



Republic of Ghana

STANDARD TREATMENT GUIDELINES



Ministry of Health

Sixth Edition, 2010



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LIST OF TABLES

- Table 2-1: Assessment of the degree of dehydration in children with diarrhoea
- Table 2-2: Treatment by Fluid therapy- Plan A
- Table 2-3: Treatment by Fluid therapy- Plan B
- Table 2-4: Treatment by Fluid therapy- Plan C
- Table 2-5: *Helicobacter pylori* Eradication Therapy
- Table 5-1: Pain Management in the Sickle Cell Patient
- Table 6-1: Schedule for Immunization for Children
- Table 8-1: Antihypertensive Treatment by Drug Class
- Table 8-2: New York Heart Association functional Classification for Heart Failure
- Table 10-1: Drug Treatment of Seizures
- Table 10-2: Guidelines for the Management of the Unconscious Patient
- Table 12-1: Guidelines for the Treatment of Itching of specific causes
- Table 13-1: Regime for managing Diabetic Ketoacidosis in Adults
- Table 13-2: Regime for managing diabetic Ketoacidosis in Children
- Table 13-3: Example of Sliding Scale Chart
- Table 15-1: Misoprostol Dosages for Reproductive Health
- Table 16-1: Classification for Acute Kidney Injury, based on modification of RIFLE criteria
- Table 16-2: Causes of Male Infertility
- Table 16-3: Symptoms and Signs of Urinary Tract Calculi
- Table 16-4: Distinguishing between Torsion and Epididymoorchitis
- Table 19-1: Guidelines for the Treatment of the Patient with Fever
- Table 19-2: Empirical Antibiotic Therapy for suspected Bacterial Meningitis in Adults
- Table 19-3: Artesunate + Amodiaquine Co-Blistered Tablets (Regimen for once daily dosing)
- Table 19-4: Artesunate and Amodiaquine Co-Blistered Tablets (Regimen for twice daily dosing)
- Table 19-5: Artesunate and Amodiaquine Fixed Dose Combination. (Standard Regimen, using the 3 available dosing strengths)
- Table 19-6: Artemether and Lumefantrine (Recommended Dosing Regimen)
- Table 19-7: Dihydroartemisinin and Piperaquine (Recommended Dosing Regimen)
- Table 19-8: Dosing Regimen for Quinine IM Injection in young Children
- Table 19-9: Rectal Artesunate (Pre-Referral Treatment in Children)
- Table 19-10: Rectal Artesunate (Pre-Referral Treatment in Adults)
- Table 19-11: Pharmacological Treatment of Worm Infestations
- Table 20-1: Dose of Vitamin A for Xerophthalmia
- Table 20-2: Characterising Acute Red Eye with no history of Injury
- Table 20-3: Summary of the Common Causes and Management of Conjunctivitis
- Table 23-1: Points of distinction between Inflammatory and Mechanical Back Pain
- Table 24-1: Indication for use of Rabies Immunoglobulin and Rabies vaccine
- Table 26-1: Choice of Antibiotic for Prophylaxis

Standard Treatment Guidelines (STG) are systematically developed statements that assist prescribers in deciding on appropriate treatments for specific clinical problems. They usually reflect the consensus on the optimal treatment options within a health system and aim at beneficially influencing prescribing behaviour at all levels of care.

Health systems, particularly in developing countries, are faced with growing health needs on one hand and limited resources on the other. Policy makers at various levels are therefore engaged in designing cost-effective health interventions that ensure accessible and affordable quality care for all, in particular the poor and vulnerable groups.

Inappropriate prescribing is one of the manifestations of irrational medication use behaviour. It occurs when medicines are not prescribed in accordance with guidelines that are based on scientific evidence to ensure safe, effective, and economic use. STGs provide the tool for health care providers to give quality standardised care at affordable cost.


For our growing National Health Insurance Scheme, a standard treatment guideline is seen as a cost containment tool to ensure that inefficiencies, fraud and poly-pharmacy, often associated with Health Insurance Schemes, are minimised.

Regular, objective and transparent reviews of STGs are very important because the development process is a continual effort and not limited to a one-time production. This process includes gaining acceptance of the concept and preparing the text for wide consultation and consensus building. This is to ensure that users identify with and collectively own the process of development.

This document is the sixth edition of the Ministry of Health's officially approved prescribers' and dispensers' guide for all levels of healthcare. Great effort has been put into aligning the prevailing health insurance benefits package to this edition. This edition is also available on compact disk and can be accessed on the internet at www.ghndp.org.

The Ministry of Health is particularly grateful to its development partners for their continuous support for the health sector.

I am confident that all users of this document would find this edition very useful.



Dr Benjamin Kunbuor
Hon. Minister for Health

May, 2010

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Website: www.fdbghana.gov.gh

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CHAPTER 1: INTRODUCTION

The Government of Ghana, through the National Drug Policy, remains committed to ensuring the availability of, and accessibility to affordable and good quality medicines for all Ghanaians; and it is expected that these medicines would be used rationally. Achieving these objectives require a comprehensive strategy that, not only includes supply and distribution, but also appropriate and thoughtful prescribing, dispensing and use of medicines.

The Ministry of Health since 1983 has been publishing a list of Essential Drugs with Therapeutic Guidelines to aid the rational use of drugs. This document has been reviewed in response to new knowledge on drugs and diseases and changes in the epidemiology of diseases in Ghana. The Ministry has also produced separate guidelines for specific disease control programmes, diseases and identifiable health providers.

The Standard Treatment Guidelines have been prepared as a tool to assist and guide prescribers (including doctors, medical assistants, and midwives), pharmacists, dispensers, and other healthcare staff who prescribe at primary care facilities in providing quality care to patients. The guidelines list the preferred treatments for common health problems experienced by people in the health system and were subjected to stakeholder discussions before being finalised to ensure that the opinion of the intended users were considered and incorporated.

The guidelines are designed to be used as a guide to treatment choices and as a reference book to help in the overall management of patients, such as when to refer. The guidelines are meant for use at all levels within the health system, both public and private.

It is recognised that the treatment guidance detailed in this book may differ from the reader's current practice. It is emphasised that the choices described here have the weight of scientific evidence to support them, together with the collective opinion of a wide group of recognised national and international experts. The recommendations have been rated on the following basis:

Evidence rating A – requires at least one randomised control trial as part of a body of scientific literature of overall good quality and consistency addressing the specific recommendation.

Evidence rating B – requires the availability of well-conducted clinical studies but no randomised clinical trials on the topic of recommendation.

Evidence rating C – requires evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities. This indicates an absence of directly applicable clinical studies of good quality.

Treatments other than those recommended here may have to be justified to colleagues, managers, or in law.

The content of these treatment guidelines will undergo a process of continuous review. Comments or suggestions for improvement are welcome.

Those comments or suggestions for addition of diseases should include evidence of prevalence as well as a draft treatment guideline using the format set out in this book. In the case of a request for a new drug or replacing a listed product with another product, the evidence base must be clearly defined and included with the request.

These suggestions should be sent to:

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HOW TO USE THIS BOOK

To use these guidelines effectively, it is important that you become familiar with the contents and layout.

The contents of this book have as much as possible been arranged in order of 'body systems'. Within each section, a number of disease states which are significant in Ghana have been identified. For each of these disease states the information and guidance has been standardised to include a brief description of the condition or disease and the more common symptoms and signs. In each case the objectives of treatment have been set out, followed by recommended non-pharmacological as well as the pharmacological treatment choices.

The choice of treatment used here is based on the principles of 'evidence based medicine'. That is, it is based on the international medical and pharmaceutical literature, which clearly demonstrates the efficacy of the treatment choices.

The treatment guidelines try to take the user through a sequence of diagnosis, treatment, treatment objectives, and choice of treatment and review of outcome. It is strongly recommended that prescribers adopt a similar approach to practice. Care should be taken to avoid symptomatic management of uncertain diagnoses.

When treating patients, the final responsibility for the well being of the individual patient remains with the prescriber. Prescribers must take steps to ensure that they are competent to manage the most common conditions

presenting at their practice and familiarise themselves particularly with those aspects of the treatment guidelines relating to those conditions. It is important to remember that the guidance given in this book is based on the assumption that the prescriber is competent to handle patients at this level, including the availability of diagnostic tests and monitoring equipment.

This edition uses the Recommended International Non-Proprietary Name (rINN) in line with WHO recommendations and practice.

REFERRAL

These guidelines also make provision for referral of patients to other health facilities. Patients should be referred when the prescriber is not able to manage the patient either through lack of personal experience or the availability of appropriate facilities. Patients should be referred, in accordance with agreed arrangements to facilities where the necessary competence, diagnostic and support facilities exist. The patient should be given a letter or note indicating the problem and what has been done so far, including laboratory tests and treatment. When indicated, emergency treatment must be given before referring the patient. It may also be necessary for the patient to be accompanied by a member of health staff and it should be remembered that the act of referral does not remove from the prescriber the responsibility for the well being of the patient.

ABBREVIATIONS

The following are abbreviations commonly used in general prescribing of medicines. While several of them may be found in this treatment guideline, it has not been necessary to use all of them in the text of this book.

IV	intravenous
IM	intramuscular
SC	subcutaneous
kg	kilogram
g	gram
mg	milligram
L	litre
dl	decilitre
ml	millilitre
mmol	millimole
mEq	milliequivalent
hr(s)	hour(s)

min(s)	minute(s)
sec(s)	second(s)
m	metre(s)
cm	centimetre(s)
BW	body weight
°C	degree celcius
mmHg	millimetres of mercury
a.c.	ante cibum (before food)
b.d.	bis die (12 hourly)
o.d.	omni die (daily)
o.m.	omni mane (in the morning)
o.n.	omni nocte (at night)
p.c.	post cibum (after food)
p.r.n.	pro re nata (when required)
q.d.s	quarter die sumendus (6 hourly)
q.q.h	quarta quaque hora (4 hourly)
stat	statim (immediately, as initial dose)
t.d.s.	ter die sumendus (8 hourly)

Medicines written as oral could be tablets, capsules, caplets, suspensions and syrups.

PRESCRIPTION WRITING

Medicines should be prescribed only when they are necessary in treatment following a clear diagnosis. Not all patients need a prescription for a medicine; non-pharmacological treatment may be suitable and this has been highlighted in these guidelines.

In all cases the benefit of administering the medicine should be considered in relation to the risk involved. This is particularly important during pregnancy where the risk to both mother and foetus must be considered.

Prescriptions should

- be written legibly in ink or otherwise so as to be indelible
- be written by the prescriber and not left for another person to complete
- be dated
- state the full name and address of the patient
- specify the age and weight of the patient (especially in the case of children)
- be signed in ink by the prescriber
- bear the contact details of the prescriber (e.g. name and telephone number)

When writing a prescription the following should be noted:

- Name of medicines and preparations should be written in full. Unofficial abbreviations should not be used because there is a high possibility of misinterpretation
- Non-proprietary (generic) names are given in the book and they should always be used in prescribing
- Avoid the unnecessary use of decimal points, e.g. 3 mg and not 3.0 mg
- Quantities of 1 gram or more should be written 1 g
- Quantities less than 1 gram should be written in milligrams, e.g. 500 mg, and not 0.5 g
- Quantities less than 1mg should be written in micrograms, e.g. 100 microgram, not 0.1 mg
- Where decimals are unavoidable a zero should be written in front of the decimal point where there is no other figure, e.g. 0.5 ml, and not .5ml
- 'Micrograms' and 'nanograms' should not be abbreviated. Similarly, 'units' should not be abbreviated.
- Use the term 'millilitre' (ml or mL) not cubic centimetre (cc, or cm³)
- State dose and dose frequency. In the case where medications are to be given 'as required', a minimum dose interval should be specified, e.g. 'every 4-6 hrs as required for pain'
- State the quantity to be supplied or indicate the number of days of treatment required
- Write directions, preferably in English without abbreviation. It is recognised that some Latin abbreviations are used and these are detailed in the section on abbreviations. Do not use other abbreviations
- Avoid combination drugs, unless there is a significant therapeutic advantage over single ingredient preparations (e.g. Co-trimoxazole)
- Avoid the use of symptomatic treatments for minor self-limiting conditions
- Avoid, where possible, the prescribing of placebos. Instead, spend some time educating and reassuring the patient.
- Avoid multiple prescribing (polypharmacy), especially when the diagnosis is not clear
- Avoid the use of the parenteral route of administration except where there are clear, clinical indications for this route. Use the oral route whenever possible

CHAPTER 2: DISORDERS OF THE GASTROINTESTINAL TRACT

1. DIARRHOEA

Diarrhoea means passing frequent, loose, watery stools 3 or more times in a day. Diarrhoea is often accompanied by vomiting. It is very common in children. The commonest cause in this age group is viral. There is therefore usually no need to prescribe antibiotics. Fluid loss occurs quickly in children because of their size. If this is not corrected it may result in dehydration which can be fatal.

In children, other diseases like malaria, pneumonia, ear infections, urinary infections, may cause diarrhoea. Examine the child fully to make sure there is no obvious cause for the diarrhoea. The presence of a fever usually indicates an underlying cause.

Never take the complaint of diarrhoea lightly. Always ask how many times that day and the day before the patient has been to the toilet, and the texture of the stools. To one person who usually passes stool once in three (3) days, a motion every day seems like diarrhoea, but to another person this is normal.

Giving antibiotics may cause or prolong the diarrhoea except in special circumstances (see below). Malnutrition causes diarrhoea, which in turn also causes malnutrition, setting up a vicious cycle. Never give enemas or laxatives to patients with diarrhoea.

CAUSES

- Viral e.g. Rotavirus
- Bacterial e.g. Shigella
- Protozoal e.g. Amoebae
- Side effects of some medications. e.g. Penicillins

SYMPTOMS

- Frequent watery stools
- Blood or mucus in the stool
- Presence of fever
- Reduced urine output
- Associated vomiting

SIGNS

- Dehydration (see Table 2-1)

The following table can be used to assess the degree of dehydration in children with diarrhoea.

Table 2-1: Assessment of the Degree of Dehydration in Children with Diarrhoea

1. LOOK AT			
Condition	<u>Lethargic or unconscious, floppy</u>	Restless, irritable	Well, alert
Eyes	Very sunken and dry	Sunken	Normal
Tears	Absent	Absent	Present
Mouth and Tongue	Very dry	Dry	Moist
Thirst	Drinks poorly or not able to drink	<u>Thirsty, drinks eagerly</u>	Drinks normally, not thirsty
2. FEEL			
Skin	<u>Goes back very slowly after pinching</u>	<u>Goes back slowly after pinching</u>	<u>Goes back quickly after pinching</u>
3. DECIDE	If the patient has two or more signs, including at least one underlined sign, there is severe dehydration	If the patient has two or more signs including at least one underlined sign, there is some dehydration	The patient has no signs of dehydration
4. TREATMENT PLAN	Weigh patient and use Plan C (see Table 2-4)	Weigh patient and use Plan B (see Table 2-3)	Plan A (see Table 2-2)
5. % DEHYDRATION	> 10% (Severe)	5–10% (Mild to moderate)	<5% (Nil)



Note

In adults and children older than five (5) years of age, other signs of severe dehydration that may be present are absent radial pulse and low blood pressure. The skin pinch may be less useful in patients with marasmus (severe wasting) or kwashiorkor (severe malnutrition with oedema) or obese patients. Tears are a relevant sign only for infants and young children.

INVESTIGATIONS

- FBC
- Blood film for malaria parasite
- Stool routine examination
- Stool for culture and sensitivity
- Blood urea and creatinine

**Note**

If diarrhoea present **WITH** vomiting, low grade fever with no mucus in stools think of **viral infection**

If diarrhoea present **WITH** vomiting, **abdominal** cramps, blood and mucus in stools **WITH** fever, think of **bacterial infection**

If diarrhoea present **WITH** blood and mucus in stool **WITH** no fever, think of **amoebiasis**

If profuse diarrhoea present (rice water stools) **WITH** vomiting, think of **cholera**

If diarrhoea present **WITH** excessive vomiting (especially if in more than one member of the household or group) think of **food poisoning**

TREATMENT**Treatment objectives**

- To prevent dehydration: this is very important since so much of the child's body fluid is being lost through the stools and vomiting
- To replace lost fluid: as much fluid as goes into the stools should be given to the child to drink for replacement
- To maintain nutrition: mothers tend not to give a child who has diarrhoea anything or very little to eat, at a time when he needs all the food he can get! Continue to feed as much as can be tolerated
- To maintain personal hygiene: or else you end up taking the germs from the stools, back into the mouth, continuing the diarrhoea you are trying to stop
- To eliminate infecting organisms where appropriate

Non-pharmacological treatment

- Keep surroundings clean
- Improve personal hygiene e.g. hand washing after toilet
- Home-based fluid intake
- Maintain diet

Pharmacological treatment**(Evidence rating: A)****Fluid therapy:**

Child with no dehydration (<5%), gets treatment Plan A.

Child with mild-moderate dehydration (5-10%), gets treatment Plan B.

Child with severe dehydration (>10%), gets treatment Plan C.

