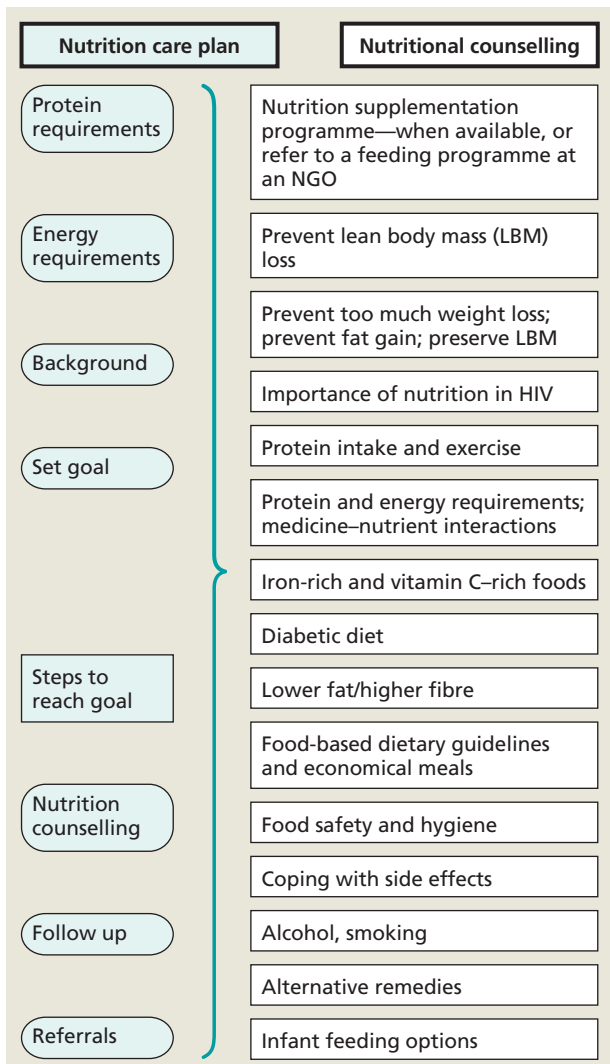






## 17.5 Nutrition in HIV/AIDS

**FIGURE 17.5** Flow diagram for nutritional services for HIV-positive and/or ART adult patients (cont.)



- As the infant begins to accept cup feeding, replace breast feedings with cup feedings one feeding at a time.
  - Once all the breast milk feedings are accepted by cup, begin feeding only breast milk substitutes (i.e., formula or modified cow's or goat's milk)
    - Urge the mother to provide extra comfort to the baby during this time.
    - Support the mother because the baby may cry and fuss.
6. If replacement milk is not AFASS at 4 months:
    - And if the mother is healthy
    - And if she is exclusively breastfeeding
    - Then continue breastfeeding until replacement milk is AFASS or infant is 6 months and can tolerate unmodified milk and solid foods
  7. For all children 0–5 years with a TB sputum positive mother—
    - Continue breastfeeding if possible.
    - Give child isoniazid preventive therapy (IPT) 5 mg/kg.

**— PLUS —**

    - Pyridoxine 5 mg daily for 6 months
  8. Breast feeding can be difficult for weak, ill, or very premature infants, or infants with malformations around the mouth. These infants can often be fed expressed breast milk.
  9. Contraindications to breastfeeding are cancer of the breast and cancer treatment with chemotherapy.
  10. Warn the nursing mother to avoid all medicines and drugs, especially tetracyclines, sulphonamides, combined oral contraceptives, and chloramphenicol.
  11. Warn the nursing mother to avoid caffeine and alcohol.

### 17.6 Obesity and Overweight

Obesity is defined as excess body fat deposited in the body contributing to comorbidity. Body mass index (BMI) is the measurement of obesity and is calculated as follows:

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (in meters) squared (m}^2\text{)}}$$

Table 17.6 translates the BMI into a weight assessment.

**TABLE 17.6 Determining Patient Weight Status**

Classification	Criteria
Underweight	BMI <18
Healthy body weight	BMI 18 to 25
Overweight	BMI 25 to 30 or waist circumference >88 cm (F) and >102 (M)
Obesity	BMI >30 or waist circumference >88 cm (F) and >102 (M)

#### Causes

- High energy (i.e., calorie) intake: eating too much, eating a lot of fatty food
- Low expenditure: sedentary lifestyle, no exercise or limited activity
- Disease: hypothyroidism, diabetes mellitus, pituitary cancer

#### Risk factors

- Hypertension (i.e., high blood pressure)
- Diabetes mellitus
- Ischaemic heart disease
- Hyperlipidaemia (i.e., high cholesterol)
- Obstructive sleep apnoea
- Fatty liver
- Gallstones

- Kidney problems
- Musculoskeletal problems in weight-bearing joints

### Symptoms and signs

- Overweight
- Difficult breathing
- Poor sleeping patterns
- Joint damage due to weight
- Low fertility
- Poor self-image, antisocial, depression

### Investigations

- Blood pressure
- Blood glucose
- Cholesterol

### Management

1. Advise the patient to decrease calorie intake, especially fat intake.
2. Refer the patient to a registered dietician for individualized dietary counselling and to compile an energy-reduced, healthy diet plan.
3. Recommend behaviour therapy (i.e., controlling appetite, participating in hobbies, combating depression).
4. Urge the patient to increase physical activity and to exercise daily. Advise starting slowly and building up fitness.
5. Use pharmacotherapy only if necessary (i.e., if other methods have not worked).
6. Recommend surgery only if necessary (i.e., other methods have not worked).

### Health education

- Advise the patient on the nature of being overweight or obese and the concomitant health dangers.
  - Explain the patient's situation in terms of a balloon filled with water: if you keep pouring water in (i.e., eating) and not taking water out (i.e., exercising), the balloon will get larger and larger.

## 17.7 Iodine Deficiency

- Warn the patient about DM, high BP, strokes, MI, and other conditions that are caused or made worse by being overweight or obese.
- Give the patient practical suggestions about how to lose weight.
  - Refer the patient to a registered dietician for individualized counseling on how to reach a healthy weight.
  - Stress that the patient must learn how to eat less and follow an energy-reduced, healthy diet.
  - Urge the patient to increase physical activity and to exercise daily, but caution him or her to start slowly, perhaps with walking around the block, walking up stairs, or going to the gym.
- Provide support and encouragement to the patient.
  - Tell the patient that you understand that losing the weight will be hard work. He or she should not expect to meet weight goals in few weeks. It takes just as long to take weight off as it does to put weight on.
  - Suggest that the patient aim to achieve at least a 10% weight loss every year.
  - Ask the patient to return to the clinic regularly for weight checks, BP, glucose, and other measurements.

### 17.7 Iodine Deficiency

Iodine deficiency is found primarily in areas where iodine intake is quite low, often in arid land-locked areas where individuals do not consume seafood. Iodine deficiency gives rise to a state of hypothyroidism because iodine is necessary for thyroid hormones (T3 and T4) production and function.

#### Causes

Low dietary intake of iodine causes the pituitary hormone TSH to rise and therefore stimulate thyroid gland tissue growth.

## Symptoms and signs

In adults (hypothyroidism)

- Fatigue
- Mental slowness
- Depression
- Goitre (i.e., enlargement of the thyroid)
- Weight gain
- Slow body metabolism and low basal temperatures
- Constipation

In children

- Cretinism with mental retardation
- Deaf-mutism
- Squint
- Disorders of stance and gait (physical performance low)
- Stunted growth
- Hypothyroidism

## Management

1. Recommend 150 mcg of iodine per day.
2. Encourage the patient to consume foods that contain iodine: dried kelp, iodised salt, saltwater fish (e.g., sardines, hake, pilchards), and other seafood (e.g., shrimp, crayfish).

## Health education

- Advise the patient to—
  - Always keep iodised salt in a closed and dry container so that the iodine in the salt will be preserved
  - Add iodised salt to food on the table or when it is nearly cooked in order to avoid destruction and loss of the iodine
  - Consume iodine-rich foods.
- Discuss the components of a healthy diet (see [17.1](#) above) with the patient.
- Refer the patient to a registered dietician for dietary counselling.

### 17.8 Vitamin A Deficiency

Retinol (Vitamin A) is necessary for—

- Proper vision
- Proper maintenance of the mucus membranes of the lungs and stomach
- Proper growth and development in children
- Increased resistance to infections and other diseases

Groups at high risk of vitamin A deficiency include—

- Children aged 6 months to 6 years
- Children who are not breastfed
- Low birth-weight infants
- Children living in drought-affected areas
- Children with measles, acute respiratory infection, or severe diarrhoea
- People depending on seasonal vegetables
- People living in poor socioeconomic conditions
- People in refugee camps, prisons, or urban slums

#### Causes

- Low dietary intake
- Low vitamin A storage at birth due to maternal deficiency
- Low vitamin A storage in low birth-weight infants
- Interference with absorption
- Interference with transportation of vitamin A
- Rapid loss and increased requirement of vitamin A
- Household food insecurity
- Lack of vegetable gardens
- Inadequate care for mother and children
- Inadequate basic services
- Inadequate knowledge
- Inadequate primary health care

#### Symptoms and signs

- Xerophthalmia
- Blindness
- Increased morbidity and mortality



- Increased severity and duration of illness
- Inadequate growth in children
- Night blindness
- Bitot's spots
- Corneal xerosis
- Keratomalacia
- Corneal scar

### Investigations

- Routine examination of eyes of all children
- Regular xerophthalmia surveillance

### Management

See [table 17.8](#).

### Health education

- Inform patients and parents that—
  - Vitamin A deficient children cannot see in the dark and have dry eyes.
  - Vitamin A deficiency can lead to blindness.
  - Vitamin A supplementation can save sight.
  - Good food sources of vitamin A are breast milk, green leafy vegetables (e.g., spinach and broccoli), orange or yellow fruits (e.g., mangoes, paw-paws) and vegetables (e.g., carrots, sweet potatoes), liver, eggs, milk, butter, fish, and fish oils. Eat these foods whenever possible.
- Advise patients and parents to—
  - Check children's eyes regularly and report to a health worker if any of the signs of vitamin A deficiency occur.
  - Grow green leafy vegetables and orange or yellow fruit and vegetables in your garden.
  - Breastfeed children exclusively for 6 months and continue breastfeeding with complimentary foods thereafter.
  - Feed children at least 5 times per day (see [17.1.6](#) above).
  - Immunise children against diseases.

## 17.8 Vitamin A Deficiency

- Monitor children's growth to detect early malnutrition.
- Refer patient to a registered dietician for dietary counselling.
- Advise the patient or parent on cooking hygiene and clean water and sanitation.

TABLE 17.8 Management of Vitamin A Deficiency

Schedule and Instructions	Patient	Dosage
<b>Prevention schedule—</b> Give vitamin A to all children ages 9 months to 6 years, who present in any health facility, children in emergency situation, and lactating mothers in the first month after delivery.	Children ages 1 to 6 years	200,000 units vitamin A PO 2 times every year
	Infants ages 9 months to 1 year and those <8 kg	100,000 IU vitamin A PO stat. Give this dose with measles vaccine at 9 months.
	Mothers immediately after delivery <sup>a</sup>	200,000 units vitamin A PO. Do not give vitamin A capsules to mothers later than 1 month after delivery. <sup>a</sup>
<b>Disease targeted schedule—</b> Give vitamin A to preschool-age children presenting at health facilities with measles, marasmus, kwashiorkor, marasmic kwashiorkor, diarrhoea lasting 7 days or longer, TB, acute respiratory infection, and HIV/AIDS.	Children ages 1 to 6 years	<ul style="list-style-type: none"> <li>• 200,000 units vitamin A PO at first visit</li> <li>• Repeat dose the following day</li> </ul>
	Infants ages 6 months to 1 year and those <8 kg	<ul style="list-style-type: none"> <li>• 100,000 IU vitamin A PO at time of first contact with health worker</li> <li>• Repeat dose the following day</li> <li>• Repeat dose after 15 days</li> </ul>

TABLE 17.8 Management of Vitamin A Deficiency (cont.)

Schedule and Instructions	Patient	Dosage
<b>Xerophthalmia treatment schedule—</b> Give vitamin A for all stages of active xerophthalmia, night blindness, Bitot's spots, conjunctiva xerosis, and corneal ulceration. <b>Note:</b> Corneal eye involvement is an emergency. Act fast to save sight.	<b>Children 1 year of age and older</b>	
	Immediately on diagnosis	200,000 units vitamin A PO
	The following day	200,000 units vitamin A PO
	4 weeks later	200,000 units vitamin A PO
	<b>Children younger than 1 year and children of any age &lt;8 kg</b>	
	Immediately on diagnosis	100,000 units vitamin A PO
	The following day	100,000 units vitamin A PO
	4 weeks later	100,000 units vitamin A PO
	<b>Women of reproductive age who have xerophthalmia signs<sup>a</sup></b>	10,000 IU vitamin A PO per day for 14 days

<sup>a</sup> Vitamin A should not be used in pregnancy and for women of child-bearing age except as indicated.

# Infectious Diseases

18. HIV/AIDS	<u>630</u>
19. Tuberculosis	<u>658</u>
20. Fever of Unknown Origin	<u>672</u>
21. Malaria	<u>677</u>
22. Schistosomiasis (Bilharzia)	<u>684</u>
23. Rabies	<u>686</u>



### 18. HIV/AIDS

HIV disease is an infection with human immunodeficiency virus. AIDS (acquired immunodeficiency syndrome), or advanced HIV disease, is the condition that results from long-term (i.e., chronic) HIV infection and is defined by an absolute CD4 count of less than or equal to 350 cells/mm<sup>3</sup> and specific opportunistic infections or malignancies.

#### Cause

- HIV type 1, 2
- Transmitted by exposure to infected blood and blood products and other body fluids through—
  - Sexual contact
  - HIV-infected mother to child
  - Health care settings (accidental injuries, contact with infected fluids)
- Majority of the transmission in Africa is by sexual exposure

### 18.1 HIV/AIDS in Adults and Adolescents

#### 18.1.1 Treating HIV/AIDS Adult and Adolescent Patients

##### Symptoms and signs

- Acute viraemia (primary HIV infection) for 2 weeks
- Usually flu-like symptoms including—
  - Fever
  - Lymphadenopathy (persistent, nonadjacent sites)
  - Pharyngitis
  - Maculopapular rash
  - Small orogenital ulcers
  - Muscular pain, joint pain, headache

Symptoms are grouped according to level of immunosuppression in the WHO clinical staging system. [Table 18.1.1](#) outlines the WHO clinical staging criteria.

**TABLE 18.1.1 WHO Clinical Staging of HIV in Adults and Adolescents**

Stage	Symptoms and Signs
Clinical stage 1	<ul style="list-style-type: none"> <li>• Asymptomatic</li> <li>• Persistent generalized lymphadenopathy (PGL)</li> </ul>
Clinical stage 2	<ul style="list-style-type: none"> <li>• Unexplained moderate weight loss (&lt;10% of presumed or measured body weight)</li> <li>• Recurrent respiratory tract infections (e.g., sinusitis, tonsillitis, otitis media, and pharyngitis)</li> <li>• Herpes zoster</li> <li>• Angular cheilitis</li> <li>• Recurrent oral ulceration</li> <li>• Papular pruritic eruptions</li> <li>• Seborrhoeic dermatitis</li> <li>• Fungal nail infections</li> </ul>
Clinical stage 3	<ul style="list-style-type: none"> <li>• Unexplained severe weight loss (&gt;10% of presumed or measured body weight)</li> <li>• Unexplained chronic diarrhoea for longer than one month</li> <li>• Unexplained persistent fever (above 37.5 °C intermittent or constant, for more than one month)</li> <li>• Persistent oral candidiasis</li> <li>• Oral hairy leukoplakia</li> <li>• Pulmonary tuberculosis (current)</li> <li>• Severe bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, or bacteraemia)</li> <li>• Acute necrotizing ulcerative stomatitis, gingivitis, or periodontitis</li> <li>• Unexplained anaemia (&lt;8 g/dL), neutropaenia (&lt;0.5 × 10<sup>9</sup> per litre) and/or chronic thrombocytopaenia (&lt;50 × 10<sup>9</sup> per litre)</li> </ul>

## 18.1 HIV/AIDS in Adults and Adolescents

TABLE 18.1.1 WHO Clinical Staging of HIV in Adults and Adolescents (cont.)

Stage	Symptoms and Signs
Clinical stage 4	<ul style="list-style-type: none"><li>• HIV wasting syndrome</li><li>• Pneumocystis pneumonia</li><li>• Recurrent severe bacterial pneumonia</li><li>• Chronic herpes simplex infection (i.e., orolabial, genital, or ano-rectal of more than one month's duration or visceral at any site)</li><li>• Oesophageal candidiasis (or candidiasis of trachea, bronchi, or lungs)</li><li>• Extrapulmonary tuberculosis</li><li>• Kaposi's sarcoma</li><li>• Cytomegalovirus infection (e.g., retinitis or infection of other organs)</li><li>• Central nervous system toxoplasmosis</li><li>• HIV encephalopathy</li><li>• Extrapulmonary cryptococcosis including meningitis</li><li>• Disseminated nontuberculous mycobacterial infection</li><li>• Progressive multifocal leukoencephalopathy</li><li>• Chronic cryptosporidiosis (with diarrhoea)</li><li>• Chronic isosporiasis</li><li>• Disseminated mycosis (e.g., coccidiomycosis or histoplasmosis)</li><li>• Recurrent nontyphoidal Salmonella bacteraemia</li><li>• Lymphoma (cerebral or B-cell non-Hodgkin's) or other solid HIV-associated tumours</li><li>• Invasive cervical carcinoma</li><li>• Atypical disseminated leishmaniasis</li><li>• Symptomatic HIV-associated nephropathy or symptomatic HIV-associated cardiomyopathy</li></ul>



### Investigations

- Do an HIV rapid test if not already done. If test is positive, refer patient to an HIV care clinic.
- Evaluate for the need to begin highly active antiretroviral therapy (HAART)—
  - Take a complete medical history
  - Do a physical examination
  - Determine the patient's WHO clinical stage
  - Determine the CD4 cell count
- Register the patient into the Antiretroviral Management Information System (ARVMIS).
- Make an accurate assessment of the clinical stage of each HIV patient at every 6 months.
- Re-check the indications for HAART—
  - At VCT centre, antenatal care (ANC) or prevention of mother-to-child (PMTCT) site, outpatient department (OPD), primary care clinic or hospital—
    - ◆ Do enzyme-linked immunosorbent assay (ELISA) or rapid HIV testing
  - At primary care clinic, OPD, or hospital—
    - ◆ Take a CD4 cell count
  - At a communicable disease clinic or an ANC-HAART clinic, run the following tests—
    - ◆ Full blood count
    - ◆ Hb
    - ◆ Creatinine clearance
    - ◆ Blood glucose
    - ◆ Pregnancy test
    - ◆ Fasting cholesterol and triglycerides
    - ◆ Amylase
    - ◆ Viral load
    - ◆ ALT
    - ◆ CD4 cell count

## 18.1 HIV/AIDS in Adults and Adolescents

### Management

1. Refer to the MoHSS 2010 *National Guidelines for Antiretroviral Therapy Management*.
2. The goals of antiretroviral treatment are to—
  - Reduce the HIV viral load to undetectable levels for as long as possible
  - Preserve the immune system and reduce frequency and severity of HIV-related illness
3. At present three classes or types of antiretroviral medicines are available in Namibia:
  - Nucleoside reverse transcriptase inhibitors (NRTIs)
    - Zidovudine (AZT or ZDV)
    - Lamivudine (3TC)
    - Didanosine (ddI)
    - Stavudine (D4T)
    - Tenofovir (TDF)
    - Abacavir (ABC)
  - Non-nucleoside transcriptase inhibitors (NNRTIs)
    - Nevirapine (NVP)
    - Efavirenz (EFV)
  - Protease inhibitors (PIs)
    - Lopinavir/ritonavir (LPV/r)
    - Ritonavir (RTV)
4. The principles of antiretroviral therapy include the following—
  - The concentration of virions in the blood (viral load) is a marker of disease progression. Low viral load is associated with slower disease progression.
  - Sustained suppression of the viral load can be achieved by various combinations of 3 or more medicines known as HAART.
5. HAART is indicated for—
  - All persons with confirmed HIV infection who have CD4 less than or equal to 350 cells/mm<sup>3</sup> including pregnant women, irrespective of WHO clinical stage

- All persons who are categorised as WHO clinical stage 3 or 4, irrespective of CD4 cell count
- 6. Early diagnosis is the key to prompt commencing of HAART before CD4 falls to a dangerously low level. These indications may change—please refer to “[How to Use This Book](#)” in the frontmatter.
  - Postexposure prophylaxis—see the MoHSS 2010 *National Guidelines for Antiretroviral Therapy Management*
  - Reduction of mother-to-child transmission of HIV—see the MoHSS 2008 *National Guidelines for Antiretroviral Therapy Management*
- 7. When optimal response to treatment is achieved, the median CD4 cell rise is 100 to 200 cells within the first year.
- 8. HAART has the following limitations—
  - HAART does not eliminate the virus. Treatment may fail to control viraemia; also, viraemia rapidly increases after stopping therapy (or even after stopping one of the three medicines). Patients must continue the treatment for life.
  - Resistant HIV strains emerge, in particular if patients have poor adherence and are in advanced disease. Adherence to therapy for a long period is difficult. A decline in adherence to ART over time has been widely documented.
  - Sexual transmission of HIV may continue to occur, even if the viral load is at an undetectable level in serum. Sexual transmission of strains resistant to multiple ARV classes has already been documented.
  - Side effects of treatment are common. Evidence of long-term side effects is increasing; such side effects confer serious health risks. Medicine interactions are also frequent.
  - Treatment options are currently limited for patients who do not tolerate the available regimes or develop resistance.

## 18.1 HIV/AIDS in Adults and Adolescents

9. The availability and cost of HAART in Namibia is as follows—
  - Most ARV medicines are available in Namibia through state and private pharmacies.
  - Fixed-dose combinations of ARV (such as D4T/3TC/NVP) are now available and greatly improve adherence; hence they should be used wherever possible.
10. For the recommended ARV regimen instructions in Namibia for adults and adolescents, see the IMAI documents or the MoHSS 2010 *National Guidelines for Antiretroviral Therapy Management*.

### 18.1.2 Prophylaxis of Opportunistic Infections

An opportunistic infection (OI) is an infection caused by a microorganism that does not normally cause disease in humans; it occurs in persons with abnormally functioning immune systems (such as HIV/AIDS patients or transplant patients receiving immunosuppressive medicines). Prophylaxis of OIs reduces the risk of death and hospitalization of persons with HIV.

#### Management

1. Treat pneumocystis pneumonia, bacterial pneumonia, and toxoplasma encephalitis.
  - Primary prophylaxis: co-trimoxazole (see [appendix 1](#)—IMAI documents)
    - $2 \times 400/80$  mg tablets = 800/160 mg total per day
    - Indications
      - ◆ Persons with HIV, WHO clinical stage 3 or 4 disease
      - ◆ CD4 cell count  $<350$  cell/mm<sup>3</sup>
      - ◆ All TB/HIV coinfecting patients regardless CD4 cell counts
    - Co-trimoxazole prophylaxis can be discontinued after 2 consecutive CD4 cell counts with  $>350$  cells/mm<sup>3</sup>, 6 months apart in patients on ART

- Co-trimoxazole prophylaxis should be restarted any time CD4 cell count falls below 350 cells/mm<sup>3</sup> on any one occasion
- Secondary prophylaxis: co-trimoxazole
  - Any patient with history of *Pneumocystis carinii* pneumonia (PCP) or toxoplasmosis should continue maintenance co-trimoxazole 800/160 mg once per day until patient is on ART and CD4 >350 on two consecutive counts, 6 months apart
  - Intolerance to co-trimoxazole
    - ◆ Ensure that genuine intolerance exists. Consider desensitization if facilities are available. Alternative: dapsonsone 100 mg PO per day

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**Note:** For patients who have an adverse reaction that is not life threatening, treatment with co-trimoxazole should be continued if clinically feasible (possibly at reduced dose or frequency). Patients with genuine allergy (i.e., fever and rash) may tolerate reintroduction of the medicine with a gradual increase in dose (desensitisation).

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- ◆ Dapsone as a sole agent is less effective in preventing PCP than TMP-SMX.

### 2. Treat cryptococcal meningitis.

- Primary prophylaxis: not recommended
- Secondary prophylaxis: fluconazole
  - After recovery from a confirmed diagnosis of cryptococcal disease, ongoing fluconazole 200 mg once per day should be administered until the patient's CD4 count is above 200 cells/mm<sup>3</sup> on two consecutive counts, 6 months apart

### 3. Treat tuberculosis using a preventive treatment of isoniazid (H). See [appendix 1](#)—IMAI documents.

- Check TB status (see “Section IV. Infectious Diseases. [Chapter 19. Tuberculosis](#)”).

## 18.1 HIV/AIDS in Adults and Adolescents

- Indications for isoniazid preventive treatment:
  - HIV-positive adults or children in whom active TB disease has been excluded who have not received TB treatment within the last 2 years or any previous isoniazid prophylaxis
  - Children (age 5 and below) who are in close contact with an infectious TB patient
  - Close contacts of a smear-positive TB patient who—
    - ◆ Has medical conditions that suppress the immune system (e.g., Hodgkin's disease, leukaemia, or diabetes mellitus)
    - ◆ Is undergoing immunosuppressive therapy (e.g., chronic steroids or cancer chemotherapy)
- Prescribe isoniazid for 6 months (5 mg/kg body weight to a maximum of 300 mg per day) and pyridoxine 12.5 mg per day
- In the presence of any symptoms of TB (e.g., cough, fever, lymph node swelling, feeling generally unwell), prophylaxis should be postponed and TB investigations carried out.
- In nonadherent patients, prophylaxis should be discontinued with no further attempt to restart.
- 4. Treat malaria using intermittent presumptive treatment during pregnancy.
  - Dose: 3 tablets per dose (one tablet equals sulfadoxine 500 mg plus pyrimethamine 25 mg)
  - Pregnant women without HIV—
    - 2 doses of sulfadoxine-pyrimethamine, one month apart, during pregnancy
  - Pregnant HIV-positive women at WHO clinical stage 1 or 2 and CD4 less than or equal to 350 cells/mm<sup>3</sup>—
    - 3 doses of sulfadoxine-pyrimethamine, one month apart

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**Note:** Pregnant HIV-positive women on co-trimoxazole *should not* be given and *should not* take sulfadoxine-pyrimethamine.

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### Health education

- Stress the importance of the following to all HIV/AIDS patients—
  - Continual lifelong attendance at ART clinic and adherence to treatment
  - Having a treatment supporter
  - Positive living
  - Contact testing and VCT
  - Reproductive counselling (e.g., PMTCT, children, contraception)
  - Correct and consistent condom use
- Advise the patient to consume a healthy diet (see “[Section III. Nutrition and Lifestyle](#)”).
- Encourage the patient to adopt a healthy lifestyle: no alcohol, no smoking, and getting some exercise.

## 18.2 HIV/AIDS in Children

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The vast majority of HIV-positive children are infected through mother-to-child transmission (MTCT) of HIV. Infection may occur during pregnancy, during labour and delivery, or postnatally (through breastfeeding). A small number of infections in children are attributable to transmission through, for example, sexual abuse, the use of contaminated sharp objects, and blood transfusion (rare in Namibia).

### 18.2.1 The Natural Course of HIV Disease in Children

Symptomatic infants <12 months of age usually have a shorter survival period than older children. Untreated, one-third of HIV-infected infants die before 1 year of age and half die before 2 years.

## 18.2 HIV/AIDS in Children

TABLE 18.2.1A WHO Clinical Staging of HIV in Children

Stage	Symptoms and Signs
Clinical stage 1	<ul style="list-style-type: none"> <li>• Asymptomatic</li> <li>• Persistent generalised lymphadenopathy (PGL)</li> </ul>
Clinical stage 2	<ul style="list-style-type: none"> <li>• Unexplained persistent hepatosplenomegaly</li> <li>• Papular pruritic eruptions</li> <li>• Fungal nail infections</li> <li>• Angular cheilitis</li> <li>• Lineal gingival erythema (LGE)</li> <li>• Extensive wart virus infection</li> <li>• Extensive molluscum contagiosum</li> <li>• Recurrent oral ulcerations</li> <li>• Unexplained persistent parotid enlargement</li> <li>• Herpes zoster</li> <li>• Recurrent or chronic upper respiratory infections (e.g., otitis media, otorrhoea, sinusitis, tonsillitis)</li> </ul>
Clinical stage 3	<ul style="list-style-type: none"> <li>• Unexplained moderate malnutrition or wasting not adequately responding to standard therapy</li> <li>• Unexplained persistent diarrhoea (14 days or more)</li> <li>• Unexplained persistent fever (above 37.5 °C, intermittent or constant, for longer than 1 month)</li> <li>• Persistent oral candidiasis (after first 6 to 8 weeks of life)</li> <li>• Oral hairy leukoplakia</li> <li>• Acute necrotizing ulcerative gingivitis or periodontitis</li> <li>• Lymph node TB</li> <li>• Pulmonary TB</li> <li>• Severe recurrent bacterial pneumonia</li> <li>• Symptomatic LIP</li> <li>• Chronic HIV-associated lung disease including bronchiectasis</li> <li>• Unexplained anaemia (&lt;8.0 g/dL), neutropaenia (&lt;0.5 x 10<sup>9</sup>/L) or chronic thrombocytopenia (&lt;50 x 10<sup>9</sup>/L)</li> </ul>



TABLE 18.2.1A WHO Clinical Staging of HIV in Children (cont.)

Stage	Symptoms and Signs
Clinical stage 4	<ul style="list-style-type: none"> <li>• Unexplained severe wasting, stunting, or severe malnutrition not responding to standard therapy</li> <li>• Pneumocystis pneumonia</li> <li>• Recurrent severe bacterial infections (e.g., empyema, pyomyositis, bone or joint infection or meningitis) but excluding pneumonia</li> <li>• Chronic herpes simplex infection (e.g., orolabial or cutaneous of more than 1 month's duration, or visceral at any site)</li> <li>• Oesophageal candidiasis (or candidiasis of trachea, bronchi, or lungs)</li> <li>• Extrapulmonary TB</li> <li>• Kaposi's sarcoma</li> <li>• Cytomegalovirus (CMV) infection; retinitis or CMV infection affecting another organ, with onset at age older than 1 month</li> <li>• Central nervous system toxoplasmosis (after 1 month of life)</li> <li>• HIV encephalopathy</li> <li>• Extrapulmonary cryptococcosis (including meningitis)</li> <li>• Disseminated endemic mycosis (i.e., coccidiomycosis or histoplasmosis)</li> <li>• Disseminated nontuberculous mycobacterial infections</li> <li>• Chronic cryptosporidiosis (with diarrhoea)</li> <li>• Chronic isosporiasis</li> <li>• Cerebral or B-cell non-Hodgkin's lymphoma</li> <li>• Progressive multifocal leukoencephalopathy (PML)</li> <li>• Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy</li> </ul>

## 18.2 HIV/AIDS in Children

Table 18.2.1A lists conditions and infections associated with different stages of immunosuppression in confirmed HIV-positive children. Some HIV-related conditions, such as unexplained persistent hepatosplenomegaly and lymphoid interstitial pneumonitis (LIP) are usually found only in children.

CD4+ T-lymphocyte count and percentage values in healthy infants who are not infected with HIV are considerably higher than those observed in uninfected adults and slowly decline to adult values by age 5 years. Although the CD4+ absolute number that identifies a specific level of immune suppression changes with age (see table 18.2.1B), the CD4+ percentage that defines each immunologic category is not as variable. Thus, monitoring CD4+ percentage, not number, is a better indicator of disease progression in children.

Paediatric clinical staging and immunologic classification systems for HIV infection have been developed that include age-related definitions of immune suppression.

### 18.2.2 Diagnosis of HIV Disease in Children

Every HIV exposed infant should be tested from as early as 6 weeks of age with the HIV DNA polymerase chain reaction (PCR) test, ideally using the dried blood spot (DBS) technique.

Positive HIV antibody tests (i.e., HIV rapid test) in children  $\geq 18$  months of age will confirm their infection. (Refer to the diagnosis algorithm in the MoHSS 2010 *National Guidelines for Antiretroviral Therapy Management*.)

### 18.2.3 HAART in Children

The MoHSS has adopted the 2008 WHO recommendation that all infants  $< 12$  months of age with confirmed HIV infection should be started on HAART irrespective of clinical or immunological stage.