Treatment Plan A – No dehydration

- Child can be treated safely at home
- Instruct mother to give
 - Home-based fluids like rice water, koko, soup, water, and Oral

- Rehydration Salt (ORS). Breastfed babies should be given breast milk and ORS
- Give as much as child wants of all the fluids

Table 2-2: Treatment by Fluid Therapy - Plan A

Age	ORS Basic Amount	ORS for every extra stool passed
<2 years	500 ml or more	50–100 ml
2–10 years	1000 ml or more	100–200 ml
>10 years	2000 ml or more	100–200 ml

- Child should continue to feed.
- Ask the mother to return to the health facility if the child gets worse, passes more watery stools, vomits repeatedly, becomes very thirsty, eats or drinks poorly or is not better in 2 days.
- Instruct mother on how to prevent diarrhoea.

Treatment Plan B – mild to moderate dehydration

For the child with mild-moderate dehydration, use treatment Plan B.

- Child to be treated in the health facility.
- Give ORS over the first 4 hours as shown in the table 2-3 below.
 - If child vomits, wait 10 minutes and start again.
 - Continue with other fluids the child will accept.
 - Instruct mother to continue breast feeding if child is breast fed.
 - Observe stools passed and record quantity.
- Check for signs of worsening dehydration.
- If eyes become puffy, too much fluid is being given so stop ORS and continue with breast milk or water, or other fluids if child is not breastfed.
- Reassess state of dehydration after 4 hours
 - If clinical state has improved with no dehydration - go to plan A
 - If there is still mild-moderate dehydration repeat plan B
 - If condition is worsening – go to plan C

Table 2-3: Treatment by Fluid Therapy - Plan B

Weight	<6 kg	6 <10 kg	10-<12 kg	12–19 kg
Age*	Up to 4 months	4 months up to 12 months	12 months up to 2 years	2 years up to 5 years
Amount of ORS	200–400 ml	400–700 ml	700–900 ml	900–1400 ml

*Use the child's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the child's weight (in kg) by 75.

Treatment Plan C—Severe dehydration

- A child with severe dehydration requires treatment with IV fluids in hospital.
- Start IV fluids immediately. Give 100 ml/kg Ringer's lactate solution or, if not available, normal saline or cholera replacement fluid (5:4:1), divided as shown in the Table for Plan C below: If you cannot give this and cannot pass a nasogastric tube refer to a health facility that can do so. In the interim start ORS sips.
- If the child can drink, give ORS by mouth while the drip is set up.

Treat severe dehydration quickly

Table 2-4: Treatment by Fluid Therapy - Plan C

Age	First give 30 ml/kg in:	Then give 70 ml/kg in:
Infants (< 12 months)	1 hour*	5 hours
Children (12 months up to 5 years)	30 minutes*	2½ hours

*Repeat once if radial pulse is still very weak or not detectable.

- Reassess the child every 1-2 hours. If hydration status is not improving, give the IV fluid more rapidly than as stated in the table above.
- Also give ORS (about 5 ml/kg body weight/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1–2 hours (children).
- Reassess an infant after 6 hours and a child after 3 hours. Classify dehydration. Then choose the appropriate plan (A, B, or C) to continue treatment
- Start ORS as soon as patients can drink at 5 ml/kg body weight/hour.
- Assess child hourly. If not improving or dehydration is worse, increase drip rate.
- Do not stop the IV fluids until the child has been observed to retain the ORS for at least 1 hour and there is improvement in the clinical condition.
- Continue ORS on treatment plan B and continue to observe child until child has no signs of dehydration, then move to Plan A.

**Note**

ORS currently recommended for use in mild to moderate diarrhoea has a reduced sodium and glucose concentration (low osmolarity).

How to prepare ORS

ORS: Dissolve the contents of one sachet of ORS in 600 ml (approximately the volume of one clean large beer bottle or two small Fanta bottles) of clean water. The child or adult should drink AS MUCH of it as he/she wants. If the child vomits, the mother should wait about 10 minutes and give it again.

Severe diarrhoea may be complicated by marked fluid loss accompanied by loss of potassium (hypokalaemia) or on the other hand, impaired renal function leading to acidosis and elevated blood potassium (hyperkalaemia). When the patient is passing adequate amounts of urine, probably indicating good renal function, start potassium containing foods such as coconut water and fresh fruits.

If there is clinical and /or laboratory evidence of severe hypokalaemia, Intravenous potassium chloride replacement may be given in the form of half strength Darrow's solution or Ringer's lactate, but only in a hospital.

If possible infants and children should continue to breastfeed or eat during the period of diarrhoea.

Anti-infective therapy:

Viral diarrhoea

No antibiotic treatment required. Give oral rehydration therapy alone as above.

Bacterial diarrhoea

- Ciprofloxacin, oral,
Adults
500 mg 12 hourly for 3 days
Children
15 mg/kg/dose 12 hourly for 3 days

Alternative treatment

- Co-trimoxazole, oral, (avoid in patients with G6PD deficiency)
Adults
960 mg 12 hourly for 7 days
Children
6-12 years; 480 mg 12 hourly for 7 days
6 months-5 years; 240 mg 12 hourly for 7 days

Amoebic diarrhoea

- Metronidazole, oral,
Adults
800 mg 8 hourly for 5 days;
Children
8-12 years; 400 mg 8 hourly for 5 days
4-7 years; 200 mg 8 hourly for 5 days
0-3 years; 100 mg 8 hourly for 5 days

Giardiasis

- Metronidazole, oral,
 - Adults
400 mg 8 hourly for 5 days
 - Children
8-12 years; 400 mg 8 hourly for 5 days
4-7 years; 200 mg 8 hourly for 5 days
0-3 years; 100 mg 8 hourly for 5 days

Cholera

- Tetracycline, oral,
 - Adults
500 mg 6 hourly for 3 days
 - Children
Not recommended
- **Or**
Doxycycline, oral,
 - Adults
100 mg 12 hourly for 3 days
 - Children
Not recommended
- **Or**
Erythromycin, oral,
 - Adults
500 mg 8 hourly for 5 days
 - Children
> 13 years; 500 mg 8 hourly for 5 days
6 years -12 years; 250-500 mg 8 hourly for 5 days
1 year - 5 years; 125-250 mg 8 hourly for 5 days
< 1 year; 62.5-125 mg 8 hourly for 5 days

Zinc supplementation for diarrhoea

- Zinc supplementation
 - Adults
Not required
 - Children
> 6 months; 20 mg/day for 10-14 days
< 6 months; 10 mg/day for 10-14 days

**Note**

Anti-diarrhoeal medicines like Mist Kaolin, co-phenotrope, codeine, loperamide have **no** place in the treatment of diarrhoea in children and are likely to do more harm than good. Similarly, antibiotic-containing kaolin or pectin preparations are of no therapeutic value in the management of children with diarrhoea.

REFER

Refer patient if condition does not improve or gets worse

2. CONSTIPATION

There is no objective definition of constipation because of great individual variation in normal bowel habits. Always ascertain what the patient means by constipation. Patients usually use the term constipation to mean that their faeces are too hard, they do not defaecate often enough, defaecation causes straining or there is a sense of incomplete evacuation.

It is important to evaluate what the patient means by the complaint. If frequency and/or consistency of bowel motions is outside the expected physiological variation, or has changed recently, the patient should be fully investigated for possible underlying cause. Carry out digital rectal examination. Complaints of diarrhoea alternating with constipation may indicate a large bowel cancer especially in those aged forty (40) and above. In children and the elderly, it may indicate chronic constipation with spurious diarrhoea.

Persistence of constipation despite appropriate interventions will require re-evaluation of the underlying cause. Prolonged use of laxatives is very common in the community and may be habitual. Their chronic use must be discouraged to avoid hypokalaemia and its consequences.

CAUSES

'Medical' Causes

- Diet deficient in roughage
- Ignoring the urge to defaecate e.g. due to immobility
- Myxoedema
- Irritable bowel syndrome
- Hypercalcaemia
- Drugs e.g. atropine, codeine phosphate, morphine, tricyclic antidepressants, disopyramide
- Lazy bowel from chronic laxative use including 'herbal' preparations should be ascertained
- Lack of exercise

'Surgical' Causes

- Anal fissure and other painful perianal lesions
- Carcinoma of the rectum and sigmoid colon
- Foreign body in the gut
- Pelvic mass e.g. fibroid, foetus
- Any gastrointestinal obstruction
- Aganglionic and acquired megacolon

SYMPTOMS

- Constipation itself is a symptom. When associated with inability to pass flatus, severe abdominal pain, or vomiting there may be the need for urgent referral to a surgeon.

SIGNS

- Constipation, if associated with frequent high pitched bowel sounds or absent bowel sounds

INVESTIGATIONS

- Stool routine examination
- Stool for occult blood
- Sigmoidoscopy/Colonoscopy

TREATMENT

Treatment objectives

- To identify possible cause of constipation
- To relieve constipation

Non-pharmacological treatment

- Adherence to an appropriate diet and regular exercise. Diet should include adequate amounts of fibre and fluid (four to six 250 ml glasses of fluid per day).

Pharmacological treatment

(Evidence rating: B)

- Bisacodyl, oral,
 - Adults
10-20 mg at night
 - Or**
 - Senna tablets, oral,
Adults
2-4 tablets at bedtime
 - Or**
 - Psyllium (ispaghula husk), oral,
Adults
5-10 ml once or twice a day
 - Or**
 - Liquid paraffin, oral,
10-30 ml at night
 - Or**
 - Glycerol suppositories
Adults
4 mg at night
Children
1-2 years; 2 mg at night
< 1 year; 1 mg at night

Or

Bisacodyl suppository

Adults

10 mg in the morning

Children

> 10 years;

5 mg in the morning

< 10 years;

on medical advice only

In acute illness or for hospitalised patients, the following agents are preferred:

- Lactulose liquid, oral,

Adults

15-30 ml orally daily until response then 10-20 ml daily

Children

10-18 years;

15 ml 12 hourly

5-10 years;

10 ml 12 hourly

1-5 years;

5 ml 12 hourly

< 1 year;

2.5 ml 12 hourly

Alternative treatment

- Magnesium sulphate, oral,

Adults

5-10 g in a glass of water, once or twice daily

**Note**

Do not use magnesium salts in patients with impaired renal function.

REFER

The following categories of patients should be referred to a surgeon:

- Patients with absent bowel sounds or not passing flatus
- Suspected surgical causes
- Cases resistant to treatment

3. PEPTIC ULCER DISEASE

Peptic ulcer may be duodenal or gastric. Duodenal ulcers are more common and occur more often in younger adults. Gastric ulcers usually occur after middle age.

CAUSES

- Excessive secretion of gastric acid
- Inadequate protection of the lining of the stomach and duodenum against digestion by acid and pepsin
- *Helicobacter pylori* (*H. pylori*) infection

- Medicines e.g. non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids

SYMPTOMS

- Abdominal pain
 - May be a minor discomfort, gnawing, burning, dull ache or very severe pain
 - Typically in the epigastrium or right hypochondrium
 - Occasionally high up behind the sternum or low down around the umbilicus
 - In duodenal ulcer, typically comes on when the patient is hungry and may wake the patient up in the middle of the night.
 - In gastric ulcer, it is typically worsened by food
 - Is relieved by alkalis and food in duodenal ulcer
- Vomiting may occur in both duodenal and gastric ulcers

SIGNS

- Tenderness in the epigastrium, right hypochondrium or umbilical region during an attack

INVESTIGATIONS

- Haemoglobin
- Oesophago-gastro-duodenoscopy
 - With biopsy for histology and staining (for *H. pylori*)
 - With urease test (for *H. pylori*)
- Barium meal in the absence of endoscopy
- Stool examination to exclude intestinal parasites

TREATMENT

Treatment objectives

- To relieve pain and reduce gastric acid secretion
- To promote healing of the ulcer
- To eradicate *H. pylori* if present
- To prevent recurrence of the ulcer
- To avoid complications

Non-pharmacological treatment

- Avoid smoking and alcohol intake
- Avoid foods that aggravate the pain
- Allay anxiety and stress

- Surgery - indications for surgery:
 - Chronicity - crippling periodic attacks
 - Economic factors which make it difficult for the patient to persevere with medical treatment
 - Complications
 - Perforation
 - Gastric outlet obstruction
 - Haemorrhage that does not respond to conservative measures

Pharmacological treatment (Evidence rating: A)

Dyspepsia

- Magnesium trisilicate, oral,
15 ml 8 hourly (in between meals and at bedtime to control dyspepsia)
Avoid taking antacids within 2 hours of proton pump inhibitors (PPIs).

NSAID-associated duodenal or gastric ulcer and gastro-duodenal erosions

- Esomeprazole, oral,
Adults
20 mg daily for 4 weeks. Repeat course if ulcer is not fully healed.
Or
Omeprazole, oral,
Adults
20 mg daily for 4 weeks. Repeat course if ulcer is not fully healed.
Or
Rabeprazole, oral,
Adults
20 mg daily for 4 weeks. Repeat course if ulcer is not fully healed.

Bleeding peptic ulcer

- Esomeprazole, IV,
Adults
40 mg daily
Or
Omeprazole, IV,
Adults
40 mg 12 hourly for up to 5 days

***Helicobacter pylori* Eradication**

Majority of patients presenting with duodenal ulcer are infected with *Helicobacter pylori*. Eradication of *H. pylori* should therefore be done using a 7-day course of treatment consisting of a PPI plus a combination of **two** of the antibiotics indicated in the table below.

Table 2-5: *Helicobacter pylori* Eradication Therapy

PPI	Antibiotic		
	Amoxicillin, oral,	Clarithromycin, oral,	Metronidazole, oral,
Esomeprazole, oral, 20 mg 12 hourly	1 g 12 hourly	500 mg 12 hourly	-----
	-----	500 mg 12 hourly	400 mg 12 hourly
Or Omeprazole, oral, 20 mg 12 hourly	1 g 12 hourly	500 mg 12 hourly	-----
	500 mg 8 hourly	-----	400 mg 8 hourly
	-----	500 mg 12 hourly	400 mg 12 hourly
Or Rabeprazole, oral, 20 mg 12 hourly	1 g 12 hourly	500 mg 12 hourly	-----
	-----	500 mg 12 hourly	400 mg 12 hourly

REFER

Where surgery is indicated as stated above.

4. GASTROESOPHAGEAL REFLUX DISEASE

Gastroesophageal reflux disease (GERD) is caused by backflow of gastric or duodenal contents or both past the lower oesophageal sphincter into the oesophagus without belching or vomiting.

The disease is classified into two groups based on endoscopy findings as non-erosive gastroesophageal disease (non erosive GERD) and erosive gastroesophageal disease (erosive GERD). Failure to treat may result in oesophagitis, ulceration, strictures and rarely adenocarcinoma.

CAUSES

- Hiatus hernia
- Increased intra-abdominal pressure e.g. in pregnancy
- Obesity
- Long term use of nasogastric tube
- Agents that decrease lower oesophageal sphincter pressure e.g. alcohol, cigarettes, anticholinergics (e.g. Propantheline bromide), other drugs – Morphine, Diazepam and Meperidine
- Children with chronic neurological disease

SYMPTOMS

- Heartburn - worsens with vigorous exercise, bending forward, lying; relieved by antacids and sitting upright

- Dyspepsia
- Early satiety
- Retrosternal and epigastric pain: mimics angina pectoris radiating to neck, jaws and arms; the pain is worse on bending down e.g. sweeping
- Pain on swallowing
- Nocturnal regurgitation: wakes patients up with coughing, choking and filling of the mouth with saliva
- Nocturnal regurgitation: wakes patients up with coughing, choking and filling of the mouth with saliva
- Nocturnal asthma
- In children:
 - Failure to thrive
 - Forceful regurgitation which may lead to aspiration pneumonia
 - Iron deficiency anaemia

SIGNS

- Epigastric tenderness occasionally

INVESTIGATIONS

- Barium swallow with fluoroscopy (especially useful in children)
- Oesophago-gastro-duodenoscopy (OGD) or upper gastro-intestinal tract endoscopy
- Abdominal ultrasound (to exclude other diseases)

TREATMENT

Treatment objectives

- To relieve symptoms
- To prevent complications

Non-pharmacological treatment

Lifestyle changes are very important in the treatment of GERD in all patients.