TABLE 18.2.1B WHO Immunological Classification for Established HIV Infection (2007)

HIV-Associated Immunodeficiency	Age-Related CD4 Values				>5 years (absolute number per mm <sup>3</sup> or CD4)
	<11 months (%CD4)	12 to 35 months (%CD4)	36 to 59 months (%CD4)	>59 months (%CD4)	
None or not significant	>35	> 30	>25	>25	>500
Mild	30 to 35	25 to 30	20 to 25	20 to 25	350 to 499
Advanced	25 to 29	20 to 24	15 to 19	15 to 19	200 to 349
Severe	<25	<20	<15	<15	<200 or <15%

## 18.2 HIV/AIDS in Children

If the infant has received single dose nevirapine (NVP) as part of PMTCT ARV prophylaxis, the infant should be started on a regimen that substitutes ritonavir-boosted lopinavir (LPV/r) for NVP to avoid the risk of selection of resistance to nevirapine. This measure is not necessary for those infants who received zidovudine/lamivudine (AZT/3TC) as tail coverage after single dose (SD) of NVP.

Children  $\geq 12$  months are eligible for HAART if they are in—

- WHO clinical stage 3 or 4 HIV disease, irrespective of CD4 % count
- OR —
- WHO clinical stage 1 or 2 HIV disease *and* have
  - CD4 %  $< 25\%$  at 12 to 18 months of age
  - CD4 %  $< 20\%$  at 18 months to 5 years
  - CD4 count  $< 200$  cells/mm<sup>3</sup> at  $> 5$  years

Algorithms describing the testing of infants under 18 months of age, taking into account breastfeeding, are included in the MoHSS *National Guidelines for Prevention of Mother-to-Child Transmission* (July 2008) and the *National Guidelines for Antiretroviral Therapy Management*, 2nd edition (April 2007).

Dosages of medicines need to be adapted to the weight of a child and hence are usually prescribed per kg or per surface area. (See [appendix 1](#), the IMAI/IMCI documents, and the 2008 MoHSS *National Guidelines for Antiretroviral Therapy Management*.)

### 18.2.4 Supportive and Prophylactic Treatment

Follow these steps to provide supportive and prophylactic treatment.

1. Co-trimoxazole prophylaxis (recommended doses in [table 18.2.4](#)) is recommended for—
  - All HIV-exposed children from the age of 6 weeks until HIV has been excluded
  - All known HIV-infected children regardless of im-

munological status or age. It is possible to *consider* stopping co-trimoxazole in children >5 years old who are stable on HAART with good adherence, with secure access to ART, and with CD4 and clinical evidence of immune recovery. Noting, however, that children may undergo a period of poor adherence with resultant decrease in immune status as they grow and develop, continuing with co-trimoxazole, which is generally well tolerated, could be safer.

**TABLE 18.2.4 Recommended Doses of Co-trimoxazole for Prophylaxis**

Age	Co-trimoxazole Dosage
6 weeks to 5 months	2.5 mL once daily
6 months to 6 years	5 mL once daily
6 years to 14 years	10 mL or 1400/80 mg tablet once daily
Older than 14 years	Two daily

**Note:** There is no need for routine supplementation with iron.

- For helminth infections, give albendazole from the age of 6 months. If the child's weight is >10 kg, give 400 mg stat (2 tablets of 200 mg). For a child weighing <10 kg, give 10.0 to 15.0 mg/kg stat.
- All HIV-infected children should be actively screened for TB, especially children (0 to 5 years) who are close contact with an infectious TB patient. If the child has no signs or symptoms of active TB, he or she should be given 6 months of TB prophylaxis with isoniazid. The dosage of isoniazid is 10 mg/kg per day. Peripheral neuropathy is uncommon in children on isoniazid; however, children >5 years old may benefit from pyridoxine (see "Section IV. Infectious Diseases. [Chapter 19. Tuberculosis](#)").

### Health education

- *Always* monitor growth, weight, immunisations, and nutrition (see “[Section III. Nutrition and Lifestyle](#)”).
- Laboratory monitoring is also important.
- Stress the importance of good oral hygiene to the patient and parent or caregiver.
- Remind the parent or caregiver to practise hygienic food preparation.

## 18.3 Prevention of Mother-to-Child Transmission

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See also the MoHSS *Guidelines on Prevention of Mother-to-Child Transmission*.

Transmission from an HIV-positive pregnant woman to her child can occur during pregnancy, labour, and delivery, or through breastfeeding. The risk of MTCT is 20% to 45% in breastfeeding populations without any intervention. Left untreated, 50% of HIV infected children will die in the first 2 years of life.

All women diagnosed as HIV positive during pregnancy should be referred to the nearest ARV clinic for staging and consideration of appropriate treatment. Further management of HIV-infected pregnant women should be guided by the current PMTCT guidelines.

### Factors that increase risk of mother-to-child transmission

- High viral load or advanced HIV and CD4 count
- Invasive obstetrical practices, episiotomy, prolonged rupture of the membranes, mode of delivery, amniocentesis
- Breastfeeding an conditions of the breast
- Poor nutrition
- Maternal TB
- Genital tract infections (STIs)

## 18.3 Prevention of Mother-to-Child Transmission

- Prematurity
- Multiple births

### Antenatal care

1. Provide medical care for pregnant mother.
  - Provide counselling on hygiene; nutrition; prevention and treatment of STIs, TB, and other diseases; HIV testing; and treatment of mother.
  - Administer co-trimoxazole and TB and malaria prophylaxis as appropriate
  - Perform a medical examination.
  - Perform routine blood tests (e.g., blood group, Rh, hepatitis B, Hb, RPR, HIV).
  - Start routine iron and vitamin supplementation.
2. Supervise the growth and health of unborn child (see “Section V. Obstetrics and Gynaecology. Chapter 24. Obstetrics”).
3. Perform routine HIV testing (pre- and post-counseling).
4. Provide couples with HIV counselling and testing (CHCT).

### Managing labour in HIV-infected women

- Avoid procedures such as foetal scalp monitoring and scalp blood sampling.
- Use universal precautions, including eye protection during delivery.
- Avoid or delay artificial rupture of membranes.
- Caesarean section should be performed only for standard obstetric indications.

### Postnatal Care

- Inform the mother of the infant feeding choices available.
- Provide postexposure prophylaxis to infant according to current PMTCT guidelines.
- Make an early infant diagnosis at 6 weeks.

## 18.4 Diagnosis of HIV Disease

### ARV treatment for HIV-positive mothers

1. Refer to current MoHSS *Guidelines on Prevention of Mother-to-Child Transmission* or the *National Guidelines for Antiretroviral Therapy*
2. Choice of ARV varies according to scenario
  - **Scenario 1.** HIV-infected pregnant women already on HAART during current pregnancy
  - **Scenario 2.** HIV-positive pregnant women eligible but not yet on HAART
  - **Scenario 3.** HIV-infected pregnant women who do not qualify for HAART but present at ANC
  - **Scenario 4.** HIV-infected pregnant women who present at maternity ward in labour but have not received any ARVs during their pregnancy
  - **Scenario 5.** Infants born to HIV-infected mothers who received no ARV medicines during pregnancy or labour

## 18.4 Diagnosis of HIV Disease and VCT

### 18.4.1 Diagnosis

Patients with undiagnosed HIV disease may have only minor health problems when presenting to a health care facility, or they may be quite sick with an acute illness. Although symptomatic HIV infections may be clinically obvious (in particular when the presence of opportunistic infections has been confirmed), HIV testing with consent *must* be performed. HIV testing is important for the management of the patient and for the referral and counselling of sexual partners.

The laboratory request form includes information that is analysed by MoHSS at regular intervals for surveillance of the HIV/AIDS epidemic. All health care workers must thoroughly complete each laboratory request form.



Early diagnosis leads to reduction of HIV transmission to uninfected partners, timely and appropriate treatment of symptoms and complications, and the commencement of HAART before the CD4 count falls catastrophically. Moreover, promotion of positive living with HIV helps to delay the onset of symptoms. Any illness severe enough to require a hospital attendance should prompt the health care worker to recommend HIV testing, in particular recurrent attendances or persistent problems.

Receiving an HIV positive diagnosis has a profound impact. Adequate preparation of the person for the diagnosis is essential for acceptance. Appropriate counselling, ensuring informed consent, confidentiality, and non-discrimination are essential.

### 18.4.2 Voluntary Counselling and Testing

#### Guiding principles of VCT

- HIV testing must be voluntary
- Pre- and post-test counselling should accompany every HIV test
- Post-test counselling and other support services are crucial
- Confidentiality must be ensured
- Human rights should be respected

#### Vulnerable populations

- Youth
- Prisoners
- Sex workers and other higher risk groups
- Refugees or displaced persons
- Armed forces

#### VCT sites

1. The waiting period is short at most VCT sites. They offer—
  - Same-day results to client
  - Rapid HIV test kits
  - Namibia rapid HIV testing algorithm

## 18.4 Diagnosis of HIV Disease

TABLE 18.4.2 Results of Dual Testing

Both Tests Positive	Discordant Result	Both Tests Negative
Report positive	One test negative One test positive	Report negative Window period
	<ul style="list-style-type: none"> <li>• Perform tie breaker</li> <li>• Use Herma-strip or ELISA as a tie breaker.                             <ul style="list-style-type: none"> <li>– If positive, report as positive</li> <li>– If negative, report as negative</li> </ul> </li> </ul>	Additional testing after 3 months

2. Dual testing may be performed using both Determine and Unigold Rapid Tests with a finger stick (blood specimen). See [table 18.4.2](#).
3. The counselling room should be presentable, quiet, and private.
4. Condom demonstrations are given.
5. If repeat testing needs to be done, the client will be encouraged to disclose if he or she has been to other centres for HIV testing.
6. Informed consent must be given.
  - Minimum age of consent: 16 years of age and above
  - Below 16 who are married, pregnant, or a parent (mature minors)
  - Below 15 years (with the knowledge and participation of their parents)
  - In the case of children, the parents or guardians will be consulted to determine the reasons for testing, and then the child will be referred to a doctor.
7. Confidentiality and anonymity are stressed.
8. Disclosure of VCT result will be only to the client.
  - If sharing of information is necessary, informed consent will be obtained from the client.
  - The VCT centre may discuss partner notification with the client.

- Written results are provided only for HIV-positive clients.
- Results are never given by telephone or other media.
- 9. Referrals to agencies and support services will be confidential.
- 10. Detection and treatment of other STIs should be offered to the client.
- 11. TB screening and referral are available at the VCT centre.
  - All HIV-positive VCT clients must receive counseling and health education about TB.
  - Clients who test positive for TB will be referred to TB centre.
- 12. Family planning services are available, including—
  - Basic family planning information
  - Dual protection
  - Use of condoms for HIV and STI prevention
  - Hormonal contraceptive

### 18.5 Postexposure Prophylaxis

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Postexposure prophylaxis (PEP) is the use of therapeutic agents to prevent infection following exposure.

#### Risk of nosocomial transmission

- Risk (according to U.S. Centers for Disease Control and Prevention guidelines) of HIV:
  - Percutaneous = 0.3% (3 in 1,000)
  - Mucous membrane = 0.095% (9 in 10,000)
- Risk of hepatitis B virus: 1% to 31%
- Risk of hepatitis C virus: 0% to 7% (1.8%)

#### Increased risk

- Deep penetrating injury
- Visible blood on device or needle
- Hollow needle that has been used during venesection of source
- Terminal HIV patient as source

### Source fluids

- Blood
- Visibly bloody fluids
- Semen
- Vaginal secretions
- Cerebrospinal, synovial, pleuritic, pericardial, peritoneal, and amniotic fluids

### Infection control recommendations

- See the MoHSS *National Infection, Prevention, and Control Guidelines*.
- The following are recommended for infection control:
  1. Safer working practices
  2. Proper hand washing technique (surgical and other)
  3. Antiseptic hand rub technique
  4. Personal protective equipment (e.g., gloves, masks, aprons, goggles, caps)
  5. Disinfection and decontamination of equipment
  6. Sharps disposal in special sharps containers
  7. National and regional incineration according to specific standards
  8. Training of all staff

### Management of exposure

1. Determine the nature of the incident:
  - Percutaneous (i.e., needle stick, bone fragments, instruments)
  - Mucous membrane (i.e., splashed by body fluid, exposure to eyes)
  - Exposure of broken skin (i.e., abrasions, cuts, eczema)
2. Provide emergency care.
  - Wash and rinse skin with soap and water for 15 minutes, no scrubbing.
  - Irrigate mucous membrane with plenty of water.
  - Encourage gentle free bleeding.
  - Remove all contaminated clothing.
  - *Never* apply antiseptics or bleach to the wound.

3. Inform the person in charge, the designated general practitioner, the medical officer, the superintendent, and the principal medical officer.
  - Complete the PEP Incident Report Form. Provide details about—
    - The exposed staff member including name, age, sex, occupation, vaccinations, whether pregnant, and medical history.
    - The source blood or fluid including whether the source was known or unknown, from a patient or blood donor, and identifying marks and hospital number.
    - The exposure including information about the instrument (e.g., the needle type, blade, glass), whether blood was visible, and the route (i.e., percutaneous or mucous membrane) of the instrument.
    - The incident including the date, time of the incident, and reporting time.
  - Complete the employer's Report of Accident Form.
  - Investigate the circumstances of the exposure.
  - Propose measures to avoid recurrence.
4. Evaluate the exposure source.
  - If the source is available—
    - Take a medical history.
    - Take blood specimens—anti-HIV, HbsAg, anti-hepatitis C, *Treponema pallidum* haemagglutination assay (TPHA)—and dispatch the blood specimens to pathology care, the National Institute for Pathology, or other laboratory.
    - Counsel the source.
    - Ask him or her to sign a consent form.
    - Use a secret code for confidentiality on request form.
  - If the source not available, assess from history.
5. Evaluate the exposed staff member, the exposed health care worker, and the contact.

## 18.5 Postexposure Prophylaxis

- Take a medical history, including HIV status, vaccinations, immune status to hepatitis B and C.
  - Perform a medical examination.
  - Take blood specimens—anti-HIV, HbsAg, anti-hepatitis C, TPHA—and dispatch the blood specimens to pathology care, the National Institute for Pathology, or other laboratory.
  - Counsel the exposed person on the pros and cons of PEP.
  - Ask the exposed person to sign a consent form.
  - Use a secret code for confidentiality on the request form.
6. Assess the need for PEP (see the PEP algorithm in [figure 18.5](#)).
- Decide whether the exposure is significant.
  - Determine the risk (i.e., type of fluid, route, and severity of exposure).
  - Record recommendations; counsel the exposed staff member.
  - Exposed person must understand and sign assessment form.
  - The exposed person must also sign if PEP is refused.
7. Begin the PEP regime.
- Use the PEP starter pack within 1 to 2 hours, before 24 to 36 hours, but not after 72 hours.
  - Instruct the patient to continue the PEP for 28 days, taking 1 tablet once per day—
    - AZT 300 mg (i.e., zidovudine) plus 3TC 150 mg (i.e., lamivudine). Use the dual combination if available. For the expanded regime, see the *MoHSS National Guidelines for Postexposure Prophylaxis* at the Workplace.
  - After blood results come back:
    - Decide to continue for the full 28 days.
    - OR ——
    - Decide to stop if the blood test results are negative.
    - Record this decision (section 8).

8. Do baseline blood tests: FBC, ALT/AST, U+E, creatinine, RPR, urine dipsticks, and pregnancy test.
9. Repeat postexposure testing as follows:
  - In 2 weeks (FBC, ALT/AST, U+E)
  - In 6 weeks (HIV serology)
  - In 3 months (HIV serology)
  - In 6 months (HIV serology)

### Health education

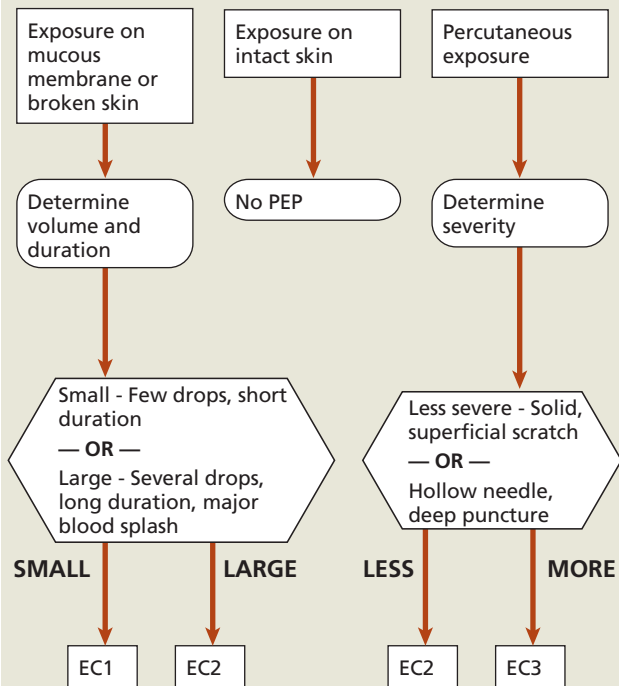
- Stress the importance of using barrier protection (i.e., coats, gowns, gloves, masks, goggles).
- Advise the patient to—
  - Wash hands and contaminated surfaces thoroughly
  - Wash hands after gloves are removed
  - Avoid accidental injuries during procedures and when cleaning, handling, and disposing of sharps
  - Never bend or re-cap needles
- Sharps containers must be puncture resistant.
- Advise female workers to avoid pregnancy for 6 months after PEP.
- Advise all workers not to donate blood for 6 months after PEP.

## 18.5 Postexposure Prophylaxis

FIGURE 18.5 Algorithm for PEP after occupational exposure

**Step 1.** Administer first aid. Immediately clean the wound with soap and water or flush mucous membranes with water.

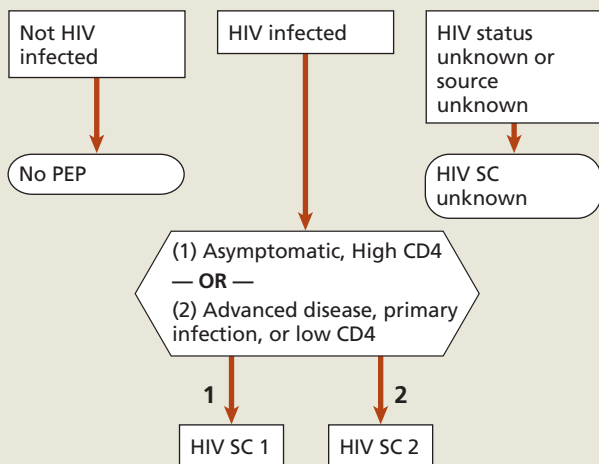
**Step 2.** Determine the type of exposure using the exposure code (EC).





## 18.5 Postexposure Prophylaxis

**Step 3.** Determine HIV status using the HIV source code (HIV SC).



**Step 4.** Determine PEP recommendation from EC and HIV SC.

HIV SC	EC	PEP recommendation
1	1	PEP may not be warranted
2	1	Consider basic regimen
1	2	Basic regimen recommended
2	2	Expanded regimen recommended
1 or 2	3	Expanded regimen recommended
Unknown	When EC is 2 or 3 and a risk exists, consider PEP basic regimen.	

**Step 5.** Test the exposed person for HIV and hepatitis B.

- Administer tetanus immunisation.
- Administer hepatitis B immunoglobulin as indicated.
- Initiate hepatitis B vaccination series if unvaccinated and non-immune.

### 19.1 Pulmonary and Extrapulmonary Tuberculosis

Pulmonary and extrapulmonary TB are caused by *Mycobacterium tuberculosis*. They are commonly spread through droplets when a patient with 'open' tuberculosis coughs or sneezes.

#### Risk factors

- Compromised immunity (e.g., HIV/AIDS, patients on chemotherapy)
- Environmental factors such as over-crowding and poor ventilation and lighting
- Medical conditions (e.g., diabetes)
- Poor nutrition
- Pregnancy
- Positive TB contact

#### 19.1.1 Pulmonary TB Symptoms and Signs

##### Pulmonary TB (PTB) in an adult—

- Persistent cough  $\geq 3$  weeks,
- Coughing blood (i.e., haemoptysis)
- Chest pains
- Shortness of breath
- Feeling tired all the time, weakness, malaise
- Weight loss
- Loss of appetite
- Night sweats, on-and-off fever, mainly at night
- Enlarged lymph nodes in neck (for longer than 3 weeks)
- Yellow sputum indicates secondary bacterial infection
- Finger clubbing

##### PTB in a child—

- History of TB contact
- Enlarged, painless lymph nodes
- Unexplained fever
- Malnutrition
- Deformed spine

- Joint swelling without history of trauma
- Unexplained swelling of abdomen, or ascites
- Fits or coma

### 19.1.2 Extrapulmonary TB Symptoms and Signs

The signs and symptoms for extrapulmonary TB (EPTB) depend on the site or organ affected by tuberculosis. Common forms of EPTB with signs and symptoms in parentheses are—

- Lymphadenopathy (swollen lymph nodes)
- Pleural TB (pleural effusion: difficulty in breathing, dullness to percussion)
- TB pericarditis (fever, dull retrosternal pain)
- Miliary TB (dry cough, hepatosplenomegaly)
- Abdominal TB (ascites, obstruction, mass)
- TB meningitis (headache, meningism, impaired consciousness)
- TB spine or bone (deformity, pain, abscess, osteomyelitis)

### 19.1.3 Investigations and Management of TB

#### Investigations

##### Sputum microscopy

- Take two sputum specimens—
  - Spot specimen immediately
  - Early morning specimen
- Evaluate the results—
  - 1 or more positive acid-fast bacilli (AFB): diagnosis is smear-positive PTB.
  - 2 negative AFB = clinical grounds + CXR: diagnosis is smear-negative PTB (i.e., both smears negative plus clinical and/or radiological evidence).
- Provide HIV counselling and testing.
- Take FBC.

## 19.1 Pulmonary and Extrapulmonary TB

### Perform additional investigations, if indicated—

- Tuberculin test (especially in children)
- CXR only indicated when:
  - 2 or more negative AFB
  - Serious condition
  - Severe haemoptysis
  - Other occupational exposure
- Sputum TB culture and drug sensitivity testing (C/DST); suspected multidrug resistant TB (MDR)
- Bronchoscopy
- Fine needle aspiration
- Culture of pleural, peritoneal, cerebrospinal fluids

### Management

1. Treatment can be initiated in any facility for straight-forward smear-positive cases.
2. It can be ambulatory or hospital-based depending on patient's condition.
3. Direct observation of treatment must be arranged for all patients on TB treatment.

### Treatment

#### First-line TB therapy

- Category I regimen—see the MoHSS *National Guidelines for Management of Tuberculosis*. All new patients with any form of TB receive—
  - Initial phase: 2 months of rifampin, isoniazid, pyrazinamide, and ethambutol (RHZE) daily
  - Then continuation phase: 4 months of rifampin and isoniazid (RH)
- Category II regimen—see the MoHSS *National Guidelines for Management of Tuberculosis*
  - Indications—
    - ◆ Relapse after category I or II treatment
    - ◆ Defaulters
    - ◆ Category I treatment failure
    - ◆ Recurrent TB

- Patients receive—
  - ◆ Initial: 2 months RHZE daily plus streptomycin (S) on weekdays
  - ◆ Then 1 month RHZE daily
  - ◆ Then continuation phase: 5 months rifampin, isoniazid, and ethambutol (RHE) daily

**Second-line therapy** for polyresistant MDR and extensively drug-resistant (XDR) TB. Patients with suspected or confirmed drug-resistant TB should be referred for treatment at the nearest drug resistant TB care unit in the region.

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**Note:** Namibia also has capreomycin, kanamycin, para-aminosalicylate (PAS) and amoxicillin/clavulanic acid, levofloxacin, which can be used for patients with resistance to some second-line medicines and those with XDR.

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- Steroid (prednisolone) indications (see also the MoHSS *National Guidelines for the Management of Tuberculosis*)—
  - Severe allergic reactions to medicines
  - Pleural, pericardial, peritoneal effusions
  - TB of eye, larynx, kidney, adrenals
  - TB meningitis
  - Critically ill patient
  - Dosage:
    - ◆ Adults: 30 mg 2 times per day for 4 weeks, then 15 mg 2 times per day for 2 weeks, then decrease gradually over several weeks
    - ◆ Children: 1 to 3 mg/kg per day
  - Pleural effusion: 2 mg 2 times per day for 2 weeks, then taper slowly
- Pyridoxine: in all patients
  - Adult = 12.5 mg once per day
  - Children >5 years = 5 mg once per day
  - Peripheral neuropathy = 100 to 200 mg once per day

## 19.1 Pulmonary and Extrapulmonary TB

### TB prophylaxis with isoniazid preventive therapy (TB-IPT)

- Rule out active TB indications in HIV-positive patients (children and adults)
- Indicated for children under age 5 who have close contact with recently diagnosed smear-positive TB patients.
  - Isoniazid
    - ◆ Adults: 300 mg once per day for 6 months
    - ◆ Children: 5 mg/kg for once per day for 6 months
  - Pyridoxine 12.5 mg once per day
- IPT is *not* indicated in ill patients; patients who have had TB in the past 2 years; patients who have received a full course of IPT; patients with alcoholism, jaundice, and liver insufficiency.

### TB in HIV positive patients—

- Refer to MoHSS TB guidelines, HIV section.
- Refer patient to an HIV care clinic.
  - HAART can be started.
  - Nevirapine should not be used in patients on TB treatment.

### Treatment monitoring

- Perform sputum examinations.
- Record on DOTS form.
- Stress the need for regular clinic attendance.
- Look for improved general clinical condition.
- Look for an increase in body weight.

### Fill in and record

- TB register
- TB contact card
- TB or MDR TB treatment card
- TB patient identity card
- Community-based DOTS form
- TB cough examination register
- MDR TB medicine side effect monitoring form (for MDR TB patient)

### Side effects of tuberculosis medicines

- Isoniazid (H)—Take on empty stomach, 30 minutes before or 2 hours after a meal.
  - Cutaneous hypersensitivity, mild itching
  - Peripheral neuropathy
  - Hepatitis, optic neuritis
- Rifampicin (R)—Take on empty stomach, 30 minutes before or 2 hours after a meal. Do not take with alcohol.
  - Reddish colouration of body fluids
  - Influenza-like syndrome
  - Exfoliative dermatitis
  - Hepatitis
- Pyrazinamide (Z)
  - Joint pains
  - Gout
- Ethambutol (E)
  - Visual acuity and colour vision changes
  - Peripheral neuropathy
  - Blindness
- Streptomycin (S) or kanamycin
  - Hypersensitivity reactions
  - Ototoxicity, hearing loss, vertigo, tinnitus
  - Nephrotoxicity
- Ethionamide
  - Headaches, hallucinations, depression
  - Hypoglycaemia
  - Hepatitis
  - Gynaecomastia
  - Menstrual disturbance; impotence
  - Acne
  - Peripheral neuropathy
- Levofloxacin
  - Nausea, vomiting, loss of appetite
  - Dizziness, headaches, mood changes, convulsions
- Cycloserine
  - Headaches, dizziness, confusion, depression, convulsion, tremors,

## 19.1 Pulmonary and Extrapulmonary TB

- Suicidal tendencies
- Hepatitis

### Health education

- TB is curable if medication is taken as prescribed.
- Take medication regularly. Prescriptions are free.
- Treatment lasts a minimum of 6 months.
- Continue treatment even if signs and symptoms disappear.
- Failure to adhere causes relapse and resistant TB.
- TB is transmitted from one person to others by coughing.
- Cough hygiene reduces transmission.
- Check close contacts with infected persons. Bring all contacts to clinic, especially children.
- Find DOTS supporter.
- Check HIV status.
- Return for sputum examinations at 6 weeks, 10 weeks, 5 months, and 7 months.
- Come in for regular follow-up visits at the hospital or clinic.
- Follow these dietary measures. **Note:** These guidelines are only basic; see a registered dietician for individualized dietary counselling.
  - Increase calorie (energy) and protein intake (see “[Section III. Nutrition and Lifestyle](#)”).
  - Vary diet accordingly in case of diarrhoea, nausea, and vomiting, and poor appetite (see “[Section III. Nutrition and Lifestyle](#)”).
  - Increase intake of vitamin B6-rich foods (e.g., mahangu, whole wheat foods and cereals, starches, beans, peas, lentils, seeds, nuts, green leafy vegetables, eggs, and liver).
  - Drink clean water (6 to 8 glasses per day).
- In the case of breastfeeding mothers—
  - TB medicines are safe.
  - Children in close contact should be investigated.



## 19.1 Pulmonary and Extrapulmonary TB

- TB-IPT (isoniazid) is recommended, then BCG afterwards.
- Adopt a healthy lifestyle.
- Stop smoking.
- Stop consuming alcohol.
- Learn the side effects of TB.
- Patients with the following conditions should be referred to the next level—
  - Sever dyspnoea
  - Persistent fever
  - Not improving though adherent to medication
  - Jaundice
  - Diabetes mellitus
  - MDR TB
  - Haemoptysis

### 19.2 Children with Tuberculosis

#### Symptoms and signs

- History of TB contact
- Loss of body weight and appetite
- Upper or lower RTI not responding to antibiotics
- No recovery after measles or whooping cough
- Growth chart disorders
- Failure to thrive
- Wheezing not responding to bronchodilators
- Abdominal swelling, mass, or fluid
- Superficial lymph nodes (painless)
- Painful swelling of joint or bone
- Collapsed vertebral body and back pain

Reprint [table 19.2A](#) and use it to assess whether a child has TB.

#### Investigations

**Note:** Diagnosis can be confused easily with other respiratory conditions, particularly in HIV-positive children

- Sputum AFB test (difficult to obtain)
- Gastric lavage
- Tuberculin skin test
- CXR
- HIV test

#### Management

1. Readjust dose to body weight ([table 19.2B](#)).
2. Use fixed-dose combination or single-dose anti-TB medicines ([table 19.2C](#)). See also the MoHSS *National Guidelines for Management of Tuberculosis*.

TABLE 19.2A Scoring Table for TB in Children

**Note:** Fill in the shaded column. If the child's score card result is >7, TB is indicated. Start TB treatment.

Feature	Scoring			Score
	0	1	3	
Length of illness	Less than 2 weeks	2 to 4 weeks	More than 4 weeks	
Nutrition (weight)	Above 80% for age	Between 60% and 80% for age	Less than 60% for age	
Family tuberculosis, past or present	None	Report by family	Contact proven to be sputum smear-positive	
<b>Scoring for Other Features, If Present</b>				
Positive tuberculin test (Mantoux)			3	
Large painless lymph nodes; firm, soft, sinus in neck, axilla, or groin			3	
Unexplained fever, night sweats; no response to malaria treatment			2	
Malnutrition, not improving after 4 weeks on feeding programme			3	
Angle deformity of the spine			4	
Joint swelling, bone swelling, or sinusitis			3	
Unexplained abdominal mass or ascites			3	
Central nervous system: change in temperature, fits, or coma (send to hospital, if possible)			3	
			<b>Total score</b>	

## 19.2 Children with Tuberculosis

TABLE 19.2B Readjusting the Daily Dosage to the Body Weight of a Child

Body Weight of Child (in kg)	Initial Phase (2 months)		Continuous Phase (4 months)
	(RHZ) (R60/H30/Z150) Number of Tablets or Sachets <sup>a</sup>	E 100 <sup>b</sup> Number of Tablets or Sachets <sup>a</sup>	(RH) (R60/H30) Number of Tablets or Sachets <sup>a</sup>
<7	1	1	1
8 to 9	1.5	1.5	1.5
10 to 14	2	2.5	2
15 to 19	3	3.5	3
20 to 24	4	4.5	4
25 to 29	5	5.5	5

<sup>a</sup> For children who cannot swallow solid tablets

<sup>b</sup> Young children with primary TB should be given 3-medicine combination only (without ethambutol).

TABLE 19.2C Daily Dosages for Children of Fixed-Dose Combination or Single-Dose Anti-TB Medicines

Medicine	Before Treatment, Calculate Dosage by Body Weight of Child (in kg)
Rifampicin 150 mg tablet	10 (8 to 12)
Isoniazid 100 mg tablet	5 (4 to 6)
Pyrazinamide 500 mg tablet	25 (20 to 30)
Ethambutol 100 mg tablet	20 (15 to 25)
Streptomycin injection <sup>a</sup>	15 (12 to 18)

<sup>a</sup> Streptomycin should be avoided when possible in children because the injections are painful and irreversible auditory nerve damage may occur. The use of streptomycin in children is mainly reserved for the first 2 months of treatment of TB meningitis.

## 19.3 Lymphadenopathy

Lymphadenopathy may be localised or a generalised swelling of lymph nodes. See figures [19.3A](#) and [19.3B](#) for algorithms at the clinic and level 2 hospital.