- Elevate head of bed by about 30 degrees or sleep on pillows
- Avoid sleeping within 3 hours after eating
- Avoid over-eating and heavy meals before bedtime
- Avoid foods that aggravate symptoms e.g. fatty and spicy food
- Avoid smoking and alcohol
- Avoid non-steroidal anti-inflammatory drugs (NSAIDs)
- Moderate exercise
- Weight reduction in overweight and obese individuals

- Avoid corsets, wear loose clothing
- Surgery - indications for surgery include;
 - Severe cases
 - Treatment failure
 - Complications

Pharmacological treatment (Evidence rating: B)

Non-erosive GERD

- Antacids and alginate-containing antacids
- Omeprazole, oral,

Adults

20 mg daily for 4 to 8 weeks

Children

> 20 kg; 20 mg daily

10-20 kg; 10 mg daily

Or

Esomeprazole, oral,

Adults

40 mg daily for 4 to 8 weeks

Or

Rabeprazole, oral,

Adults

20 mg daily for 4 to 8 weeks

Severe or Erosive GERD

- Omeprazole, oral,

Adults

20-40 mg daily for 8 weeks

Children

> 20 kg; 40 mg daily

10-20 kg; 20 mg daily

Or

Esomeprazole, oral,

Adults

40 mg daily for 8 weeks

Or

Rabeprazole, oral,

Adults

20-40 mg daily for 8 weeks

- Prokinetic drugs (e.g. Metoclopramide or Domperidone) that stimulate gastric emptying and increase lower oesophageal sphincter contractions should be added to PPI's in severe disease with bloating
Metoclopramide, oral,
10-20 mg 6-8 hourly
Or
Domperidone, oral,
10 mg 6-8 hourly

REFER

Refer cases not responding to the measures above to a physician or surgical specialist.

5. PAIN ORIGINATING FROM THE OESOPHAGUS

Oesophageal pain is usually burning in quality and tends to be localized behind the sternum. It may sometimes be confused with other causes of chest pain (see section on **Chest Pain**).

CAUSES

- Irritation of the oesophageal mucosa by reflux of the acidic contents of the stomach (reflux oesophagitis)
- Hiatus hernia
- Spasm of the oesophageal muscle in response to obstruction.
- Tumours

SYMPTOMS

- Chest pain
 - Associated with meals
 - Worse on regurgitation
 - Worse on lying flat
- Difficulty in swallowing

SIGNS

- Usually none

INVESTIGATIONS

- Barium meal examination
- Endoscopy

TREATMENT

Treatment objectives

- To relieve pain
- To treat identified cause

Non-pharmacological treatment

- Bland foods and milk (may sometimes relieve the pain)

Pharmacological treatment

- Antacids (may sometimes relieve the pain)

REFER

Refer to a specialist for confirmation of diagnosis and management.

6. HAEMORRHOIDS

Most patients with anal conditions complain of “piles” regardless of what anorectal symptoms they have. Haemorrhoids are enlarged, displaced anal cushions derived from engorged veins.

First degree haemorrhoids remain in the rectum. Second degree haemorrhoids prolapse, but reduce spontaneously, whereas third degree haemorrhoids prolapse and have to be replaced manually or remain prolapsed permanently until repaired.

Always do a digital rectal examination to exclude carcinoma. Haemorrhoids developing during pregnancy should be managed conservatively as most will resolve after delivery. No treatment is required for haemorrhoids that are asymptomatic. Avoid the use of purgatives.

CAUSES

- Increased intra-abdominal pressure e.g. chronic cough, pregnancy, intra-abdominal or pelvic tumours
- Familial predisposition
- Anorectal tumours (secondary haemorrhoids)

SYMPTOMS

- Passage of bright red blood at defaecation
- Mucoïd discharge
- Swelling at anus
- Perianal irritation or itch (pruritus ani)
- Discomfort after opening bowels
- Pain occurs only during an acute attack of prolapse with thrombosis, congestion and oedema

SIGNS

- Inspection of the anus may be normal
- Redundant folds of skin (skin tags) may be seen in the position of the haemorrhoids and straining may show the haemorrhoids. In third degree haemorrhoids, there is a swelling at the anus

- Internal haemorrhoids are not palpable inside the rectum unless thrombosed
- The patient may present with a complication of the haemorrhoids e.g. profuse bleeding, prolapse, strangulation, thrombosis, infection or ulceration or severe anaemia

INVESTIGATIONS

- FBC
- Proctoscopy (the gold standard for diagnosis)
- Sigmoidoscopy (to exclude carcinoma of rectum)

TREATMENT

Treatment objectives

- To correct anaemia, if present
- To relieve symptoms
- To prevent complications

Non-pharmacological treatment

- Increase intake of fluid and roughage
- Avoid prolonged straining at defecation
- For prolapsed haemorrhoids, lie patient down and elevate the foot end of the bed. Try gentle digital reduction after application of local anaesthetic cream. If this fails, apply cold compresses. Sedation of the patient may be required
- For infected haemorrhoids, warm sitz baths 2-3 times a day

Pharmacological treatment

(Evidence rating: C)

When associated with constipation:

- Liquid paraffin, oral,

Adults

10-30 ml at night

Or

Senna granules, oral,

Adults

1 sachet with water after supper

When associated with local itching or discomfort:

- Ointments or suppositories (with or without steroids), applied or inserted anally,

Adults

One suppository 12 hourly for 7-10 days

When associated with local itching or discomfort:

- Ointments or suppositories (with or without steroids), applied or inserted anally,

Adults

One suppository 12 hourly for 7-10 days

If haemorrhoids infected:

- Gentamicin, IV,

Adults

40-80 mg 8 hourly for 5 to 7 days

Plus

- Metronidazole, oral,

Adults

400 mg 8 hourly for 5 to 7 days

Alternative treatment

- Ciprofloxacin, oral,

Adults

500 mg 12 hourly

Plus

Metronidazole, oral,

Adults

400 mg 8 hourly for 5 to 7 days

Or

Amoxicillin, oral,

Adults

500 mg 8 hourly

Plus

Metronidazole, oral,

Adults

400 mg 8 hourly for 5 to 7 days

When associated with anaemia:

- Iron preparation (ferrous sulphate/fumarate)

Or

Blood transfusion as indicated (see section on **Anaemia**)

REFER

The patient should be referred to a facility with resources for injection sclerotherapy, rubber band ligation or operative treatment if indicated.

7. AMOEBIC LIVER ABSCESS

This is a collection of brownish coloured fluid in the liver occurring often as a single mass in the right lobe, as a complication of intestinal infection with *Entamoeba histolytica*. Occasionally, pyogenic abscesses may have a similar clinical presentation, and will require treatment with appropriate antibiotics

CAUSES

- *Entamoeba histolytica*

SYMPTOMS

- Right upper abdominal pain
- Abdominal distension
- Fever
- Cough

SIGNS

- Large tender liver
- Tenderness and or bulging at right intercostal spaces
- Jaundice
- Dullness to percussion on the right lower zones with basal crepitations

INVESTIGATIONS

- Abdominal ultrasound
- Chest X-ray
- FBC
- Stool examination

TREATMENT

Treatment objectives

- To eradicate infection
- To prevent further destruction of liver tissue
- To prevent rupture of abscess into pleural, pericardial or peritoneal space

Non-pharmacological treatment

- Surgical drainage of abscess if indicated

Pharmacological treatment

(Evidence rating: A)

- Metronidazole, oral,

Adults

800 mg 8 hourly for 10 days

Children

7-12 years;

200-400 mg 8 hourly for 10 days

4-7 years;

200 mg 8 hourly for 10 days

1-3 years;

100-200 mg 8 hourly for 10 days

Or

Tinidazole, oral,

Adults

2 g daily for 3-6 days

Children

50-60 mg/kg daily for 5 days

REFER

Patients with abscesses that are large or not responding to treatment will need to be referred to a physician or surgical specialist.

8. JAUNDICE

This is a condition in which the skin, palms and the sclerae become yellow in colour as a result of elevated levels of bilirubin in the bloodstream. The symptoms and signs that accompany jaundice often give helpful clues to the underlying cause.

In adults and children, hyperbilirubinaemia may result in hepatic encephalopathy (See sections on **Chronic Hepatitis, Obstructive Jaundice and Liver Failure**).

Jaundice in neonates can result in kernicterus because of the consequences of hyperbilirubinaemia on the brain of the newborn. Kernicterus causes death in most infants and survivors suffer mental and physical handicaps with cerebral palsy, high frequency nerve deafness, poor memory, low IQ and visual-motor incoordination.

Jaundice appearing in the first 48 hours after birth, or a bilirubin concentration >170 micromol/L in premature infants, or >255 micromol/L in full-term infants, warrants investigation. However, jaundice appearing from the third day after birth onward is usually physiological.

Exchange transfusion is the definitive treatment for Hyperbilirubinaemia that has reached the level where kernicterus may occur.

CAUSES**Adults**

- Hepatitis - viral, alcoholic, drug-induced (including allopathic and herbal preparations)

- Haemolysis from various causes including malaria, glucose-6-phosphate dehydrogenase (G6PD) deficiency and sickle cell disease, allopathic drugs and herbal concoctions
- Chronic liver diseases - decompensated cirrhosis, biliary cirrhosis, chronic hepatitis, hepatoma
- Gall bladder diseases - stones, infections
- Carcinoma of head of pancreas
- Septicaemia

Pregnancy

(See section on **Jaundice in Pregnancy**)

Children

- Physiological jaundice - jaundice appearing between the 2nd to 5th day of life for which all other causes have been excluded
- Haemolysis - sickle cell disease, G6PD deficiency, drugs and herbs, Haemolytic disease of the newborn
- Extravasation of a large amount blood
- Infections - particularly septicaemia
- In the newborn, congenital infections, conditions of reduced red cell life span, impaired liver uptake and excretion of bilirubin, increased enteric reabsorption of bilirubin and biliary atresia

SYMPTOMS

- Yellowish or greenish discolouration of the eyes or skin
- Itching
- Deep yellow discolouration of urine
- Pale stools

SIGNS

- Pallor (may indicate possibility of haemolysis, chronic disease or malignancy)
- Scratch marks (indicative of obstruction)
- Hepatomegaly (may be tender)
- Splenomegaly in portal hypertension
- Palpable gall bladder
- Ascites
- Bleeding tendencies (cephalohaematoma, subgaleal haematoma, upper gastrointestinal bleeding)
- Hepatic flap (indicative of liver failure)

INVESTIGATIONS

Adults and children

- FBC
- Sickling status
- Liver function tests
- G6PD status
- Hepatitis Bs Ag
- Prothrombin time, INR
- Blood culture
- Urinalysis
- Abdominal ultrasound

Newborn

- Total and direct serum bilirubin concentration
- Haematocrit, reticulocyte count, direct Coombs test
- Blood film for red cell anomalies
- Blood group and rhesus (Rh) group of both infant and mother
- G6PD status
- Cultures of blood, urine, and spinal fluid may be indicated by the history, physical examination or initial laboratory findings
- Abdominal ultrasound

TREATMENT

Treatment objectives

- To identify and treat cause of jaundice
- To relieve symptoms associated with jaundice
- To prevent complications associated with elevated levels of bilirubin in the blood

Non-pharmacological treatment

Newborns

- Phototherapy is used if the jaundice is mild e.g. term babies with physiological jaundice with serum bilirubin levels less than 340 micromol/L

Pharmacological treatment

(Evidence rating: A)

- Exchange transfusion, via umbilical vein, 160 ml/kg over about 2 hours



Note

Use warm blood (37°C), cross-matched against maternal and infant serum. Monitor heart rate, respiratory rate, bilirubin and blood glucose during the procedure.

Note

Use warm blood (37°C), cross-matched against maternal and infant serum. Monitor heart rate, respiratory rate, bilirubin and blood glucose during the procedure. Further exchanges may be needed if the bilirubin level continues to rise. Stop the exchange transfusion if the heart rate fluctuates by more than 20 beats/minute.

The threshold for intervention by phototherapy or exchange transfusion should be lower in the following cases: in sick or low birth weight babies, or following asphyxia, prolonged hypoxemia, acidosis and sepsis.

Since there is no exact test to determine the risk of kernicterus and hence the level at which exchange transfusion is necessary the following rule of thumb has proved useful as a guide;

- Serum bilirubin of more than 340 micromol/L in term infant i.e. $>2 \text{ kg or (body weight (kg) } \times 10) \times 17 \text{ micromol/L}$ in newborns weighing $<2 \text{ kg}$
- Cord Hb $<12 \text{ g/dL}$ or cord bilirubin $>80 \text{ micromol/L}$
- Rate of rise of bilirubin $>17 \text{ micromol/L/hr}$ (1 mg/dL/hr)
- Rapid progression of anaemia in presence of resolving jaundice
- Hydrops fetalis (requires immediate exchange with packed cells)

REFER

Refer newborns with deep jaundice requiring exchange transfusion where the facility is not available.

9. HEPATITIS

Hepatitis is an inflammation of the liver with multiple aetiologies. It may present as an acute illness with jaundice and altered liver function tests. When symptoms, signs or laboratory abnormalities persist for more than 6 months it is considered that the hepatitis is chronic.

ACUTE HEPATITIS CAUSES

- Viruses (Hepatitis A, B, C, D and E, Yellow Fever etc.)
- Drugs (allopathic, alternative and herbal preparations)

SYMPTOMS

- Right hypochondrial pain
- Fever (occurring 1 to 4 weeks before the jaundice appears)
- Malaise
- Anorexia
- Nausea
- Yellow or dark coloured urine and pale stools
- Itching
- Fatigue

SIGNS

- Jaundice
- Right hypochondrial tenderness
- Hepatomegaly

INVESTIGATIONS

- FBC
- Liver function tests
- Hepatitis Bs Ag + Hepatitis C
- Abdominal Ultrasound

TREATMENT

Treatment objectives

- To identify and eliminate the precipitating cause
- To relieve symptoms

Non-pharmacological treatment

- Rest
- High calorie fluids especially glucose drinks, fruit juice, light porridge, koko, rice-water, mashed kenkey
- Any food that the patient can tolerate
- Avoid alcohol

Pharmacological treatment

(Evidence rating: B)

- Vitamin B preparations

REFER

Refer patients with rapidly progressing symptoms and signs to a physician specialist

CHRONIC HEPATITIS

This refers to chronic inflammation of the liver of more than 6 months duration, with persistently elevated liver function tests. Chronic hepatitis can progress to liver cirrhosis, portal hypertension with upper gastrointestinal bleeding, hepatic encephalopathy and hepatocellular carcinoma.

Immunisation against Hepatitis B is now available for children under the Expanded Programme on Immunisation (EPI). Adults at risk (especially health workers) should be immunized against Hepatitis B infection after initial assessment of their immunological status regarding previous exposure to the virus.

CAUSES

- Chronic infection of the liver with hepatitis B and C viruses

SYMPTOMS

- Usually asymptomatic
- Chronic fatigue

- Malaise

SIGNS

- Ascites
- Gynaecomastia
- Palmar erythema
- Parotid enlargement
- Testicular atrophy
- Spider naevi
- Dupuytren's contracture
- Jaundice

INVESTIGATIONS

- Hepatitis B s antigen, Hepatitis B e antigen, Viral DNA load
- Hepatitis C antigen
- HIV testing
- Abdominal Ultrasound

TREATMENT

Treatment objectives

- To prevent disease progression and complications
- To prevent hepatic encephalopathy

Non-pharmacological treatment

- Avoid alcohol
- Avoid hepatotoxic agents and drugs e.g. Paracetamol

Pharmacological treatment

(Evidence rating: B)

- Definitive drug therapy is long term and expensive and must be undertaken by a Specialist

REFER

All patients with chronic liver disease to a physician specialist

10. HEPATIC ENCEPHALOPATHY

This describes a syndrome with neuropsychiatric features reflecting a state of disordered central nervous system function, due to inability of the liver to detoxify ammonia and other chemicals as a result of severe liver disease and failure. It may be a complication of either acute or chronic liver disease.

CAUSES

- Viral hepatitis

- Cirrhosis of the liver
- Fatty liver of pregnancy
- Drugs e.g. halothane, isoniazid, paracetamol overdose, herbal concoctions
- Longstanding cholestasis
- Precipitating factors including:
 - Hypotension
 - Infection
 - Fluid and electrolyte imbalance (excessive use of loop diuretics)
 - Sedatives
 - Increased gastrointestinal tract (GIT) protein load e.g. heavy GIT bleeding
 - Alcoholic binge

SYMPTOMS

- Jaundice
- Fever
- Disturbed consciousness which progresses as follows: disorder of sleep, hypersomnia and inversion of sleep rhythm, apathy and eventually coma
- Personality changes

SIGNS

- Intellectual deterioration
- Cyanosis
- Fetor hepaticus
- Speech impairment
- Features of chronic liver disease
- Neurological abnormalities:
 - Asterixis (a flapping tremor) indicates precoma and strongly supports the diagnosis of encephalopathy
 - Inability to draw or construct objects e.g. a 5-pointed star
 - Incoordination
 - Impaired handwriting
- Encephalopathy:
 - Grade 1: Mild confusion, irritable, tremor, restless
 - Grade 2: Lethargic responses, decreased inhibitions, disorientation, agitation, asterixis
 - Grade 3: Stuporous but arousable, aggressive bursts, inarticulate speech and marked confusion

- Grade 4: Coma

INVESTIGATIONS

- FBC
- Blood glucose
- Liver function tests
- Blood urea and electrolytes
- Hepatitis BsAg, Hepatitis C
- Prothrombin time, INR

TREATMENT

Treatment objectives

- To identify and correct precipitating factors

Non-pharmacological treatment

- Place in the coma position if unconscious
- Daily tap water enemas may be used to further reduce enteric bacteria
- Avoid protein feeds, sedatives and drugs metabolized by the liver. Increase protein intake slowly on recovery.
- Encourage intake of high carbohydrate diet by mouth or NG tube
- Maintain fluid and electrolyte balance.
- Monitor temperature, pulse and respiratory rate, blood pressure, pupils, urine output and blood glucose regularly
- Avoid paracetamol and other hepatotoxic drugs and agents

Pharmacological treatment (Evidence rating: C)

Prevent worsening coma by emptying the bowel with:

- Magnesium sulphate, oral,
Adults
15 ml 8 hourly
Or
Lactulose liquid, oral,
Adults
30-50 ml 8 hourly. (Aim for 2 soft stools /day and no diarrhoea)
- Glucose 5-10%, IV,
Adults
500 ml 8 hourly
- High potency Vitamin B, IV, (formulated as two separate vials)
Adults
One pair of vials daily - added to glucose IV solution

- Metronidazole, oral,
Adults
400 mg 8 hourly
Or
Neomycin, oral,
Adults
1 g 6 hourly

If the patient starts bleeding or INR >1.5, administer:

- Vitamin K (Phytomenadione), IV or oral, avoid IM injections
10 mg daily for 5-7 days
- Platelets, fresh frozen plasma and blood should be given as needed cautiously
Treat stress ulceration with:
- Omeprazole, IV,
Adults
40 mg daily **or** oral, 20 mg daily
Or
Ranitidine, IV,
Adults
50 mg 8 hourly **or** oral 150 mg 12 hourly
Treat any infection that may be present appropriately (See section on **specific infections**)

REFER

Refer if the condition does not improve. All children with hepatic encephalopathy must be referred to a specialist.