Persistent generalised lymphadenopathy (PGL) of HIV infection is defined as—

- More than 3 separate lymph node groups affected
- At least 2 nodes >1.5 cm in diameter at each site
- Duration of more than 1 month
- No local infection that might explain the lymphadenopathy

### Causes

- Localised or regional
  - Bacterial infection (in particular staphylococcus and streptococcus in association with skin conditions or trauma)
  - TB (and other mycobacteria)
  - Genital ulcer disease
  - Malignancy (e.g., Kaposi's sarcoma, lymphoma)
- Generalised
  - Mycobacterium other than tuberculosis (MOTT) or mycobacterium tuberculosis (MTB)
  - Viral infections (e.g., CMV)
  - Toxoplasmosis
  - Fungal (e.g., cryptococcus, histoplasmosis)
  - Secondary syphilis
  - Kaposi's sarcoma (not necessarily associated with cutaneous Kaposi's sarcoma)
  - Lymphoma or leukaemia
  - PGL of HIV infection
- Serious causes of lymphadenopathy (infective or malignant) are suggested by—
  - Marked asymmetry or a unilateral enlargement of lymph node
  - Rapidly enlarging lymph nodes
  - Matted nodes

## 19.3 Lymphadenopathy

- Fluctuant nodes
- Painless nodes
- General symptoms (such as weight loss and fever)

FIGURE 19.3A Algorithm for lymphadenopathy, clinical level, adults

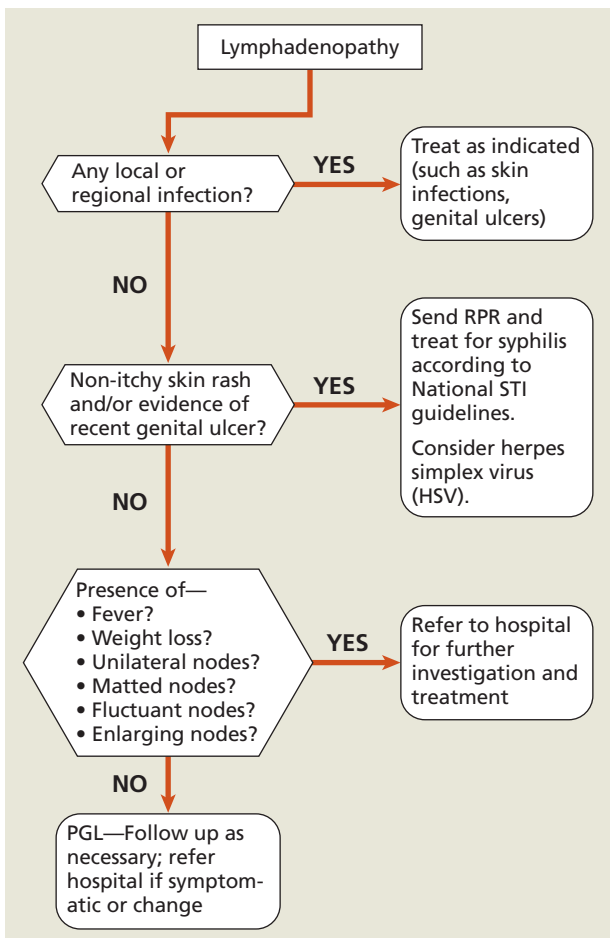
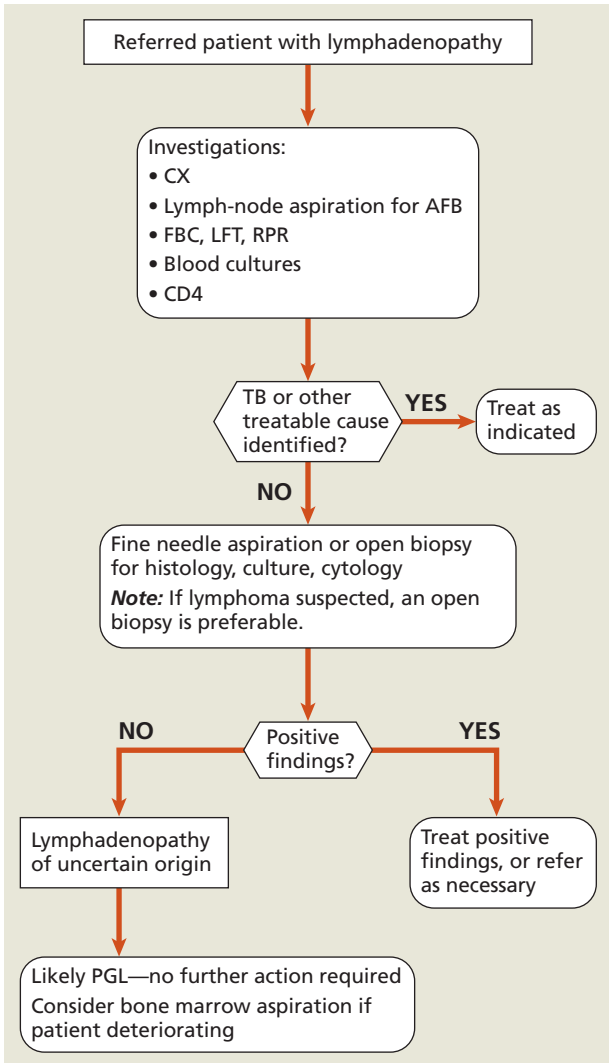


FIGURE 19.3B Algorithm for lymphadenopathy, level 2 hospital, adults



### 20.1 Fever

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#### Causes

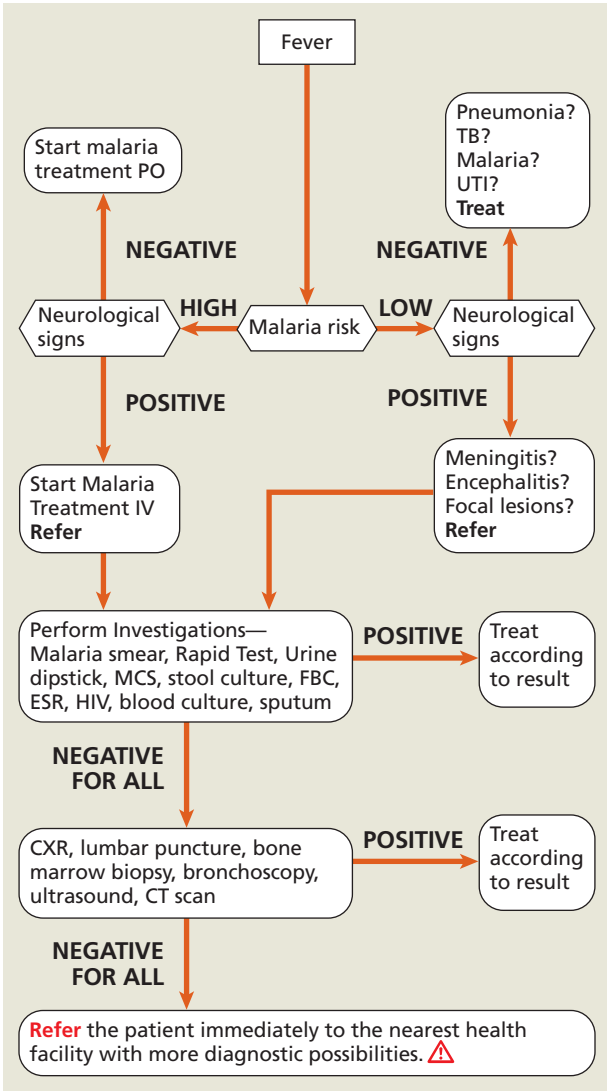
- Infections
  - Protozoal—
    - ◆ Malaria
  - Bacterial—
    - ◆ ENT, lower respiratory tract, CNS, pelvic, urinary tract infections or abscesses
    - ◆ Bacteraemia due to salmonella, *Streptococcus pneumoniae*, *Haemophilus influenzae*, or borrelia
  - Mycobacterial—
    - ◆ *Mycobacterium tuberculosis*
    - ◆ Atypical mycobacteria
  - Viral—
    - ◆ Upper respiratory tract infections
    - ◆ Cytomegalovirus (CMV), Epstein-Barr virus (EBV), herpes virus
    - ◆ HIV infection
  - Fungal—
    - ◆ PCP
    - ◆ Fungal pneumonia
    - ◆ Fungal meningitis
- Malignancies (e.g., lymphomas)
- Connective tissue disorders (e.g., systemic lupus erythematosus, rheumatoid arthritis, sarcoidosis, medicine reactions)
- Pyrexia of unknown origin (i.e., fever for more than 2 weeks without direct cause)

#### Management

See [figure 20.1](#).



FIGURE 20.1 Algorithm of fever management



### 20.2 Fever in the HIV Patient

Fever in the HIV patient is defined as recurrent or persistent fever (temperature  $>37.5^{\circ}\text{C}$ ) with duration of more than 2 weeks as the only clinical presentation in a patient with HIV infection. See figures 20.2A and 20.2B for management algorithms in the clinic and hospital.

In a very sick child with a temperature of  $39^{\circ}\text{C}$  or higher—

- If in endemic areas, treat malaria according to national guidelines.
- Start treatment with antibiotics for possible septicaemia: ampicillin<sup>1</sup> 50 mg/kg IV stat.

#### Causes

As in 20.1, plus the following:

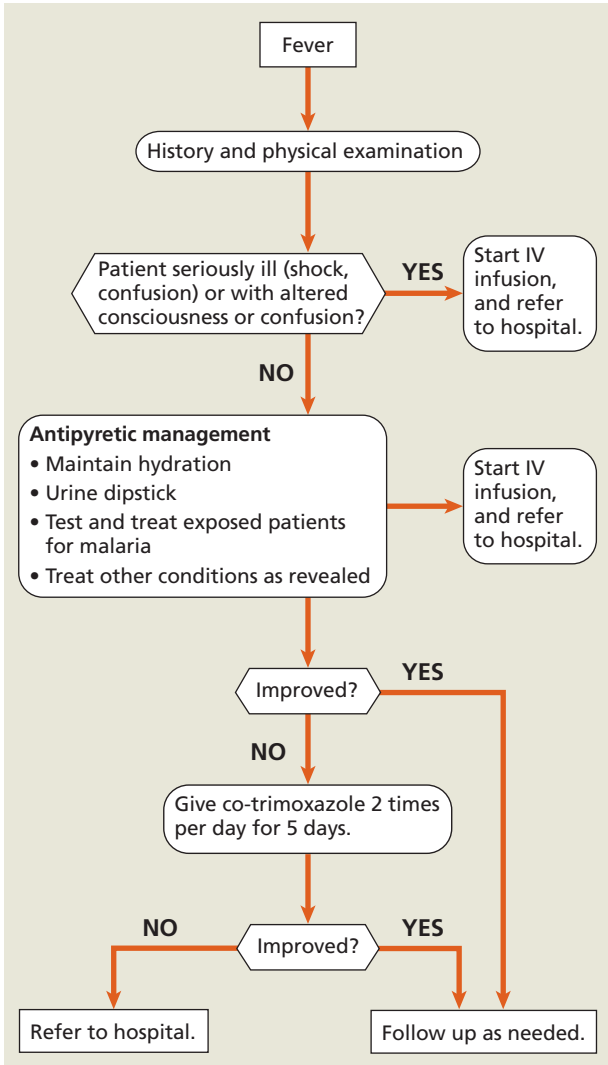
- Occult bacterial infections (e.g., chronic sinusitis, otitis media, urinary tract infection), osteomyelitis, abscess, salmonellosis, syphilis, liver abscesses
- Mycobacterial infection (e.g., *M. tuberculosis*, *M. avium*)
- Fungal infections (e.g., cryptococcus)
- Chronic viral infections (e.g., CMV, EBV)
- Parasitic infections (e.g., toxoplasma)
- Neoplasms (e.g., lymphoma, Kaposi's sarcoma, smooth muscle tumours)

#### Investigations

- White blood cell count
- Urinalysis and culture
- Malaria rapid test; if negative, send for malaria smear
- Lumbar puncture
- Stool microscopy
- Blood and sputum culture
- CXR
- Ultrasound abdomen and pelvis
- Bone X-ray where osteomyelitis suspected

<sup>1</sup> Refer to appendix 5 for treating patients with a history of penicillin allergy

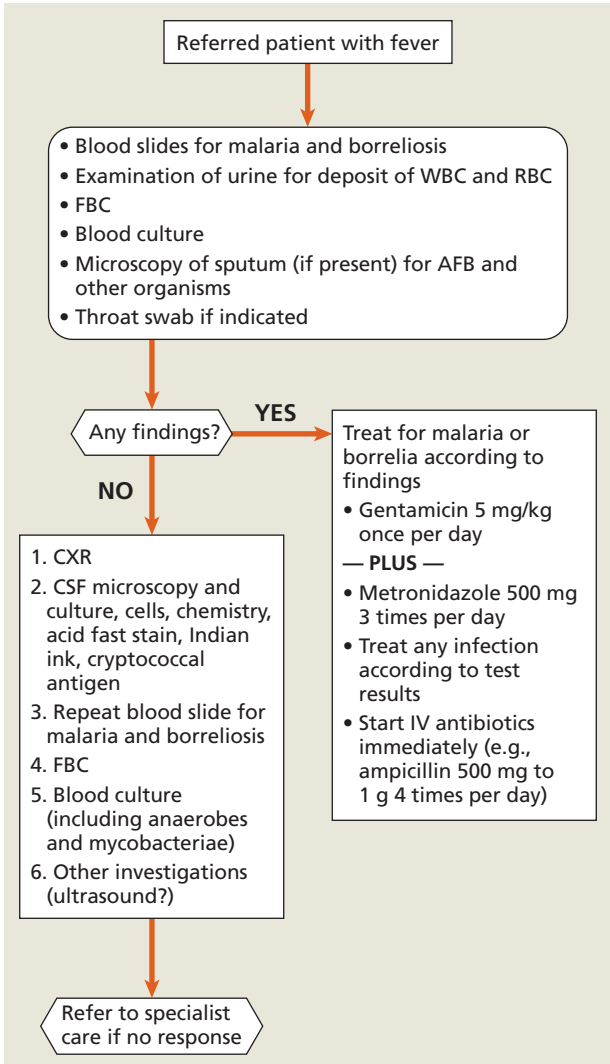
**FIGURE 20.2A** Algorithm of fever management in the clinic



FEVER

## 20.2 Fever in the HIV Patient

FIGURE 20.2B Algorithm of fever management in the hospital





## 21. Malaria

### Causes

- *Plasmodium falciparum* (95% of malaria in Namibia)
- *P. ovale*
- *P. vivax* (occasionally, more in the north)
- *P. malariae* (rare)

### Symptoms and signs of simple or uncomplicated malaria

- Fever (usually high)
- Rigors or shivering
- Sweating
- Chills, chattering teeth
- Headache, backache, general myalgia
- Loss of appetite
- Nausea, vomiting
- Abdominal pain
- Diarrhoea
- Pale, yellow eyes
- Often palpable spleen and liver
- In children, irritability, drowsiness, excessive crying, cough

### Symptoms and signs of complicated malaria

- Changes in behaviour
- Changes in consciousness, drowsiness, coma
- Delirium, disorientation
- Convulsions
- Hyperparasitaemia (parasite count more than 5% parasitised red cells)
- Very high fever ( $>40.5^{\circ}\text{C}$ ), prostration
- Severe diarrhoea or repeated vomiting
- Shock (fast pulse, low BP)
- Jaundice
- Anaemia (i.e., low Hb)
- Pulmonary oedema (dyspnoea and tachypnoea)
- Hypoglycaemia (especially after quinine treatment)
- Oliguria
- Haematuria or very dark urine

- Bleeding tendency
- Complications of kidney failure, liver failure, cerebral malaria

### Investigations

- Rapid malaria diagnostic test to be done for all suspected cases.
- Malaria smear (microscopy or parasite count)
- FBC and white cell differential count
- Blood glucose
- Arterial blood gases (when indicated)
- LFT
- Urine dipsticks
- LP

### Management

---

**Note:** Negative rapid test or negative blood smear does not exclude malaria and treatment can be initiated on clinical grounds.

---

#### In clinic, health centre, or hospital—

- Uncomplicated malaria—
  1. Exclude other causes of fever. (See “Section IV. Infectious Diseases. [Chapter 20. Fever](#)” and IMCI/IMAI documents.)
  2. Give patient plenty of fluids to drink. Suggest the patient try sips if he or she is vomiting.
  3. Give paracetamol for fever and headache.
  4. Start first-line prescription treatment: artemether (20 mg)/lumefantrine(120 mg); adults and children >6 months: 6 doses in 3 days. See [table 21A](#). This medication is not for use in pregnancy and for children weighing <5 kg. See [tables 21B](#) and [21C](#).
  5. Evaluate. If the fever and illness persist for 2 to 3 days, start second-line treatment: quinine tablets; adults and children: 10 mg/kg every 8 hours for 7 days. If the patient vomits within 30 minutes after given treatment, repeat the dose.

## 21. Malaria

**TABLE 21A Dosage of Artemether/Lumefantrine by Age Group and Body Weight**

Age Group	Weight (in kg)	Day 1		Day 2	Day 3
		First Dose	After 8 hrs	Give 2 Times per Day	Give 2 Times per Day
6 months to 2 years	5 to 14	1 tablet	1 tablet	1 tablet	1 tablet
3 to 7 years	15 to 24	2 tablets	2 tablets	2 tablets	2 tablets
8 to 10 years	25 to 34	3 tablets	3 tablets	3 tablets	3 tablets
≥11 years	≥35	4 tablets	4 tablets	4 tablets	4 tablets


**TABLE 21B Treating Malaria in Pregnancy**

Medicine	Dosage
Quinine	10 mg/kg every 8 hours for 7 days

**TABLE 21C Alternative First-line Treatment of Malaria for Children 2 to 6 Months: Sulfadoxine-Pyrimethamine**

Body Weight of Child	Number of Tablets
<10 to 14 kg	½



6. Refer the following to next level—
  - All children <5 years
  - All pregnant women
  - HIV stage 3 or 4
  - Patient who is vomiting vigorously
  - Patient who shows no improvement
- Complicated malaria—**refer** to nearest hospital urgently. In hospital— 
  1. Start an IV drip (200 mL 5% D/W or 0.9% saline with 5% D/W).
  2. Give an IV quinine loading dose and follow up with oral medicine (for children, until the patient can take oral quinine for a total of 7 days).
    - Adults:
      - ◆ Give IV loading dose of 20 mg/kg in dextrose; infuse over 4 hours.
      - ◆ Then give 10 mg/kg every 8 hours until patient is able to take PO.
      - ◆ Give oral quinine for a total of 7 days.
    - Children:
      - ◆ Give IV loading dose of 20 mg/kg diluted in 10 mL dextrose/kg over 4 hours.
      - ◆ Then after 12 hours, give 10 mg/kg diluted in 10 mL dextrose/kg over 2 hours.
      - ◆ Repeat every 12 hours.
    - Do *not* give loading dose if the patient has received quinine, quinidine, or mefloquine in the preceding 12 hours. *Always* monitor glucose when giving quinine.
  3. If the patient shows no response with quinine after 2 days, add—
    - Doxycycline 100 mg 2 times per day for 7 days, but not for pregnant women or in children <8 years.

— OR —

    - Clindamycin 600 mg 3 times per day for 5 days (for pregnant women and children <8 years)

4. If the patient still shows no response, give artemether 3.2 mg/kg IM loading; then 1.6 mg/kg per day for minimum 3 days or until oral treatment can be taken. **Note:** Artemether is not yet available in state health facilities.
5. General measures in the treatment of complicated malaria—
  - Rehydrate with Plasmalyte B or Ringer's lactate/N saline 1 to 2 L.
  - Give red cell concentrate if Hb < 7g/dL; consider the patient's clinical condition as well.
  - Treat convulsions with diazepam (see "Section II. Diseases and Disorders According to Body Systems. Chapter 11. Neurological System." for a discussion of convulsions).
  - Refer patient to ICU for cerebral malaria or multi-organ failure.

#### Chemoprophylaxis—

- Before travelling
  - Mefloquine
    - ◆ Adults: 250 mg per week (adults)
    - ◆ Children >15 kg: 5 mg/kg per week
    - ◆ Start 1 week before travelling; take for a minimum 4 weeks until 1 week after return.
    - ◆ **Note:** Do not give mefloquine in the case of psychiatric disorders, epilepsy, children <15 kg, and pregnancy.
  - OR —
  - Doxycycline 100 mg per day
    - ◆ Start 1 to 2 days before travelling, then daily until 4 weeks after return
    - ◆ **Note:** Do not give to children <8 years or to pregnant women.
- For pregnant women (*only* for those in their first and second pregnancies): Give sulfadoxine/pyrimethamine, 3 tablets each at 26 to 28 weeks and at 34 to 36 weeks. Give dosages at least 4 weeks apart. In high-risk HIV areas, give a third dose after another 4 weeks.

### Side effects of anti-malarial medicines

- Dizziness, tinnitus
- Fatigue
- Nausea, vomiting
- Abdominal pain, diarrhoea
- Palpitations
- Muscle aches, joint pains
- Sleep disorders
- Headaches
- Skin rashes

### Health education

Avoid mosquito bites (especially in children <5 years and pregnant women) by—

- Wearing long-sleeved shirts and long trousers after sunset (i.e., protective clothing)
- Sleeping under a treated mosquito net every night: either long-lasting nets or insecticide treated nets. Long-lasting nets will last 3 to 4 years even after washing.
- Making sure your nets are treated yearly with deltamethrin and permethrin
- Applying mosquito repellents on exposed parts of the body
- Screening windows and doors in the house
- Having your house sprayed with DDT or deltamethrin 4 months before the malaria season
- Using mosquito coils
- Filling in, covering, or draining any source of standing water near the house where mosquitoes can breed
- Removing empty tins and bottles from your environment
- Allowing application of larvicides for large open water areas; temephos is not dangerous for consumption by animals or humans.
- Seeking medical attention on the first day of fever. Early diagnosis is important.
- Knowing the early signs and symptoms of malaria

### 22. Schistosomiasis (Bilharzia)

Schistosomiasis, or bilharzia, is infection with schistosomes (flukes). Flukes are common in the Caprivi Region especially along the Kwando (Kongola), Kavango, and Zambezi rivers. Cases have also been reported in Kunene and Omusati regions around the outflow of the Western Kunene River, the Omusati Canal, and the Olushandja Dam. Early treatment is crucial.

#### Causes

- *Schistosoma haematobium*
- *S. mansoni*
- *S. japonicum*

#### Symptoms and signs

- Fever
- ‘Swimmers itch’ after swimming in infested water (i.e., local allergic phase with urticaria on skin)
- Abdominal pain, liver discomfort
- Joint pains
- Pneumonitis
- Chronic diarrhoea (may be bloody) (*S. mansoni*)
- Haematuria or blood in urine at end of voiding (*S. haematobium*)
- Dysuria
- Enlarged liver and spleen
- Complications: ureteric obstruction, bladder cancer, recurrent UTI, and renal failure

#### Investigations

- Microscopy of urine for living eggs (at first visit; then 3 and 6 months after treatment)
- Microscopy of stools
- Biopsy of rectum

### Management

#### In clinic or health centre—

1. **Refer** suspect cases to hospital. 

#### In hospital—

1. Give praziquantel 40mg/kg stat.
2. In pregnancy, delay treatment until after delivery.
3. A breastfeeding mother should not breastfeed her baby for 3 full days after treatment.
4. Repeat treatment if urine reveals live eggs.

### Health education

#### Advise the patient to—

- Avoid contact or swimming in infested water.
- Boil drinking water.
- *Not* use infested water to wash food, vegetables, or clothes.

### 23. Rabies

---

Rabies, an acute and usually fatal infectious disease of the central nervous system, is caused by a virus.

#### Causes

- Infection with a rhabdovirus
- History of an animal bite—often a wild animal acting abnormally tame, or an animal that has abnormal behaviour, or a pet that suddenly bites someone

#### Symptoms and signs

- Usually long incubation period (30 to 50 days), but considerably shorter incubation period in patients who have head, trunk, or multiple bites
- Early symptoms and signs—
  - Numbness and tingling around site of infection
  - Generalised hyper-excitability (i.e., restlessness, aggressiveness)
  - Fever
  - Depression
- Late symptoms and signs—
  - Difficulty in swallowing, even fluids
  - Glottal spasm; respiratory paralysis
  - Hydrophobia (i.e., patient is afraid of water)
  - Increased irritability
  - Increased salivation
  - Convulsions; tetany
  - Maniacal behaviour (e.g., patient tries to bite other people)

#### Management

---

**Note:** The animal that caused the bite must be captured and observed. If the animal dies within 1 week, it probably had rabies. The dead animal should be taken to hospital for tests at the veterinary laboratory.

---

#### In the clinic, health centre, or hospital—

1. Ascertain the history of the animal bite.

2. Provide wound management. (See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of bites.)
3. Give the patient tetanus toxoid IM stat. (See “Section VI. Diseases and Disorders According to Age Groups. [Chapter 26. Paediatrics](#)” for a discussion of immunisation-preventable diseases.)
4. Refer the patient to hospital if—
  - There is a possibility that the animal has rabies
  - The wound is large or serious

#### In hospital—

1. Provide postexposure prophylaxis after an animal bite.
  - Give human rabies immunoglobulin (150 IU/2 mL): 20 units/kg stat. If it is anatomically and volume-wise feasible, administer the whole amount around the wound site; otherwise administer a minimum of half of the total amount around wound site and the other half deep IM.

— PLUS —

  - Give rabies vaccine as soon as possible after exposure: 5 doses of 20 units/kg on days 0, 3, 7, 14, and 28.
2. Provide respiratory, cardiovascular, and nutritional support in high care.
3. Use morphine, diazepam, and chlorpromazine for hyper-excitability. Tailor dose accordingly.

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**Note:** If the disease is already manifest in a patient, the only possible treatment is symptomatic treatment, and the disease is fatal.

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#### Prevention—

- People who work in close contact with animals (e.g., at the Society for the Prevention of Cruelty to Animals or for veterinary services) should have pre-exposure vaccination.
- For pre-exposure vaccination, give 3 doses of 1 mL on days 0, 7, 21, or 28.





# Obstetrics and Gynaecology

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### 24.1 Maternal Emergencies in Pregnancy

#### 24.1.1 Antepartum Haemorrhage

Antepartum haemorrhage (APH) is bleeding from the genital tract in any pregnant woman after 20 weeks gestation.

##### Causes

- Placental causes—
  - Placenta praevia
  - Abruptio placentae
- Nonplacental causes—
  - Cervicitis, cervical erosions or polyps, cervical cancer
  - Vulva varicosities, haemorrhoids

##### 24.1.1.1 Placenta Praevia

In placenta praevia, the placenta embeds itself in the lower pole of the uterus, partially or wholly covering the internal os in front of the presenting part. Multiparous women are at high risk.


##### Symptoms and signs

See [table 24.1.1.1](#).

##### Investigation

Sonar or ultrasound

##### Management

1. Refer to hospital; **refer** immediately should bleeding start. 
2. Vaginal examinations are dangerous and should be avoided.
3. Keep as inpatient until delivery.
4. Order bed rest.
5. Correct anaemia.
6. Administer steroids if <34 weeks.
7. Deliver at 38 weeks by caesarean section (C/S).

### 24.1.1.2 Abruptio Placentae

In abruptio placentae, there is bleeding from the placental site due to premature separation of a normally situated placenta after 28 weeks.

#### Causes

- Often no clear cause
- Hypertension during pregnancy; preeclamptic toxæmia (PET)
- Trauma (e.g., blow to or fall on the abdomen or traction on the cord)

#### Symptoms and signs

See [table 24.1.1.1](#).

**TABLE 24.1.1.1 Comparison of Symptoms and Signs of Placenta Praevia and Abruptio Placentae**

Symptoms and Signs	Placenta Praevia	Abruptio Placentae
Haemorrhage (bleeding)	Bleeding (always) Fresh blood (bright red)	Not always bleeding (concealed behind placenta) May pass dark blood or clots
Pain (abdominal)	None (painless)	Moderate to severe (but absent in small bleeds)
Signs of shock	None	Severe (despite moderate or no obvious signs of bleeding)
Uterus	Normal	Uterus is often very tender, painful, and sometimes hard
Abdominal examination	Often malpresen- tation of foetus (high head or presenting part)	Normal presentation of foetus
Signs of foetal distress	None (unless bleeding is profuse)	Present Foetal heart rate (FHR) may be absent
Vaginal examination	<i>Never to be done</i>	<i>Never to be done</i>


## 24.1 Maternal Emergencies in Pregnancy

### Investigations

- FBC
- U+E
- Clotting profile
- Cross-match for 2 to 4 units RCC

### Management

#### In clinic, health centre, or hospital—

1. *Never* do a vaginal examination, as it can cause massive bleeding.
2. Resuscitate.
  - Insert 2 IV lines (cannula size 14 to 16).
  - Correct hypovolaemia (crystalloids and colloids).
  - Give oxygen 4 to 6 L per minute to the mother by mask to improve oxygenation to the foetus.
3. **Refer** to hospital urgently. 
4. If transport is delayed, do the following:
  - Order strict bed rest for the mother; elevate the legs and let her cross her legs.
  - Do observations half hourly, including pulse and blood pressure.
  - Start an IV infusion with normal saline.
  - If the patient has no signs of shock, stop contractions with salbutamol or hexoprenaline.

#### In hospital—

- Abruption placentae—
  1. Continue resuscitation.
  2. Conduct special investigations.
  3. Correct anaemia, giving blood transfusion if necessary.
  4. Correct clotting defects, using fresh frozen plasma if necessary.
  5. Deliver patient within 6 hours of admission—
    - By normal vaginal delivery if the foetus is dead
    - By C/S if the patient has uncontrolled bleeding or BP, a previous C/S, or malpresentation
  6. Continue oxytocin infusion until 24 hours after delivery.

## 24.1 Maternal Emergencies in Pregnancy

7. Give prophylactic antibiotics.
- Placenta praevia—
    1. Give steroids if <34 weeks.
    2. Perform C/S at 38 weeks or before if the bleeding endangers the life of the mother.
    3. Keep a patient with known placenta praevia in the hospital from diagnosis until delivery.

### 24.1.2 Hypertension in Pregnancy

#### 24.1.2.1 Preeclampsia

Preeclampsia (PE) is pregnancy-induced hypertension.

- *Chronic hypertension* is hypertension before 20 weeks or pre-existing prior to pregnancy.
- *Pregnancy-induced hypertension* is defined as >140/90 mm Hg on two occasions, >6 hours apart.
- *Preeclampsia* is hypertension plus proteinuria (>300 mg per 24 hours or >2+ on urine dipstick) plus oedema after 20 weeks.
- *Eclampsia* is severe hypertension (usually >160/110 mm Hg) plus proteinuria (usually >5 g per 24 hours or 3+ on dipstick) plus oedema plus convulsion or other severe neurological signs.

#### Causes

Unknown, but the following factors are involved—

- Immunological
- Genetic
- Endothelial dysfunction
- Abnormal placental implantation
- Fatty acid metabolism
- Coagulation and platelet dysfunction

#### Symptoms and signs

- Often asymptomatic (therefore, monitor BP at every antenatal visit)
- Proteinuria plus high BP

## 24.1 Maternal Emergencies in Pregnancy

- HELLP syndrome (H = haemolysis; EL = elevated liver enzymes; LP = low platelet count): acute epigastric pain, hepatic tenderness, radiating to back, not relieved by antacids

TABLE 24.1.2.1 Symptoms and Signs of Preeclampsia

Symptoms and Signs	Moderate Preeclampsia	Serious Preeclampsia
Oedema	None/only the feet	Feet, hands, and vulva
Diastolic BP	>90 to 110 mm Hg	>110 mm Hg or systolic >160 mm Hg
Proteinuria	Mild	Severe
Headache	None	Mild
Decreased vision	None	Mild
Epigastric pain	None	Mild

### Signs of crisis

**Note:** See the MoHSS *National Guidelines on Emergency Obstetric Care*.

- Eclampsia or convulsions
- CVA
- Uncontrolled BP
- Pulmonary oedema; left ventricular heart failure
- Liver tenderness
- HELLP syndrome
- Renal failure
- Haematological abnormalities
- Foetal distress or intrauterine death

### Complications

- Kidney failure
- Liver failure
- Pulmonary oedema
- Heart failure
- Retinal detachment

## 24.1 Maternal Emergencies in Pregnancy

- Abruptio placenta
- Death (mother and foetus)

### Investigations

- FBC: Hb, Hct, platelet count
- U+E, uric acid
- LFT
- 24-hour urine collection (proteinuria and creatinine clearance)
- Sonar or ultrasound for growth assessment

### Management

#### In clinic or health centre—

Refer to hospital. 

#### In hospital—

1. Order bed rest.
2. Monitor BP, pulse, urine output, reflexes, and breathing.
3. Start an IV line if diastolic >110 mmHg and/or systolic >150 to 160 mmHg.
4. Catheterise.
5. Deliver infant immediately if mother shows signs of crisis or is >36 weeks.
  - Vaginal delivery preferred.
  - Use C/S or forceps delivery if foetus >30 weeks
  - If foetus is <28 weeks, delay delivery by reducing BP; if not successful, deliver.
6. Rapidly lower blood pressure using these steps.
  - Step 1. Use magnesium sulphate ( $MgSO_4$ ) in early eclampsia and if C/S will be done in 24 to 48 hours.
    - Give 4 to 6 g loading dose in 200 mL normal saline by IV infusion over 5 to 15 minutes.
    - Then follow by 5 g using undiluted 50% injection by deep IM injection into each buttock.
    - Repeat 5 gm IM every 4 hours if the respiratory rate is over 16 per minute, the urine output in previous 4 hours was >100 mL, and the knee jerk and ankle reflexes are present. If any of these are

## 24.1 Maternal Emergencies in Pregnancy

absent, wait for 2 hours, and retest before giving injection.

- Continue  $\text{MgSO}_4$  for about 24 hours after delivery or last fit.

— OR —

- Give continuous infusion 8 g in 200 mL saline at 50 mL per hour.
  - Check urine output and deep tendon reflexes regularly (i.e., hourly).
  - Record input and output.
- Step 2. Give the mother a dihydralazine injection (Nepresol).
- Initial dose: 6.25 mg IV in 10 mL sterile water administered slowly over 4 minutes
  - Repeat dose after 30 minutes.

— OR —

- Use Nepresol infusion solution—
    - ♦ Mix 1 ampoule (25 mg) in 200 mL normal saline or Plasmolyte B (not dextrose) in glass container.
    - ♦ Start the infusion slowly at 10 drops per minute, then the double dose every 30 minutes, titrated according to response to a maximum of 40 drops per minute.
- Step 3. Give nifedipine 5 mg PO. Observe BP carefully.
- Step 4. Give labetalol (if available) infusion 200 mg in 200 mL saline at 5 drops per minute.
7. Start maintenance therapy.
- First line: methyldopa 250 mg per day PO initially increased to 500 mg in 4 divided doses
  - Second line: nifedipine and dihydralazine
  - Third line: nifedipine, doxazosin, and dihydralazine
  - Fourth line (seldom used): beta blocker

### Health education

- Advise the patient to rest sometimes with her feet elevated.



## 24.1 Maternal Emergencies in Pregnancy

- The mother will have to deliver in hospital because complications are common.
- Counsel the patient on the likelihood of PE recurrence in future pregnancies (40%).

### 24.1.2.2 Eclampsia

Eclampsia is pregnancy-induced hypertension with convulsions.

#### Symptoms and signs

- Pregnancy
- High BP (sustained)
- Signs and symptoms of convulsions (see “Section II. Diseases and Disorders According to Body System. Chapter 11. Neurological System” for a discussion of seizures)
- Unconsciousness

#### Management

1. Resuscitate if necessary using ABC (see “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of cardiopulmonary resuscitation in adults, 1.7.1.)
2. Prevent aspiration and trauma during convulsions.
3. Provide oxygen by face mask.
4. Start IV fluids: 5% dextrose.
5. Prevent or stop convulsions.
  - Give diazepam 10 mg IV stat.
  - Give magnesium sulphate (see preeclampsia management, above)
6. Control BP (see preeclampsia management, above)
7. For restlessness, give diazepam 5 mg IV.
8. Deliver baby very urgently.

### 24.1.3 Prolonged Labour (Poor Progress)

Labour is said to be prolonged when it exceeds the normal limit of 8 hours for the latent phase and 7 to 9 hours for the active phase.

## 24.1 Maternal Emergencies in Pregnancy

- Normal duration of the first stage (from onset of labour to 3 cm dilatation)—
  - Primigravidas
    - ◆ Latent phase <8 hours
    - ◆ Active phase 1 cm dilatation per hour
  - Multiparas: total 7 to 8 hours
- Normal duration of second stage: ±30 minutes
- Normal duration of third stage: ±30 minutes to 1 hour

### Causes

- Abnormal uterine contractions
- Poor maternal effort
- Cephalopelvic disproportion (CPD)
- A large baby
- Abnormal presentations (e.g., face to pubis, persistent occipitoposterior position, transverse lie, or breech)

---


**Note:** Abnormal presentations often show as foetal distress (i.e., decreased FHR and movements and meconium) and often indicates the need for C/S.

---

### Management

- **Prolonged first stage:** latent or active stage prolonged and active line crossed—
  1. Rupture membranes (unless the mother is HIV positive).
  2. Let mother lie on her left side.
  3. Start infusion of modified Ringer's lactate.
  4. Give oxytocin—
    - Primigravidas: 10 units in 1 L fluid (e.g., Ringer's lactate or dextrose 5%) at 15 or 30 or 60 drops/minute with careful assessment of contractions
    - Multigravidas: use careful assessment and give oxytocin only rarely.
  5. Provide analgesia—
    - Inhalation analgesia (nitrous oxide)
    - Pethidine 50 to 100 mg IM or IV
    - **PLUS** ——
    - Hydroxyzine 25 to 50 mg IM

## 24.1 Maternal Emergencies in Pregnancy

- Morphine 10 mg bolus IM (only in intrauterine death)
  - Epidural analgesia
6. Make final decision on type of delivery within 6 hours
  7. Transfer to hospital—
    - If medical assistance (i.e., instrumental delivery or C/S) is required.
    - In the case of CPD or abnormal presentations, **refer** the mother urgently to the nearest hospital. 
    - If patient has severe uterine contractions during second stage, give salbutamol inhalations as needed.
    - Provide oxygen therapy during transfer.
- **Prolonged second stage:** >1 hour full dilatation, foetal head not descended after 1 hour, 30 to 45 minutes pushing without delivery—
    1. Transfer or refer to hospital.
    2. Perform C/S or instrument delivery after careful assessment.
  - **Prolonged third stage:** after delivery of baby until delivery of placenta >1 hour—
    1. Begin active treatment of normal third stage.
      - Give ergometrine maleate 500 mcg plus oxytocin 5 units stat IM.
      - Deliver placenta by Brandt-Andrews method (i.e., steady traction on placenta while supporting the uterus abdominally).
      - Check if contraction of uterus is appropriate
    2. For further management see [24.1.6](#) below.

### 24.1.4 Impacted Shoulders (Shoulder Dystocia)

Impacted shoulders, or shoulder dystocia, is a complication of a large baby in relation to the pelvic outlet (usually associated with the large babies of undiagnosed diabetic mothers).

## 24.1 Maternal Emergencies in Pregnancy

### Management

1. Two assistants are required.
2. Use the McRoberts manoeuvre (refer to the MoHSS *National Guidelines for Emergency Obstetric Care*).

If no success—

1. Perform an episiotomy or, if necessary, bilateral episiotomies.
2. Have the midwife deliver the posterior shoulder and arm first then the anterior shoulder.
3. Use rotational manoeuvres or, if necessary, perform a cleidotomy.
4. Inform the mother of complications in the baby—
  - Dislocated shoulders: refer the baby (and mother) to hospital
  - Fractured clavicles: immobilized against the chest; injury will heal in  $\pm 8$  weeks
  - Erb's palsy: will correct itself in time

### 24.1.5 Cord Prolapse

In cord prolapse, the umbilical cord lies in front of the presenting part and the membranes are intact, or it lies outside the cervix.

### Management

1. Call an assistant.
2. Do a vaginal examination:
  - Using a sterile, gloved hand, feel (only once) for pulsation of the cord.
  - Push the infant's head upwards gently.
  - Replace cord in vagina.
  - Pad over perineum.
3. Insert a Foley's catheter in bladder (with the help of an assistant).
  - Insert 500 mL saline.
  - Clamp.
4. Position patient in the knee-chest position or on her side.

## 24.1 Maternal Emergencies in Pregnancy

5. If *not* fully dilated, give salbutamol inhalations 2 puffs as needed or hexoprenaline 50 mcg infusion to decrease contractions.
6. Check foetal heart by sonar.
7. In the operating theatre, perform C/S.


### 24.1.6 Retained Placenta

See prolonged third stage in 24.1.3, above. In this condition the placenta is not expelled from the vagina 1 hour after delivering the baby.

#### Causes

- Faulty technique of delivering the placenta
- Full urinary bladder preventing its descent
- Constricting ring

#### Management

1. Ensure the patient's urinary bladder is empty.
2. Start active treatment of third stage—
  - Give syntometrine (i.e., ergometrine 0.5 g plus oxytocin 5 U) stat IM.
  - If prolonged (>30 minutes), repeat ergometrine 500 mcg plus oxytocin 5 U).
3. Give oxytocin infusion (40 U added to 1 L Ringer's lactate) at 60 drops per minute.
4. Repeat controlled cord traction (i.e., Brandt-Andrews method) within 30 minutes.
5. Try the above process 2 times.
6. The midwife should not attempt to manually remove the placenta because of danger of haemorrhage or incomplete delivery of the placenta.
7. **Refer** the patient *urgently* to the nearest hospital or doctor if she has active bleeding. 
8. For removal in the operating theatre under anaesthetic, see the MoHSS *National Guidelines for Emergency Obstetric Care*. Give misoprostol 1,000 mcg per rectum plus 200 mcg sublingually every 2 hours × 5 tablets.

### 24.1.7 Postpartum Haemorrhage

Postpartum haemorrhage (PPH) is a bleed of more than 500 mL vaginally after delivery of the baby.

- Primary PPH is bleeding within the first 24 hours
- Secondary PPH is bleeding after 24 hours

---

**Note:** PPH is one of the most common causes of maternal death. See the MoHSS *National Guidelines for Emergency Obstetric Care*.

---

#### Causes

- Primary—
  - Atonic uterus (idiopathic or retained products)
  - Trauma to the genital tract (tears or episiotomy wound)
- Secondary—
  - Infections
  - Coagulopathy

#### Symptoms and signs

- Continuous vaginal bleed
- Mother can develop shock: low BP, tachycardia, cold and clammy skin


#### Management

**In clinic, health centre, and hospital—**

See [figure 24.1.7](#).

1. Call for help of other team members.
2. Resuscitate (See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of cardiopulmonary resuscitation in adults, [171](#).)
3. Start an IV normal saline infusion; adjust flow rate against the patient’s BP.
4. Check delivery of placenta.
  - If the uterus has contracted well but the patient is still bleeding, examine the placenta for completeness. Remove remaining parts.
  - If the placenta is complete but the patient is still bleeding, examine the vagina and cervix for tears. Suture these.

## 24.1 Maternal Emergencies in Pregnancy

- Achieve uterine contraction.
  - Massage the lower abdomen to let the uterus contract.
  - Empty bladder (catheterise).
  - Give 500 to 1,000 mcg misoprostol per rectum stat after delivery of baby plus 200 mcg sublingually.
  - See 24.1.6 above for instructions on retained placenta (i.e., giving oxytocin infusion, ergotamine plus oxytocin).
- Refer** to hospital sooner rather than later, immediately if possible. 

### In hospital—

See the MoHSS *National Guidelines for Emergency Obstetric Care*.

- Inspect for trauma of genital tract.
- Check clotting profile.
- Remove the placenta in theatre under anaesthetic only if no other choice.

### Health education

If Hb <10 g/dL, give advice on a healthy diet and iron supplementation (see “Section III. Nutrition and Lifestyle”).

### 24.1.8 Trauma to the Genital Tract

Cervical, vaginal, and perineal lacerations all constitute trauma to the genital tract.

#### Causes

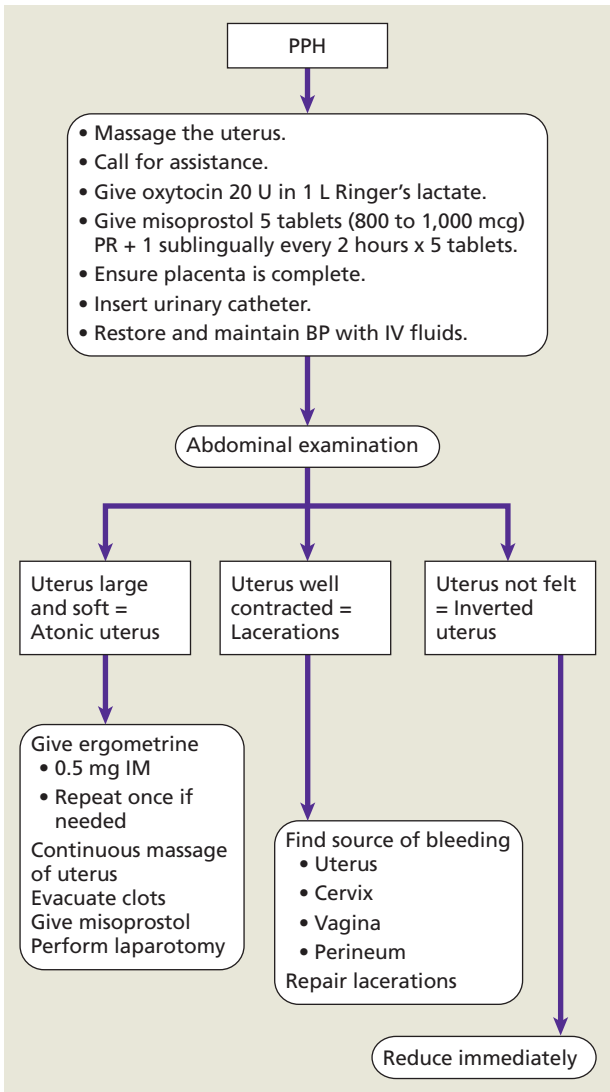
- Patient bearing down (pushing) through an undilated cervical os
- In primigravidas in whom labour is prolonged and cooperation is poor
- During the spontaneous delivery of a large baby
- Malpresentation and delivery
- Instrumental deliveries

#### Symptoms and signs

- Bleeding immediately after the baby is born
- The flow of blood is continuous

## 24.1 Maternal Emergencies in Pregnancy

FIGURE 24.1.7 Algorithm for Management of PPH





## 24.1 Maternal Emergencies in Pregnancy

- A heavy trickle or blood clots in vagina
- The uterus has a good tone and is firmly contracted

### Management

In the clinic, health centre, or hospital—

1. With patient in lithotomy position, adequate lighting and instruments, examine genital tract carefully.
2. Suture the laceration. **Note:** Suturing should be done by experienced staff member or doctor.
3. Midwife or nurse can pack vagina to compress the bleeding vessels (only in severe haemorrhage).
  - Place woman in Sims' left lateral position.
  - Use speculum or first and second fingers of the left hand as a perineal retractory.
  - Pack the vagina with strips of gauze or folded gauze.
  - Then apply a pad, which is firmly held in position by a binder.
4. Refer to hospital, and provide IV infusion while transferring the patient.

In hospital—

1. Swab clots or pack out of the vagina.
2. Insert catheter to empty bladder.
3. Exam carefully.
4. Treat the cause of the trauma (i.e., uterine atonia or inversion, ruptured uterus, perineal tear) in the operating theatre.

### 24.1.9 Ruptured Uterus

A ruptured uterus is one of the most serious accidents in obstetrics and needs immediate care. Maternal mortality is almost 50% to 60%, and infant mortality is almost always 100%.

#### Causes

- Previous C/Ss. All patients with previous C/S must be delivered in hospital.
- Abnormal presentations
- Multiparity


## 24.1 Maternal Emergencies in Pregnancy

- Obstructed labour
- The misuse of oxytocin

### Symptoms and signs

- Patient usually had a previous C/S
- Low abdominal pain especially in between contractions
- Shock comes slowly in some cases and rapidly in others
- Abdominal signs of obstructed labour (e.g., rising pulse, tonic contractions, and high presenting part)
- The lower segment is very tender
- Vaginal bleeding is a dangerous sign
- When the uterus ruptures, the severely painful uterine contractions stop and the woman feels something give way
- The foetus can be readily palpated beneath the abdominal wall
- No FHR

### Management

1. **Urgently refer** to doctor or hospital. 
2. Resuscitate.
3. Provide oxygen therapy.
4. Treat shock.
5. Give blood transfusion.
6. Emergency surgery will be performed by the doctor to save the patient's life.

## 24.2 Antenatal Care

Antenatal care (ANC) is health care provided to all pregnant women, and it includes promotive, preventive, and treatment services.

### Objectives

- Performing regular checks of mother to include physical examination, information and education, and counselling
- Identifying risk factors such as—
  - Disease conditions: diabetes, hypertension, anaemia, STIs
  - Teenage pregnancy
  - Past obstetric history: primigravida, elderly primipara, multiple pregnancy, grand multipara, abortions, foetal and neonatal deaths
  - Family history (e.g., congenital anomalies, hypertension)
- Performing regular checks of the foetus for normal development and growth
- Screening for problems during pregnancy (see 24.3, below)
- Prescribing medications if necessary (e.g., ferrous and folic supplements, ARVs, and TB and malaria prophylaxis)

### Antenatal examination

- Remember to open antenatal record card.
- Record at the first antenatal visit—
  - Personal history
  - Obstetric history (how many pregnancies, how many deliveries, how many abortions) and poor obstetric history
  - Medical history (underlying diseases, medications, HIV history and treatment)
  - Surgical history (previous C/S, other)
  - Pregnancy test (a quantitative human chorionic gonadotropin test [beta-hCG]) result (if not certain

## 24.2 Antenatal Care

that the patient is pregnant)

- Estimation of gestational age: last menstrual period (LMP), expected date of delivery (EDD), ultrasound, symphysis fundal height (SFH)
- Conduct regular monitoring at antenatal visits—
  - Every 4 weeks until 28 weeks
  - Every 2 weeks until 36 weeks
  - Weekly until delivery
- Check at each visit—
  - Mother—
    - ◆ Blood pressure
    - ◆ Weight; investigate abnormal increase
    - ◆ Signs of abnormal fluid retention, such as pitting oedema of both legs
    - ◆ Urine dipstick: protein and glucose
    - ◆ Hb and look for signs of anaemia
    - ◆ Medical examination, including thyroid, heart, lung, breasts, gums
  - Foetus—
    - ◆ FHR and movements
    - ◆ Progress of pregnancy (SFH, abdominal palpation)
    - ◆ Increase in size of the uterus (SFH)
    - ◆ Position of foetus

---

**Note:** Refer, or get advice on what to do, if the patient has risk factors or danger signs.

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### Investigations

- At 14 weeks, take maternal blood samples for—
  - FBC, Hb
  - Rhesus D (Rh)
  - Antibody screen
  - RPR/TPHA (syphilis)
  - HIV 1+2 counselling and testing
- In some indications—
  - Blood grouping (ABO)

- Glucose, GTT
- Rubella IgG, hepatitis B surface antigen (Hep BsAg)
- Urine MCS
- Ultrasound

## Management

**Note:** Medicines should be avoided or used with caution during pregnancy. Medicines to be avoided in pregnancy include metronidazole, tetracycline, ciprofloxacin, sulphonamide, pyrimethamine (use with caution), streptomycin, co-trimoxazole, mebendazole, diuretics (e.g., furosemide), acetosalicylic acid, efavirenz, contraceptives, and alcohol.

1. All pregnant women should take ferrous fumarate + folic acid tablet once per day.
2. Give tetanus toxoid (TT) if the patient is not fully immunised against tetanus.
3. In malaria areas, all pregnant women should take one dose of sulfadoxine/pyrimethamine (i.e., 3 tablets) at 26 to 28 weeks and at 34 to 36 weeks. Give at least 4 weeks apart. In high-risk HIV areas, give a third dose after another 4 weeks to provide immunity for mother and baby during breastfeeding.
4. For an HIV-positive mother, see “Section IV. Infectious Diseases. [Chapter 18. HIV/AIDS](#)” for a discussion of PMTCT.
5. Refer the patient if she exhibits the following danger symptoms or signs—
  - Severe headaches
  - Severe abdominal pain
  - Amniotic fluid leakage
  - Vaginal bleeding
  - Reduced or absent foetal movements
  - Anaemia <6 g/dL
  - Antepartum haemorrhage
  - Severe hypertension (BP >160/110 mm Hg), eclampsia

## 24.2 Antenatal Care

- Reduced FHR
  - Pre-term rupture membranes
  - Severe vomiting
  - Severe UTI, kidney infection, or acute abdomen
  - Respiratory distress
  - Deep venous thrombosis (DVT)
  - Pyrexia (i.e., fever) of unknown origin (PUO)
6. Refer mothers older than 40 years or who have cardiac, respiratory, endocrine, or thyroid disorders to a specialist.
  7. Refer mothers who have a history of previous perinatal problems to a specialist.
  8. Refer mother to a specialist if the foetus has abnormal presentation, if the mother has had previous C/S, or if the delivery will be of a large baby.

### Health education

- Emphasise the importance of—
  - Regular visits to the antenatal clinic
  - Good personal hygiene
  - Appropriate diet and exercise
  - Resting when tired
  - Taking no medicines unless prescribed by a doctor
  - Delivering in a health facility
- If the mother is HIV positive, advise both her and the father on how to reduce transmission from mother to baby by—
  - Avoiding unprotected sex during pregnancy (use a condom)
  - Ensuring a safe delivery by coming to the clinic or hospital
  - Accessing HAART for the baby immediately after birth
  - Adopting safer feeding options (i.e., breastfeeding only or replacement feeding only)
  - Starting HAART
  - Considering delivery through C/S

### 24.3 General Complaints during Pregnancy

During pregnancy, hormonal changes occur to enable the female's body to bear a growing foetus. These changes might cause a mother numerous small problems that are uncomfortable. All pregnant women with complaints should be thoroughly examined to rule out serious problems.

#### 24.3.1 Abdominal Pain

Abdominal pain is common, especially in the last months of pregnancy. The pain can be continuous or can be present only when walking or with activities. Check to be sure the patient has—

- No yellow vaginal discharge (could indicate pelvic inflammatory disease [PID], STIs)
- No dysuria (UTI, pyelonephritis)
- No vaginal bleeding (threatening abortion or miscarriage, ectopic pregnancy)
- No uterine contractions (threatening abortion, risk of preterm labour)
- No tenderness of the abdomen and uterus (ectopic, abruptio placentae)

#### Management

1. If none of the above conditions are present, advise the patient to rest more.
2. If the patient is in mild pain, give paracetamol.

#### Health education

Explain to the mother that this pain is normal, and ask her to rest a bit more.

#### 24.3.2 Anaemia in Pregnancy

A haemoglobin  $<10$  g/dL is regarded as anaemia. Anaemia in pregnancy is a common problem and to prevent it, ferrous fumarate and folic acid supplements should be given for the duration of pregnancy.

## 24.3 General Complaints during Pregnancy

### Causes

- Low intake of iron and folic acid
- Infections such as HIV, TB, parasites
- Malignancies
- Chronic blood loss
- Thalassaemias and sickle cell disease
- Repeated pregnancies

### Symptoms and signs

See “Section II. Diseases and Disorders According to Body Systems. [Chapter 4. Blood System](#)” for a discussion of anaemia.

### Management

1. Determine cause of the anaemia; investigate before treatment. (See “Section II. Diseases and Disorders According to Body Systems. [Chapter 4. Blood System](#)” for a discussion of anaemia.)
2. If the patient has Hb <7 g/dL, refer to hospital. Treatment will include—
  - Ferrous preparation 3 times per day
  - Transfusion if necessary
3. If the patient has Hb >7 to 10 g/dL start iron and vitamin supplementation to include—
  - Ferrous fumarate and folic acid 3 times per day
  - Cyanocobalamin (vitamin B12) and mineral supplementation
  - Refer patient to a specialist if symptomatic, if she is >36 weeks, or if MCV is high.

### Health education

- Explain the cause of anaemia
- Advise on nutrition and diet (see “[Section III: Nutrition and Lifestyle](#)”).
- Instruct the patient to use the medication as prescribed.
- Advise on side effects of medications (e.g., iron tablets will darken stools).
- Instruct the patient to come back every 2 weeks for follow-up.



### 24.3.3 Abortion

See 24.4.2, below.

### 24.3.4 Antepartum Haemorrhage

See 24.1.1, above.

### 24.3.5 Backache

Backache is common and due to the musculoskeletal changes during pregnancy.

#### Management

1. Rule out premature labour.
2. Rule out pyelonephritis or UTI (using urine dipsticks).
3. Rule out spinal TB.
4. Put a warm compress on the back for 10 to 15 minutes if the pain is serious.
5. Give paracetamol if severe.

#### Health education

Advise the patient to—

- Wear comfortable, not high-heeled, shoes.
- Sleep on firm mattress.
- Not lift heavy weights.
- Massage, take hot baths.
- Lie on side with legs curved.
- Try to rest more.
- Have regular exercise by walking.

### 24.3.6 Constipation

Constipation is often the result of a diet with too few fluids or too little fibre. Constipation can aggravate haemorrhoids.

#### Management

Advise the patient to—

1. Drink at least 2 glasses of water with every meal.
2. Eat a fibre-rich diet (e.g., vegetables, fruits, whole wheat breads). (If an improved diet does not help, give the patient bisacodyl (5 mg) 1 to 2 tablets stat in the evening.)
3. Get more physical exercise.

### 24.3.7 Cramps in the Legs

Leg cramps can be due to varicose veins, poor circulation in legs, or low levels of calcium or magnesium in the blood. They occur throughout pregnancy but especially in the third trimester.

#### Health education

- Advise a patient who has varicose veins to—
  - Rest often with feet elevated above her head.
  - Not wear tightly fitting clothes.
  - Not stand for a long period.
  - Not cross legs while sitting but rather to sit with legs straight.
  - Obtain special stretch stockings from her doctor for serious cramps.
- Advise a patient who does not have varicose veins—
  - That cramps are probably due to a lack of calcium in the blood.
  - To drink a lot of milk (i.e., at least 1 glass with every meal). If the addition of milk to her diet does not ease the cramping, the patient can be given calcium gluconate tablets 300 mg 2 times per day for 10 days (if available in the clinic).
  - To take mineral and vitamin supplements.

### 24.3.8 Dyspnoea (Shortness of Breath)

Dyspnoea is usually the result of pressure of the uterus on the diaphragm, but make sure that the patient does not have—

- Heart failure
- Anaemia
- Lung disease

#### Management

1. Advise the patient to get plenty of rest and avoid physical exertion.
2. Perform regular examinations of her lungs and heart (chest) in the clinic.
3. If severe, refer the patient for specialist care.

### Health education

- Advise the patient to—
  - Try to rest a lot
  - Avoid physical exertion
  - Come back to the clinic regularly for review
- Reassure the patient that she will feel better as soon as the baby is born.

### 24.3.9 Ectopic Pregnancy

See 24.4.6, below.

### 24.3.10 Haemorrhoids

Haemorrhoids are very common during pregnancy as a result of high pressure in the abdomen due to either constipation or the enlarging uterus.

#### Management

**Note:** Haemorrhoids usually improve after the delivery.

1. Treat as in constipation.
2. Refer the patient to hospital if she has severe pain or is bleeding.
3. If there are serious problems with the haemorrhoids, see “Section II. Diseases and Disorders According to Body Systems. Chapter 7. Gastrointestinal System” for a discussion of haemorrhoids.

### 24.3.11 Heartburn

Heartburn is the result of acid reflux from the stomach into the oesophagus, when an enlarged uterus pushes up the stomach.

#### Management

1. Give antacid without sodium, such as aluminium hydroxide.
2. Give ranitidine 150 mg once per day.
3. Give omeprazole (if available).

### Health education

Advise the patient to—

- Eat small regular meals and drink milk between meals.
- Not eat or drink just before going to bed.
- Sleep on a high cushion.

### 24.3.12 Indrawn Nipples

Indrawn nipples can make breastfeeding difficult after delivery.

#### Health education

- Gently massage flat nipples between the thumb and forefinger when bathing (avoid excessive massaging as it can stimulate the release of oxytocin and result in premature uterine contractions).
- If there is no response to gentle massaging, consult a doctor after delivery of the baby.

### 24.3.13 Nausea and Vomiting

Nausea and vomiting usually occur in the first trimester and are probably due to the hormonal changes. Emotional stress can make this worse. Check that the patient has—

- No bowel obstruction (e.g., constipation, distension, hyperactive bowel sounds)
- No acute abdomen

#### Management and health education


1. Advise the patient to—
  - Eat small, regular meals.
  - Eat dry bread or biscuits before rising in the morning.
  - Avoid spicy or fatty food.
2. If the vomiting is serious, refer to the doctor.
3. In the case of hyperemesis gravidarum, hospitalisation is required.

### 24.3.14 Oedema of the Feet

Oedema of the feet is most often the result of hormonal changes during pregnancy. Check to be sure the patient has—

- No heart failure
- No preeclampsia (i.e., no high BP, no proteins in urine)

#### Management

1. Advise the patient to—
  - Keep the legs elevated as often as possible.
  - Rest a lot.
  - Reduce salt intake.
2. Examine the patient regularly at the clinic during pregnancy (i.e., urine for protein dipsticks and take blood pressure).
3. If the following are present, **refer** the patient to hospital immediately— 
  - Signs of heart failure
  - Proteins in the urine
  - Blood pressure with a diastole of more than 90 mm Hg
  - Headaches, visual disturbances, epigastric pains

### 24.4 High-Risk Antenatal Disorders

Most high-risk antenatal disorders need to be attended to carefully and often need to be referred to hospital.

Common symptoms and signs of high-risk disorders in pregnancy include—

- Bleeding from vagina (per vagina [PV])
- Abdominal pain
- High blood pressure
- Loss of foetal movements

For referral of high-risk obstetric patients, see the MoHSS *National Guidelines on Emergency Obstetric Care*.

#### 24.4.1 Abdominal Pain during Pregnancy

##### Causes

- Early pregnancy—
  - Abortion or miscarriage (episodic, cramps, pain, but no vomiting)
  - Ectopic pregnancy (continuous pain, no vomiting)
  - Pyelonephritis (suprapubic pain, dysuria, fever)
  - Appendicitis
  - Torsion of ovarian cyst
  - Degeneration of myoma or fibroid
  - Hepatitis, cholecystitis, kidney stones
- Late pregnancy—
  - Abruptio placentae
  - Preeclampsia

##### Investigations

Always consider the tests in [table 24.4.1](#) to rule out the possible diagnoses indicated.

##### Management

Find the cause and treat accordingly.

#### 24.4.2 Abortion

An abortion is the loss of the foetus or products of conception before week 22 of the pregnancy. It can be spontane-

TABLE 24.4.1 Investigations—Abdominal Pain in Pregnancy

Type of Test	Test	Possible Diagnoses
Non-pregnancy-related tests	Urine dipsticks	UTI Pyelonephritis
	FBC CRP	Appendicitis PID
	LFT	Hepatitis Cholecystitis
	Sonar	Kidney stones Myoma
Pregnancy-related tests	beta-hCG	Confirm pregnancy
	FBC U+E Clotting profile	Abruptio placentae
	Blood pressure monitoring	Eclampsia Preeclampsia
	Sonar	Abortion Ectopic pregnancy

ous or caused by accidental or non-accidental (criminal or therapeutic) interference with a pregnancy. Types of abortion:

- Threatening which can lead to a complete abortion.
- Inevitable (pregnancy cannot be saved)
- Complete or incomplete

### Symptoms and signs

- History of amenorrhoea for at least one month
- Vaginal bleeding
- May or may not experience abdominal cramps
- History of passing products of conception
- If infection is present, fever; chills: a bad-smelling, purulent, or bloody vaginal discharge
- Lower abdominal tenderness
- The cervical os can be as follows:
  - Threatening abortion—cervical os is closed

## 24.4 High-Risk Antenatal Disorders

- Inevitable abortion—cervical os is open
- Complete or incomplete abortion—cervical os is open
- Signs of shock are sometimes present: cold, clammy skin, tachycardia, low systolic blood pressure <90 mm Hg

### Management

#### In clinic, health centre, or hospital—

1. Treat shock if necessary.
2. Establish whether the abortion is threatening or inevitable.
3. Establish whether the abortion is complete or incomplete.
4. Monitor mother and foetus regularly.
5. Order strict bed rest if threatening.
6. Follow up after 2 days.
7. Refer patient to hospital if she has clots or heavy bleeding.

#### In hospital—

1. Perform sonar exam.
2. Perform dilatation and curettage (D+C)
3. Before medical curettage, give misoprostol × 5 tablets per rectum plus 1 tablet sublingually every 2 hours (× 5 tablets)

### 24.4.3 Antepartum Haemorrhage

See [24.1.1](#) above.