11. ASCITES

Ascites is an abnormal accumulation of fluid in the peritoneal cavity.

CAUSES

- May arise as a complication or sequelae of chronic liver disease, kidney or heart failure, abdominal tuberculosis, intra-abdominal or pelvic malignancies.

SYMPTOMS

- Abdominal enlargement
- Difficulty breathing

SIGNS

- Distended abdomen

- Abdominal tenderness
- Signs relating to the underlying causes (see appropriate chapter)

INVESTIGATIONS

- A diagnostic paracentesis for:
 - Appearance and colour
 - Biochemistry
 - Culture and sensitivity
 - Acid fast bacilli
 - Cytology
- Abdominal and pelvic ultrasound scan
- Appropriate investigations for specific causes

TREATMENT

Treatment objectives

- To relieve symptoms
- To identify and manage underlying cause

Non-pharmacological treatment

- Bed rest
- Salt restriction <2 g/day
- Fluid restriction to 1.5 L/day
- Paracentesis (sterile abdominal tap) in massive ascites with respiratory compromise

Pharmacological treatment

(Evidence rating: B)

- Furosemide, oral, (avoid in liver disease)

Adults

40 mg 12 hourly

Children

1-2 mg/kg daily

And

- Spironolactone, oral, (only with normal renal function)

Adults

50-100 mg daily

Children

0.3-3 mg/kg daily

REFER

Refer when underlying cause cannot be identified.

12. MALNUTRITION

Food is necessary for proper growth, development of the body and maintenance of health. A normal and properly balanced diet, consists of food that has sufficient amounts of proteins necessary for growth and maintenance, carbohydrates and fats necessary for energy and vitamins and minerals for protecting against disease.

Malnutrition occurs when there is a deficiency in intake of some or all of the above nutrients. It is most commonly seen in children less than five years, particularly after weaning. In many cases, the malnourished child is brought to the health unit because of other complaints such as diarrhoea, vomiting, fever, worms or cough. In adults, malnutrition frequently occurs in association with chronic alcoholism.

Malnutrition can result in a breakdown of the child's or adult's ability to fight disease and infection. An infection in a malnourished individual may thus become very severe and result in death. A child suffering from malnutrition may have features of marasmus, kwashiorkor or both (marasmic-kwashiorkor). These children lack both protein and sources of energy (Protein Energy Malnutrition, PEM).

Protein Energy Malnutrition (PEM) is divided into 3 stages using weight/age, weight/height and mid upper arm circumference. The mild form of PEM is the commonest type in Ghana.

Mild PEM

- Weight for age: <80% but >75%
- Weight for height: 70-80%
- Mid Upper Arm circumference: 12.5 -13.5 cm
- The child is thin with some muscle wasting
- The child plays less because of lack of energy.

Moderate PEM

- Weight for age: <75% but >60%
- Mid Upper Arm circumference: 12.0 -12.5 cm
- Early signs of kwashiorkor or marasmus may be present.
- The symptoms and signs are as in mild PEM but more pronounced

Severe PEM

- Weight for age: < 60% of expected weight for age
- Weight for height: < 70%
- Mid Upper Arm circumference: < 12 cm.
- In this stage there are signs of marasmus, kwashiorkor or marasmic - kwashiorkor.

CAUSES

- Inadequacy of quality and/or quantity of food intake
- Social neglect
- Chronic illness and cancers
 - Infections and infestations (children):
 - Measles, pertussis HIV, pulmonary tuberculosis
 - Worm infestations
- Alcoholism (adults)

SYMPTOMS

- Weight loss
- Poor weight gain (marasmus)
 - May be noted as drop or flattening in weight on the “Road To Health” Chart
- Body swelling (Kwashiorkor)
- Lack of energy
- Apathy
- Disinterest in food

SIGNS**Marasmus**

- Thin (reduced muscle bulk)
- Prominent bones
- Hanging skin folds especially over the buttocks
- Unusually alert
- Looks like an old man

Kwashiorkor

- Thin and wasted arms
- Puffy face and legs due to oedema
- Brownish or reddish hair
- Flaky skin rash especially on the legs
- Sores on the oedematous parts of the body in severe cases
- Miserable and apathetic appearance
- Disinterest in food

INVESTIGATIONS

- FBC
- Urea and electrolytes
- Urine culture and sensitivity
- Chest X-ray

- HIV testing
- Gastric lavage for acid fast bacilli

TREATMENT

Treatment objectives

- To correct the nutritional deficiency
- To prevent reoccurrence
- To check and correct complications
- Fluid and electrolyte imbalance
- Anaemia
- To identify and treat underlying infections and infestations
- To adequately manage chronic illnesses

Non-pharmacological treatment

Acute phase

- Frequent feeding with small amounts of a balanced diet
- Moderate calorie food intake initially

Recuperation phase

- Meals should be introduced progressively
- High calorie concentrated foods for growth enhancement
- Return to acceptable balanced family meals
- Participation of parents and care givers in nutrition education
 - Preventive methods including:
 - Growth monitoring
 - Breast-feeding for at least 6 months and up to 2 years
 - Introduce a weaning diet at 4-6 months, using locally available foods
 - Encourage family planning
 - Encourage a balanced diet for the family including pregnant and lactating women
 - Encourage nutrition education in schools and villages and include fathers

Pharmacological treatment

(Evidence rating: C)

- Immunize all children as per Expanded Programme on Immunization (EPI) guidelines
- Vitamin A supplementation

Children

1-6 years;

200,000 I.U. 6 monthly

< 1 year;

100,000 I.U. 6 monthly

- Treatment of underlying infections and infestations (see appropriate section)
- Treat alcoholism in adults (see section on **Chronic Alcoholism**)

REFER

Refer the child, parents and caregivers to the Reproductive and Child Health (RCH) Unit and the Social Welfare Department within the health facility, district or region.

Adults with malnutrition should be referred to the appropriate specialist for management of the underlying cause or in cases of neglect; the patient's family should be referred to the Social Welfare Department.

13. ANAEMIA

Anaemia is defined as decreased concentration of haemoglobin for the age and sex of the individual (i.e. below 13 g/dL in adult males, 12 g/dL in adult females, 11 g/dL in children, and below 13.5 g/dL in the 1st week of life). Anaemia always has a cause which must be identified and properly managed. The condition giving rise to the anaemia may be acute or chronic. Investigate the cause before initiating treatment. In an emergency, take blood samples before treatment.

CAUSES

Micronutrient and vitamin deficiency

- Iron
- Folic acid
- B₁₂ which is more commonly due to problems with absorption

Bleeding

- Heavy menstrual periods
- Haemorrhoids (piles)
- Peptic ulcers
- Infestations e.g. hookworm, bilharzia
- Cancers
 - Leukaemias
 - Lymphomas
 - Others

Haemolysis

- Malaria
- Sickle cell disease
- G6PD deficiency
- Hypersplenism
- Autoimmune
- Drugs

Bone marrow failure

- Disease infiltration e.g. leukaemia
- Aplasia – primary or secondary e.g. due to cytotoxics
Chronic diseases
- Kidney disease
- Tuberculosis
- Hypothyroidism

SYMPTOMS

- Easy fatigability

- Dizziness
- Shortness of breath on exertion
- Palpitations
- Fresh blood in stools
- Black stools
- Haematuria

SIGNS

- Pale mucous membranes and palms
- Angular stomatitis
- “Spoon shaped” and ridged finger and toe nails
- Spleen and liver may be palpable
- Signs of heart failure (in severe anaemia)
- Jaundice (in haemolysis)
- Petechiae and purpura (in aplastic anaemia)

INVESTIGATIONS

- FBC
- Reticulocyte count and blood film comment
- Sickling test and Hb electrophoresis if indicated
- Blood film for malaria parasites
- Stool for hookworm ova
- Urine for schistosome ova
- Specialized tests depending on the suspected cause e.g. bone marrow examination in suspected marrow failure

TREATMENT

Treatment objectives

- To treat underlying cause of anaemia
- To restore haemoglobin levels to normal
- To replenish iron stores after correction of anaemia in iron deficiency
- To restore haemoglobin to steady state level in sickle cell disease patients
- To correct anaemia in proven vitamin B₁₂ deficiency and maintain normal levels life-long
- To correct anaemia and maintain daily supplements in folate deficiency

Non-pharmacological treatment

- Advise on a balanced diet. Regular intake of leafy foods e.g. “nkontomire” as well as fresh fruits and vegetables, beans, liver, meat, eggs, fish
- Early reporting to hospital with unusual loss of energy, bleeding, and black stools

Pharmacological treatment (Evidence rating: B)

Iron deficiency

- Ferrous sulphate, oral,

Adults

200 mg 8 hourly

Children

3-6 mg/kg 8-12 hourly

>10 yrs;

200 mg 12 hourly

8-10 yrs;

200 mg daily

5-7 yrs;

80-120 mg 8-12 hourly

1-4 yrs;

45-90 mg 8-12 hourly

< 1 year;

30-60 mg 8-12 hourly

Alternative treatment

- Ferrous fumarate, oral,
200 mg elemental iron per day in three divided doses

Or

Any polysaccharide oral iron preparation

200 mg elemental iron per day in three divided doses

Folate deficiency

- Folic acid, oral,

Adults

5 mg daily for 30 days

Children

2.5-5 mg daily for 30 days

- Continue treatment for 3 months after haemoglobin level normalises, in order to replenish iron stores
- Rinse mouth after administration of syrup to prevent discolouration of teeth
- Severe anaemia with signs of cardiac failure will need treatment of the heart failure in addition to blood transfusion with packed cells.

Vitamin B₁₂ deficiency

- Hydroxocobalamin, IM,

Adults

1 mg three times a week for 2 weeks then 1 mg every 3 months

REFER

- Specialist referrals are indicated in patients with;
 - recurrent severe anaemia which is not due to sickle cell disease
 - anaemia due to uncontrolled bleeding

- haemoglobin levels that do not improve after two weeks on the above treatment
- heavy menstrual loss (to a gynaecologist)
- specialized investigations unavailable at point of care

14. BLEEDING DISORDERS

These are diseases characterised by excessive bleeding. They may be present from birth or acquired later in life. The bleeding may be due to defective blood vessels, platelet disorders or clotting factor deficiency. A good history is important in distinguishing between the various causes. Past episodes of excessive bleeding e.g. following circumcision, a family history of bleeding and drug therapy should be enquired about.

Bleeding may be spontaneous or follow trauma or surgery. The pattern of bleeding is a helpful guide to its cause: in platelet and vessel wall defects, bleeding is usually into skin and mucosal surfaces like the gums, nose, gastrointestinal tract; in coagulation factor deficiency (e.g. haemophilia), bleeding is into deep tissues like the brain, joints and muscles.

In newborns with Vitamin K deficiency (which leads to multiple coagulation factor deficiency) spontaneous bleeding occurs from various sites such as the umbilical cord, gastrointestinal tract, scalp, brain. There is usually a history of failure to administer Vitamin K injection at birth.

Patients may be severely anaemic and in haemorrhagic shock if there is a large bleed.



Note

For information on appropriate blood products for various bleeding disorders see “National Guidelines for the Clinical Use of Blood and Blood Products in Ghana” for more details.

CAUSES

- Liver disease
- Vitamin K deficiency especially in newborns
- Drug induced - herbal preparations, warfarin, heparin, NSAIDs e.g. Aspirin, ibuprofen
- Bone marrow failure and malignancy e.g. aplastic anaemia and leukaemia
- Low platelet count from any cause
- Haemophilia
- Severe septicaemia resulting in Disseminated Intravascular Coagulation (DIC)

SYMPTOMS

- Spontaneous bleeding from mucous membranes or cuts
- Easy bruising
- Excessive bleeding from cuts or incisions
- Swelling at site of blood collection e.g. joints
- Pain

SIGNS

- Excessive bleeding
- Swelling at site of blood collection e.g. joints
- Tenderness
- Purpura
- Pallor

INVESTIGATIONS

- FBC
- Platelet count and blood film comment
- Bleeding time
- Prothrombin time, partial thromboplastin time
- Liver function tests

TREATMENT**Treatment objectives**

- To prevent or arrest life-threatening bleeding
- To identify and correct underlying cause

Non-pharmacological treatment

- Apply pressure dressing or ice packs to minimise bleeding where possible
- Stop any drugs thought to be responsible for bleeding or which may aggravate bleeding
- Educate haemophiliacs on their disease, encouraging them to minimise trauma prone activities, and to inform doctors of their condition before any surgical procedure
- Avoid unnecessary injections and surgical procedures in all patients (especially those with a family history of bleeding tendencies)

Pharmacological treatment**(Evidence rating: B)****Liver disease**

- Vitamin K, IV,
Adults
10 mg stat

Children

3-5 mg stat

Neonates (irrespective of history of vitamin K injection)

Term; 1 mg

Preterm; 500 micrograms

- Fresh frozen plasma

Adults, Children, Neonates

15-20 ml/kg

Acute severe blood loss

- Fresh Whole Blood, IV,

Adults, Children and Neonates

5 ml/kg for each 1 g/L Hb rise expected

Haemophilia A

Cryoprecipitate, IV,

Adults, Children, Neonates

1.5-2.0 packs/10 kg

Haemophilia B and DIC

- Fresh frozen plasma

Adults, Children, Neonates

15-20 ml/kg

Thrombocytopenia requiring platelet transfusion

- Platelet concentrate

Adults, Children, Neonates:

10 ml/kg (raises platelet count by 50,000 per microlitre)

Shock

- Sodium chloride 0.9%

(See section on **Shock**)**Alternative treatment****Haemophilia A and von Willebrand's disease**

- Desmopressin, SC or IV,

Or

Recombinant factor VIII, IV,

Haemophilia B

- Recombinant factor IX

Prevention of local fibrinolysis

- Tranexamic acid, oral and IV,

REFER

Refer all haemophiliacs, all patients with unexplained recurring bleeding episodes and those requiring surgery to the physician specialist or haematologist for further evaluation.

15. SICKLE CELL DISEASE

This is a hereditary disease characterized by the possession of two abnormal haemoglobins, one of which is haemoglobin S.

There are various types, including HbSS, HbSC and HbS β -thalassaemia. The possession of one normal haemoglobin (haemoglobin A) together with one abnormal haemoglobin (e.g. AS or AC) does not constitute sickle cell disease. It is a haemoglobinopathy trait.

The use of the word 'sickler' to describe patients with sickle cell disease must be avoided. It has no meaning and tends to give a person an unfavourable label.

Sickle cell disease patients may present either in the steady state, in crises or with complications.

The crises are commonly vaso-occlusive (precipitated by cold weather, dehydration, infection, ischaemia or physical exertion), which often cause pain in the bones. Other types of crises may also occur. These include haemolytic, aplastic and sequestration crises. In aplastic crises there is anaemia with a low reticulocyte count. In sequestration crises, the spleen and liver enlarge rapidly due to trapping of red blood cells. Anaemia is very severe in this case.

Patients with sickle cell disease should be encouraged to have periodic check-ups at a Sickle Cell Clinic.