### 24.4.4 Cardiac Disorders

#### Symptoms and signs

Signs of acute cardiac failure—

- Intense shortness of breath
- Cyanosis
- Rapid and or irregular pulse
- Cold, sweating extremities
- Cough with blood-stained sputum



- Generalized oedema without hypertension or proteinuria

### Management

1. Refer all cardiac patients to hospital early in pregnancy for assessment. These patients may present with sudden severe collapse of the mother during labour.
2. Provide special antenatal care.
3. Admit at 37 weeks or earlier if severe.
4. Advise the patients that all patients with cardiac disorders must be delivered in hospital.

### 24.4.5 Diabetes Mellitus

See the MoHSS *National Guidelines on Emergency Obstetric Care*.

### Management

1. Refer all diabetic patients to hospital early in pregnancy for assessment.
2. Provide special antenatal care.
3. Advise the patient that all patients with DM must be delivered in hospital.

### 24.4.6 Ectopic Pregnancy

An ectopic pregnancy is a state where the foetus develops outside the uterus, usually in the fallopian tube. As the foetus grows and develops, the tube is stretched until it bursts, causing internal bleeding, and can lead to death.

### Symptoms and signs

- Usually a positive pregnancy test
- Usually amenorrhoea for 6 to 8 weeks
- Lower abdominal pain of sudden onset but getting worse
- Back pain, shoulder pain (these pains are referred from irritation of the diaphragm)
- Tenderness over the lower abdomen with positive rebound tenderness
- Sometimes vaginal bleeding

## 24.4 High-Risk Antenatal Disorders

- On vaginal examination, tenderness and maybe a palpable mass on the side of the uterus
- Shock can be present (i.e., cold, clammy skin, low BP, tachycardia)
- Anaemia (i.e., low Hb; <10 g/dL)

### Investigations

- beta-hCG
- Sonar

### Management

1. **Refer** to hospital urgently. 
2. Patient requires laparoscopy or laparotomy.

### 24.4.7 HIV in Pregnancy and Labour

See the MoHSS *National Guidelines on Emergency Obstetric Care*.

#### Management

1. Follow the PMTCT guidelines (see 24.7 below and “Section IV. Infectious Diseases. [Chapter 18. HIV/AIDS](#)” discussions of PMTCT).
2. C/S is advised.

### 24.4.8 Multiple Pregnancies

See the MoHSS *National Guidelines for Emergency Obstetric Care*.

#### Management

1. Refer to hospital—
  - For diagnosis by sonar
  - From the time of diagnosis for antenatal care
  - All primigravidas and multigravidas
  - Patients who have a high risk of premature labour

### 24.4.9 Preeclampsia and Pregnancy-Induced Hypertension

See 24.1.2 above. See also “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of hypertensive crisis.

### 24.4.10 Premature Rupture of Membranes

This condition is rupture of membranes without contractions before 28 to 37 completed weeks of gestation (pre-term) or before the onset of labour (pre-labour).

#### Risks

- Amniotic fluid may become infected
- Foetal pneumonia due to inhalation of infected liquor
- Puerperal sepsis

#### Management

1. Confirm the gestational age.
2. Confirm rupture by speculum examination and litmus paper test.
3. Monitor the foetal condition.
4. Check whether pre-labour or pre-term.
  - If term—
    - Induce labour by proper rupture of membranes.
    - Give prostaglandin PO. **Note:** Vaginal insertion has risk of ruptured membranes.
    - Start oxytocin infusion.
  - If >34 weeks—
    - Refer to hospital.
    - Induce labour if—
      - ◆ It has been >24 hours since membranes ruptured.
      - ◆ Patient exhibits signs of infection.
  - If <34 weeks—
    - Refer to hospital.
    - Order bed rest.
    - Give a course of steroids for 24 hours.
    - If it has been >24 hours since membranes ruptured, start antibiotics—
      - ◆ Ampicillin or penicillin<sup>1</sup>
      - PLUS —
      - ◆ Metronidazole
    - Do not perform a vaginal examination.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 24.4 High-Risk Antenatal Disorders

- Deliver when steroid course has been completed (1 dose only).
5. If there are signs of infection, refer to hospital for delivery

### 24.4.11 Previous Caesarean Section

#### Management

1. Patient will require a critical assessment in antenatal clinic (refer sooner rather than later).
2. Refer to hospital at 36 weeks for final decision on mode of delivery—
  - Elective C/S
  - Vaginal birth after C/S (VBAC) **Note:** This option needs to be discussed with an obstetrician.

## 24.5 Labour and Delivery

### 24.5.1 First Stage of Labour

During the first stage of labour, do the following—

- Give the mother emotional support.
- Take a medical history (e.g., how many pregnancies, births, abortions, any problems during earlier pregnancies or births, general health problems).
- Ensure that patient's bladder is empty.
- Open the partogram, and monitor progress of labour and delivery.

### Management

#### 1. Check foetal condition—

- Check the FHR.
  - Using the cardiotopograph (CTG), monitor contractions and foetal heart patterns.
  - Listen to the FHR during a contraction.
  - Check the FHR for 1 full minute every half hour. A normal FHR is 120 to 160 beats per minute. A FHR of >160 or <120 indicates foetal distress, and the mother should be referred.
  - Give oxygen to the mother if available.
- Check the amniotic fluid.
  - Observe and record the condition of membranes (i.e., intact or ruptured).
  - If the membranes are ruptured, observe the colour of the amniotic fluid (i.e., clear or green, thick).
  - If the fluid is not clear, refer; it indicates foetal distress.
- Change of shape of foetal head (moulding).
  - The shape of the foetal head can show that the pelvis of the mother is too narrow for the baby (see the MoHSS *National Guidelines on Emergency Obstetric Care*).

## 24.5 Labour and Delivery

- Examine the head shape at each vaginal examination and record on the partogram.
  - Sonar—
    - ◆ Amniotic fluid index (AFI)
    - ◆ Foetal doppler
2. Monitor the progress of labour—
- Check the descent of foetal head or presenting part.
    - Palpate how much of the head you can feel above the pelvis and if it is fixed.
    - Try to feel if the head is coming down with contractions. Note also if there are changes in the shape of the head.
    - Plot the number in fifths on a cervicograph.
  - Check uterine contractions.
    - Record the duration and frequency of uterine contractions every half hour.
    - If contractions are poor or if rectum seems full of stools, give enema.
  - Check cervical dilation.
    - Determine cervical dilation by performing vaginal examination every 2 to 4 hours. The findings should be plotted in the partogram.
    - Once an 8-cm dilatation has been reached, examine every hour.
    - Cervical dilation at the rate of less than 1 cm per hour indicates slow progress or delay in labour. In that case, refer.
3. Monitor maternal condition—
- Check and record temperature, heart rate, respiration, and BP hourly.
  - Check protein and ketones in urine.
  - Check Hb.
4. Monitor the duration of labour—
- Record the time of onset of labour.
  - Record the time of arrival at the clinic.

### Induction of labour

1. If labour needs to be induced, perform an amniotomy (i.e., rupture of membranes).
2. Start an oxytocin infusion (5% dextrose water or other balanced electrolyte solution) increase every 15 to 30 minutes; 10 U in 1 L fluid (Ringer's lactate or dextrose 5%) at 15 or 30 or 60 drops per minute with careful assessment of contractions.
3. To assist with the ripening of unfavourable cervix (see the MoHSS *National Guidelines for Emergency Obstetric Care*)—
  - Perform a vaginal examination, and monitor FHR regularly.
  - Use prostaglandin gel 1 mg/3 g—
    - For open cervix, insert intracervically
    - For closed cervix, insert vaginally
  - Give prostaglandin E2 PO, tablets 4 × 500 mcg.
  - Give misoprostol 800 mcg stat vaginally. Not suitable for clinics due to risk of uterine hypertonus.

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**Note:** Do not combine oxytocin, prostaglandin, and misoprostol.

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### 24.5.2 Second Stage of Labour

#### Management

1. Ensure that cervix is fully dilated, otherwise wait.
2. Explain the process to the patient.
3. Ensure that the patient's bladder is empty.
4. Ask the patient to push only during a contraction.
5. Monitor progress: descent and expulsion.
6. Protect the perineum from tearing.
7. See if an episiotomy is needed (see “Technique” in the MoHSS *National Guidelines on Emergency Obstetric Care*).
8. If the cord is around the baby's neck try to loosen it over the baby's head. If it is tight, clamp it with two artery forceps and cut with a pair of scissors.

## 24.5 Labour and Delivery

9. When the head is fully rotated, place your hands on either side of the head and support it during delivery. Do *not* at any time apply pressure to the abdomen to assist expulsion of the foetus.
10. Note the time of birth.
11. Refer patients with the following problems—
  - Prolonged and obstructed labour (poor progress)
  - Meconium-stained liquor
  - Cord prolapse
  - Baby <2 kg
  - Foetal distress or asphyxia (i.e., FHR constantly <100 beats per minute or >160 beats per minute, or baby not breathing well)

### 24.5.3 Third Stage of Labour and Postnatal Care


#### Management immediately after birth—

- Baby—
  1. Evaluate the baby's condition using the APGAR score and record in the baby's immunisation chart.
  2. Resuscitate if necessary (see "Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)" for a discussion of resuscitation of the newborn).
  3. Keep the baby warm.
  4. Start breastfeeding immediately after delivery.
  5. Give phytomenadione (vitamin K) 1 mg IM stat.
  6. Clean the eyes with sterile warm water.
  7. Give chloramphenicol eye drops (1 drop in each eye).
  8. Weigh and compare to chart.
  9. Check general condition (i.e., nutrition, skin, discharge from eyes or nose, fontanels).
  10. Do not forget immunisations.
- Mother—
  1. Examine fundal height and palpate uterus lightly to determine whether it has contracted well (and to exclude undiagnosed twins).
  2. Ensure that bladder is empty; catheterise if bladder is full and mother cannot urinate.



3. Clamp the cord near the vulva to observe lengthening of the cord.
4. Wait for placenta to come out and check that it is complete and normal (i.e., all cotyledons are complete). Weigh and examine it later.
5. Massage the lower abdomen lightly to stimulate a contraction and expel clots.
6. Give the mother—
  - Ergometrine 0.5 mg IM immediately
  - OR —
  - Oxytocin alone with birth of shoulder of the baby
  - In cardiac problems or hypertension, give *only* oxytocin 5 U by slow IV injection.
7. Get the baby to breastfeed.
8. Examine vulva, perineum, and vagina for lacerations or abnormal bleeding. It may need repair.
9. Check BP, HR, and respiration.
10. Test urine and Hb.
11. Check the abdomen to ensure that it is soft and without any tenderness.
12. In C/S, check wound healing and discharge for 24 hours.
13. At 2 to 3 days (or up to a week for some women) after the birth, check breasts to determine whether there is sufficient breast milk and if there are abscesses, lumps, or cracked or inverted nipples.

#### If there is major bleeding after delivery or PPH—

1. Check for tears and ruptures.
2. Check the placenta again to see if it is complete.
3. Check BP and HR.
4. Put up IV line with Plasmolyte B or normal saline and oxytocin 10 U in 500 mL dextrose saline at rate of 15 drops/minute.
5. Give misoprostol 800 to 1000 mcg per rectum plus 200 mcg sublingually every 2 hours × 5 doses.
6. Give oxygen by mask.
7. Refer to hospital with patient's full history. 

### 24.6 Postpartum Complaints

The first 42 days (6 weeks) after delivery of the baby are called the puerperium. During this time, the mother's body will change back to the physiological state that it was in before the pregnancy. Breastfeeding will be established. Most of the complaints and problems can be easily handled.

Postnatal care during the puerperium will include the following:

- Baby—
  - Start immunisations.
  - Make sure that breastfeeding is working.
  - Schedule follow-up date.
- Mother—
  - Watch for problems.
  - Schedule follow-up date in 6 weeks.

#### 24.6.1 Postpartum Haemorrhage

See [24.1.7](#) above.

#### 24.6.2 Abdominal Pain

These pains are usually abdominal cramps due to the contraction or decreasing in size of the uterus.

##### Management

1. Place a warm compress on the lower abdomen for 10 to 15 minutes 3 times per day.
2. Give paracetamol 1g 3 times per day or as needed.
3. If the pain is severe, if the patient has fever, or if the patient has a foul-smelling discharge, refer immediately.

#### 24.6.3 Cracked or Tender Nipples


##### Management

1. Encourage the mother to continue breastfeeding as long as she can tolerate it.
2. Instruct the mother to prevent engorgement of the breast; rather she should express the milk out of the breast and give the milk to the baby by bottle.

3. Advise the mother to apply a safe cream to the breast to keep the nipples soft.
4. Recommend letting the sun shine on the breast for a short while (10 to 15 minutes 3 times per day).
5. If the breast becomes tender, warm, and swollen, refer the patient to the hospital.

### 24.6.4 Engorgement of the Breasts

#### Management

1. Advise the mother to—
  - Place a warm compress on the breast before the infant drinks.
  - Massage the breast carefully before the infant drinks.
  - Ensure proper latch-on by the infant.
  - Express the rest of the milk when the infant has finished.
  - Apply cabbage leaves onto breast.
  - Wear a good supportive brassiere.
2. Give paracetamol 1g 3 times per day.
3. If the breast becomes tender, warm, and swollen, or there is fever, **refer** the patient to hospital. 

### 24.6.5 Inadequate Lactation (Too Little Breast Milk)

#### Management

1. Advise the mother to—
  - Stimulate nipples by gentle massage
  - Give frequent feedings (every 2 hours)
  - *Not* give water and other feedings to baby in between until full breastfeeding is established; check hydration by number of nappies and state of baby.
2. Search for the cause (i.e., physically or mentally) and treat—
  - Advise the mother to drink a lot of fluids.
  - Mother must rest and be less anxious.
  - Advise the mother to place a warm compress on breasts before feeding.

## 24.6 Postpartum Complaints

- Suggest the mother start feeding the baby only 5 minutes on every breast, then slowly increase to 20 minutes.
- 3. Check growth charts of baby. If normal, there is no problem. If abnormal, refer to hospital.
- 4. Check baby's stools.
- 5. If medication is needed, give metoclopramide 10 mg 3 times per day for 1 to 2 weeks or sulphiride 25 mg 3 times per day for 1 week.

### 24.6.6 Mastitis (Breast Infection)

#### Symptoms and signs

- Occurs usually 2 to 3 weeks after starting breast feeding
- Pain of the whole breast
- Red and inflamed breast
- Painful lump in one breast
- Often fever and rigors
- An abscess may develop

#### Management<sup>1</sup>

##### If no abscess—

1. Advise mother to express milk or breastfeed if possible.
2. Advise mother to massage breast gently.
3. Suggest applying heat.
4. If mother has fever >24 hours, give oral antibiotic—
  - Penicillin V 500 mg 4 times per day for 5 to 7 days
  - OR —
  - Amoxicillin 500 mg 3 times per day for 5 to 7 days
  - If allergic to penicillin, erythromycin 500 mg 4 times per day for 5 to 7 days
5. Give anti-inflammatory and pain relief: paracetamol and ibuprofen.
6. Review after 2 days.
7. Refer to hospital if no improvement.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### If abscess—

1. Refer to hospital for drainage.

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**Note:** In either case, advise the mother to continue breast-feeding.

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### Health education

- Stress the importance of good hygiene.
- Advise the mother to avoid cracks on the nipples by applying petroleum jelly (Vaseline®).

### 24.6.7 Pain from Episiotomy or Tears

#### Management

1. Examine the perineum looking for haematoma, sepsis, or swelling.
2. Advise the mother to take daily sitz-baths in a bowl with water, salt, or povidone-iodine for 10 to 15 minutes 3 times per day.
3. Give paracetamol 1g 3 times per day or as needed.
4. Advise patient to avoid constipation by intake of plenty of fluids and a fibre-rich diet.

### 24.6.8 Postpartum Depression

Mothers often feel depressed and weepy about 3 to 5 days after delivery. This depression is probably due to hormonal changes and will usually pass without any treatment. Only a small percentage of mothers become deeply depressed, refuse food or any contact with their infants, and can have aggressive or psychotic tendencies.

#### Management

**Refer** the mother and child to hospital in severe cases. 

### 24.6.9 Fever in the Puerperium

A continuous high temperature (fever) of  $>38^{\circ}\text{C}$  for any 2 days in the 10 days after delivery (not including the first 24 hours) should be investigated.

## 24.6 Postpartum Complaints

### Causes

- Puerperal sepsis
- Urinary tract infection (UTI)
- Mastitis or breast abscess
- Respiratory tract infection (URTI)
- Thrombophlebitis

### Symptoms and signs

Depend on the cause of the fever—

- Puerperal sepsis—smelly, purulent, vaginal discharge
- UTI—dysuria, frequency, pain suprapubic or in flanks
- Mastitis—painful, swollen breast
- URTI—cough, sore throat, nasal discharge
- Thrombophlebitis—pain, swelling in the upper or lower leg

### Management

1. Diagnose the cause of the fever, and treat accordingly.


### 24.6.10 Puerperal Sepsis

Puerperal sepsis is an infection of the uterus, usually caused by bacteria due to unsterile techniques during delivery.

### Symptoms and signs

- Fever and chills
- Lower abdominal pain
- Smelly, yellow, bloody vaginal discharge
- Weakness
- Nausea and vomiting
- History of recent delivery
- Lower abdominal tenderness
- Tenderness with vaginal examination
- Signs of shock can be present

### Management

1. **Refer** to hospital immediately. 
2. Start an IV normal saline infusion; adjust flow rate against patient's BP.
3. Give the patient nothing PO.

4. If the patient is in shock, see “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of shock.

### 24.7 HIV and Pregnancy

Fertility declines when HIV disease progresses. Amenorrhoea can occur at low CD4 counts or where patient has lost more than 15% of her body weight. Pregnancy is possible even in advanced HIV disease. All HIV-positive women should be counselled on the possibility of MTCT and also reassured that pregnancy will not accelerate the course of HIV. **Note:** All ART clinic staff should be able to appropriately advise couples with HIV who want to conceive a child. Couples should be encouraged to discuss pregnancy with the ART clinic staff to minimise risks to parents and child.

#### Health education before conception

- Explain the effect of the viral load and treatment on the likelihood of transmission from mother to child (i.e., the lower the viral load, the lower the risk of onward transmission).
- Advise patients to wait until they are on treatment to conceive.
- Discuss the safety of conception.
  - Where couples are discordant (see table 18.4.2), the risk of transmission between them can be minimised by having unprotected sex only at the most fertile few days of the month and continuing to use condoms at all other times.
  - For this reason, the woman must record the dates of her menses for 3 months before conception so the doctor or nurse can calculate the most fertile time in the menstrual cycle.
- Discuss the future, including possibility of HIV in the child.

## 24.7 HIV and Pregnancy

- A woman with HIV has the right to terminate the pregnancy as a medical indication. This decision should be taken early in pregnancy.
- Appropriate family planning or sterilisation, if that is the woman's choice, should be addressed at this time.

### 24.7.1 Opportunistic Infection Prophylaxis during Pregnancy

#### Management

1. Prescribe co-trimoxazole 960 mg once per day for all patients with CD4 <300.
2. Prescribe isoniazid prophylaxis 300 mg per day plus 10.0 to 12.5 mg pyridoxine for 6 months for all pregnant women who have no symptoms or signs of active TB, have not previously received INH prophylaxis, and have not had TB treatment in the previous 2 years.
3. Prescribe intermittent preventive treatment (IPT) for malaria: 3 tablets of sulfadoxine/pyrimethamine (SP) during second trimester followed by the same treatment in the third trimester (at least 4 weeks later) as per the MoHSS *National Malaria Guidelines*. In malarial areas, advise sleeping under insecticide-treated nets.

### 24.7.2 Transmission of HIV to Foetus

#### Health education

- Transmission from an HIV-positive pregnant woman to her child can occur during pregnancy, labour and delivery, or through breastfeeding.
- The risk of MTCT is 20% to 45% in breastfeeding.
- If untreated, 50% of HIV-infected children will die during the first 2 years of life.
- All women diagnosed as HIV positive during pregnancy should be referred to nearest ARV clinic for staging and consideration of appropriate treatment. Management of HIV-infected pregnant women should be guided by the current PMTCT guidelines.



### 24.7.3 Labour in HIV Infected Women

#### Management

1. Avoid procedures such as foetal scalp monitoring and scalp blood sampling.
2. Use universal precautions, including eye protection during delivery.
3. Avoid artificial rupture of membranes.
4. C/S should be performed for standard obstetric indications.

For further treatment of the HIV-positive women, see “Section IV. Infectious Diseases. [Chapter 18. HIV/AIDS](#)” for a discussion of PMTCT.

### 24.7.4 Contraception for Couples with HIV

Couples should be assisted in choosing a contraceptive with consideration of the following issues:

- Effect on HIV transmission
- Pregnancy failure rate
- Desire to have children in the future
- Acceptability of the method and possible interactions with ARVs

A combination of a barrier method (condom) and highly reliable method (e.g., pill, injection, and sterilisation) is recommended to prevent pregnancy and also transmission of HIV.

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**Note:** Nevirapine (and also rifampicin in those women on anti-TB therapy) increase metabolism of oestrogen; hence, women using oestrogen-containing contraceptives must be advised to use an additional barrier method to prevent pregnancy. (See [table 24.7.4](#).)

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## 24.7 HIV and Pregnancy

TABLE 24.7.4 Contraception for Couples with HIV

Method	Effect on HIV Transmission	Comments
Tubal sterilisation	No effect	Permanent
Vasectomy (male sterilisation)	No effect	Permanent
Injection (depo-provera)	No effect	Injection every 3 months. Must explain that it causes irregular bleeding followed by amenorrhoea.
Norplant	No effect	Subdermal implant. Lasts 5 years. Must explain that it causes irregular bleeding followed by amenorrhoea.
Oral contraceptive	No effect	Requires daily pill. Oestrogen level affected by nevirapine, requires use of an additional barrier method
IUD	No effect	Duration 5 to 10 years
Male condom	Reduced more than 10-fold	Requires consistent, correct use
Female condom (e.g., Femidom®)	Reduced more than 10-fold	Woman needs clear instruction on utilisation and support of partner. Requires consistent use. More expensive than male condom.
Rhythm	No effect	Not recommended for birth control in persons with HIV
Withdrawal	No effect	Not recommended for birth control in persons with HIV

## 25 Gynaecology

### 25.1 Breast Disorders

#### Health education

- Females must examine their breasts monthly after menstruation for any palpable masses.
- Most of these masses are benign, but a certain percentage is malignant, even in young females.

#### 25.1.1 Mastitis

Mastitis is breast infection. See “Section V. Obstetrics and Gynaecology. Chapter 24. Obstetrics” for a discussion of mastitis.

#### 25.1.2 Breast Abscess

##### Symptoms and signs

- Painful lump in breast, throbbing, keeping patient awake
- Redness
- Swelling
- Fluctuating mass
- Hard when not yet ripe
- Fever

##### Management

**Perform surgical drainage of abscess if abscess is ripe—**

1. Apply ethyl chloride skin spray or local anaesthetic (e.g., lignocaine with epinephrine).
2. Incise and drain.
3. Insert small forceps to loosen loculated pus.
4. Apply betadine dressing.
5. Follow up daily for 3 days; apply new dressings.
6. Prescribe antibiotic treatment: erythromycin 250 mg every 6 hours or clindamycin 150 mg every 6 hours.

### Wait and follow up if abscess is not ripe—

1. Incise and drain when ripe.
2. Continue antibiotic treatment after procedure: erythromycin 250 mg every 6 hours or clindamycin 150 mg every 6 hours.

### 25.1.3 Abnormal Palpable Findings in the Breast

**Note:** All lumps, tumours, or knots felt in the breast must be investigated.

#### Causes

- Abscess
- Cyst
- Fibroadenoma or fibroadenosis
- Carcinoma
- Lipoma

#### Symptoms and signs

- Often no symptoms—often found by accident or found with routine examination or palpation
- Inflammatory mass: warm, tender, swollen and red, fluctuating
- Noninflammatory mass: not painful, small, well defined, firm
- Lumpiness of breast (fibroadenoma)
- More tender with menstrual cycle (fibroadenoma)
- Signs of cancer (carcinoma)—
  - Discharge from nipple
  - Nipple changes
  - Dimpling of skin
  - Ulcer of the skin

#### Investigations

- Breast examination—
  - Patient must lie down with arms relaxed next to side.

- Carefully feel all breast tissue (start in one quadrant and work your way around).
- Palpate with flat part of second and third fingers, not finger tips.
- Make small circular movements to feel properly.
- When lump is found, establish size and determine whether it is fixed or loose and whether the overlying skin is normal or changed.
- Feel for lymph nodes in axilla.
- Aspiration
- Fine needle biopsy, cytology

### Management

#### In clinic, health centre, or hospital—

1. Remember that it is difficult to determine a cause early in the disease.
2. Establish whether patient has an infection of the breast.
3. Treat breast infections.
4. Refer *all* other masses for aspiration and cytology.

#### In hospital—

1. Perform fine needle aspiration and/or biopsy.
2. Refer the patient to the surgeon or oncologist.

### 25.2 Female Gynaecological Disorders

#### 25.2.1 Dysmenorrhoea

Dysmenorrhoea is pain just before or during menstruation.

##### Causes

- Infection of the pelvic organs (e.g., PID)
- Malignancy (associated with pelvic swelling or mass)
- Intrauterine contraceptive device (IUD)
- Workload, stress
- Malnutrition and anaemia
- Endometriosis until proven otherwise
- Usually no specific cause can be identified

##### Symptoms and signs

- Lower abdominal pain (i.e., cramps, just before menstruation and during a few days of menstruation)
- Headaches
- Diarrhoea or constipation, nausea
- Abdominal distension (seldom, and not an emergency)
- The patient menstruates or will start soon

##### Management

1. Treat at the clinic.
2. Manage the cause if identified.
3. Give aspirin 300 to 600 mg 3 times per day. Start aspirin 1 to 2 days before menstruation commences.
4. Give mefenamic acid 500 mg 3 times per day if available.
5. Consider oral contraception.

##### Health education

- Inform the patient that this problem will occur every month with menstruation.
- Instruct her to use the tablets prescribed.
- Inform her that sometimes the dysmenorrhoea disappears with time and age.
- Mention that oral contraceptives often reduce this problem.

### 25.2.2 Menstruation Problems

A menstrual cycle that is no longer normal is classified as follows:

- More and heavier bleeding (menorrhagia)
- More frequent bleeding (metrorrhagia)
- A combination of both (menometrorrhagia)
- No bleeding at all (amenorrhoea)

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**Note:** Always rule out pregnancy.

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#### Causes

- Uterus: myoma, polyps, adenomyosis
- Genital malignancies: cervix cancer, endometrial cancer, and vulva or vaginal cancer
- Hormonal problems: physiological, ovarian, or adrenal problems; oral contraceptives
- Endocrine problems: hypophysis; ovarian, adrenal, or thyroid disorders
- Haematological: bleeding tendencies, leukaemia
- Liver disease
- Psychological (amenorrhoea): anxiety or stress, anorexia
- Medications: antinauseants, antihypertensives, or antidepressants

#### Symptoms and signs

- Abnormal vaginal bleeding
- Others depending on the underlying cause

#### Investigations

- Full gynaecological and vaginal examination
- Pregnancy test
- PAP smear
- Urine dipsticks
- FBC
- TFT
- Bleeding tendency screen (INR, PTT, fibrinogen)
- Dilatation and curettage (D+C)

## 25.2 Female Gynaecological Disorders

### Management

1. See [table 25.2.2](#), and follow the algorithm on vaginal bleeding in [figure 25.2.2](#).
2. In pregnancy, see “Section V. Obstetrics and Gynaecology. [Chapter 24. Obstetrics](#)” for a discussion of high-risk antenatal disorders.

TABLE 25.2.2 Differential Diagnoses of Vaginal Bleeding

Organ	History	Inspection	Test
Vulva	Trauma Rape Sex	Vulva	Rape kit
Vagina	Trauma Rape Sex	Vagina	PV Speculum
Urological	UTI Trauma STIs	Vulva Vagina	Urine dipsticks MCS
Rectal	Haemorrhoids Anal tears Constipation Sex	Buttocks Anus	PR Occult blood

### 25.2.2.1 Myoma of the Uterus

Myomas are benign growths of the uterus that cause problems due to their size and position. They are common in females >30 years and in women who did not have children.

#### Symptoms and signs

- Heavy, often irregular menstruation
- Dysmenorrhoea (starts at later age in women that have not suffered of this before)
- Spontaneous abortions
- Irregular, enlarged uterus
- Anaemia (heavy menstruation over a long period causing iron-deficiency anaemia)



### Management

1. For anaemia, give ferrous sulphate 200 mg 1 tablet 3 times per day.
2. Refer the patient to the doctor for further examination.
3. Treatment is necessary because fibroids never disappear on their own.
4. Surgical intervention (myectomy, hysterectomy) may be required.

### 25.2.2.2 Cervical Cancer

#### Symptoms and signs

- Very often asymptomatic
- Abnormal vaginal bleeding
- Postcoital bleeding
- Vaginal discharge (bloody, brownish)
- No pain
- No signs of infection unless a secondary superinfection is present

#### Investigation

- PAP smear. **Note:** For early detection, take routine annual PAP smears for every woman of child-bearing age.
- Conus biopsy, punch biopsy, large loop excision of the transformation zone (LLETZ) biopsy
- FBC
- ESR
- X-rays: CXR, skeletal X-rays

#### Management

Refer to hospital immediately if PAP smear shows cytological changes or abnormalities.

### 25.2.3 Abnormal Vaginal Discharge

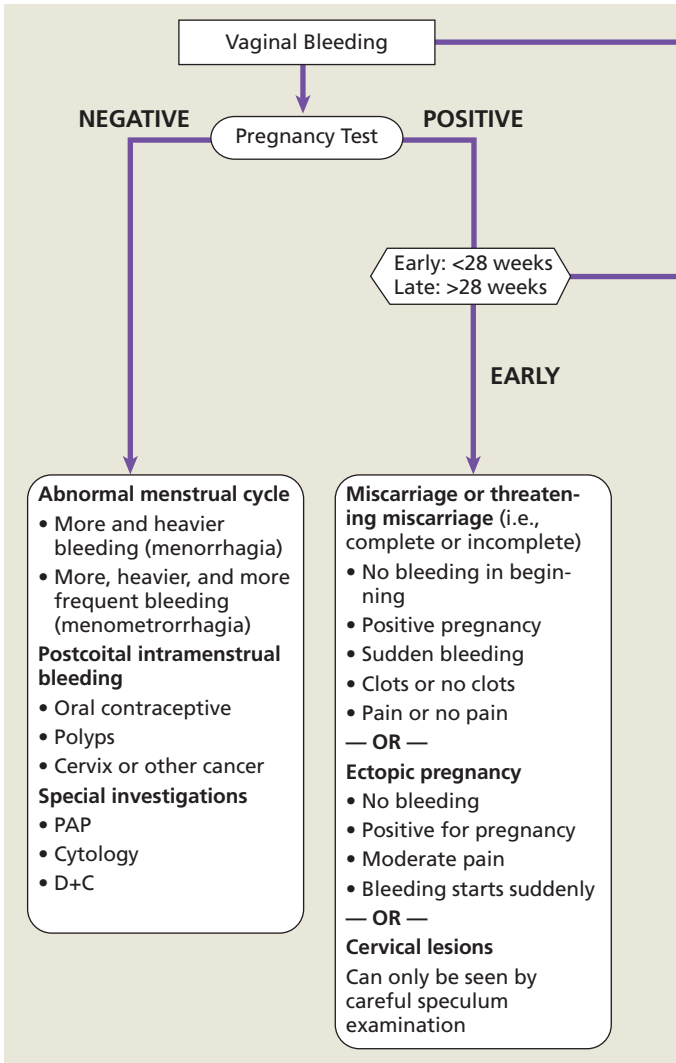
See “Section IV. Infectious Diseases. [Chapter 9. Urogenital System](#)” for a discussion of STIs.