SYMPTOMS

- Joint and bone pain, especially during cold wet seasons
- Periodic jaundice
- Abdominal pain, especially in the splenic area
- Spontaneous sustained erection without sexual arousal in male patients (see section on Priapism)

SIGNS

- Jaundice
- Pallor
- Hepatomegaly
- Splenomegaly (may be absent in older patients)
- There may be old or recent scarification marks particularly over the abdominal wall
- Venous ulcers

INVESTIGATION

- FBC
- Sickling test
- Haemoglobin electrophoresis

TREATMENT**Treatment objectives**

- To prevent the development of sickle cell crises
- To identify and manage the precipitating cause
- To manage sickle cell crises and complications

Non-pharmacological treatment

- Avoid common precipitating causes of crises such as malaria, pneumonia and exposure to extremes of weather
- Encourage drinking plenty of fluids to prevent dehydration
- Maintain a good nutritional state
- Prompt treatment of infections
- Genetic counseling and parental education

Pharmacological treatment**(Evidence rating: B)****In Crisis**

- Glucose in Sodium Chloride, IV,
Adults
Glucose 5% in Sodium Chloride 0.9% 2-4L daily
Children
Glucose 4.3% in Sodium Chloride 0.18% 150 ml/kg daily
- Paracetamol, oral or suppository, 6-8 hourly or Ibuprofen, oral, 8 hourly (for pain relief)

Table 5-1 : Pain Management in the Sickle Cell Patient

	Paracetamol	Ibuprofen
Adults	500 mg-1 g	400-600 mg
Children		
6-12 years	250-500 mg	200-400 mg
1-5 years	120-250 mg	100-200 mg
3 months to 1 year	60-120 mg	Not recommended

- Pethidine, IM, (if in severe pain). Do not give if there is difficulty in breathing.

Adults

25-100 mg 4-6 hourly as required

Children

0.5–2 mg/kg 4–6 hourly as required

- Blood transfusion (packed cells) when needed, but not routinely. Transfusion will be necessary if haemoglobin level < 5 g/dl

In the Steady State

- Folic acid, oral,

Adults

5 mg daily

Children

> 1 year;

5 mg daily

< 1 year;

2.5 mg daily

REFER

Refer all sickle cell patients with complications such as bleeding into the eye, aseptic necrosis of the hip, priapism, haematuria, stroke, osteomyelitis, persistent proteinuria and persistent jaundice to the appropriate specialist.

16. MULTIPLE MYELOMA

In multiple myeloma, abnormal plasma cells are produced in the bone marrow. These abnormal plasma cells produce abnormal immunoglobulins in excess. The abnormal plasma cells in the bone marrow result in a reduction in normal blood cell production and erosion of bone with release of calcium. The abnormal immunoglobulin in blood results in hyperviscosity, renal failure and impaired ability to fight infections. Multiple myeloma usually affects adults above the age of 40 years.

CAUSES

- Usually unknown
- Chemicals e.g. dioxins, solvents and cleaning agents
- Radiation
- Viruses e.g. Herpes virus 8, Epstein-Barr, HIV, Hepatitis virus

SYMPTOMS

- Bone pain
- Excessive thirst
- Excessive micturition
- Easy fatigability

SIGNS

- Pallor
- Recurrent infections

- Bony lumps
- Pathological fractures

INVESTIGATIONS

- FBC and blood film comment
- ESR
- Skeletal survey including skull X-ray
- Serum protein levels
- Serum protein electrophoresis
- Urine Bence Jones protein
- Blood urea, electrolytes, creatinine
- Plasma calcium levels
- Serum uric acid

TREATMENT

Treatment objectives

- To reduce the number of abnormal plasma cells to normal and reduce their rate of increase
- To treat anaemia
- To reduce bone pain
- To manage pathological fracture
- To improve or maintain good bone mineral density
- To reduce the incidence of infections and renal complications

Non-pharmacological treatment

- Patients should drink at least 3 litres of fluid each day throughout the course of their disease

Pharmacological treatment

Supportive treatment if indicated:

- Sodium chloride 0.9%, IV,
- Allopurinol, oral, 100-300 mg daily
- Blood transfusion
- Analgesia (avoid NSAIDs in renal failure)
- Disodium Pamidronate, IV, 90 mg monthly
- Epoetin alfa, 3000 units 2-3 times a week

Active agents

- Melphalan, oral,
- Prednisolone, oral,
- Vincristine, IV,
- Doxorubicin hydrochloride, IV,

- Doxorubicin hydrochloride, IV,
- Dexamethasone, oral,
- Thalidomide, oral

REFER

All patients should be referred to a tertiary centre for further evaluation and definitive management. Follow-up can be done by a physician specialist with guidance from the haematologist.

17. LEUKAEMIA

Leukaemia is the uncontrolled production of white cells at different stages of maturation. There are two main types of leukaemia depending on the type of white cell affected. These are lymphoid leukaemia and myeloid leukaemia. Each can further be divided into acute (where the patient falls suddenly ill) and chronic (where the patient may have been harbouring the disease for months and occasionally years without knowing).

Leukaemia may therefore present as Acute Lymphoid Leukaemia (ALL), Chronic Lymphoid Leukaemia (CLL), Acute Myeloid Leukaemia (AML) and Chronic Myeloid Leukaemia (CML).

ALL is commonest in children especially boys, CLL is commonest in the elderly, AML and CML cut across all age groups and sexes.

CAUSES

- Usually no cause in any particular case
- Viruses e.g. Human T Lymphotropic Virus Type 1 (HTLV-1) and Epstein Barr Virus (EBV)
- Chemicals e.g. benzene, industrial solvents, pesticides (lindane), dyes,
- Drugs e.g. alkylating agents such as Melphalan
- Radiation

SYMPTOMS

Acute leukaemia

- Fever
- Easy fatigability
- Bruising tendencies
- Bone and joint pain especially in children

Chronic leukaemia

- Asymptomatic
- Dragging sensation left side of abdomen
- Easy satiety

- Weight loss
- Generalized itch
- Lymph nodal swellings

SIGNS

Acute leukaemia

- Pallor
- Fever
- Skin and mucosal haemorrhages
- Gum hypertrophy (AML subtype 5)
- Firm, rubbery, non-tender lymph nodes (lymphoid leukaemia)
- Splenomegaly

Chronic leukaemia

- Splenomegaly, often massive in CML
- Generalized lymph node enlargement in CLL

INVESTIGATIONS

- FBC and blood film comment
- Chest X-ray
- Bone marrow aspirate and trephine biopsy
- BCR-ABL rearrangement in ALL and CML

TREATMENT

Treatment objectives

- To aim for a cure for ALL in children
- To aim for a cure for good prognostic cases of ALL in adults
- To achieve remission and prolong good quality life in AML
- To control white cell counts and symptoms and prolong good quality life in CML

Non-pharmacological treatment

- Watchful waiting or careful observation in CLL
- Good hydration

Pharmacologic treatment (Evidence rating: A)

Supportive treatment:

- Red cell and platelet transfusions as needed
- Antibiotics in case of infections
- Filgrastim for situations of severe neutropenia

- Metoclopramide hydrochloride to counteract nausea during chemotherapy
- Allopurinol to reduce the risk of tumour lysis syndrome
- Ranitidine or Omeprazole for gastric protection

Specific treatment:

- Refer to specialist for combination chemotherapy

Acute Lymphoid Leukaemia (ALL)

Active agent

- Vincristine, IV,
- Crisantaspase, IV, IM or SC,
- Daunorubicin, IV,
- Cyclophosphamide, IV,
- Methotrexate, IV, IT and oral,
- Folinic acid, IV and oral,
- Mercaptopurine, oral,
- Cytarabine, IV, SC and IT,
- Prednisolone, oral,
- Dexamethazone, oral,

Acute Myeloid Leukaemia (AML)

- Daunorubicin, IV,
- Cytarabine, IV, SC, IT,
- Mitoxantrone IV,
- Etoposide IV, oral,

Chronic Lymphoid Leukaemia (CLL)

- Chlorambucil oral with or without prednisolone

Alternative treatment

- Cyclophosphamide, oral,
- Combination chemotherapy with cyclophosphamide, IV or oral, vincristine IV and prednisolone oral.

Chronic Myeloid Leukaemia (CML)

- Imatinib, oral,

Alternative treatment

- Hydroxycarbamide, oral,
- Busulphan, oral,

REFER

Refer all patients to tertiary centre for further evaluation and management. Follow-up can continue at a regional centre by a physician under the distant guidance of a haematologist in the case of chronic leukaemias. From the tertiary centre, patients with a good chance of cure by bone marrow transplant and who have a stem cell donor should be referred to the appropriate centre.

18. LYMPHOMA

This refers to a heterogeneous group of disorders characterized by malignant proliferation of lymphoid tissue usually presenting as lymph node swellings. There are 2 major histological types distinguished by the presence or absence of the Reed Sternberg (RS) cell. The 2 main groups are Hodgkin's Lymphoma; (RS cell present) and Non-Hodgkin's Lymphoma (RS cell absent). No age is exempt although generally the incidence of Non-Hodgkin's Lymphoma (NHL) increases with age and immunosuppression while Hodgkin's Lymphoma (HL) shows a bimodal peak.

Burkitt's lymphoma, a subtype of NHL, is one of the fastest growing tumours known. There are three clinical variants - the endemic, sporadic and immunodeficiency associated forms. The endemic form is found in tropical and malaria endemic regions like Ghana and commonly presents as a jaw swelling with loosening of the associated teeth. In Ghana, it is the commonest childhood malignancy. It has a peak age incidence at 4-7 years with a male preponderance.

CAUSES

- May not be found in any particular case
- Chronic antigenic stimulation as in *Helicobacter pylori* infection in gastric lymphoma
- Viruses e.g. Herpes virus 8, Epstein-Barr virus, HTLV-1
- Chemicals e.g. pesticides, herbicides
- Wood dust

SYMPTOMS

- Lymph node swelling which may wax and wane
- Fever
- Night sweats
- Weight loss
- Easy fatigability

SIGNS

- Firm, rubbery, non-tender lymph nodes
- Splenomegaly
- Superior vena cava syndrome if bulky mediastinal masses are present
- Pallor if marrow has been involved

INVESTIGATIONS

- Lymph node biopsy of a significantly enlarged node for histology
- FBC and blood film comment
- Chest X-ray
- Bone marrow aspirate and trephine biopsy

TREATMENT**Treatment objectives**

- To provide a cure
- To provide support treatment

Non-pharmacological treatment

- Watchful waiting in low grade NHL
- Good hydration

Pharmacological treatment**Non-Hodgkin's Lymphoma**

- Chemotherapy using a combination of Cyclophosphamide IV, Doxorubicin Hydrochloride IV, Vincristine Sulphate IV and Prednisolone oral

Alternative treatment

ESHAP -Etoposide IV, Cytarabine IV, Methylprednisolone IV, IV ICE-Ifosfamide IV, Carboplatin IV, Etoposide IV,

Hodgkin's Lymphoma

- Radiation, B
Combination chemotherapy using Chlorambucil oral, Vinblastine IV, Procarbazine oral and Prednisolone oral

Alternative treatment

Combinations involving Bleomycin IV/IM, Vincristine IV, Dacarbazine IV and Radiotherapy

REFER

All patients should be referred to a tertiary centre for initial management. Follow-up can continue at a regional centre by a physician under the distant guidance of a haematologist.

19. IMMUNIZATION

Childhood immunizable diseases can have a devastating effect on the health of the child and can be prevented by immunization. The diseases currently covered by EPI in Ghana are:

- Measles
- Whooping cough
- Tetanus
- Tuberculosis
- Diphtheria
- Poliomyelitis
- Yellow fever
- Hepatitis B
- *Haemophilus influenzae* Type B infections

To protect Ghanaian children against five of the diseases described above, a pentavalent vaccine popularly called “Five in One” has been introduced into Ghana's immunization programme. The vaccine protects all children against Diphtheria, Pertussis, Tetanus, Hepatitis B and *Haemophilus influenzae* Type B. The pentavalent vaccine should **not** be given to children **above 2 years** because of the increase in side effects due to the Pertussis component.

The schedule for immunization for children is as follows:

Table 6-1: Schedule for Immunization for Children

Age	Vaccine	Dose
BIRTH	BCG Polio 'O'	0.05 ml intradermally 2 drops orally
6 weeks	“Five in One” 1 Polio '1'	0.5 ml IM 2 drops orally
10 weeks	“Five in One” 2 Polio '2'	0.5 ml IM 2 drops orally
14 weeks	“Five in One” 3 Polio '3'	0.5 ml IM 2 drops orally
9 months	Measles	0.5 ml deep SC or IM
9 months	Yellow Fever	0.5 ml IM

*Five in One” vaccine (Diphtheria, Pertussis, Tetanus, *Haemophilus influenzae* b and Hepatitis B)

**Note**

1. Measles - No child should be denied measles vaccine because of a past episode of presumed measles
2. “Five in One” - Minimum interval between doses is 4 weeks.
3. Immunization schedule should still be completed if some doses have been missed

Absolute Contraindications to Immunization

- Infants should not be vaccinated if a previous vaccination was followed by anaphylaxis, encephalitis or non-febrile convulsions
- Yellow fever vaccine should not be given if there is history of anaphylaxis with ingestion of egg
- Individuals with symptomatic HIV infection should not receive BCG and yellow fever vaccines since these are live vaccines. BCG vaccine can be given at birth since the HIV infected newborn is asymptomatic.
- Measles vaccine should be given to HIV positive patients even though it is a live vaccine because the benefit outweighs the risk.

20. MEASLES

Measles is an acute infectious disease which occurs usually in children between 6 months and 3 years who have not been immunized or have been incompletely or unsuccessfully immunized. It is very infectious from up to 7 days before to 5 days after appearance of the rash.

Measles is often complicated by croup, vitamin A deficiency leading to xerophthalmia and blindness, otitis media and deafness from otitis media. Other complications include bronchopneumonia, diarrhoea, malnutrition and activation of latent tuberculosis.

Measles is prevented by immunization. Any non-immunised child of age 9 months and above who comes into contact with a measles sufferer should be immunized. Report all cases to the District Disease Control Officer for appropriate action.

CAUSES

- Measles virus

SYMPTOMS

- High fever, present before the rash appears
- Generalised itchy maculo-papular eruption
- Runny nose
- Cough
- Red eyes
- Sore mouth
- Diarrhoea
- Child is generally miserable

SIGNS

- Fever
- Rash

- Conjunctivitis
- Koplik's spots (white grain-like spots on the buccal mucosa)

INVESTIGATIONS

- Measles immunoglobulin M (IgM) antibody assay if possible
- Chest X-ray
- FBC

TREATMENT

Treatment objectives

- To relieve symptoms
- To treat complications
- To prevent death
- To maintain good nutrition

Non-pharmacological treatment

- Tepid sponging for fever
- Encourage oral hygiene
- Continue feeding with soft high calorie foods
- Wash eyes with clean water

Pharmacological treatment

(Evidence rating: C)

- There is no specific treatment for measles, since it is caused by a virus. In uncomplicated cases there is no need for antibiotics.
- Gentian Violet paint (to treat sores in and around mouth. Do not drink nor swallow GV paint)
- Calamine lotion (for skin irritation apply to the affected areas)
- For pain and fever treat with paracetamol
- Paracetamol, oral,

Adults

500 mg-1g 6-8 hourly

Children

6-12 years;	250-500 mg 6-8 hourly
1-5 years;	120-250 mg 6-8 hourly
3 months-1 year;	60-120 mg 6-8 hourly

- Vitamin A, oral,

Children

> 1 year;	200,000 units stat
< 1 year;	100,000 units stat

Repeat dose on the second day

- Manage diarrhoea according to severity of dehydration (see section on Diarrhoea)

REFER

Refer patients with complications such as a black (haemorrhagic) rash, stridor, pneumonia, encephalitis, great difficulty in eating or drinking, dehydration or malnutrition to the hospital.

21. PERTUSSIS

This is a bacterial respiratory tract infection common in children. It may be complicated by protein-calorie malnutrition, bronchiectasis and cerebral hypoxia flowing apnoeic episodes leading to convulsions and coma. Secondary bacterial infections like otitis media, pneumonia or activation of latent tuberculosis may also occur.

Pertussis can be prevented by the “Five in One” immunization recommended for all children (see immunization schedule at the beginning of this chapter).

In the event of a child developing pertussis before immunization, the “Five in One” vaccine should still be given to protect against the four other diseases.

During epidemics, or when there is a clear history of contact in a child with catarrh, antibiotics may help reduce the period of infectivity and reduce transmission. All cases should be reported to the District Disease Control Officer.

CAUSES

- *Bordetella pertussis*

SYMPTOMS

- Cough
- Fever
- Poor appetite, refusal of food
- Runny nose
- Vomiting

SIGNS

- Whooping cough
- Cyanosis
- Fever
- Apnoea

INVESTIGATIONS

- FBC - High absolute lymphocyte count
- Chest X-ray

TREATMENT**Treatment objectives**

- To prevent complications
- To maintain good nutrition

Non-pharmacological treatment

- Feed frequently between coughing spasms
- Encourage adequate oral fluid intake
- Admit to hospital when complications like dehydration, fever, pneumonia and malnutrition arise

Pharmacological treatment**(Evidence rating: A)**

- Erythromycin, oral,

Adults

500 mg 6 hourly for 7 days

Children

8-12 years;

250-500 mg 6 hourly for 7 days

2-8 years;

250 mg of syrup 6 hourly for 7 days

< 2 years;

125 mg of syrup 6 hourly for 7 days

REFER

Refer infants who have an episode of apnoea (prolonged cessation of breathing) or of turning blue.