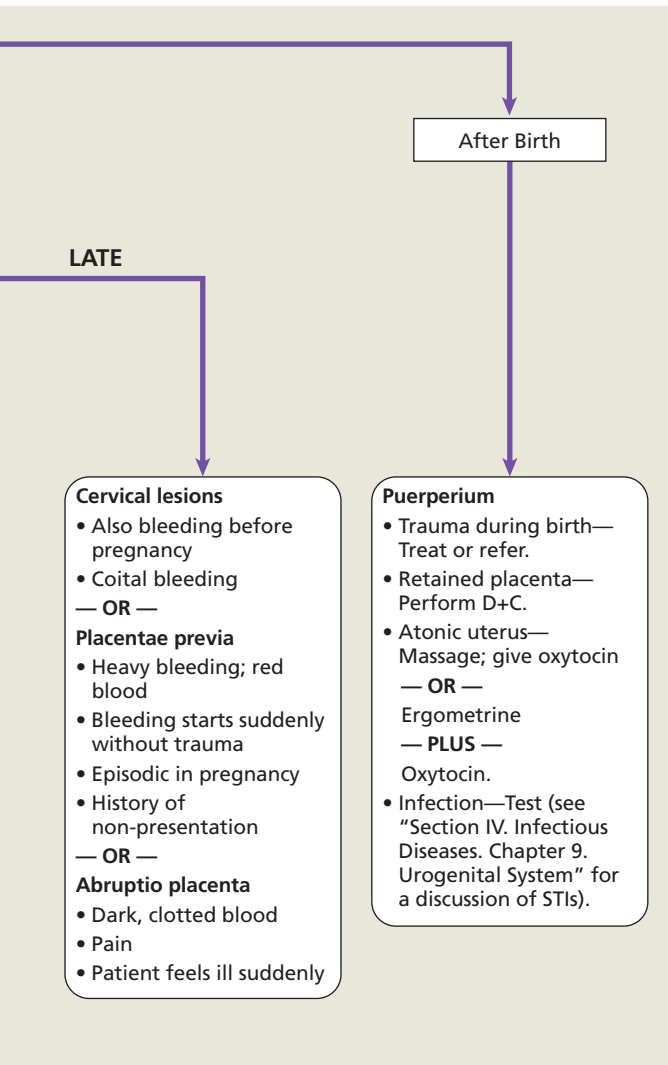
### 25.2.4 Lower Abdominal Pain

See “Section IV. Infectious Diseases. [Chapter 9. Urogenital System](#)” for a discussion of STIs.

## 25.2 Female Gynaecological Disorders

FIGURE 25.2.2 Algorithm of differential diagnoses of vaginal bleeding





### 25.2.5 Bartholin's Abscess

The Bartholin's glands lie on either side of the opening of the vagina. When these glands get infected, a Bartholin's abscess forms. Gonorrhoea is the most common cause, but other bacteria can also be causative.

#### Symptoms and signs

- Pain in the vulva area
- Pain with sexual intercourse
- Redness of the area
- Tenderness and swelling in the area
- A fluctuating abscess

#### Management

**If the patient has an abscess—**

1. Refer to hospital for drainage and marsupialisation

**If no abscess is present—**

1. Treat at the clinic.
2. See “Section IV. Infectious Diseases. [Chapter 9. Urogenital System](#)” for a discussion of STIs.
3. Give paracetamol 1g PO 3 times per day or when necessary.
4. Treat the male partner as well.

#### Health education

- Advise the patient to take sitz baths in a bowl with saltwater for 15 to 20 minutes 3 times per day.
- Caution the patient not to squeeze or press the lesion.
- Instruct the patient to come back to the clinic in 3 days; if no improvement, refer to hospital.
- Advise patient to bring her partner along for treatment as well.

## 25.3 Menopause

The menopause is the cessation of menstruation in a female and usually occurs at the age of 45 to 55 years. Perimenopause is the time around the menopause and can last a few years until the menopause has set in.

### Causes

- Age (normal)
- Failing ovarian follicular development
- Falling ovarian sex hormone secretion (i.e., low oestrogen levels)
- Rising follicle-stimulating hormone (FSH)
- Thermo-regulatory set-point lowered

### Symptoms and signs

- “Hot flushes” (i.e., a sudden, unanticipated, and often unpleasant wave of body heat that can range from mild to intense)
- Night sweats
- Palpitations
- Headaches
- Insomnia, tiredness
- Irregular menstruation
- Vaginal atrophy and dryness
- Loss of libido, painful intercourse
- Bladder irritability, incontinence, UTIs
- Weight gain (sometimes)
- Skin changes: dryness, thinning, loss of head hair, increase or loss of body hair)
- Mood swings, emotional changes (e.g., depression, irritability, short-temperedness, weepiness)
- Lack of concentration, failing memory
- Osteoporosis

### Investigations

- Breast self-examination and doctor examination (regular)
- Mammography

- Cervical smear
- Bone densitometry
- FSH, luteinizing hormone (LH)

### Management

1. Explain the process to the patient and reassure her.
2. Suggest lifestyle adjustments (see below).
3. For severe symptoms, refer to a specialist.
4. Use hormone replacement therapy (HRT). **Note:** Carefully consider with the patient the risks versus the benefits. Review and reassess annually.
  - HRT in a patient who has a uterus: Use a progesterone-oestrogen combination (cyclic or continuous).
    - May be oral, transdermal, or parenteral
    - Adjustments needed until relief of symptoms is achieved
  - HRT in a patient without uterus: Use oestrogen only.
  - Effects of HRT—
    - Decrease in osteoporosis
    - Slight decrease in Alzheimer's disease and in cancer of the large bowel
    - Slight reduction in coronary heart disease
    - Increase in stroke, venous thrombosis, and endometrial cancer
    - Slight increased risk for breast cancer
    - Slight increase in liver function changes
  - Contraindication of HRT—
    - Most important: previous hormone-dependent malignant tumour of breast or endometrium
    - Relative contraindications to HRT include the following. In all these instances, consult a specialist—
      - ◆ Coronary heart disease
      - ◆ Stroke
      - ◆ Breast cancer
      - ◆ Previous thromboembolism.

5. Use alternative treatment (if available).
  - Clonidine up to 200 mcg per day
  - Progesterone injections: Depo-Provera or Nur-Isterate
  - Venlafaxine 37.5 mg PO per day
  - Fluoxetine 20 mg PO per day
  - Phyto-oestrogens

### Health education

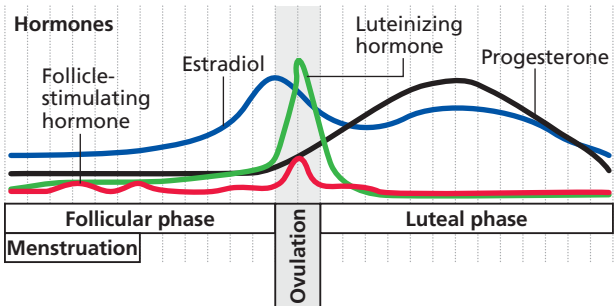
- Explain to the patient that menopause is a normal process, not a disease, and will pass by itself.
- Urge the patient to live as normal as possible.
- Encourage the patient to—
  - Follow a healthy diet (see “[Section III, Nutrition and Lifestyle](#)”)
  - Sleep and exercise enough
  - Wear light, loose clothing
  - Avoid alcohol

## 25.4 Contraception

Contraception is the prevention of conception and possible pregnancy after sexual intercourse by the use of a specific device or medication. The devices can also be used for the prevention of transmission of STIs and HIV during sexual intercourse.

The female body has two important sex hormones: oestrogen and progesterone. They vary in the body during the monthly menstrual cycle. Just after menstruation the levels of oestrogen slowly pick up and peak at about 14 days after menstruation and ovulation occurs; thus, this time is the best for conception. The levels of progesterone start rising a little later and peak just before menstruation, then fall again. (See [figure 25.4](#).)

**FIGURE 25.4 The female hormonal cycle**



The two hormones influence the female body in a number of ways.

- Oestrogen—
  - Makes woman feel sexy and beautiful
  - Gives the woman energy
  - Makes the woman feel less depressed
  - Sometimes causes headaches
  - Makes woman ready for conception



- Makes the lining of the uterus thick, spongy, and able to implant foetus
- Is highest when the woman is not menstruating
- Progesterone—
  - Makes the woman feel irritable, grumpy
  - Makes the woman feel depressed
  - Causes breast tenderness
  - Causes swelling of fingers, body, legs or feet
  - Is highest just before menstruation

Contraceptive methods available include the following:

- Traditional methods (i.e., sexual abstinence, withdrawal, breastfeeding)
- Natural methods (i.e., calendar rhythm, cervical mucus)
- Barrier method (i.e., condoms and Femidoms<sup>®</sup>, diaphragm and cervical cap, spermicides)
- Oral hormonal contraceptives (i.e., ‘the pill’)
- Injectable hormonal contraceptives
- Intrauterine contraceptive devices (IUDs)
- Voluntary surgical sterilization

A patient choosing a contraception method should always consider—

- Effectiveness
- Safety
- Dosage schedule

When taking the patient’s history, include the following:

- Social history
- Obstetric and gynaecological history (i.e., deliveries, diseases)
- Thorough medical history (e.g., previous deep vein thrombosis, heart diseases, liver diseases, high blood pressure, cancer).

### Investigations

- Examination including measuring BP and checking breasts for lumps

## 25.4 Contraception

- PAP smear (If unsure about the results, refer.)
- Pregnancy test to ensure woman is not pregnant

### Health education

- Help the client choose a contraceptive method.
- Assess the client, and advise on the most suitable options. Not all contraceptive methods are suitable for every client.
- All contraceptives have desirable and undesirable effects; ensure that the client is fully informed.
- The client must make a free and informed choice.
- Talk about safe sex or undue pressuring into sex.
- Talk about HIV and STIs.
- Observe confidentiality.
- Namibia has—
  - No age limits for contraception
  - No requirement for parental approval

### 25.4.1 Condoms and Femidoms®

Condoms and Femidoms® are effective as both a barrier method for contraception and way to prevent transmission of STIs and HIV. Common causes of failure are—

- Breaking (e.g., old condoms)
- Not using or applying them correctly
- Spilling semen as condom is removed

### 25.4.2 Hormonal Contraception Methods

Oral contraception (the pill) is the most accepted method in Namibia. The common preparation contains low doses of oestrogen and progesterone and needs to be taken daily, more or less at the same time of day. [Table 2.4.2](#) outlines the contraindications and signs of complication of hormonal contraception methods.

A number of medicines affect the contraceptive action of the pill—

- Anti-epileptics
- Antibiotics

TABLE 25.4.2 Hormonal Contraception Methods

Contraindications	Signs of Complication
<ul style="list-style-type: none"> <li>• Women &gt;35 years, with high risk factors</li> <li>• Women &gt;35 years who smoke, have high cholesterol, or both</li> <li>• Women who cannot be regular about taking the pill daily</li> <li>• Breastfeeding mothers in first 6 months</li> <li>• Women with the following medical conditions:               <ul style="list-style-type: none"> <li>- Gallbladder disease</li> <li>- Uterine, breast, cervix, or other cancer</li> <li>- Heart disease</li> <li>- Hypertension</li> <li>- History of blood clots</li> <li>- Stroke</li> <li>- Severe migraine or headaches</li> <li>- Depression</li> <li>- Unexplained abnormal vaginal bleeding</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Severe abdominal pain</li> <li>• Severe chest or arm pain</li> <li>• Shortness of breath</li> <li>• Severe pain or swelling in legs (calf or thigh)</li> <li>• Eye problems such as blurred vision or loss of vision</li> <li>• Severe headaches or migraines</li> <li>• Yellowing of skin or eyes</li> </ul>

- Anti-TB medicines
- ARVs and any other agents that will significantly induce hepatic enzymes.

A woman who needs to use any of these medications should be encouraged to use alternative contraceptive method.

### 25.4.3 Injectable Contraceptives

Injectable contraceptives are long-acting progestins, are quite effective, and are relatively free from serious side effects. The most commonly used injectable contraceptives in Namibia are—

- Medroxyprogesterone acetate (Depo-Provera): given every 12 weeks
- Norethindrone enanthate (Nur-Isterate): given every 8 weeks

Table 25.4.3 outlines the indications, contraindications, and signs of complications of injectable contraceptives.

**TABLE 25.4.3 Injectable Contraceptives\***

Indications	Contraindications	Signs of Complications
<ul style="list-style-type: none"> <li>• Women who have at least one living child</li> <li>• Women who do not want to be pregnant within 2 years</li> <li>• Women who desire no more children or are over 35 years and do not want to be sterilized</li> <li>• Breastfeeding mothers 6 weeks after delivery</li> <li>• Women who cannot use the pill because of oestrogen-related contraindications such as severe headaches, high blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Liver problems</li> <li>• Abnormal uterine bleeding</li> <li>• Malignancy</li> <li>• Prior thrombosis</li> <li>• Pregnancy, obesity, hypertension, depression</li> </ul>	<ul style="list-style-type: none"> <li>• Headaches</li> <li>• Dizziness or heavy bleeding</li> </ul>

\* Note: Return of fertility may be delayed for between 4 and 24 months after stopping the injections

### 24.4.4 Intrauterine Device

This method is not often used in Namibia mainly because of lack of trained personnel. The effectiveness of IUDs is estimated to be between 97% and 99%. IUDs work by

creating conditions that prevent fertilization or inhibit implantation of a fertilized ovum. [Table 25.4.4](#) outlines the indications and signs of complications of IUDs.

**TABLE 25.4.4 Intrauterine Device**

Indications	Signs of Complications
<ul style="list-style-type: none"> <li>• Women who have had one or more deliveries</li> <li>• Women who want a reversible method but find other methods difficult to use or lack a reliable source of contraceptive supplies</li> <li>• Women who have the number of children they want but do not desire sterilization</li> <li>• Women who have no history of PID</li> <li>• Women who have no STIs</li> </ul>	<ul style="list-style-type: none"> <li>• A late or no menstrual period indicating possible pregnancy (including ectopic pregnancy)</li> <li>• Sustained heavy bleeding</li> <li>• Acute abdominal pain, high fever, or other symptoms of pelvic infection</li> <li>• Abnormal or foul-smelling vaginal discharge</li> </ul>

### 25.4.5 Sterilization Method

Sterilization is a permanent method and requires trained health personnel with appropriate equipment and facilities.

### 25.4.6 Postcoital Contraception

Postcoital contraception (often called the *morning after pill*) is indicated for prevention of unwanted pregnancy after unprotected sexual intercourse (e.g., after rape and teenage ‘mishaps’). The postcoital prevention must be taken as soon as possible, preferably within 12 hours but not later than 72 hours of the sexual intercourse

#### Management

The following three methods can be used.

- Progesterone only (89% effectiveness): levonorgestrel 1.5 mg within 12 hours after coitus but not later than 72 hours
  - **Note:** If the patient is taking an anticonvulsant

or TB treatment with rifampicin, a higher dose is needed.

- Side effects:
    - ◆ Nausea
    - ◆ Vomiting seldom (if vomiting within 2 hours, repeat the course)
    - ◆ Abdominal pain
    - ◆ Fatigue
    - ◆ Headache and dizziness
    - ◆ Temporary disruption of the menstrual cycle
      - If taken before ovulation, the patient may have progesterone withdrawal bleeding within 7 days.
      - If taken after ovulation, delayed bleeding is possible.
  - Combination therapy with progesterone plus oestrogen (74% effectiveness) within 12 hours after coitus but not later than 72 hours
    - Two tablets levonorgestrel 150 mcg plus ethinyl estradiol 30 mcg (Ovral) stat then repeat after 12 hours
- PLUS —**
- Metoclopramide 10 mg 3 times per day stat
  - Other methods (e.g., IUD) as recommended by a specialist.

## 25.5 Rape

The Combating of Rape Act (Act 8 of 2000) and the Combating of Immoral Practices Amendment Act (Act 7 of 2000) employ the following three definitions regarding sexual offences.

*Rape* is “the intentional commission of a sexual act under coercive circumstances.”

A *sexual act* refers to intimate sexual contact which includes—

- Any form of genital stimulation
- Cunnilingus or oral stimulation of the genitals
- Insertion of any object into the anus or vagina (procedures utilised for good medical therapeutic practices are excluded)
- Insertion of any body part into the anus or vagina
- Insertion of the penis into the mouth of a person
- Insertion of the penis into the anus or vagina of a person

*Coercive circumstances* refer to the gaining of an advantage over another by employing force, often achieved by the following:

- Misrepresentation (the assailant pretends to be someone else)
- Using force against another person
- Threatening to use force against another person
- Intimidation (using a position of force or multiple assailants)
- Abusing a person who is not mentally capable of defending him- or herself
- Abusing a drunk or drugged person
- Detaining a person unlawfully

### Symptoms and signs

Physical—

- External or internal injuries that do not appear to be consistent with the description of how they occurred

- Difficulty walking, moving, or sitting
- Torn, stained, or bloody underclothing
- Pain, swelling, or itching in genital area
- Abdominal pain
- Abrasions or lacerations of the area of the vagina (including the hymen, labia, perineum, and posterior forchette) and breasts
- Bruises, bleeding, or lacerations in external genitalia, vaginal, or anal areas
- Unexplained vaginal or penile discharge
- Perineal warts
- Labial fusion
- Oral infections (i.e., gonorrhoea in the mouth)
- STIs especially human parvovirus (HPV), HSV, and PID
- Poor sphincter tone
- Recurrent UTIs
- Pregnancy
- Early onset of sexual activity
- Excessive masturbation
- Bedwetting

### Emotional—

- Post-traumatic stress disorder
- Suicide attempts
- Delinquent or criminal behaviour
- Inability to distinguish affection from sexual behaviour
- Inappropriate displays of affection
- Discomfort or rejection of healthy family affection
- Regressive behaviour such as thumb sucking, rocking, or biting
- Low self-esteem
- Fear and anxiety
- Guilt
- Shame
- Depression, withdrawal from society
- Sudden changes in personality



- Inappropriate play with toys, self, or others
- Unusual or inappropriate knowledge of sex for the victim's age
- Hostility or aggression
- Psychological disorders
- Sleeping disorders
- Eating disorders
- Substance abuse
- Intimacy problems
- Sexual dysfunction
- Running away from home
- Problems in school
- Perpetration of sexual or physical abuse

### Management

1. Keep information private and confidential. Restrict access of information to authorized personnel only.
2. Deliver services in an environment that ensures privacy.
3. Send the patient to the Women and Child Protection Unit (Abuse Centre).
4. Reassure that any course of action will only be taken with the victim's permission (within the limits of the law).
5. Call a doctor.
6. Ask questions in a non-judgemental and empathetic manner.
7. Be patient; many victims are reluctant to acknowledge a history of abuse.
8. Ask questions before or after the physical examination, while victim fully clothed.
9. Collect physical evidence using the sexual evidence collection kit of the National Forensic Science Institute, which will be provided by the investigating officer to the assigned medical practitioner.
10. Be aware of support programs and services for the victim and family.

## 25.5 Rape

11. Treat any medical problems.
12. Perform a pregnancy test.
13. Offer emergency contraceptive pills (see 25.4, above).
14. Provide information about STI and HIV screening, and offer STI treatment (see “Section II. Diseases and Disorders According to Body System. Chapter 9. Urogenital System” for a discussion of STIs).
15. Offer post-rape prophylaxis (see “Section IV. Infectious Diseases. Chapter 18. HIV/AIDS” for a discussion of PEP) where available and if not refer.
16. Counsel and provide understanding and compassion.
17. Refer to an organization that offers psychological counselling and legal advice.
18. Try to establish a safe place for the victim to go temporarily (if abuse is inside the home).

# Diseases and Disorders According to Age Groups

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### 26.1 Integrated Diagnostic Approach to the Sick Child

Use the Integrated Management of Childhood Illnesses (IMCI) for all children seen in the clinic. The approach differs based on age groups:

- Approach 1: The sick infant age 1 week up to 2 months
- Approach 2: The sick child age 2 months up to 5 years

#### 26.1.1 Approach 1. The Sick Infant

Ages: 1 week up to 2 months

##### Management

1. Check for possible bacterial infection—
  - Breathing
  - Convulsions
  - Fever
  - Pus from eyes, ears, umbilicus
  - Skin
  - Lethargy or unconsciousness
  - Movements
  - Jaundice
2. Ask about diarrhoea; check for dehydration and classify.
3. Check for feeding problems and low birth weight—
  - Ask about difficulties in feeding or breastfeeding
  - Use weight-for-age charts
4. Check immunisation status; use the immunisation schedule.
5. Treat according to IMCI guidelines. Use the management chart for the sick infant age 1 week up to 2 months.

### 26.1.2 Approach 2. The Sick Child

Ages: 2 months up to 5 years

#### Management

1. Check for general danger signs—
  - No drinking or breastfeeding
  - Vomiting
  - Diarrhoea
  - Convulsions
  - Lethargy
  - Unconsciousness
2. Ask about primary symptoms and classify according to IMCI—
  - Cough or difficult breathing
  - Diarrhoea now or in past 3 months
  - Fever
  - Ear problems
3. Check for malnutrition and anaemia—
  - Use growth chart.
  - Use the weight-for-age chart.
4. Check for suspected HIV infection; perform VCT and HIV tests.
5. Check immunisation status; use the immunisation schedule.
6. Check vitamin A supplementation.
7. Assess other problems.
8. Treat according to IMCI guidelines. Use management chart for sick child age 2 months up to 5 years.

### 26.2 Disorders of the Newborn and Neonate

#### 26.2.1 The Sick Newborn

The newborn (neonate) is quite delicate and adjusting to life outside the mother's womb. Important physiological systems such as the immune system are still maturing, and therefore, the infant is susceptible to environmental insults.

#### Symptoms and signs

Refer if— 

- You are worried
- APGAR score <6 at 5 minutes
- Respiratory rate >60/minute
- Respiratory distress
- Cyanosis
- Anaemia
- Jaundice
- Hypothermia
- Twitching or tremor
- Failure to suck or cry
- Glucose <2.2 mmol/L
- Small for gestation baby
- Large for gestation baby (>4.5 kg)
- Congenital abnormalities
- Ruptured membranes >24 hours before birth
- Foul-smelling liquor

#### Management

1. See “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of resuscitation of the newborn.

#### Health education

Discuss the following with the parents:

- Proper attention and care—to provide the child with an opportunity to grow healthy
- Regular visits to the clinic for growth monitoring

- Proper feeding—essential for normal growth (breast-feeding if possible)
- Weighing the child regularly, and using the growth chart
  - Good growth shows that child is being fed well
  - Not gaining or losing weight is an early sign that there may be a problem
- Caring for a child with diarrhoea
- The importance of—
  - Immunization in preventing several killer diseases
  - Personal hygiene and cleanliness of their environment
  - Separating children with fever, cough, lice, or skin rash from other children

### 26.2.2 Respiratory Distress Syndrome

Respiratory distress syndrome refers to difficulty in breathing.

#### Causes

- Hyaline membrane disease (usually premature baby)
- Meconium aspiration (ruptured membranes >24 hours before birth, prolonged second stage labour)
- Bronchiolitis (<6 months, respiratory syncytial virus [RSV])
- Pneumonia
- Pneumothorax
- Critical congenital heart disease


#### Symptoms and signs

- APGAR score low
- Respiratory rate >60 per minute
- Rib and sternal recession
- Grunting
- Cyanosis if severe
- Meconium in liquor and airways of baby (i.e., meconium aspiration)
- Air trapping, bilateral (bronchiolitis)
- Crepitations, bilateral (bronchiolitis)

- Difficulty in feeding
- Mild fever and rhinitis (bronchiolitis)

### Management

#### In the clinic, health centre, or hospital—

2. Carefully suction airways immediately after birth (meconium aspiration).
3. Give oxygen by mask at 2 L per minute.
4. Keep baby warm.
5. Prevent dehydration.
6. Give dextrose water by NGT.
7. **Refer** to hospital immediately. 

#### In hospital—

1. Actively resuscitate.
2. Give oxygen by intubation or mask, and monitor oxygenation.
3. Provide assisted ventilation if necessary (by CPAP or intermittent positive pressure ventilation [IPPV]).
4. Provide warmth and a crib.
5. Start IV fluids (10% dextrose or Neonatelite).
6. Check for metabolic acidosis and hypoglycaemia.
7. Do CXR immediately.
8. Start antibiotics,<sup>1</sup> if necessary.
  - Gentamicin IV in the first week of life—
    - ◆ <33 weeks gestation: 5 mg/kg per 48 hours
    - ◆ <38 weeks gestation: 4 mg/kg per 36 hours
    - ◆ ≥38 weeks gestation: 4 mg/kg per 24 hours
  - **PLUS** —
  - Penicillin (e.g., benzylpenicillin [penicillin G] IV 25,000 to 50,000 IU/kg per dose, every 12 hours for 10 days)
  - **OR** —
  - Ampicillin IV 50 to 100 mg/kg
    - ◆ <7 days: 50 to 100 mg/kg every 12 hours
    - ◆ 7 days to 3 weeks: 50 to 100 mg/kg every 8 hours

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy



## 26.2 Disorders of the Newborn and Neonate

- ◆ 3 weeks: 50 to 100 mg/kg every 6 hours

9. Preferably give baby nothing PO until improvement.

### 26.2.3 Septicaemia in the Newborn

Septicaemia is a general infection caused by bacteria in the blood stream.

#### Causes


- In the foetus (unborn baby): membranes have ruptured very early in labour
- In a newborn: through the umbilical cord or respiratory system

#### Symptoms and signs

- Child looks ill
- Poor feeding
- Failure to gain weight
- Lethargy or irritability
- Fever sometimes, but often the temperature is normal or subnormal
- Diarrhoea
- Vomiting
- Jaundice
- Abdominal distension
- Apnoea or cyanotic attack
- Convulsions or coma
- Bleeding tendency in the skin
- Hypothermia

#### Management

**In clinic, health centre, or hospital—**

1. **Refer** the baby to the hospital immediately. 
2. Keep the baby warm.
3. Keep the baby well hydrated and fed. Send mother along.

**In hospital—**

1. Find cause.

### 2. Treat accordingly—

#### ■ Antibiotic therapy<sup>1</sup>

- Reconsider choice of antibiotic when the results of blood and CSF cultures become available or if the child does not improve within 72 to 96 hours.
- Be aware of the antibiotic sensitivity or resistance profile of bacterial pathogens in your hospital or community.

#### ● Give—

- ◆ Benzylpenicillin 50,000 IU/kg per dose, every 12 hours daily for 7 to 10 days.

— OR —

- ◆ Gentamicin IV 5 mg/kg per dose, once per day for 7 to 10 days. Monitor blood levels.

— PLUS —

- ◆ Cefotaxime IV 50 mg/kg over 30 minutes, for 7 to 10 days

- <7 days 50 mg/kg every 12 hours
- 7 days 50 mg/kg every 8 hours

— OR —

- ◆ Ampicillin IV 50 mg/kg for 7 to 10 days

- <7 days 50 mg/kg every 12 hours
- 7 days 25 mg/kg every 6 hours

#### ■ Fungal infections

- Fluconazole IV 6 to 12 mg/kg as a single dose infused over 60 minutes

- ◆ ≤2 weeks 6 to 12 mg/kg every 72 hours
- ◆ 2 weeks 6 to 12 mg/kg every 48 hours

— OR —

- Amphotericin B IV 0.5 to 1.0 mg/kg every 24 hours infused over 2 hours for 14 days

- ◆ Monitor renal function.

#### ■ Anaerobic infections

- Metronidazole, PO or IV, 7.5 mg/kg for 7 to 10 days

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

- ◆ ≤ 7 days 7.5 mg/kg every 12 hours
- ◆ 7 days 7.5 mg/kg every 8 hours

3. If complicated, refer to paediatrician.

### 26.2.4 Neonatal Conjunctivitis

Neonatal conjunctivitis is acute purulent conjunctivitis of the newborn in the first 28 days of life, and is an ophthalmic emergency requiring urgent treatment to save the child's eye(s).

#### Causes

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- Streptococcus
- Enterobacteriaceae

#### Symptoms and signs

- Purulent exudation of eyes
- Swollen eyelids
- Red conjunctivae
- Severe cases can have corneal ulcers or opacities (especially gonococcal infection)

#### Investigations

Pus swabs for MCS

#### Management

**In clinic, health centre, or hospital—**

1. Clean eyes regularly (every 10 to 30 minutes initially) with clean water or saline to remove pus. Open eyelids carefully to expose conjunctiva and rinse. Use retractors if eyelids are swollen tight.
2. Treat the child systemically (i.e., for gonorrhoea):
  - Ceftriaxone 50 mg/kg IM stat to a maximum of 125 mg
  - **PLUS** ——
  - Erythromycin syrup 10 mg/kg 4 times per day for 14 days (especially in chlamydia infection)
3. Treat the child topically.

- Chloramphenicol 1% eye ointment or drops 4 times per day for 7 days
- 4. Treat the mother and sexual partner for STI.
- 5. Refer to a specialist if—
  - Baby shows no improvement
  - Baby has corneal ulcers and opacities

### Health education

- Prevention: good antenatal care and screening for STIs
- Prophylaxis:
  - Ocular chloramphenicol 1% ointment for all newborns as a stat dosage
  - 5% betadine solution into eyes when no antibiotic eye drops are available

### 26.2.5 Neonatal Tetanus

Neonatal tetanus is a bacterial infection of newborns due to *Clostridium tetani*. Newborns can get tetanus from sepsis of the umbilicus, through cutting of the cord with unsterile instruments, or from putting cow dung on the umbilicus. The neonate behaves normally for first 2 days of life. Illness sets in between 3 and 28 days of age.

Neonatal tetanus is a notifiable disease (see [appendix 3](#)).

### Symptoms and signs

- Inability to suck
- Convulsions
- Irritability
- Feeding difficulties
- Generalized stiffness of muscles
- Muscular spasms can occur (they resemble ticks or convulsions)
- Respiratory problems, cyanosis (i.e., baby becomes blue due to lack of oxygen),
- Tachycardia (i.e., fast pulse rate)
- Raised blood pressure
- Sweating
- Risus sardonicus (i.e., permanent smile)
- Trismus (i.e., difficulty in opening mouth)

### Management

1. **Refer** urgently for intensive care. 

### 26.2.6 Neonatal Jaundice

Jaundice is a yellowish colour of the skin and eyes of the newborn. Neonatal jaundice is of two types:

- Physiological (normal) jaundice: 2 to 5 days after birth and clears with time.
- Pathological (dangerous or abnormal) jaundice: immediate; occurs within 36 hours and lasts longer than 5 days

### Causes

- Physiological 'slow liver' (i.e., immature liver)
- Infection or septicaemia in newborn or unborn
- Blood incompatibility between mother and newborn

#### 26.2.6.1 Physiological Jaundice

### Symptoms and signs

- No suckling problems
- Mild jaundice (i.e., yellowish skin discolouration)
- Yellow sclera (eyes)

### Management

1. No special treatment needed (normal sunlight is sufficient).

### Health education

- Advise the mother—
  - That physiological jaundice is not a serious problem and will disappear by itself
  - To protect baby from sunburn if mother puts it in the sun.
  - That the condition is not a result of her eating oranges.
- Instruct the mother to bring the child to the clinic immediately if the jaundice lasts for more than 5 days or if the following develop—

- Problems with feeding
- Irritability
- Fever
- Convulsions

### 26.2.6.2 Pathological Jaundice

#### Symptoms and signs

- Baby usually looks sick
- Sucks poorly
- Signs of septicaemia
- Signs of central nervous system involvement (i.e., convulsions, coma)
- Jaundice within 2 days
- Jaundice longer than 14 days

#### Investigations

- Total bilirubin
- Unconjugated bilirubin
- Conjugated bilirubin

#### Management

**In clinic, health centre, or hospital—**

1. **Refer** to hospital urgently 

**In hospital—**

1. Check bilirubin levels (total):  $<275 \mu\text{mol/L}$  (physiological),  $>275 \mu\text{mol/L}$  (pathological)
  - Unconjugated (in neonatal jaundice)
  - Conjugated bilirubin (in persistent jaundice)
2. Check mother's blood group (search for ABO and Rh incompatibility).
3. Start phototherapy (ultraviolet light). Always cover babies' eyes.
  - For a full-term infant, if  $>260 \mu\text{mol/L}$  unconjugated bilirubin
  - For a preterm, if  $>170 \mu\text{mol/L}$
4. Provide exchange transfusion if severe (term  $>340 \mu\text{mol/L}$  or preterm  $>260 \mu\text{mol/L}$ )

### Health education

Baby must be sent to hospital for treatment of the jaundice because high levels can cause abnormalities in the child's brain.

### 26.2.7 Common Problems during Breastfeeding

- Sore nipples—
  - Continue breastfeeding
  - Ensure proper latching on
  - Creams and shield are of little benefit
- Engorgement or full breasts (see “Section V. Obstetrics and Gynaecology. Chapter 24. Obstetrics” for a discussion of postpartum problems)
- Mastitis (see “Section V. Obstetrics and Gynaecology. Chapter 24. Obstetrics” for a discussion of postpartum problems)
- Poor suckling
- Insufficient breast milk
- Physiological jaundice
- Failure to gain weight

### 26.2.8 Low Birth-Weight and Preterm Babies

A low birth-weight baby is a baby that weighs  $\leq 2.5$  kg and needs close monitoring and management. The causes of low birth weight usually trace back to the antenatal period.

#### Causes

- Maternal infection (e.g., HIV/AIDS, TB)
- Toxic substances (e.g., smoking, alcohol)
- Severe maternal malnutrition
- Multiple pregnancies (twins or more)
- Congenital infections (e.g., syphilis, rubella, herpes, toxoplasmosis)
- Teenage pregnancy


#### Complications after birth

- Birth asphyxia

## 26.3 Immunisation-Preventable Diseases

- Meconium aspiration (particularly with intrauterine-growth-retarded babies)
- Problems with regulating temperature (i.e., hypothermia)
- Susceptibility to infections
- Hypoglycaemia

### Management

1. **Refer** to hospital as soon as possible. 
2. Meanwhile, feed every 2 to 4 hours with breast milk; baby must be fed more often.
3. Keep the baby warm. If possible, keep close to mother, ideally baby lies tucked between the mother's breasts.
4. If the baby is unable to suck, pass an NGT and give small amounts (5 to 10 mL) of breast milk or, if unavailable, same amount of 10% dextrose water every 3 hours.

## 26.3 Immunisation-Preventable Diseases

### 26.3.1 Tetanus

Tetanus is an infectious disease caused by the anaerobic tetanus bacillus that produces a strong toxin that affects the central nervous system and thereby causes the spasms that are characteristic of this disease. (See also [26.2.5](#), above.)

#### Causes

- Anaerobic bacilli *Clostridium tetani*
- Common sources of infection—
  - Wounds that are contaminated (by cattle dung, soil, rusted nails, wood splinters)
  - Unhygienic cutting and cleaning of umbilical stump after birth

#### Symptoms and signs


- Tonic muscle spasms



- Trismus (i.e., difficulties in opening the mouth)
- Fever
- Risus sardonicus (i.e., permanent smile on face)
- Hyperreflexia (increased by loud noise or quick movement)
- Arching of the back
- Glottal spasms
- Respiratory problems

### Management

#### In clinic, health centre, or hospital—

1. **Refer** all patients with possible tetanus to hospital. 
2. Sedate the patient to reduce the spasms. Give diazepam 0.2 mg/kg every 4 hours to a maximum of 10 mg; IV or per rectum.
3. Patient must be accompanied during transport to the hospital.
4. Suction airway continuously to prevent respiratory problems.

#### In hospital—

1. Give tetanus immunoglobulin (antitoxin)
  - Newborn: 500 IU IM stat; give at two sites because volume is too large for one site
  - Children: 2000 IU IM stat
2. Debride the wound.
3. Give antibiotic.<sup>1</sup>
  - Neonates: benzylpenicillin (penicillin G), 50,000 IU/kg per dose every 12 hours
  - Children 1 month to 18 years: benzylpenicillin (penicillin G), 50,000 IU/kg per dose, every 6 hours
4. Treat respiratory failure in ICU with ventilation.

### Health education

- Immunise all children.
- Give tetanus toxoid (TT) after wound has been treated.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

### 26.3.2 Measles (Rubeola)

Measles is a highly contagious viral disease that can occur in epidemic proportions. The incubation period is 10 to 12 days. Measles is especially dangerous in under-nourished children. It is a notifiable disease (see [appendix 3](#)).

#### Symptoms and signs

- Fever
- Cough
- Loss of appetite
- Vomiting
- Diarrhoea
- Conjunctivitis or irritation of the eyes
- Photophobia (i.e., sensitive to light)
- Rash on the whole body—maculopapular rash, starts on the face and neck, spreads trunk and extremities
- Koplik spots in the mouth can be found 1 or 2 days before the rash appears
- A watery mucoid discharge from the nose
- Stomatitis (sores around the mouth)

#### Complications

- Otitis media
- Diarrhoea with green loose watery stools
- Pneumonia—dyspnoea, nasal flaring, and rib retractions
- Croup
- Severe conjunctivitis
- Severe stomatitis

#### Management

1. Give paracetamol for fever.
2. Give retinol (vitamin A) for 2 days.
  - For children <1 year or weighing <8 kg: 100,000 IU per day
  - Children >1 year or weighing >8 kg: 200,000 IU per day
3. Multivitamin syrup 5 mL PO per day for 2 weeks.
4. If breastfeeding, continue.

5. Treat conjunctivitis. (See “Section II. Diseases and Disorders According to Body System. Chapter 13. Ophthalmology.” for a discussion of red, inflamed eyes.)
6. Treat diarrhoea with ORS.
7. Treat infected gums. Order chlorhexidine mouthwash every day for 5 days, and stress the importance of good oral hygiene.
8. If child is sent home, ask the mother to return if the symptoms worsen or do not improve in 3 days.
9. Refer to hospital for—
  - Pneumonia
  - Croup
  - Severe malnutrition

### Health education

- Measles is a preventable disease, if the child is immunised against it.
- Prophylaxis—
  - Measles immunoglobulin in low-immunity or premature contacts
  - Immunisation—any children in the neighbourhood of the infected child should be sent to the clinic
- Encourage the mother to keep on breastfeeding the child even though he or she is sick.
- Advise the parents to give the child a lot of fluid to drink.
- If the child’s temperature is high, instruct the parents to use tepid sponging to cool the child.
- Advise the parents to keep the child calm in the house and to avoid bright sunlight because it will cause pain in the child’s eyes.

### 26.3.3 German Measles (Rubella)

Rubella (German measles) is a less contagious viral disease than measles, usually spread by airborne droplets or by close contact. Incubation period is 14 to 21 days. It is so mild that many cases go unnoticed.

## 26.3 Immunisation-Preventable Diseases

Immunity appears to be lifelong following infection or immunisation. **Note:** Rubella during pregnancy causes severe foetal abnormalities; prevent congenital rubella through early vaccination of all females.

### Symptoms and signs

- 1 to 5 days of malaise
- Generalized lymph gland enlargement (especially neck and periauricular)
- Typical rash (similar to that of measles but less extensive and fades quickly)
- No Koplik spots, photophobia, or cough

### Management

1. Symptomatic treatment on outpatient basis.

### Health education

- Advocate vaccination or immunisation of all female children.
- Give MMR (measles, mumps, and rubella) if available.

### 26.3.4 Poliomyelitis

Poliomyelitis is a contagious viral disease that often occurs in epidemics. It can be suspected in—

- Any case of acute flaccid paralysis (AFP) in a child <15 years of age
- Any child <5 years with AFP for which no other cause can be identified
- Any case of paralytic illness regardless of age

Polio is a notifiable disease (see [appendix 3](#)) and is preventable by vaccination.

### Causes

- Poliomyelitis virus 1, 2, 3
- Spread by faecal-oral route
- The incubation period is 5 to 35 days

### Symptoms and signs

- Asymptomatic infections—no specific symptoms (in 95%)

- Abortive poliomyelitis—nonspecific symptoms including fever, headaches, sore throat, neck stiffness, muscle pain, vomiting, diarrhoea, or constipation
- Nonparalytic poliomyelitis—
  - Meningeal irritation
  - Viral meningitis
- Paralytic poliomyelitis—
  - Weakness in one or more limbs
  - Asymmetrical lower motor neuron paralysis
  - Muscular spasms of the limbs
  - Tenderness upon touch of muscles
  - No sensory loss
- Bulbar poliomyelitis—
  - Respiratory problems (i.e., reduced chest expansion)
  - Cranial nerve involvement (palate; pharyngeal and laryngeal paralysis)

### Management

#### In clinic, health centre, or hospital—

1. **Refer** all cases of paralysis to hospital urgently. 

#### In hospital—

1. Identify cause of paralysis.
2. Collect 2 adequate stools 24 to 48 hours apart within 14 days of onset of AFP.
3. Isolate patient to prevent faecal-oral spread.
4. Order strict bed rest.
5. Assess respiration regularly.
6. Ventilate if necessary.
7. Start intensive physiotherapy after 10 days.

### Health education

- Advocate for immunisation of all children and adults.
- Send all contacts to clinic for immunisation
- Regularly follow up affected persons.

### 26.3.5 Diphtheria

Diphtheria is a bacterial infection caused by *Corynebacterium diphtheriae*, which is spread by droplet infection and mainly occurs in the nasopharynx. The incubation period is 2 to 7 days. The bacteria produces a toxin, which gives rise to the typical symptoms and signs of diphtheria.

#### Symptoms and signs

- Fever
- Weakness
- Nausea and vomiting
- Acute pharyngitis
- Acute nasopharyngitis
- Acute laryngitis (i.e., hoarseness of the voice)
- Oedema of the throat
- Discharge from the nose (can be bloody)
- Enlarged lymph nodes in the neck
- Grey membrane (pseudo membrane) on the posterior wall of the pharynx
- The neck may look swollen; difficulty in breathing

#### Complications

- Myocarditis (i.e., increase tiredness, tachycardia, and low BP)
- Neuritis (i.e., soft palate paralysis or may affect other limbs)
- Renal failure
- Thrombocytopenia (lead to bleeding)

#### Management

**In clinic, health centre, or hospital—**

1. Refer to hospital.

**In hospital—**

1. Isolate until 3 throat swabs (nose and throat or skin) are negative.
2. Give procaine penicillin<sup>1</sup> G 25,000 to 50,000 U/kg per day IM in 2 divided doses for 14 days if patient cannot

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

swallow. If (or when) the patient is able to swallow, give penicillin V 125 to 250 mg 4 times per day for 14 days. In case of penicillin allergy, give erythromycin 40 to 50 mg/kg per day PO or IV to a maximum 2 g per day if patient cannot swallow. If (or when) the patient is able to swallow, give erythromycin 25 to 250 mg 4 times per day for 14 days.

3. Give diphtheria antitoxin 20,000 IU stat.

### Health education

- Hospitalization is required.
- Diphtheria is a preventable disease.
- Urge prophylaxis: diphtheria immunoglobulin in low-immunity or premature contacts.
- Advocate for immunization of all children in the neighbourhood.

### 26.3.6 Whooping Cough (Pertussis)

Whooping cough is an infectious disease caused by the bacterium *Bordetella pertussis*, which causes an inflammation of the mucous membranes of the nose, throat, and greater airways. Whooping cough presents with a history of—

- Cough persisting 2 or more weeks
- Paroxysmal cough (2 to 6 weeks)
- Cough followed by vomiting

This disease can be prevented by immunization.

### Symptoms and signs

- Usually no fever
- Loss of appetite
- Difficult breathing (in infants)
- Thick sputum in the mouth
- Bouts of coughing are immediately followed by a whooping sound (during inhalation)
- The cough will last 4 to 12 weeks
- Often vomiting after a coughing bout
- Danger of dehydration

## 26.4 Immunisation

- Signs of respiratory distress especially in younger children will be cyanosis, laboured breathing, and sometimes convulsions

### Management

1. Feed every 3 hours.
2. Give oral rehydration mixture between feedings.
3. If severe or baby <3 months, refer to hospital.
4. Give antibiotics
  - In older children:
    - Erythromycin: 40 to 50 mg/kg per day in 4 divided doses to 14 days
    - OR ——
    - Clarithromycin 15 mg/kg per day in 2 divided doses for 7 days
  - In neonates: azithromycin suspension 10 mg/kg once per day
5. Give salbutamol if wheezing.
6. Treat contacts with erythromycin 125 mg 4 times per day for 14 days.

### Health education

- Send all children to the clinic for immunisation.
- Follow-up infected child every 2 weeks in the clinic; weigh and make sure child does not lose weight.
- If child has lost weight, refer to the hospital.

## 26.4 Immunisation

---

Immunisation is the active stimulation of the immune system with a specific antigen. This stimulation induces an immune response, which confers immunity against the disease. The probabilities of death when no immunisation is done are as follows:

- Measles—3 in 100
- Tetanus—1 in 100
- Whooping cough—1 in 100
- Polio—1 in 200



A child who is not immunised is more likely to become undernourished, to become disabled, and to die. Breastfeeding is a “natural immunisation” against several diseases.

Table 26.4 presents the recommended immunisation schedule and vaccine availability for Namibia.

### Health education

- Immunisation protects against dangerous diseases.
  - Measles is a significant cause of malnutrition, poor mental growth, and blindness
  - Polio virus infection will cripple for life.
  - Tetanus bacteria thrive in dirty cuts and kill most of the people who become infected.
- Immunisation is urgent. All immunisations should be completed in the first year of the child’s life.
  - Most deaths occur before the age of 1 year.
  - The full course of immunisations needs to be completed.
  - Immunise against 6 major childhood diseases in the first year of the child’s life. (See immunisation schedule in [table 26.4](#).)
- Immunising a sick child is safe.
  - Immunising is safe for children suffering from a minor illness or malnutrition (e.g., fever, cough, cold, diarrhoea, or some other mild illness).
- Every woman between the ages of 15 and 44 should be fully immunised against tetanus.
  - A mother giving birth in unhygienic conditions puts both mother and child at increased risk from tetanus, a major killer of the newborn.
  - Tetanus bacteria thrive in dirty cuts. The knife used to cut umbilical cord should first be cleaned and boiled or heated in a flame and allowed to cool.
  - All women who become pregnant should check their tetanus vaccination status. Schedule—
    - ◆ First dose as soon as a woman becomes pregnant
    - ◆ Second dose 4 weeks after the first

TABLE 26.4 Immunisation Schedule

**Note:** Vaccines in shaded cells are available at MoHSS facilities.

**Namibian Extended Programme of Immunisation Vaccines**

	Position	Birth	6 Weeks	10 Weeks	14 Weeks	Later
Bacillus Calmette-Guérin (BCG)	Deltoid <ul style="list-style-type: none"> <li>• 1 dose 0.5 mL intradermal at birth at left upper arm at the insertion of the deltoid muscle.</li> </ul>	X				X (5 and 10 years)
Diphtheria, pertussis, and tetanus (DPT) plus hepatitis B (HepB) plus Haemophilus influenza B (Hib)	Thigh <ul style="list-style-type: none"> <li>• 3 doses 0.5 mL IM at the lateral aspect of the thigh at 6, 10, and 14 weeks</li> </ul>		X	X	X	
Diphtheria and tetanus (DT)	Thigh for infants and young toddlers; deltoid for older children					X (5 and 10 years)
Polio drops	Mouth <ul style="list-style-type: none"> <li>• 4 doses (2 drops per dose) PO at birth, then at 6, 10, and 14 weeks</li> </ul>	X	X	X	X	X (5 and 10 years)

**Note:** Oral polio vaccine droppers should not touch the child's lips.

TABLE 26.4 Immunisation Schedule (cont.)

Note: Vaccines in shaded cells are available at MoHSS facilities.

**Namibian Extended Programme of Immunisation Vaccines**

Vaccines	Position	Weeks					Later
		Birth	6	10	14	Weeks	
Measles	Deltoid • 1 dose of 0.5 mL subcutaneous at 9 months, right upper arm.						X (9 months)
TT	Deltoid • 5 doses (0.5 mL) for women 15 to 45 years: first dose at first contact, second dose at 4 weeks, third dose at 6 months, fourth dose after a year, and fifth dose another year later.						X (5 years, then every 5 years)

**Other Vaccines**

**(not part standard immunisation schedule)**

Hepatitis A and B	Deltoid						X (12 months)
MMR	Deltoid						X (15 months)

TABLE 26.4 Immunisation Schedule (cont.)

Note: Vaccines in shaded cells are available at MoHSS facilities.

**Namibian Extended  
Programme of Immunisation  
Vaccines**

	Position	Birth				Later
		Weeks	6	10	14	
Pneumococcus	Deltoid					X (2 years)
Meningococcal	Deltoid					X (2 years)
Rabies	Thigh for infants and young toddlers; Deltoid for older children					Adult
Yellow fever	Deltoid					Adult, as needed, traveller
Typhoid	Deltoid					As needed

Note: Disposable syringes and needles should always be used.

- ◆ Third dose 6 to 12 months after the second dose
- ◆ Protection lasts for five years

---

**Note:** By the time child reaches 1 year of age, he or she should have completed a full course of immunisation against TB, diphtheria, tetanus, whooping cough, polio, and measles.

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### Immunisation side effects

- The child may cry, develop fever, rash, or small sore.
- If the child has convulsions, start diazepam (see “Section II. Diseases and Disorders According to Body Systems. [Chapter 11. Neurological System](#)” for a discussion of convulsions), and refer to a doctor.
- DPT can cause fever 12 or more hours after injection for 1 to 2 days. Give paracetamol.
- Measles vaccine can cause fever for 1 to 3 days appearing about a week after the vaccination and sometimes a mild rash 2 weeks after the injection. The child is not infectious to others, and the rash clears by itself in a few days.
- BCG will normally produce a small sore at the site of the injection, which without treatment in 2 to 3 months leaves a scar. Keep the sore clean but not bandaged until it heals.
- TT may cause pain, redness, and swelling for 2 days at the site of the injection. Reassure parents, caregivers, and child that these symptoms will disappear on their own, and no treatment is needed.

Remind the parents or caregivers that, no matter what the side effect, the child needs—

- Plenty of food and liquids
- Breastfeeding

If the side effect lasts longer than 3 days, advise the parents or caregivers to take the child to a health centre.

### Contraindications to immunisation

- Children with HIV/AIDS symptoms should not get BCG at birth.
- Children with severe reaction to the first dose (i.e., convulsion or shock within 3 days of the injection) should not receive the second or subsequent doses of DPT.
- Severely ill children who need hospitalisation should not be immunised.
- Children who have a defective or altered immune system (e.g., leukaemia, other malignancies, or febrile illnesses) should not be immunised.
- Pregnant women should not be immunised throughout pregnancy.

### HIV Infection and Immunisation

Routine immunisation should be offered to all children irrespective of their HIV status.

BCG is the only vaccine with a significant risk of complication and should not be given to—

- Children who have severe immunosuppression due to HIV infection or other causes.

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**Note:** Current WHO guidelines recommend delaying BCG in HIV-exposed children until HIV status is known if logistically possible.

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- Infants of mothers with known, active PTB should not receive BCG at birth. They should complete INH prophylaxis and then receive BCG.

Other vaccines recommended for HIV-infected children which are not currently available in the state sector, include—

- Pneumococcus
- Varicella-zoster (chicken pox)
- Hepatitis A
- Influenza vaccine (given yearly)
- Rotavirus

## 26.5 Other Paediatric Disorders

### 26.5.1 Chicken Pox (Varicella)

Chicken pox is a highly infectious viral disease caused by *Varicella zoster*, which is spread by droplet infection. The incubation period is 10 to 12 days. The disease can occur at any age, but occurs most frequently between the ages of 5 and 10 years.

#### Symptoms and signs

- Loss of appetite
- Weakness
- High fever
- Headaches
- Rash (appears only later)
  - It starts as flat red areas, develops into papules, then develops into clear vesicles, and results in dry scabs.
  - The rash starts on the trunk and later spreads to the limbs.
  - There are small sores on mucus membrane of the mouth.
  - The rash is very itchy.

#### Management

1. Provide symptomatic treatment.
2. For itchiness, recommend calamine lotion.
3. For severely immunocompromised patients, prescribe acyclovir 15 mg/kg per day.

**Note:** Varicella immunoglobulin should be considered for specialist use in hospital in children with severe HIV/AIDS, newborn infants whose mother developed varicella within 5 days of, or 2 days after, delivery; those infants exposed to varicella after birth.

### 26.5.2 Croup

See “Section I. Common Emergencies and Trauma. Chapter 1. Emergencies” for a discussion of acute airway obstruction.

### 26.5.3 Diarrhoea

See “Section II. Diseases and Disorders According to Body Systems. Chapter 7. Gastrointestinal System” for a discussion of diarrhoea.

### 26.5.4 Fever Convulsions

*Fever convulsion* refers to a seizure with a fever. It is an age-related disorder almost always characterized by generalized seizures occurring during an acute febrile illness occurring between 6 months and 5 years. It presents with a high temperature, but without signs of intracranial disease.

Fever convulsions can repeat, but are differentiated from epilepsy because fever is present. Often the child has a family history of fever convulsions. Most of the children suffering from fever convulsions will stop having the convulsions around 5 years of age.

#### Symptoms and signs

- The very young child—
  - Fever
  - Subtle signs of convulsions—
    - ◆ Horizontal eye deviations
    - ◆ Repetitive blinking or fluttering of eyelids
    - ◆ Drooling or sucking
    - ◆ Rowing or swimming movements of limbs
    - ◆ Apnoea
    - ◆ Abnormal cry
- Older child—
  - Tonic-clonic convulsions affecting the whole body but usually not lasting longer than 1 minute
  - No neck stiffness
  - No bulging of the fontanel

#### Differential diagnosis of children presenting with fever and seizure

**Note:** Viral infection, otitis media, and tonsillitis account for 85% to 90%, with the others making up 10% to 15% of all causes.



- Viral infection (upper respiratory tract infection, nonspecific viral illness, chicken pox, and other exanthema)
- Otitis media
- Tonsillitis
- Urinary tract infection
- Gastroenteritis
- Lower respiratory tract infection
- Meningitis
- Post-immunisation
- Post-epileptic fever (only likely after generalised seizure of >10 minutes)

### Investigations

- Rule out infection
- FBC, CRP
- Malaria smear
- Urine examination
- Blood culture
- LP puncture strongly advised in this group if no contraindications are present

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**Note:** If contraindications are present, start treatment for septic meningitis after a blood culture has been taken.

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### Management

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**Note:** Perform emergency treatment (ABCD) and treatment to stop the convulsion (see “Section I. Common Emergencies and Trauma. [Chapter 1. Emergencies](#)” for a discussion of SE and “Section II. Diseases and Disorders According to Body Systems. [Chapter 11. Neurological Systems](#)” for a discussion of convulsions). Further management will depend on the history and clinical findings. Follow the applicable scenario below.

---

### Scenario A: symptoms and signs of meningitis

- Management—
  1. Investigate and treat for meningitis (see “Section II. Diseases and Disorders According to Body System. Chapter 11. Neurological System” for a discussion of meningitis).

### Scenario B: infant <18 months who has had prior treatment with antibiotics

- Symptoms and signs (evidence shows these features are associated with an increased risk for meningitis)—
  - *Complex febrile seizure*
  - Duration >15 minutes
  - Repeated convulsions within 24 hours
  - Focal seizure on finding during postictal stage

— OR —

  - Drowsy before the seizures
  - More than 3 days illness
  - Clinic contact in last 24 hours
  - Vomiting at home
  - Drowsy >1 hour post-seizure
  - Dubious neck stiffness
  - Bulging fontanel
- Management—
  1. Admit or refer to hospital.
  2. Search for a cause of the fever (special investigations).

### Scenario C: infant is >18 months

- Symptoms and signs—
  - Simple seizure with fever
  - No serious or complex features
- Management—
  1. If on investigation, a focus for infection is found (e.g., otitis media)—
    - ◆ Turn on side to avoid aspiration.
    - ◆ Do *not* insert anything in mouth.

- ◆ If the child's lips and tongue are blue, open mouth and check breathing.
  - Remove secretions if necessary.
  - Treat fever: give paracetamol and order tepid sponging.
  - Administer diazepam PR (5 mg/1mL solution). Children 2 to 5 years: give 0.5 mg/kg. (See IMAI and IMCI documents; see [appendix 1](#).)
  - Investigate and treat the focus of the infection.
  - Have a full discussion with the parents or caregivers concerning management of seizure and the likelihood of recurrence.
- 2. If on investigation, no focus for infection is found—
  - ◆ Admit or refer.
  - ◆ Examine a clean-catch urine specimen.
  - ◆ Run FBC, malaria smear, and blood culture.
  - ◆ Observe for at least 2 hours. If child is well and WCC <15,000, the fever convulsion is probably due to a viral infection.
  - ◆ Treat with regular antipyretics (e.g., paracetamol 15 mg/kg every 4 hours PO).

### Health education

Advise the parents or caregivers to—

- Understand fever convulsions and their possible recurrence with fever.
- Try to keep child cool using tepid sponging.
- Give the child paracetamol prophylactically with fever and to make certain the prophylactic treatment never runs out.
- Bring the child to the clinic so that the cause of the fever can be treated

### 26.5.5 Malnutrition

See “[Section III. Nutrition and Lifestyle](#)” for a discussion of malnutrition.

### 26.5.6 Meningitis

See “[Section II. Diseases and Disorders According to Body System. Chapter 11. Neurological System](#)” for a discussion of meningitis.

### 26.5.7 Mumps

Mumps is a highly infectious viral disease, which is spread by droplet infection and affects the salivary glands (parotid gland) uni- or bilaterally. The incubation period is 14 to 21 days.

#### Symptoms and signs

- Headaches and earache
- Weakness
- General muscular pain
- Fever high  $>38^{\circ}\text{C}$
- Swelling of the parotid gland (one of the cheeks is swollen, sometimes both)
- Pain especially with swallowing or opening mouth
- Tenderness and/or swelling of the testis is rare but must be checked

#### Management

1. Give paracetamol for fever.
2. Do *not* give antibiotics. Mumps is a viral disease, so antibiotics are of no use and should not be used.

#### Health education

- Isolate the patient; keep the child away from school.
- The patient must rest, drink a lot of fluids, and eat a good solid diet.
- Follow up at clinic if the child shows no improvement after 1 week.

### 26.5.8 Rheumatic Fever

Rheumatic fever is caused by streptococcal infection of the upper respiratory tract in children and can affect the heart valves, causing serious heart problems. It usually occurs at 5 to 15 years and must be treated at an early stage.

#### Symptoms and signs

- Refer to modified Jones criteria. Diagnosis is made on the basis of—
  - 2 or more major criteria  
—— **OR** ——
  - 1 major plus 2 or more minor  
—— **PLUS** ——
  - Evidence of streptococcal infection
- Major criteria—
  - Carditis (i.e., heart murmurs, tachycardia [fast pulse, even while sleeping])
  - Polyarthrititis (i.e., one or more joints, moving from joint to joint, usually affects the greater joints)
  - Chorea (i.e., funny, uncoordinated movements)
  - Macular rash or erythema marginatum (trunk and forearms, never on the face)
  - Nodules (subcutaneous, non-tender, small, elbows, wrists, knees, and ankles)
- Minor criteria—
  - Fever
  - Arthralgia
  - Previous rheumatic fever
  - Raised ESR or CRP
  - Leucocytosis
  - Prolonged PR interval on ECG

#### Investigations

- FBC, ESR
- CRP
- ECG
- ASO titre

### Management

1. Order bed rest.
2. Prescribe<sup>1</sup> phenoxymethylpenicillin 250 to 500 mg 4 times per day for 10 days  
— OR —  
Procaine penicillin 1.2 Mill. IU IM per day for 10 days
3. Give aspirin for 75 mg/kg per day for pain and fever.
4. Prescribe corticosteroids for acute carditis and cardiomegaly.
5. Prescribe haloperidol or sodium valproate (10 to 20 mg/kg per day) for chorea.

### Health education

- Rheumatic fever can cause rheumatic heart disease with heart valve problems.
- Patient must be followed up monthly at the clinics, so that a monthly injection of penicillin can be given.
- For long-term treatment, the patient will need the following—
  - Benzathine benzylpenicillin 1.2 Mill. IU IM every 4 weeks until the age of 20 years  
— OR —
  - Phenoxymethylpenicillin 250 mg twice daily until 20 years of age or 5 years after attack
- Encourage the patient to eat before coming for the injection.

<sup>1</sup> Refer to [appendix 5](#) for treating patients with a history of penicillin allergy

## 27. Adolescents

Adolescence is a period of dynamic change representing the transition from childhood to adulthood between ages 10 and 19. It begins with puberty, but the duration and characteristics may vary across time, culture, and socio-economic status.

### Stages of adolescent development

- Pre-puberty—under age of 10
  - Has immature reproductive organs
  - Ends with puberty and body changes
  - Can be impulsive
  - Finds that play is an essential way of learning
  - Is curious
  - Has very concrete thinking
  - Values and beliefs determined by family
  - Has strong desire to please
  - Is curious about the opposite sex
- Early adolescence—10 to 14
  - Puberty begins, growth spurt occurs
  - Increased secondary sex characteristics
  - Menstruation begins in most girls
  - Boys can produce sperm
  - Frequent mood swings
  - Questions conflicting feelings
  - Seeks to make more decisions
  - Is aware of different values
  - May begin to have sex
- Middle adolescence—15 to 19
  - Starts to challenge and tests limits
  - Is less impulsive, is more thoughtful
  - Has more advanced problem-solving skills
  - May struggle with gender or sexual identity
  - Seeks more privacy
  - May have children
  - Begins to develop own sets of values
  - Seeks to conform to group norms of behaviour and dress

## 27. Adolescents

- May be married
- Young adulthood—20 to 24
  - Has reached sexual and physical maturity
  - Develops more stable relationships
  - Is clearer about roles and expectations
  - Has developed a strong sense of self
  - Is more aware of self in relation to others
  - Makes career and vocational choices
  - Is comfortable with role as adult
  - May marry or begin childbearing

### Health education

- Advise living in a safe environment.
- Supply structure.
- Teach responsibility.
- Encourage belonging to or membership in clubs, organizations, sanctioned groups.
- Advise the adolescent to obtain self-worth resulting from achievement.
- Advise the adolescent to develop skills including problem solving and decision making.
- Provide learning opportunities.
- Give reliable information.
- Give opportunity to express curiosity.
- Provide knowledge of and access to support.
- Enlighten on options for behaviour.
- Encourage the adolescent to form a spiritual base.
- Assist the adolescent in finding a role in family and society.
- Instil values.
- Provide job skills.
- Provide support and guidance from caring adults.
- Prevent smoking initiation and alcohol and substance abuse.
- Provide reproductive health education.
- Educate on healthy eating habits and prevention of obesity.



## 28. The Geriatric Patient

Geriatrics is the branch of medicine that treats all problems related to old age and aging including the clinical problems of senescence and senility.

See also “Section II. Diseases and Disorders According to Body System. [Chapter 14. Endocrine Disorders](#)” for a discussion of andropause and “Section V. Obstetrics and Gynaecology. [Chapter 25. Gynaecology](#)” for a discussion of menopause.

### 28.1 Musculoskeletal Changes

Many musculoskeletal changes take place during the peri- and menopausal years (see “Section II. Diseases and Disorders According to Body System. [Chapter 10. Musculoskeletal System](#)”) including—

- Rheumatoid arthritis
- Osteoarthritis
- Gout
- Osteoporosis

#### 28.1.1 Osteoporosis

Osteoporosis is a disease characterised by low bone mass and micro-architectural deterioration of bone tissue leading to enhanced bone fragility and an increase in fracture risk.

#### Investigations

- Bone mineral density (BMD) and bone densitometry
- Lumbar spine or hip X-ray (if BMD is not available)

#### Management

Objectives—

- Normalize bone turnover
- Preserve or increase bone density
- Prevent fractures

## 28.2 Neurological System Changes

Steps—

1. Instruct the patient to take calcium supplementation: 600 to 1200 mg per day.
2. Prescribe cholecalciferol 5000 IU weekly for vitamin D deficiency.
3. Prescribe bisphosphonates if available.
4. Prescribe SERM (selective estrogen receptor modulators) oestrogens (e.g., raloxifene) if available.
5. Recommend dietary measures. **Note:** These guidelines are basic. Refer the patient to a registered dietician for dietary counselling.
  - Patient must follow a healthy diet. (See “[Section III. Nutrition and Lifestyle](#)” for a discussion of a healthy diet for adults and the elderly.)
  - Emphasise an adequate intake of calcium and vitamin D (e.g., drink milk, omelette, yoghurt, and oshikandela; get some sunshine on the skin daily; eat pilchards with the bones, tuna, soft margarine, and egg yolk).
  - Avoid excessive amounts of caffeine (not more than 3 cups of coffee or black tea per day) and alcohol (limit to 1 drink for women and 2 drinks for men per day).
  - Be aware of excesses of wheat bran because phytates may increase calcium excretion.
  - Restrict salt (sodium) intake
  - Lose weight, if overweight or obese. (See “[Section III. Nutrition and Lifestyle](#)” for a discussion of obesity and overweight.)

### 28.2 Neurological System Changes

#### 28.2.1 Alzheimer's Disease and Senile Dementia

Dementia is a progressive decline of cognitive function presenting initially as loss of memory and failing of intellect.