22. TETANUS

See section on **Tetanus** under Chapter 24 and page 428

23. POLIOMYELITIS

Poliomyelitis is a viral disease characterised by varying degrees of paralysis, especially of the lower limbs. The paralysis may affect any group of skeletal muscles, including the muscles of respiration. Poliomyelitis is commonly acquired in childhood. The infection is often sub-clinical and may only appear as a mild flu-like illness. Only few cases progress to develop paralysis. However, injections during periods of the febrile illness are associated with an increased incidence of paralytic poliomyelitis.

Poliomyelitis is preventable by immunization. Prevention is almost certain if 4 doses of oral polio vaccine are given as in the EPI schedule.

Poliomyelitis is spread via insanitary disposal of excreta, which contaminates drinking water. Encourage proper excreta disposal and use of safe drinking water.

All cases of poliomyelitis should be reported to the District Disease Control Officer.

CAUSES

- Polio virus (Types 1, 2 and 3)

SYMPTOMS

- Fever
- Headache
- Neck stiffness
- Muscle pain
- Vomiting
- Paralysis in a small proportion of patients

SIGNS

- Paralysis in a small proportion of patients
- Flaccid paralysis

INVESTIGATIONS

- Fresh stool sample to be sent to the Regional Public Health Reference



Note

Stool sample must be kept on ice in an insulated box

TREATMENT

Treatment objectives

- To provide supportive care till patient recovers from acute illness
- To avoid paralysis or limit the extent
- To provide rehabilitation in paralytic cases

Non-pharmacological treatment

- Bed rest
- Avoid injections during febrile illness in children
- Physiotherapy
- Provision of appropriate appliances to aid mobility

Pharmacological treatment

- No specific treatment since it is a viral illness

REFER

All cases of acute flaccid paralysis should be referred to a Disease Control Officer or Public Health Nurse. Refer patients to a paediatrician if there are problems with breathing or swallowing.

24. DIPHTHERIA

This is a bacterial infection of the throat spread by droplets. It has a high mortality rate but is fortunately rare these days because of immunisation. All cases of diphtheria should be reported to the District Disease Control Officer.

CAUSES

- *Corynebacterium diphtheriae*

SYMPTOMS

- Sore throat
- Dysphagia
- Stridor

SIGNS

- Greyish white membrane or patch in the throat

INVESTIGATIONS

- Throat/nasal swabs for culture

TREATMENT**Treatment objectives**

- To neutralise the effect of circulating antitoxins before they become fixed to the tissues
- To provide supportive care respiratory and feeding where indicated
- To eradicate the organism from the pharynx

Non-pharmacological treatment

- Bed rest
- Feeding by nasogastric tube for patients who cannot swallow

Pharmacological treatment**(Evidence rating: C)**

- Diphtheria antitoxin, IV infusion, (following an intradermal test dose of 0.1 ml of 1 in 10 dilution of antitoxin in Sodium Chloride 0.9%)

Adults and children

> 10 years;

10,000 to 20,000 units

< 10 years;

5,000 to 10,000 units

- Amoxicillin, oral,

6-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

<1 year;

62.5 mg 6 hourly for 7 days

Or

Erythromycin, oral,

Children

125-250 mg 6 hourly for 7 days

Treat carrier state with

- Erythromycin, oral,

40 mg /kg /day in 4 divided doses 6 hourly for 7 days

REFER

Refer patients with laryngeal obstruction or respiratory paralysis to an ENT specialist for tracheostomy or endotracheal intubation with assisted ventilation.

25. YELLOW FEVER

Yellow fever is caused by a virus transmitted to man by a species of mosquitoes (*Aedes Aegypti*) that bite infected monkeys. Classical yellow fever is usually fatal. Yellow fever vaccination is protective against the disease and needs to be repeated every ten years. All cases of yellow fever should be reported to the District Disease Control Officer.

CAUSES

- Yellow fever virus

SYMPTOMS

- Fever
- Weakness
- Abdominal pain
- Vomiting
- Diarrhoea
- Jaundice

SIGNS

- Jaundice
- Spontaneous bleeding

INVESTIGATIONS

- Urinalysis
- Blood sample for serology (at the Regional Public Health Reference Laboratory)

TREATMENT**Treatment objectives**

- To provide supportive care for hepatic, renal and circulatory failure
- To prevent further transmission

Non-pharmacological treatment

- If yellow fever is suspected in a patient, admit immediately to an isolation ward
- Full supportive treatment for hepatic failure and acute renal failure may be needed in patients with severe disease but the prognosis is generally poor

Pharmacological treatment

- There is no specific treatment and mild cases need no more than observation

REFER

Refer to a hospital, preferably one with an isolation unit and additionally notify the District Disease Control Officer of the Ministry of Health.

26. HEPATITIS B

(See section on **Hepatitis** on page 41)

A pentavalent vaccine is available for prevention.

27. HAEMOPHILUS INFLUENZA TYPE B

The Haemophilus influenza type B (HiB) bacterium is an important cause of infections in infants and young children. It is typically the leading cause of acute bacterial meningitis and pneumonia in infants and children less than 5 years old. It is also the causative agent for acute epiglottitis and otitis media. HiB infections are preventable by the pentavalent vaccine (see EPI schedule).

CAUSES

- *Haemophilus Influenzae* Type B (HiB)

SYMPTOMS

- Refer to relevant sections on the presenting illness e.g. meningitis, pneumonia

SIGNS

- Refer to relevant sections on the presenting illness e.g. meningitis, pneumonia

INVESTIGATIONS

- Blood culture and sensitivity
- Cerebrospinal fluid biochemistry, culture and sensitivity (if meningitis suspected)

TREATMENT**Treatment objectives**

- To eliminate the bacteria
- To provide supportive care

Non-pharmacological treatment

- Refer to relevant sections on the presenting illness e.g. meningitis, pneumonia

Pharmacological treatment

- Refer to relevant sections on the presenting illness e.g. meningitis, pneumonia

REFER

Refer patients who are not responding to treatment or who have complications

28. SICK NEWBORN

The term newborn (neonate) refers to a baby in the first month of life. At birth all well newborns are active with a strong cry. Any baby born ill will show signs of poor activity or may be described as “being flat” or floppy in severe cases.

CAUSES

- Birth asphyxia
- Prematurity
- Neonatal Infections
- Congenital malformations e.g. of heart and central nervous system
- Birth injury
- Maternal sedation/analgesia during labour
- Metabolic e.g. hypoglycaemia, hypocalcaemia

SYMPTOMS

- Weak cry or inability to cry
- Difficulty in breathing or recurrent cessation of breathing (apnoea)
- Reduced spontaneous movements or being very floppy
- Refusal of feeds
- Vomiting
- Abdominal distension

SIGNS

- Raised body temperature ($>37.5^{\circ}\text{C}$ axillary)
- Low body temperature ($<36.5^{\circ}\text{C}$ axillary)
- Pallor
- Cyanosis
- Jaundice
- Bradycardia (<100 beats/minute)
- Tachycardia (>160 beats/minute)
- Heart murmurs
- Respiratory distress (>60 beats/minute, chest indrawing)
- Abdominal distension

INVESTIGATIONS

- FBC
- Blood cultures
- Random blood glucose

- Chest X-ray
- Urine culture
- Cerebrospinal fluid biochemistry and culture and sensitivity

TREATMENT

Treatment objectives

- To treat the underlying cause appropriately
- To diagnose and correct hypoglycaemia
- To prevent permanent organ damage

Non-pharmacological treatment

- Keep baby wrapped up in dry clothes to maintain temperature (keep warm)

Pharmacological treatment

(Evidence rating: C)

- Oxygen, by face mask or nasal prongs, (2 L/minute) if available
- Glucose 10%, IV,
2 drops/minute/kg (60 ml/kg/day)
If hypoglycaemic, correct (see section on Neonatal Hypoglycaemia)
- Ampicillin, IM/IV,
50 mg/kg 12 hourly for 7 days

Plus

Gentamicin, IM/IV,
2.5 mg/kg 12 hourly for 7 days

Alternative treatment

Ampicillin, IM/IV,
50 mg/kg 12 hourly for 7 days

Plus

Cefotaxime, IV,
25-50 mg/kg 8 hourly for 7 days

REFER

Refer the patient urgently to the hospital for further investigations and continued treatment if no improvement after 48 hours.

29. NEONATAL HYPOGLYCAEMIA

This refers to a blood glucose level below 2.2mmol/L. This may result in unconsciousness and death if not promptly treated. It should be treated as soon as suspected. Successful treatment results in prompt response.

CAUSES

- Prematurity
- Intra uterine growth retardation
- Baby born to a diabetic mother
- Infection
- Asphyxia

SYMPTOMS

- Irritability/restlessness
- Tremors
- Sweating
- Seizures
- Lethargy

SIGNS

- Sweating
- Tremor
- Convulsion
- Tachycardia
- Unconsciousness

INVESTIGATION

- Random blood glucose (using a bed-side glucose metre)

TREATMENT**Treatment objectives**

- To maintain blood glucose levels within normal
- To treat underlying cause of hypoglycaemia
- To prevent complications e.g. brain damage

Non-pharmacological Treatment

- None

Pharmacological Treatment

- 10% Glucose, IV,
4 ml/kg as a bolus
Followed by maintenance dose of
 $\frac{1}{5}$ Normal Saline in 10% Glucose at 60-100 ml/kg/day

REFER

Refer if patient does not respond promptly in spite of adequate treatment.

30. NEONATAL JAUNDICE

(Also see section on **Jaundice**)

Neonatal jaundice is important because of the consequences of excess hyperbilirubinaemia on the brain of the newborn infant. This condition is called kernicterus and may cause death. Infants who survive may be handicapped with cerebral palsy, and associated deafness, mental retardation and motor incoordination.

TREATMENT

In mild cases of neonatal jaundice appearing after the 2nd day i.e. physiologic jaundice, phototherapy can be used. For brief periods in the mid morning, the baby could be exposed and placed in the sun outside in its cot. However, its eyes must be covered. Continue breastfeeding during this time.

REFER

Refer all babies who develop jaundice within 48 hours of life to a paediatrician.

Also refer all babies who have severe jaundice if exchange transfusion cannot be done at the facility.

31. BIRTH INJURIES

Birth injuries include extensive caput succedaneum, cephalhaematoma, subgaleal haemorrhage, nerve palsies and fractures.

CAUSES

- Difficult delivery including instrumental delivery

SIGNS

- Extensive Caput Succedaneum
 - Diffuse swelling of the presenting part of the scalp that may extend beyond suture lines
- Cephalhaematoma
 - Diffuse swelling of the scalp that is restricted to one half and does not extend beyond the midline
- Subgaleal haemorrhage
 - Large swelling of the scalp which may result in a distorted shape of the head and face
 - Severe pallor
 - Jaundice

- Nerve injuries
 - Excessive traction resulting in injury to the brachial plexus causing the following:
 - Erbs Palsy - Whole upper limb does not move. There's movement only in the fingers
 - Klumpke's Palsy - Fingers of the arm affected do not move but there is spontaneous movement in arm and fore arm

TREATMENT

Treatment objectives

- To arrest further bleeding
- To treat complications of anaemia and jaundice
- To re-establish near normal movement in affected area if possible

EXTENSIVE CAPUT SUCCEDANEUM

Non-pharmacological treatment

- Reassure parents. It resolves spontaneously over 3-4 days

CEPHALHAEMATOMA

Non-pharmacological treatment

- Leave swelling alone. Do not perform incision and drainage. It resolves with time
- Reassure parents

Pharmacological treatment

- Phytomenadione (vitamin K), IM, 1 mg stat

SUBGALEAL HAEMORRHAGE

Non-pharmacological treatment

- Give phototherapy if jaundice is severe

Pharmacological treatment

(Evidence rating: C)

- Transfuse with blood if Hb <12 g/L
- Phytomenadione (vitamin K), IM, 1 mg stat

NERVE INJURIES

Non-pharmacological treatment

- Patient needs early and regular physiotherapy

REFER

Refer severe cases to hospital

32. NEONATAL CONJUNCTIVITIS

Neonatal conjunctivitis or ophthalmia neonatorum is an acute purulent conjunctivitis of the newborn in the first month of life, usually contracted during birth from the genital secretions of the mother following a gonococcal or chlamydial infection. Occasionally other bacteria and viruses as well as chemical irritation may be the cause. This condition can lead to blindness. All cases should therefore be managed promptly to prevent eye damage.

Eye prophylaxis at the time of birth, which involves the cleaning of the neonate's eyes immediately after birth and the application of 1% tetracycline ointment into the eyes, is effective in preventing the condition and must be implemented as a policy in all health facilities in which child deliveries are undertaken.

Aside treatment of the neonate, the mother and sexual partner(s) should also be assessed and treated for gonorrhoea and chlamydia infection in cases suspected to be STI-related (see section on **Sexually Transmitted Infections**).

CAUSES

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- Other bacteria - staphylococci, streptococci
- Viral - herpes simplex virus
- Chemical e.g. silver nitrate

SYMPTOMS

- Eye discharge
- Swelling of the eye lids

SIGNS

- Eye discharge, which may be purulent
- Redness and swelling of the conjunctivae
- Oedema and redness of the eyelids

INVESTIGATIONS

- Conjunctival swabs for Gram staining and cultures

TREATMENT**Treatment objectives**

- To treat the infection
- To prevent blindness in the neonate

Non-pharmacological treatment

- Clean the eyelids frequently (every 2 hours) with cotton wool dipped in sterile saline solution or boiled (cooled) water

**Pharmacological treatment
(Evidence rating: B)****Treatment of the neonate**

- Ceftriaxone, IM or IV,
50 mg/kg (maximum 125mg) stat

Plus

- Erythromycin, oral (syrup),
12.5 mg/kg 6 hourly for 14 days

Plus

- Chloramphenicol eye drops, 0.5%
Applied to each eye every 2 hours for 48 hours (after cleaning away discharge-saline irrigation)

Followed by

Chloramphenicol eye drops, 0.5%

Applied to each eye 6 hourly

Or

Chloramphenicol eye ointment, 1%

Applied to each eye 6 hourly

Treatment of the mother

- Ceftriaxone, IM,
250 mg stat

Plus

- Erythromycin, oral,
500 mg 6 hourly for 7 days

Treatment of mother's partner(s)

- Ceftriaxone, IM,
250 mg stat

Or

Ciprofloxacin, oral,
500 mg stat

Plus

- Doxycycline, oral,
100 mg 12 hourly for 7 days

Or

Erythromycin, oral,
500 mg 6 hourly for 7 days

REFER

Refer all neonates with corneal involvement and those who appear distressed or unwell or who present or develop systemic signs (e.g. fever) to a paediatrician or ophthalmologist.

33. CHEST PAIN

Chest pain is a common clinical problem with several possible causes. Not all chest pain is due to a heart condition. The history and physical examination often provide useful information for making the diagnosis.

In many patients with chest pain, no abnormalities are found. These patients may display evidence of psychoneurosis (psychogenic chest pain or Da Costa syndrome). In these patients, there is often a recent history of heart disease in the family. Some of them on the other hand, who have genuine heart disease develop an anxiety state and complain frequently of chest pain. This is referred to as cardiac neurosis. Patients presumed to have psychogenic chest pain need to be referred to a psychiatrist only after a physical cause has been excluded and reassurance fails to relieve symptoms.

CAUSES

Originating from the heart:

- Ischaemic heart disease (stable angina pectoris, acute coronary syndrome)
- Acute pericarditis

Originating from the lungs and pleura:

- Pneumonia with pleurisy
- Pleural effusion or empyema
- Pulmonary embolism
- Pneumothorax
- Tumour (lung cancer)

Originating from the oesophagus:

- Reflux oesophagitis
- Hiatus hernia
- Tumours

Originating from the aorta:

- Aortic dissection

Originating from the chest wall

- Intercostal myalgia
- Costochondritis

Originating from a psychoneurosis

- Psychogenic chest pain (Da Costa Syndrome)
- Cardiac neurosis

34. ISCHAEMIC HEART DISEASE

This comprises stable angina pectoris and acute coronary syndromes.

STABLE ANGINA PECTORIS

Stable angina pectoris refers to recurrent chest pain typically induced by exertion or emotional stress and relieved by rest or glyceryl trinitrate. Individuals who experience stable angina pectoris are at a high risk of developing acute coronary syndromes or a heart attack. Risk factors include diabetes mellitus, hypertension, cigarette smoking, plasma lipid abnormalities, obesity, a family history of heart disease and elevated markers of inflammation such as C-reactive protein.

Taken together, stable angina pectoris and acute coronary syndrome are termed, Ischaemic heart disease.

CAUSES

- Atherosclerosis with narrowing of the coronary blood vessels or spasm of the vessels leading to reduction in blood supply to the heart without destruction of the heart muscle.

SYMPTOMS

- Central or precordial chest pain
 - May radiate into the left arm, neck or jaw
 - Relieved by rest
 - Relieved by glyceryl trinitrate

SIGNS

- No typical signs
- The following may be observed:
 - Obesity
 - Hypertension
 - Xanthelasmata etc.