##### Causes

- Unknown (Alzheimer's disease)
- Vascular dementia (small or larger strokes)
- Alcoholic dementia (alcohol abuse with malnutrition)
- Vascular calcification (DM, high BP, high cholesterol, obesity, no exercise, alcohol abuse)
- HIV/AIDS

##### Symptoms and signs

- Recent memory loss (e.g., what did I eat yesterday?)
- Long-term memory loss (e.g., where was I born?)
- Concentration is decreased (e.g., counting, keeping score)
- Antisocial behaviour (e.g., undressing in public)
- Loss of orientation to time and place
- Purposeless behaviour
- Getting lost
- Sleep rhythm disturbance
- Loss of insight (e.g., makes unfounded accusations)
- Aggression
- Depression, tearfulness
- Anxiety, phobias
- Lack of motivation
- Flat affect (i.e., emotionless expression)
- Personality changes

##### Management

1. Investigate for reversible causes and treat.
2. Recommend VCT for HIV.
3. Provide health education.
4. Suggest lifestyle changes. Recommend following a

## 28.3 Genitourinary System Changes

healthy diet. (See “[Section III. Nutrition and Lifestyle](#)” for a discussion of a healthy for adults and the elderly.)

5. Encourage the patient to avoid alcohol and to stop smoking.
6. Suggest the patient do mental exercises such as cross-word puzzles, reading, or sudoku.
7. Continue medications for DM, hypertension, and HIV.

### 28.2.2 Stroke

See “[Section II. Diseases and Disorders According to Body Systems. Chapter 11. Neurological System](#)” for a discussion of stroke and CVAs.

## 28.3 Genitourinary System Changes

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### 28.3.1 Stress Incontinence and Overactive Bladder

Incontinence is the inability to hold urine in the bladder.

#### Causes

- Menopause (atrophic vaginitis)
- Multiple vaginal births
- Age
- Trauma
- Surgery
- Irradiation
- Recurrent UTIs
- Stroke or other CNS disorders
- Psychiatric disorders (dementia)
- Chronic over-distension of the bladder
- Constipation
- Prostate disorders or prostatitis
- Gynaecological disorders or infections
- STIs

#### Symptoms and signs

See [table 28.31](#)

TABLE 28.3.1 Symptoms and Signs of Stress Incontinence and Overactive Bladder

Symptom or Sign	Stress Incontinence	Overactive Bladder
Frequency and urgency	No	Yes (> 8 x in 24 hours)
Urgency	No	Yes
Nocturia	Seldom	Usually
Reach toilet in time?	Yes	No
Amount of urine leakage	Small amount	Large amount
Leakage during physical activity, coughing, sneezing	Yes	No
Insomnia and night-time sleep disturbances	No	Yes

### Investigations

- Abdominal, pelvic, neurological examinations
- Urinary MCS
- Cough test for incontinence

### Management

1. Find causes and treat.
2. Recommend pelvic floor exercises.
3. Recommend bladder training.
4. Prescribe HRT.
5. Prescribe tolterodine tartrate (if available).

## 28.3.2 Decreased Sexual Function in Old Age

### Symptoms and signs

- Men—
  - Libido changes
  - Decreased erections (less often in morning, less rigid, unreliable)
  - No ejaculation at times

## 28.4 Endocrine Changes

- Women—
  - Increased sexual response occasionally (i.e., no anxiety about pregnancy, contraception, more relaxed)
  - Decreased libido
  - Decreased vaginal lubrication (dry vagina)
  - Painful intercourse
  - Urinary symptoms
  - Skin and clitoris irritability and sensitivity
- Both—
  - More direct stimulation needed
  - Orgasmic intensity diminished
  - Coital frequency diminished

### Management

1. Explain that changes are physiological. Often no treatment needed if explained properly.
2. Prescribe vaginal lubrication (women).
3. Prescribe phosphodiesterase type-5 inhibitors (men).

## 28.4 Endocrine Changes

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See “Section II. Diseases and Disorders According to Body System. [Chapter 14. Endocrine Disorders](#)” for a discussion of two common geriatric endocrine changes—

- Metabolic syndrome
- Diabetes mellitus

## 28.5 Eye Problems

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See “Section II. Diseases and Disorders According to Body System. [Chapter 13. Ophthalmology](#)” for a discussion of three common geriatric eye problems—

- Cataracts
- Decreased vision
- Glaucoma



### 29. Palliative Care: A Holistic Approach

Palliative care aims to improve the quality of life of patients and their families who are faced with life-threatening illness, through the prevention and relief of suffering. This aim is achieved through early identification, impeccable assessment, and treatment of pain and other physical, psychosocial, and spiritual problems.

Life-threatening illnesses include—

- HIV/AIDS
- Cancer
- Multiple sclerosis

Pain encountered in palliative care is usually chronic and may be intractable.

#### Health education

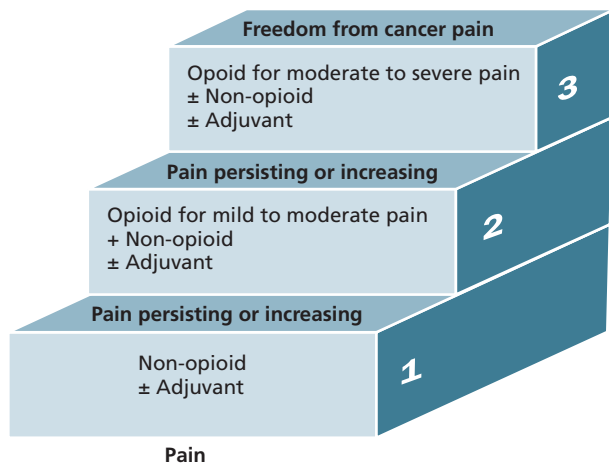
- Reassure the patient and the family that pain can be relieved.
- Explain that pain relief is not instantaneous.
- Explain that unpleasant side effects will wear off after 3 days.
- The goal of pain management is to ensure that the patient is—
  - Pain-free at rest.
  - Pain-free at night.
  - Pain-free while active.
- Use a step-by-step approach to pain relief according to the WHO analgesic ladder ([figure 29.1](#)).
- The principles governing use of analgesics are that they should be given—
  - By mouth
  - By the clock
  - By the ladder (see [figure 29.1](#))
- Reassure the patient of regular visits and reassessment by health care professional.



## 29.1 Management Strategy

- Determine the aim of treatment.
- Decide on which analgesics to use first.
- Determine any adjuvants (i.e., co-analgesics) that may be needed to counteract side effects of the analgesics.
- Alternative techniques in managing spiritual, emotional, and social problems may require referral to social worker or other people (medical or nonmedical).

FIGURE 29.1 WHO ladder of pain management



### 29.2 Pain in HIV/AIDS

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#### Causes

- Pain secondary to HIV/AIDS (e.g., neuropathy)
- Side effects of medications used in HIV management (e.g., ddI, D4T, vincristine)

#### Symptoms and signs

- Headache, possibly as a result of an opportunistic infections, tumour, herpes zoster, tension, or medication (e.g., AZT)
- Peripheral neuropathy
- Abdominal pain
- Oropharyngeal and oesophageal pain
- Skin pain (herpes zoster, Kaposi's sarcoma)
- Chest pain (pleural or lung infections or tumours, oesophagitis, cardiovascular disease, mediastinal lesions)

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**Note:** Pain medication should always be administered on schedule rather than as needed. Patients with terminal stages of AIDS and severe pain require oral morphine, often in combination with adjuvant medicines.

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### 29.3 Pain Management in Adults

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Tables [29.3A](#) and [29.3B](#) outline pain management for adults, including medications, dosages, side effects, and management of side effects.

TABLE 29.3A Pain Management in Adults

Analgesic	Starting Dose	Range		Side Effects and Cautions
		Step 1. Give non-opioid analgesics.		
Paracetamol	1g (2 x 500 mg tablets) every 4 to 6 hours (skip dose at night or give another analgesic to keep total to 8 tablets per day)	<ul style="list-style-type: none"> <li>Only one tablet may be required in the elderly or very ill, or when combined with an opioid.</li> <li>Mild pain might be controlled with dosing every 6 hours.</li> </ul>	Do not exceed eight 500 mg tablets in 24 hours (more may cause fatal liver toxicity)	
Aspirin (acetylsalicylic acid)	<ul style="list-style-type: none"> <li>600 mg (2 tablets of 300 mg) every 4 hours.</li> <li>Do not exceed 4g per day</li> </ul>	When used as an extra "rescue" dose, give 600 mg per day as a single dose	<ul style="list-style-type: none"> <li>Avoid use if gastric problems occur. Stop if patient has epigastric pain, indigestion, or black stools or if bleeding occurs.</li> <li>Do not give to children under 12 years.</li> <li>Take with or immediately after food.</li> </ul>	
— OR —				
Ibuprofen	400 mg 3 times per day	Do not exceed 1,200 mg in a day	Not to be taken on an empty stomach	

## 29.3 Pain Management in Adults

TABLE 29.3A Pain Management in Adults (cont.)

Analgesic	Starting Dose	Range	Side Effects and Cautions
<b>Step 2. Give opioids for mild to moderate pain. Give in addition to aspirin or paracetamol.</b>			
Codeine phosphate (tablets)	30 mg every 4 hours	<ul style="list-style-type: none"> <li>• 30 to 60 mg every 4 to 8 hours.</li> <li>• Maximum daily dose for pain due to ceiling effect is 180 to 240 mg</li> <li>• Switch to morphine if more pain control is needed.</li> </ul>	Give a laxative to avoid constipation unless patient already has diarrhoea.
Tramadol HCL (capsules)	50 to 100 mg not more often than every 4 hours	<ul style="list-style-type: none"> <li>• 30 to 60 mg every 4 to 8 hours.</li> <li>• Maximum daily dose for pain due to ceiling effect is 180 to 240 mg.</li> <li>• Switch to morphine if more pain control is needed.</li> </ul>	For tramadol do not exceed 400 mg in a day
<b>Step 3. Give opioids for moderate to severe pain.</b>			
Oral morphine	2.5 to 5.0 mg every 4 hours (dose can be increased by 50% or doubled after 24 hours if pain persists)	According to need of the patient without restriction in dosage. Very high dosages may be required.	Give a laxative to avoid constipation unless patient already has diarrhoea.

TABLE 29.3B Management of Side Effects of Morphine or Other Opioids

If patient has this side effect—	Then manage as follows—
<ul style="list-style-type: none"> <li>• Constipation</li> </ul>	<ul style="list-style-type: none"> <li>• Prevent by prophylaxis (unless results in diarrhoea).</li> <li>• Increase fluids and fibre-rich foods.</li> <li>• Give stool softener plus a stimulant (bisacodyl 5 to 10 mg tablets) at the time of prescribing opioids.</li> </ul>
<ul style="list-style-type: none"> <li>• Nausea or vomiting</li> </ul>	<p>Give an antiemetic (haloperidol 1.5 mg daily for 3 days or metoclopramide 10 mg 3 times per day for 3 days if needed); however, usually there is no need for a prophyllactic antiemetic.</p>
<ul style="list-style-type: none"> <li>• Confusion or drowsiness (if due to opioid)</li> <li>• Decreased alertness</li> <li>• Trouble with decisions</li> </ul>	<ul style="list-style-type: none"> <li>• Usually occurs at the start of treatment or when dose is increased. Resolves within a few days but can occur at end of life with renal failure.</li> <li>• Halve dose or increase time between doses, or provide time with less analgesia when patient wants to be (or needs to be) more fully alert to make decisions.</li> </ul>
<ul style="list-style-type: none"> <li>• Twitching (myoclonus); if severe or bothers patient during waking hours</li> </ul>	<ul style="list-style-type: none"> <li>• If on high dose consider reducing dose or changing opioids (consult or refer).</li> <li>• Reassess the pain and its treatment, or give diazepam 5 to 10 mg 3 times per day until the effect subsides.</li> </ul>
<ul style="list-style-type: none"> <li>• Somnolence (excessively sleepy)</li> </ul>	<p>Extended sleep can be from exhaustion due to pain. If persists for more than 2 days after starting, reassess level and/or type of pain and then consider reducing the dose.</p>
<ul style="list-style-type: none"> <li>• Itching</li> </ul>	<p>May occur with a normal dose. If present for more than a few days and hard to tolerate, give chlorpheniramine 4 mg every 8 hours or promethazine hydrochloride 10 mg every 8 hours.</p>
<ul style="list-style-type: none"> <li>• Urinary retention</li> </ul>	<p>Insert urinary catheter to drain bladder then remove it because this effect is rare.</p>

### 29.4 Pain Management in Children

General principles to be followed—

- Treat the underlying cause without increasing pain.
- Use nonmedicinal support, such as—
  - Emotional support
  - Physical methods such as touching, stroking, massage, and applying ice or heat
  - Cognitive methods such as preparation for procedures, distraction with music or imagery, play
  - Non-harmful traditional practices
- Use medicines specific to the type of pain.
- Address psychosocial issues.
- Continue to assess the pain.

---

**Note:** Many doctors are over-cautious in using strong opioids in children; however, the WHO 3-step analgesic ladder approach ([figure 29.1](#)) should still be used, with preference for oral medications and regular administration not as necessary.

---

Respiratory depression with strong morphine is not a problem in children over 1 year of age if treatment is started in standard doses and thereafter increased or reduced according to needs. In younger children, starting doses should be reduced.

### 29.4.1 Opioids

Children with HIV rarely need antiemetics and laxatives. Itching with opioids in the first few days is quite common and responds to antihistamines if necessary. Many children are sleepy initially, and parents should be warned of this and reassured that their child's disease has not suddenly progressed.

Table 29.4.1 outlines the dosages of standard analgesics.

TABLE 29.4.1 Dosages of Analgesic Medicines in Children

Medicine	Dosage	Comments
Paracetamol	<ul style="list-style-type: none"> <li>• Oral dose 20 mg/kg every 4 hours while awake</li> <li>• Maximum dose 90 mg/kg over 24 hours: 60 mg/kg/24 hours in neonates</li> </ul>	This dose is double the antipyretic dose.
Ibuprofen	5 to 10 mg/kg given every 6 to 8 hours	
Morphine	Standard starting dose = 0.15 to 0.3 mg/kg PO every 4 hours— <ul style="list-style-type: none"> <li>- For infants &lt;1 month: 1/3 dose for children &lt;50 kg</li> <li>- For children &lt;50 kg: 0.3 to 1.5 mg/kg every 4 hours</li> <li>- For children &gt;50 kg: 5 to 10 mg every 4 hours</li> </ul>	<ul style="list-style-type: none"> <li>• Titrate according to analgesic effect.</li> <li>• Make provision for "break through" pain.</li> <li>• Child may be sleepy initially when on morphine.</li> </ul>

## 29.4 Pain Management in Children

### 29.4.2 Adjuvant Therapy for Pain in Children

If analgesics are inadequate, the adjuvant therapies in table 29.4.2 are recommended.

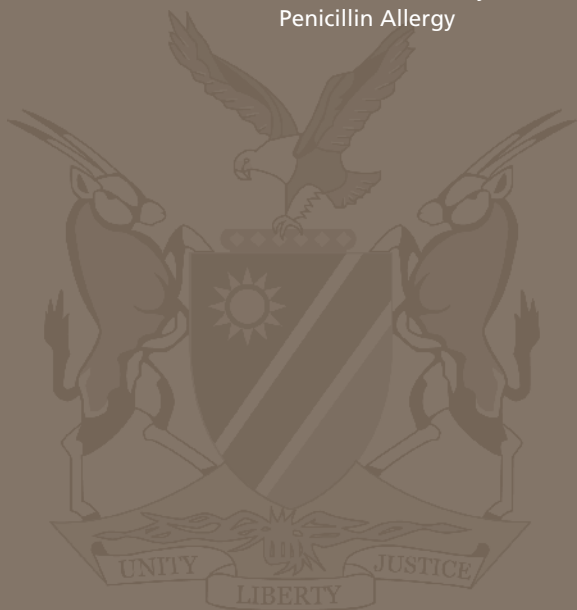
TABLE 29.4.2 Adjuvant Therapy for Pain in Children

Symptom	Medication	Dosage
Neuropathic pain	Amitriptyline	<ul style="list-style-type: none"><li>• Initial dose: 0.2 to 0.5 mg/kg given once daily at bedtime</li><li>• Increase dose by 25% every 2 to 3 days as needed</li></ul>
Itching	Antihistamines (e.g., chlorpheniramine)	0.1 mg/kg every 8 hours
Muscle spasms	Benzodiazepines (e.g., diazepam)	0.2 to 0.5 mg/kg every 24 hours in 3 to 4 divided doses
General pain	Feeding, sucking, and eating are part of children's development and provide comfort, pleasure, and stimulation	



# Appendixes

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# Integrated Management of Adolescent and Adult Illness (IMAI) Algorithm

---

## Quick check for emergency signs

- Airway and breathing
- Circulation (shock)
- Unconscious and convulsions
- Pain
- Fever

## Assess acute illness

Ask yourself the following questions as you examine the patient:

1. Cough and difficult breathing?
2. Weight loss or oedema?
3. Pallor or anaemia?
4. Presence of a genital or anal sore, wart, or ulcer?
5. For males—
  - Discharge from penis?
  - Lower abdominal pain?
  - Scrotal swelling?For females—
  - Vaginal discharge?
  - Urinary problems?
  - Lower abdominal pain?
  - Menstrual problems
6. Mouth or throat problems?
7. Fever and pain?
8. Diarrhoea?
9. Skin problems or lump?
10. Headache or neurological problem?
11. Mental problems?
12. Medications?

Classify according to IMAI. Treat according to IMAI. Consider HIV/AIDS and recommend voluntary counseling and testing. Counsel prevention (screening and prophylaxis). Conduct special investigations to prove diagnosis. Provide health education. Offer prophylaxis. Encourage follow-up care.

## Symptoms and Signs Differential List

Symptoms and Signs		Possible Causes
<b>Abdominal distention</b>		Ascites Hepatosplenomegaly Intestinal obstruction Malnutrition or kwashiorkor Obesity Parasites Pregnancy
<b>Abdominal pain</b>	Lower	Abortion Appendicitis Colitis Dysmenorrhoea Ectopic pregnancy Gastroenteritis Pelvic inflammatory disease Spastic colon Urethral stricture or retention Urethritis or UTI
	Upper	AIDS Cholecystitis Gastritis Gallstones Hepatitis Hiatus hernia Malaria Pancreatitis Poisoning Ulcers
<b>Ascites</b>		Cardiac failure Kidney failure Liver cirrhosis Liver failure TB peritonitis
<b>Backache</b>		Ankylosing spondylitis Disorders of the kidneys Old age (osteoarthritis) Pelvic inflammatory disease Posture; physical work Pregnancy Rheumatoid arthritis

Symptoms and Signs	Possible Causes
Backache (cont.)	TB Trauma Urinary tract infection
Blocked nose	Bleeding Common cold or influenza Foreign body Hay fever Polyps or adenoids Sinusitis Trauma
Changes of the hair	Malnutrition or kwashiorkor Parasite infestation Thyroid disease
Chest pain	Angina pectoris Anxiety or stress Asthma Bronchitis Diphtheria Myocardial infarction Pneumonia or pleuritis TB Trauma
Coma (unconsciousness)	Cardiac failure (severe) Diabetes mellitus Epilepsy Head injury Heat stroke Hypertension in pregnancy Kidney failure Liver failure Malaria Meningitis Near drowning Poisoning Respiratory failure Shock Stroke Trauma
Confusion	Alcohol abuse Anxiety or stress Epilepsy Fever

Symptoms and Signs	Possible Causes
<b>Confusion</b> (cont.)	Heat exhaustion Hysteria Malaria Meningitis Poisoning Puerperal psychosis Schizophrenia Senility (old age) Shock Trauma
<b>Convulsions</b>	Cerebral malaria Diabetes mellitus (hyper- or hypoglycaemia) Epilepsy Fever convulsions Meningitis Poisoning Pregnancy (preeclampsia) Tetanus
<b>Cough</b>	(See also "Chest pain.")
Non-productive	Common cold or influenza Croup Measles Pharyngitis TB Whooping cough
Productive	Bronchitis Pneumonia
<b>Cyanosis</b>	Asthma Cardiac failure Chest injuries Congenital heart disease Emphysema Pneumonia Pneumothorax Poisoning
<b>Diarrhoea</b>	AIDS Alcohol-induced gastritis Dysentery or cholera ENT disorders in children Gastroenteritis

Symptoms and Signs		Possible Causes
Diarrhoea (cont.)		Malaria Parasitic infections Poisoning
Difficult breathing		(See "Dyspnoea.")
Discharge	Ear	Foreign body Otitis externa Otitis media Trauma
	Eyes	Conjunctivitis or infections Foreign body Irritation Trauma
	Mammary	Abscess Cancer Normal Pregnancy Pituitary adenoma
	Mouth	Epilepsy Quinsy (peritonsillar abscess) Tooth abscess
	Nose	Common cold Epistaxis Onyala; epistaxis Sinusitis TB Trauma
	Rectal	Cancer Haemorrhoids Infectious diarrhoea Rectal infections
	Urinary; penile	STIs Trauma (See "Haematuria.") Urethritis or UTI
	Vaginal	PID STIs Trauma UTI (unusual)

Symptoms and Signs	Possible Causes
<b>Dizziness</b>	Anaemia Hypertension Hypo- or hyperglycaemia Hypotension Intracranial lesions or problems Otitis media Trauma
<b>Dysphagia</b>	Anxiety or stress Cancer Foreign body Mumps Pharyngitis Poisoning Tonsillitis or quinsy Trauma
<b>Dyspnoea</b>	(See also "Chest pain.") Cardiac failure Heart disease Emphysema Poisoning or snake bites Pneumonia Pneumothorax Trauma
<b>Dysuria; frequency</b>	Gonorrhoea Prostatism Spinal cord lesions UTI
<b>Enlargement of the liver</b>	Cancer Congestive heart failure Malaria Liver cirrhosis or abscess
<b>Fever</b>	Common cold or influenza ENT disorders Meningitis Respiratory infections Tooth infection UTI Viral diseases or AIDS



Symptoms and Signs	Possible Causes
Haematuria	Glomerulonephritis Schistosomiasis (bilharzia) Trauma UTI Urinary tract malignancies; tumours
Headache	Anxiety or stress Eye problem Hangover (alcohol) Hypertension Malaria Migraine Neck problems Sinusitis Sun stroke Trauma
Hearing loss	Foreign body in ear canal Meningitis Otitis externa Otitis media (perforation) Trauma Wax in the ear
Hoarseness	Cancer Common cold or influenza Tonsillitis
Hypertension	Anxiety or stress Pain Pregnancy-induced Renal disease Stroke
Hypotension	Anaphylactic shock Blood loss Myocardial infarction Pulmonary embolus Shock (septicaemia) Trauma
Insomnia	Depression Goitre (hyperthyroidism) Pain Stress, anger, or other emotional cause

Symptoms and Signs		Possible Causes
Jaundice		Alcoholism Haemolysis Hepatitis Jaundice of the newborn Liver cancer Liver cirrhosis Malaria Medicines (e.g., TB medicines)
Joint pains		Autoimmune disease Infections Osteoarthritis Rheumatoid arthritis
Muscle pains		Common cold or influenza Myositis Trauma
Nausea and vomiting		Acute abdomen Alcohol misuse Cholera Dysmenorrhoea Malaria Migraine Parasitic infestation Poisoning Pregnancy Sea- or motion-sickness Tonsillitis
Oedema	General	Glomerulonephritis Kidney failure Liver failure
	Legs	Congestive heart failure Normal after standing for a long time Preeclampsia (hypertension) in pregnancy

<b>Symptoms and Signs</b>	<b>Possible Causes</b>
<b>Palpitations</b>	Alcohol misuse Anaemia Anxiety or stress Cardiac failure Fever Hypertension Infections Menopause Rheumatic heart disease Thyrotoxicosis
<b>Paralysis</b>	Poliomyelitis Stroke Meningitis
<b>Pruritus</b>	Contact allergy (to medicines, food, or chemicals) Eczema Fungus infection Jaundice (hepatitis, liver problems) Lice or infections Medicine reaction Psoriasis Psychological Scabies
<b>Red, inflamed eye</b>	Acute glaucoma Conjunctivitis Corneal ulcer Foreign body Iritis Trauma
<b>Respiratory distress</b>	Anaphylactic shock Asthma Chemicals; smoke Croup Epiglottitis (children) Pneumonia Pulmonary oedema Upper airway obstruction

Symptoms and Signs	Possible Causes
Skin rash	AIDS Allergy (contact, medicines, food chemicals, bites or stings) Dermatological disorders or infections
Sore throat	Candidiasis (thrush) Pharyngeal abscess Pharyngitis Tonsillitis
Stranguria	Cancer Prostate enlargement Trauma Urethral stricture
Swelling	Abscess Bites and stings Enlarged lymph nodes Fracture or dislocation Goitre Rheumatoid or osteoarthritis Trauma
Vaginal bleeding	Abortion Antepartum bleeding Cancer Contraceptives Cervix erosions Hormonal problems Infections (PID) Menstruation Postpartum bleeding Trauma

## List of Notifiable Diseases In Namibia

---

The numbers represent international classification codes for the diseases.

### Class “A” Diseases

1. Acute Flaccid Paralysis (028)
2. Cholera (001)
3. Haemorrhagic Fever (032)
4. Measles (035)
5. Meningococcal Meningitis (016)
6. Neonatal Tetanus (012)
7. Plague (009)
8. Polio (028)
9. Rabies (029)
10. Yellow Fever (031)

---

**Note:** Any Class “A” disease must be reported immediately to the regional health management team.

---

### Class “B” Diseases

1. Anthrax (027)
2. Borreliosis or Relapsing Fever (025)
3. Brucellosis (010)
4. Diphtheria (014)
5. Hepatitis A (038)
6. Hepatitis B (037)
7. Schistosomiasis (046)
8. Tetanus (other than neonatal tetanus) (013)
9. Typhoid (002)
10. Whooping Cough (Pertussis) (015)

*Reference:* MoHSS. 2008. *National Guidelines for Integrated Disease Surveillance and Response*. Windhoek, Namibia: MoHSS

### Instructions for Submitting Requests for Changes to the Nemlist

---

The Nemlist forms are available for download in PDF format on this link:

<http://www.nmrc.com.na/NMPCNews/Downloads/tabid/1479/language/en-US/Default.aspx>

#### Purpose

This document provides guidelines for the submission of requests for changes to the Namibia Essential Medicines List (Nemlist).

#### Procedures

1. Fully complete Section A of the “**Request Form for changes to the Nemlist,**” of the Nemlist. (*See details below*)
2. Attach copies of publications, scientific articles, or guidelines to support the request.
3. Provide your full contact details including position, institution, telephone number, and e-mail address.
4. Submit the completed documents to—
  - District, Regional, or Windhoek Hospital Therapeutics Committees—For individual health workers, hospital departments
  - Essential Medicines List Committee (EMLC) Secretariat—For programme(s) managers or for motivations originating from Regional Therapeutics Committees

## Completing the request form for changes to the Nemlist

### Section I: Details of the request

#### A. Nature of request. *Tick the appropriate box.*

1. Addition—Inclusion of a new medicine on the list
2. Deletion—Removal of a medicine from the list
3. Replacement—Substitution of a medicine on the list with another one
4. Reclassification—Changing the level of care at which a medicine will be available for prescription and use

#### B. Details of the medicine. *Indicate—*

1. The generic or the International Non-proprietary Name (INN) of the medicine identifying the pharmaceutical substance or active ingredients
2. Strength and formulation

#### C. For requests for additions. *The requestor must provide the following details—*

1. Indication for use—Because most medicines have numerous indications, it is important to state the proposed indication for the medicine for the request. This statement will serve to identify the comparison medicine(s) in the current Nemlist and highlight which of the potential indications you feel merit consideration.
2. Suggested level of care and availability—Indicate suggested users or level of care at which the medicine is to be made available. *Tick the appropriate box.*

<b>S</b>	Specialists only—Referral hospital level
<b>AB</b>	District hospital level; to be prescribed by an MO
<b>AB*</b>	Primary health care facilities conducting deliveries
<b>ABC#</b>	Permitted in primary health care facilities for follow-up treatment in accordance to a prescription written by a medical officer

- ABC** Primary health care level (can be prescribed by any competent prescriber)
- R** Restricted use—Available at specified levels with stated restrictions or conditions on use
- IMAI-R** Available at clinics and health centres that have staff that have been trained in IMAI. They can also be stocked at district hospital levels and above and used as normal AB class items in these facilities.

#### **D. For requests for changing level of availability**

Provide details of the medicine (generic name, strength, and form), current level of care and availability, the proposed level of care and availability, and the indication(s) for use for the medicine.

#### **E. Proposed restrictions (for R class medicines)**

Indicate restrictions to be applied to the medicine. Restrictions may include the specific conditions for which the medicine is to be prescribed, accountability measures (e.g., use of registers), or specific security measures. Include as well the level at which the item may be stocked.

#### **F. Reasons for request and evidence**

State the reasons for the request for change and include supporting evidence such as list of publications or references. **Please attach copies whenever possible.** Reasons for request may include consideration of the following:

1. Therapeutic benefits and risks
2. Efficacy or safety profile
3. Cost
4. Available alternatives
5. Changes in morbidity
6. Changes in treatment guidelines or policy

Evidence is required to support claims of *relative efficacy*, *relative safety*, and *pharmacoeconomic benefit*.



### **G. Applicant details**

Provide full contact details. The EMLC will acknowledge all submissions and communicate decisions with supporting arguments where appropriate. The requestor may also be contacted for additional information to support the application.

### **Section II: Cost Information**

This section will be completed by the secretariat; with Central Medical Stores (CMS) providing cost information details, but to facilitate the evaluation of the submission and if available, the requestor should provide the following:

- A. Estimated consumption of the medicine per year
- B. Estimated number of patients to be treated with the medicine per year. This information may be obtained from the HIS-2K system if available.
- C. Estimated cost of the medicine

This information is useful for cost assessment and comparison and for determination of affordability.

### **Section III: Summary of the evaluation of by the EMLC secretariat**

This section will be completed by the EMLC secretariat. The secretariat will compile a technical report and make recommendations to the EMLC for approval or rejection of the submission. Where the EMLC is of the opinion that a further review is required, the motivation will be sent back to the secretariat for additional evidence to be obtained.

### **Section IV: Decision of the EMLC**

This section will be completed by the EMLC secretariat indicating whether an application has been approved, rejected, or deferred; the level of availability and care; restrictions for use if any; and the reasons for the decision.

## Management of Patients Who Have a History of Penicillin Allergy

The prevalence of penicillin allergy in the general population is unknown. The incidence of self-reported penicillin allergy ranges from 1% to 10%,<sup>1,2</sup> with the frequency of life-threatening anaphylaxis estimated at 0.01% to 0.05%.<sup>3</sup> For all cases of known or suspected penicillin allergy, azithromycin should be used as alternative to penicillin.

**Recommended alternative medicine in cases of penicillin allergy:** azithromycin

**Note:** if azithromycin is not available, give erythromycin.

Refer to the table below for treatment regimens based on patient population.

Patient Population	Azithromycin Regimen	Erythromycin Regimen
Adult	<ul style="list-style-type: none"> <li>• 1 gram by mouth in a single dose</li> <li>• 500 to 1000 mg by mouth once a day for 3 days</li> <li>• 500 mg by mouth once a day for 10 days</li> <li>• 500 mg by mouth as a single dose on day 1, followed by 250 mg by mouth once daily on days 2 through 5.</li> <li>• 250 to 500 mg by mouth every six to 8 hours for 7 to 14 days</li> </ul>	<ul style="list-style-type: none"> <li>• 500 mg orally four times a day for 5 to 7 days</li> <li>• 250 to 500 mg orally every six to 8 hours for 7 to 14 days</li> <li>• 500 mg orally four times a day for 10 days</li> </ul>

<sup>1</sup> Kerr, J. R. 1994. Penicillin Allergy: A Study of Incidence as Reported by Patients. *British Journal of Clinical Practice* 48:5–7.

<sup>2</sup> Ahlstedt, S. 1984. Penicillin Allergy—Can the Incidence be Reduced? *Allergy* 39:151–164.

<sup>3</sup> Idsoe, O., T. Guthe, R. R. Willcox, A. L. de Weck. 1968. Nature and Extent of Penicillin Side-Reactions, with Particular Reference to Fatalities from Anaphylactic Shock. *Bulletin of the World Health Organization* 38:159–188.

Patient Population	Azithromycin Regimen	Erythromycin Regimen
Children over six months old	<ul style="list-style-type: none"> <li>• 10 mg/kg as a single daily dose for 3 days</li> </ul>	<ul style="list-style-type: none"> <li>• 30–50 mg/kg/d (maximum 500 mg) by mouth every six to eight hours for 7 to 10 days</li> </ul>
Children six months old and younger		<ul style="list-style-type: none"> <li>• &lt;3 months 30 mg/kg/day by mouth divided doses every 12 hours</li> <li>• &gt;3 months 45 mg/kg by mouth divided every 12 hours; for 40 mg/kg divided doses for 10 days</li> </ul>



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