INVESTIGATIONS

- FBC
- Erythrocyte Sedimentation Rate
- ECG
- Cardiac enzymes: creatinine kinase-MB (CK-MB), serum aspartate transaminase (AST), serum lactic dehydrogenase (LDH) and troponins
- Blood glucose
- Blood lipid profile

TREATMENT**Treatment objectives**

- To minimise symptoms
- To prevent or reduce ischaemia
- To prevent myocardial infarction
- To identify and manage remediable risk factors

Non-pharmacological treatment

- Reassure patient
- Encourage cessation of smoking
- Ensure weight reduction (in overweight and obese individuals)
- Encourage regular exercise within limits of exercise capacity.

Pharmacological treatment**(Evidence rating: A)****Immediate Treatment**

- Glycerol trinitrate, sublingual, 500 microgram stat

Long-term Treatment

- Aspirin, oral, 75 mg daily
- Atenolol, oral, 50-100 mg, daily (avoid if beta-blockers are contraindicated e.g. asthma, heart failure)
- Isosorbide Dinitrate, oral, 10 mg 8-12 hourly
- Optimise or initiate treatment for hypertension
- Optimise or initiate treatment for diabetes mellitus
- Treat abnormal blood lipids to target levels

REFER

Refer all patients to a physician specialist.

ACUTE CORONARY SYNDROME (ACS)

ACS is a term that describes symptoms resulting from severe acute myocardial ischaemia. The ischaemia may, or may not, lead to myocardial infarction (heart attack). ACS comprises an acute elevation of the ST-segment on an electrocardiogram (ST-segment elevation myocardial infarction or STEMI), a non-ST-segment elevation myocardial infarction

(NSTEMI) and unstable angina (an ACS without elevation of cardiac enzymes). The risk factors for ACS are identical to those for, and include previous episodes of, stable angina pectoris.

Taken together, stable angina pectoris and acute coronary syndrome are termed, Ischaemic heart disease.

CAUSES

- Atherosclerosis or obstruction of the coronary blood vessels leading to reduction in blood supply to the heart muscle

SYMPTOMS

- Chest pain
 - Of sudden onset
 - Of varying degree but often severe and described as tightness, heaviness or constrictive in nature.
 - Persisting for more than 30 minutes
 - Not relieved by rest or glyceryl trinitrate
 - May radiate to the left arm, the neck or jaw
- Other symptoms include sudden onset of
 - Nausea
 - Vomiting
 - Shortness of breath or fatigue
 - Collapse

SIGNS

- Restlessness and apprehension
- Excessive sweating
- Peripheral or central cyanosis
- Pulse: thready, fast, irregular, slow or normal
- Blood pressure: low or unrecordable (following extensive damage to heart muscle)
- Bilateral crepitations in the chest (with left ventricular failure)
- Presence of a third or fourth heart sound

INVESTIGATIONS

- Standard 12 lead ECG - should be done and interpreted immediately.
- Cardiac enzymes: CK-MB, AST, LDH, and troponins
- Serum lipid profile
- Random blood glucose
- FBC, ESR

- Blood urea, electrolytes and creatinine
- Chest X-ray

TREATMENT

Treatment objectives

- To relieve distress and pain
- To limit infarct size
- To prevent and treat complications
- To reverse cardiac remodelling
- To prevent re-infarction

Non-pharmacological treatment

- Insert intravenous cannula for emergency intravenous medications
- Reassure patient and encourage bed rest in the first 48 hours
- Encourage cessation of smoking
- Ensure weight reduction (in overweight and obese individuals)

Pharmacological treatment (Evidence rating: A)

Immediate treatment

- Oxygen, intranasal, by face mask or nasal cannula
- Aspirin, oral (dispersible or chewable),
300 mg stat

Then

75-300 mg daily

- Glyceryl trinitrate, sublingual,
500 microgram stat
- Morphine, IV, 5-10 mg
- Metoclopramide, IV,
10 mg (to prevent vomiting induced by morphine)
- Atenolol, oral,
25-100 mg daily

Or

Bisoprolol, oral,
5-20 mg daily (avoid only if contraindicated)

- Lisinopril, oral,
2.5-20 mg daily
- Manage acute complications such as pulmonary oedema and cardiac arrhythmias (see appropriate section)
- Manage hyperglycaemia with insulin. Change diabetic patients previously on oral hypoglycaemic agents to insulin (see section on **Diabetes Mellitus**)

- Anticoagulate as follows:

In patients with STEMI:

- Streptokinase, IV, infusion, may be required immediately, given under specialist care. Refer patients to a medical emergency unit

In patients with NSTEMI or unstable angina:

- Heparin (Unfractionated), IV, 5,000 units stat
Followed by continuous IV infusion of 1,000 units per hour
- Enoxaparin (Low molecular weight Heparin) SC,
1mg/kg (100 units/kg) 12 hourly



Note

Do not give a Beta-blocker if the following are found at presentation:

- Patient is asthmatic
- Severe heart failure (severe breathlessness, lung
- Crepitations, raised jugular venous pressure)
- Pulse is slow (less than 60 beats/minute)
- Severe hypotension (BP less than 90/60 mmHg)

Do not give an ACE inhibitor if the patient has:

- Severe hypotension (BP less than 90/60 mmHg)
- Previous history of angioedema

Do not give IV fluids indiscriminately

- In view of the possibility of heart failure and cardiogenic shock in acute myocardial infarction, IV fluids must be given with extreme caution, if at all, and with regular examination of the lung bases and jugular venous pressure.

Long-term treatment

- Aspirin, oral,
75-150 mg daily indefinitely

- Atenolol, oral,
25-100 mg daily

Or

Bisoprolol, oral,
5-20 mg daily

- Lisinopril, oral,
2.5-20 mg daily

Or

Alternative treatment

Losartan, oral,
25-50 mg daily

Or

Candesartan, oral,
4-16 mg daily

- Atorvastatin, oral,
10-40 mg daily
Or
Rosuvastatin, oral,
5-10 mg daily
Or
Simvastatin, oral,
20 mg daily irrespective of lipid levels (if statins are not contra-
indicated)
- Isosorbide dinitrate, oral,
10 mg 8-12 hourly
- Control hypertension and hyperglycaemia appropriately, if present

REFER

Refer all patients who have suffered an acute coronary syndrome to a physician specialist or cardiologist after the initial management above.

35. DYSPNOEA

This is an awareness of difficult and distressing breathing at rest or with minimal physical activity. There are several possible underlying causes. The characteristics of the current or previous episodes and a family history of similar occurrences are all helpful clues, alongside a thorough physical examination, in determining the cause in most cases.

CAUSES

- Cardiac disease
- Respiratory disease
- Anaemia
- Metabolic acidosis (e.g. in renal failure)
- Anxiety

Acute onset

- Asthma
- Pneumonia
- Pulmonary oedema
- Pulmonary embolism
- Pneumothorax
- Foreign body aspiration

Nocturnal episodes

- Left ventricular failure
- Asthma

- During exertion
- Respiratory failure
- Heart failure
- Chronic anaemia
- Congenital heart disease

After exertion

- Heart failure
- Asthma

On lying flat on a bed (Orthopnoea)

- Heart failure

Slowly progressive in severity

- Chronic respiratory disorders (chronic bronchitis, emphysema)

Associated with wheezing

- Asthma
- Heart failure

Associated with wheezing during the working week

- Exposure to occupational allergen

Associated with deep respirations of acute onset

- Metabolic acidosis e.g. diabetic ketoacidosis or uraemia.

Associated with fever

- Respiratory (pneumonia, lung abscess, empyema)
- Cardiac (Endocarditis, Pulmonary embolism)

Associated with cough

- Respiratory (pneumonia, lung abscess, empyema)

Associated with sputum production or pleurisy

- Respiratory (pneumonia)

SYMPTOMS

See appropriate section for symptoms of the following conditions which may cause dyspnoea.

SIGNS

Cardiac

- Frothy blood-stained sputum
- Elevated blood pressure
- Orthopnoea
- Cardiomegaly
- Murmur
- Rhonchi

Respiratory

- Rhonchi
- Tachypnoea
- Fever
- Dullness on chest percussion
- Bronchial breath sounds
- Crepitations

Foreign body aspiration

- Wheezes
- Crepitations

INVESTIGATIONS

- FBC
- BUE and creatinine
- ECG
- Chest X-ray
- Other investigations depending on suspected cause (See appropriate sections)

TREATMENT

Treatment is based on the underlying condition (See appropriate sections).

REFER

Refer to a hospital if cause cannot be identified after ensuring that the airway is clear and circulation is satisfactory.

36. DEEP VEIN THROMBOSIS (DVT)

Deep Vein Thrombosis (DVT) is a condition in which a blood clot forms in a deep vein in the lower limbs. It is a common clinical problem which may progress to pulmonary embolism, sometimes with fatal consequences. As such it must be prevented in all hospitalized patients, especially those at high risk of developing it (see section on **Prevention of DVT**). It is important to differentiate DVT from cellulitis which may present with similar local clinical features.

The risk factors for DVT are as described for pulmonary embolism. (see section on **Pulmonary Embolism**)

CAUSES

Increased tendency of blood in the deep veins to clot, due to:

- Stagnation of blood in the vein
- Increased viscosity of blood
- Inflammation of the blood vessel

SYMPTOMS

- Swelling or firmness in the calf or thigh (usually unilateral)
- Pain in the affected limb
- Mild fever

SIGNS

- Warmth in the affected limb
- Swelling of the affected limb
- Occasionally tenderness in the limb

INVESTIGATIONS

- See section on **Pulmonary Embolism**

TREATMENT**Treatment objectives**

- To prevent clot propagation and pulmonary embolism
- To prevent recurrence of deep vein thrombosis

Non-pharmacological treatment

- Elastic compression stockings
- Ensure adequate hydration with oral fluids

Pharmacological treatment

- See section on **Pulmonary Embolism**

REFER

Refer patients with recurrent pulmonary embolism or in whom anti-coagulation is contra indicated to a physician specialist or vascular surgeon.

37. PROPHYLAXIS OF DVT**TREATMENT****Treatment objectives**

- To prevent deep vein thrombosis and subsequent pulmonary embolism

Non-pharmacological treatment

- Regular exercise during long journeys e.g. stopping on road journeys to take a walk or moving about on a plane during long flights and leg flexing exercises while seated.
- Intake of lots of water especially during long journeys or periods of recumbency
- Avoidance of excess amounts of coffee, tea and alcohol on long journeys.

- For hospitalized patients,
- Avoidance of prolonged recumbency and dehydration.
- Use of elastic compression stockings

Pharmacological treatment

- Heparin (unfractionated), SC,
5,000 units 8-12 hourly
- Or**
- Enoxaparin (Low molecular weight Heparin), SC,
40 mg daily
- No monitoring is required

38. PULMONARY EMBOLISM (PE)

Pulmonary embolism (PE) occurs when a blood clot in the peripheral venous circulation breaks off and obstructs the pulmonary artery or its branches. It often occurs without previous warning features. It is therefore good practice to give prophylactic treatment to all patients at high risk.

There are three considerations in the diagnosis of Pulmonary Embolism (PE):

- The presence of clinical features compatible with PE
- The absence of other probable clinical explanation/diagnosis made from clinical assessment, including a chest X-ray
- Presence of major risk factors as below:
 - Obesity
 - Immobility and hospitalisation, especially if prolonged
 - Previous PE or DVT
 - Major surgery, e.g. orthopaedic, abdominal and pelvic surgery, trauma especially involving the pelvis and lower limbs
 - Pregnancy In late pregnancy, after Caesarean section and the puerperium
 - Contraceptive pill use, hormone replacement therapy (HRT)
 - Medical conditions, e.g. congestive cardiac failure, myocardial infarction, nephrotic syndrome, stroke
 - Malignancy
 - Systemic Lupus Erythematosus
 - Inherited disorders causing hypercoagulability

CAUSES

- The dislodgement of a blood clot, usually from a vein in the lower limb, into the pulmonary arterial circulation.

SYMPTOMS

- Breathlessness may be intermittent
- Dizziness, fainting or collapse
- Sharp chest pain
- Blood stained sputum

SIGNS

- Rapid breathing
- Fast heart rate
- Hypotension
- Pleural effusion often haemorrhagic
- Low oxygen saturation on pulse oximetry <90%

INVESTIGATIONS

- Chest X-ray wedge shaped abnormality, reduced vascularity of peripheral lung parenchyma
- ECG increased rate and T wave inversion common, right axis deviation
- Doppler ultrasound scan of leg and pelvic veins
- Echocardiography if available
- APTT, INR and prothrombin time as baseline and for monitoring therapy

TREATMENT**Treatment objectives**

- To stabilise cardio-respiratory function
- To prevent further clot formation and embolisation
- To prevent death from PE
- To prevent recurrence of PE and development of pulmonary hypertension

Non-pharmacological treatment

- Elevate the affected leg on a pillow
- Apply compression stockings-after pain subsides

Pharmacological treatment**(Evidence rating: B)**

- Heparin (unfractionated), SC, IV or by continuous infusion using a perfusor,

Adults

Initial bolus dose 10,000 units, IV stat then 15,000 units, SC, 12 hourly or 24,000 units in 24 hours as a continuous IV infusion (1000 units per hour).

Monitor with APTT blood test daily target should be twice normal value

Children

Heparin, IV, 5,000 units bolus, then 15-25 units/kg per hour by continuous infusion, or 250 units/kg 12 hourly or Heparin, SC, 250 units/kg 12 hourly

Daily laboratory monitoring as above, with appropriate dose adjustment as indicated.

Or

Enoxaparin (Low molecular weight heparin), SC,

Adults

1.5mg/kg (150 units/kg) daily

- Warfarin, oral,
Adults
10 mg daily at 6 pm (starting simultaneously with heparin) for 2 days, then 5 mg daily with regular dose adjustment and monitoring of prothombin time and INR until target of 2.0 and 3.0 is attained.

REFER

Refer if there are no facilities to monitor treatment. Also patients with recurrent pulmonary embolism must be referred to a physician specialist or vascular surgeon for expert evaluation.

Contraindications to Anticoagulant Therapy

- Recent intracerebral bleed, severe liver disease, active peptic ulcer, bleeding disorders, and severe hypertension.



Note

Warfarin is contraindicated in pregnancy. Give heparin instead.

Heparin is continued until adequate warfarin dose and INR targets are reached

39. HYPERTENSION

HYPERTENSION IN ADULTS

This is a condition in which the blood pressure of an adult is persistently higher than 140/90 mmHg in a non-diabetic, or above 130/80 mmHg in a diabetic, based on the average of two or more properly measured blood pressure readings.

Hypertension carries an increased risk of early death from stroke, heart attack, heart failure and kidney failure if not properly controlled. Once a diagnosis of hypertension is made, the individual should be evaluated for the cause of the hypertension. Most adults, however, tend to have primary hypertension.

Most patients with hypertension will require two or more antihypertensive medications to achieve the desired target blood pressure. The choice of medication(s) is influenced by individual patient factors such as age, sex, cardiovascular risk, associated medical conditions and adverse effects.

CAUSES

- Primary hypertension - In the majority of patients no specific underlying cause is identified. Risk factors associated with this type of hypertension include increasing age, family history, excess body weight, excessive alcohol intake.
- Secondary hypertension - In about 10% of cases, hypertension may be due to a kidney disease, endocrine disorder, renal artery stenosis or coarctation of the aorta.

SYMPTOMS

- There are no complaints that are specific for hypertension. Most patients with hypertension may have no complaint whatsoever and are discovered by chance during medical examinations.
- Occasionally, patients may complain of:
 - Headache
 - Palpitation
 - Dizziness
 - Easy fatigability

SIGNS

- Blood pressure of $>140/90$ mmHg
- Signs specific for the various kidney, endocrine and blood vessel disorders that cause secondary hypertension.

INVESTIGATIONS

- FBC
- Urinalysis
- Blood urea, electrolytes and creatinine
- Blood glucose
- Serum lipids
- Serum uric acid
- Chest X-ray
- ECG
- Ultrasound scan of kidneys and adrenals (in suspected secondary hypertension)

TREATMENT

Treatment objectives

- To reduce blood pressure levels to 140/90 mmHg or less (130/80 mmHg or less in diabetics)
- To prevent cardiovascular, cerebrovascular and renal complications
- To identify and manage secondary hypertension appropriately

Non-pharmacological treatment

- Reduce salt intake
- Reduce animal fat intake
- Ensure regular fruit and vegetable intake
- Weight reduction in obese and overweight individuals
- Regular exercise e.g. brisk walking for 30 minutes 3 times a week
- Reduction in alcohol consumption
- Cessation of smoking

Pharmacological treatment (Evidence rating: B)

Table 8-1: Antihypertensive Treatment by Drug Class

Antihypertensive Class	Comments
Thiazide diuretics Bendroflumethiazide (bendrofluazide), oral, 2.5 mg daily	<ul style="list-style-type: none"> • Use with caution in gout, diabetes mellitus and dyslipidaemia • Enhances effectiveness of other classes of antihypertensives when used in combination
Beta-blockers Atenolol, oral, 50 -100 mg daily Or Bisoprolol, oral 5-20 mg daily Or Carvedilol, oral, 6.25-25 mg 12 hourly	<ul style="list-style-type: none"> • Useful in angina and post myocardial infarction (when not contraindicated) • Avoid in asthma, chronic obstructive pulmonary disease and heart block
Angiotensin-converting enzyme (ACE) inhibitors Lisinopril, oral, 5-40 mg daily Or Ramipril, oral, 2.5-10 mg daily	<ul style="list-style-type: none"> • Avoid in pregnancy and renovascular diseases • Can be used in heart failure, diabetes nephropathy and left ventricular dysfunction • Commonest side effect is dry persistent cough • Monitor serum potassium level periodically
Angiotensin receptor blockers Losartan, oral, 25-100 mg daily Or Candesartan, oral, 4-32 mg daily Or Valsatan, oral, 80-160 mg daily	<ul style="list-style-type: none"> • Useful alternative to ACE inhibitors when dry persistent cough is a problem • Monitor serum potassium level periodically

Table 8-1 (Continued): Antihypertensive Treatment by Drug Class

Calcium channel blockers Nifedipine retard, oral, 10-40 mg 12 hourly Or Amlodipine, oral, 5-10 mg daily	<ul style="list-style-type: none"> • Particularly useful in isolated systolic hypertension • Short acting formulations should not be used (see Hypertensive emergencies)
Alpha blockers Prazosin, oral, 0.5-20 mg in 3 divided doses starting at an initial dose of 0.5 mg 8-12 hourly and increasing gradually.	<ul style="list-style-type: none"> • Usually used with other antihypertensives • First dose given at night to avoid hypotension
Centrally acting agents Methyldopa, oral, 250 mg-1g 8-12 hourly	<ul style="list-style-type: none"> • Effective in the treatment of hypertension in pregnancy • May be used in asthma and heart failure
Vasodilators Hydralazine <u>Adults</u> Oral, 25-50 mg 12 hourly Slow IV injection over 20 minutes, 5-10 mg diluted with 10 ml Normal Saline. Repeat after 20-30 minutes if necessary	<ul style="list-style-type: none"> • Used in combination with other antihypertensives • Useful in hypertension associated with pregnancy • Used in hypertensive emergencies

REFER

Refer the following categories of hypertensive patients to an appropriate specialist:

- Those not achieving the target blood pressure (BP) level after several months of treatment
- Those on three or more anti-hypertensive drugs, yet have poor BP control
- Those with worsening of BP over a few weeks or months
- Those with plasma creatinine levels above the upper limit of normal
- Those with diabetes mellitus
- Those with multiple risk factors (diabetes, dyslipidaemia, obesity, family history of heart disease)
- Those not on diuretics but have persistently low potassium on repeated blood tests
- All children, young adults and pregnant women with elevated BP

HYPERTENSION IN CHILDREN AND ADOLESCENTS

Hypertension in children is defined as an average systolic and/or diastolic blood pressure that is ≥ 95 th percentile for gender, age, and height on 3 or more separate occasions taken in the right arm (in view of possibility of coarctation of aorta) with an appropriate cuff size that covers $\frac{2}{3}$ of the length of the arm (between shoulder and elbow) and encircling the whole arm.

In general, a blood pressure of $>110/70$ mmHg in children aged 2-5 years and $>115/76$ mmHg in those aged 6-12 years and more than $128/82$ mmHg in adolescents is considered abnormally elevated and would require a referral to, and evaluation by, a paediatrician.

Most childhood hypertension, especially in infants and younger children, is due to secondary causes ([see section on Hypertension in Adults](#)). Adolescents, however, more commonly have primary hypertension.

CAUSES

- Renal disease e.g. chronic pyelonephritis, hydronephrosis
- Vascular e.g. coarctation of aorta, renal artery stenosis
- Endocrine disorders e.g. pheochromocytoma, Cushing's syndrome, Conn's syndrome
- Obesity
- Primary (essential) hypertension

SYMPTOMS

- May be asymptomatic
- Chest pain
- Headaches
- Dyspnoea on exertion
- Excessive sweating
- Leg swelling
- Palpitations
- Haematuria

SIGNS

- BP $>110/70$ mmHg in children aged 2-5 years
 $>115/76$ mmHg in children aged 6-12 years
 $>128/82$ mmHg in adolescents
- Specific signs of various system disorders

INVESTIGATION

- As in adults

TREATMENT

Treatment objectives

- To reduce blood pressure levels to $<95^{\text{th}}$ percentile for age, gender and height in the absence of end organ-damage (otherwise to $<90^{\text{th}}$ percentile with end organ-damage)

- To prevent complication
- To treat underlying cause

Non-pharmacologic treatment

- Lifestyle changes are recommended e.g. weight control, regular exercise, low fat, low sodium diet

Pharmacologic treatment

(Evidence Rating: C)

- Hydralazine

Children

Oral,

12-18 years; 25 mg 12 hourly increased to usual maximum
50-100 mg 12 hourly

1 month-12 years; 250-500 microgram/kg 8-12 hourly increased
as necessary to maximum 7.5 mg/kg daily
(not exceeding 200 mg)

Neonate

250-500 microgram/kg 8-12 hourly increased as necessary to maximum
2-3 mg/kg every 8 hours

IV,

250-500 microgram/kg diluted in 10 ml normal saline given over 20
minutes, then 100-200 microgram/kg 4-6 hourly (max 3 mg/kg in 24
hours)

Angiotensin-converting enzyme (ACE) inhibitors

- Enalapril

Children

12-18 years; initially 2.5 mg daily (increased to maximum
10-20 mg daily in 1-2 divided doses)

1 month-12 years; initially 100 micrograms per kg daily
(increased to maximum 1 mg/kg daily in 1-2
divided doses)

Neonate

10 microgram/kg daily (increased to maximum of 500 microgram/kg
daily in 1-3 divided doses)

Angiotensin-receptor blockers

- Losartan

Children

6-16 years;

Weight 20-50 kg; 25-50 mg daily

Weight >50 kg; 50-100 mg daily

Beta blockers

- Propranolol

Children

12-18 years; 80-160 mg 12 hourly
1 month-12 years; 250 microgram-1 mg/kg 8 hourly

Neonate

250 microgram/kg 8 hourly

Calcium channel blockers

- Nifedipine

Children

12-18 years; 5-20 mg 8 hourly
1 month-12 years; 200-300 microgram/kg 8 hourly
(maximum 100 mg daily)

Or

Amlodipine

Children

12-18 years; 5-10 mg daily
1 month-12 years; 100-400 microgram/kg daily (maximum
10 mg daily)

Diuretics

- Bendroflumethiazide

Children

12-18 years; 2.5 mg daily
2-12 years; 50-100 microgram/kg daily
1 month-2 years; 50-100 microgram/kg daily

REFER

Refer all cases to a specialist for investigation and treatment.

40. HYPERTENSIVE EMERGENCIES

Severe hypertension, usually BP >180/120 mmHg in adults and lower levels in children, may be associated with acute neurological, cardiovascular or renal compromise, and could be fatal.

Hypertensive emergencies include:

- Hypertensive encephalopathy
- Left ventricular failure associated with severe hypertension
- Hypertension and dissection of aorta
- Hypertension with myocardial infarction

- Acute glomerulonephritis with severe hypertension.
- Eclampsia (in pregnant women)

Rapid correction of blood pressure with careful monitoring to avoid a precipitous drop is indicated in these circumstances.

TREATMENT

Treatment objectives

- To limit further organ-related complications by controlled reduction of BP
- To return diastolic blood pressure to <110 mmHg within 1 hour (within 10 minutes for dissecting aneurysm)

Non-pharmacological treatment

- Strict bed rest

Pharmacological treatment

(Evidence rating: A)

- Hydralazine, IV,

Adults

5-10 mg slowly over 20 minutes. This dose may be repeated after 20-30 minutes, until the patient is conscious and can take oral medications

Children

12-18 years;	5-10 mg 12 hourly repeated every 4-6 hours as necessary
1 month - 12 years;	100-500 microgram/kg repeated every 4-6 hours as necessary; maximum 3 mg/kg daily (not exceeding 60 mg)
< 1 month;	100-500 microgram/kg repeated every 4-6 hours as necessary; maximum 3 mg/kg daily

Or

Labetalol, IV,

Adults

50 mg over 1 minute repeated after 5 minutes if necessary to a maximum of 200 mg

Children

12-18 years;	50 mg over at least 1 minute repeated after 5 minutes if necessary
1 month - 12 years;	250-500 microgram/kg as a single dose (maximum 20 mg)

**Note**

Nifedipine, sublingual, is not recommended for emergency treatment of hypertension due to the erratic and unpredictable drop in BP which may be associated with dire consequences.

REFER

Patients with possible secondary hypertension should be referred to specialist centres for further investigations and management.

41. STROKE

A stroke or cerebrovascular accident is a rapidly developing focal (or global) disturbance of cerebral function lasting 24 hours or longer or leading to death, with no apparent cause other than a vascular origin. The risk factors for a stroke include hypertension, diabetes mellitus, cigarette smoking, cardiac arrhythmias, obesity, plasma lipid abnormalities, heart and peripheral vascular disease and excessive alcohol intake.

Strokes are usually sudden in onset or may show progression over several hours or occasionally days. The site of the brain lesion causing the stroke usually determines the neurological presentation.

CAUSES

- Cerebral infarction from
 - Thrombosis of a cerebral vessel
 - Embolism from a distant site (e.g. Atrial fibrillation)
- Intracerebral haemorrhage
- Subarachnoid haemorrhage

SYMPTOMS

- Weakness of one side of the body including the face
- Inability to rise up from a sitting or lying position
- Sudden fall
- Loss of speech
- Severe headache and/or neck pain (subarachnoid haemorrhage)
- Unconsciousness in some patients
- Seizures

SIGNS

- Paralysis of a limb and/or the face
- Initial flaccidity, but spasticity and exaggerated reflexes occur later
- Loss of one-half of visual field (Hemianopia)
- Loss of sensation of one-half of body (Hemi-anaesthesia)

- Extensor plantar response
- Alteration of speech (dysarthria/dysphasia)
- Neck stiffness (in subarachnoid haemorrhage)

INVESTIGATIONS

- FBC, ESR
- Blood glucose
- Serum lipid profile
- Blood urea, electrolytes and creatinine
- Uric acid
- ECG
- CT scan/MRI of the head
- Chest X-ray

TREATMENT

Treatment objectives

- To limit the progression area of brain damage
- To protect patients from the dangers of unconsciousness and immobility
- To treat the underlying cause if possible
- To institute measures to improve functional recovery
- To support and rehabilitate patients who survive with residual disability
- To prevent recurrence of cerebrovascular lesions

Non-pharmacological treatment

- Admit and monitor patient's vital signs and neurological signs frequently
- Establish adequate airway in unconscious patients.
- Nurse in the lateral position with suctioning where necessary
- Prevent pressure sores by regular turning (every 2 hours) in bed.
- Maintain adequate hydration
- Insert nasogastric tube as early as possible for feeding and medications in unconscious patients or those with swallowing difficulties
- Insert urethral/condom catheter to keep patient clean and dry.
- Early physiotherapy as soon as practicable

Pharmacological treatment

(Evidence rating: A)

Haemorrhagic strokes

- Antihypertensive medications. Reduce blood pressure gradually over several days (see section on Hypertension)

**Note**

DO NOT GIVE sublingual Nifedipine or other antihypertensive agent to reduce the blood pressure rapidly in patients with stroke. It may result in deterioration in their clinical state and death.

Infarctive strokes

- Aspirin, oral,
75 mg daily
 - Atorvastatin, oral,
10-40 mg daily
- Or**
Rosuvastatin, oral,
5-10 mg daily
- Or**
Simvastatin, oral,
20 mg daily irrespective of lipid levels
(If statins are not contra- indicated)

REFER

- Patients with worsening symptoms and signs for specialist evaluation.
- If the underlying cause cannot be managed
- Refer all patients with neurological deficits to a speech therapist, occupational therapist or physiotherapist if required.

42. HEART FAILURE

This is a condition in which the heart is unable to maintain adequate cardiac output to meet the body's metabolic requirements. The cardiac dysfunction may predominantly involve the left ventricle or the right ventricle. More commonly, however, both left and right ventricular dysfunctions co-exist. This is termed congestive cardiac failure (CCF). The functional classification of heart failure using the New York Heart Association (NYHA) Classification is described in the table below.

Table 8-2: New York Heart Association functional Classification for Heart Failure

CLASS I:	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnoea
CLASS II:	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation or Dyspnoea
CLASS III:	Marked limitation of physical activity. Comfortable at rest, but slight activity causes fatigue, palpitation or dyspnoea
CLASS IV	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency are present at rest. If any physical activity is undertaken, discomfort is increased

CAUSES

- Hypertension
- Cardiac valve disease
- Cardiomyopathy
- Severe anaemia
- Myocardial ischaemia / infarction
- Thyrotoxicosis
- Congenital heart disease
- Cardiac arrhythmia

SYMPTOMS**Left Heart Failure**

- Breathlessness on exertion
- Breathlessness on lying flat
- Intermittent breathlessness at night
- Wheezing
- Cough with frothy blood-stained sputum
- Easy fatigability

Right Heart Failure

- Swelling of the feet and lower extremities
- Abdominal swelling and discomfort

SIGNS**Left Heart Failure**

- Tachypnoea
- Tachycardia
- Basal crepitations
- Occasional rhonchi
- Gallop rhythm
- Displaced apex beat
- Cardiac murmur

Right Heart Failure

- Tachycardia
- Pitting pedal oedema
- Ascites
- Tender, smooth, soft hepatomegaly
- Raised jugular venous pressure
- Gallop rhythm

In children:

- Failure to thrive

- Difficulty in feeding

INVESTIGATIONS

- FBC
- Blood urea, electrolytes and creatinine
- Thyroid function tests
- Liver function test
- Cardiac enzymes, if myocardial infarction is suspected
- ECG
- Chest X-ray
- Echocardiography

TREATMENT

Treatment objectives

- To relieve symptoms and improve quality of life
- To improve cardiac output
- To treat the precipitating cause
- To treat complications

Non-pharmacological treatment

- Reduce salt intake
- Reduce weight in overweight and obese individuals
- Avoid alcohol
- Avoid smoking
- Encourage moderate exercise
- Bed rest in hospitalised patients

Pharmacological treatment

(Evidence rating: A)

Initial therapy of mild heart failure (NYHA CLASS I-II)

- Furosemide (frusemide), oral,
 - Adults
40-80 mg daily
 - Children
1-2 mg/kg daily
- Lisinopril, oral, (only when blood pressure > 100/60 mmHg)
 - Adults
2.5-20 mg daily

Or

- Carvedilol, oral,
Adults
3.125-12.5 mg 12 hourly (maximum 25 mg 12 hourly)

Or

Bisoprolol, oral,
Adults
1.25-10 mg daily

Initial therapy of moderate heart failure (NYHA CLASS III)

- Furosemide (frusemide), oral,
Adults
80-120 mg daily
Children
2-4 mg/kg daily
- Lisinopril, oral,
Adults
2.5-20 mg daily
Or
Losartan, oral,
Adults
25-50 mg daily
- Spironolactone, oral,
Adults
25-50 mg daily
In patients with fast atrial fibrillation
- Digoxin, oral,
Adults
250 micrograms 12 hourly for 24-48 hours,
Then
250 micrograms once daily
Elderly
125 micrograms 12 hourly for 24-48 hours,
Then
125 micrograms once daily
Children
5 micrograms/kg 12 hourly



Note

Diuretics may cause hypokalaemia, therefore monitor serum electrolytes closely. Give Potassium chloride sustained release, oral, 600-1200 mg, 12 hourly, when necessary to avoid hypokalaemia. Do not give potassium sparing diuretics such as spironolactone and Potassium chloride supplements together. Avoid potassium supplements in renal failure.

Initial therapy of severe heart failure (NYHA CLASS IV)

- Admit patient
- Prop patient up in bed
- Oxygen, by nasal cannula or face mask
- Insert an intravenous cannula
- Furosemide (Frusemide), IV, 40-80 mg, repeat after 30 minutes if necessary;
- **Thereafter**
- Furosemide (Frusemide), IV, 40-80 mg 12 hourly; If patient improves, change to
- Frusemide, oral, 40-80 mg, 12 hourly after 24- 48 hours **of IV treatment**

If patient **does not improve**, continue

- Furosemide (Frusemide), IV, 40-80 mg, 12 hourly and **give in addition**
- Morphine, IV, 5-10 mg slowly
- **And**
- Metoclopramide, IV, 10 mg to prevent vomiting
If there is fast atrial fibrillation,
- Digoxin, oral, 250 micrograms 12 hourly for 24-48 hours,
- **Then**
250 micrograms once daily
If there is cardiogenic shock,
- Dobutamine, IV, 2.5-10 micrograms/kg/minute
- Monitor urine output
- Encourage early ambulation
Consider anticoagulation prophylaxis against venous thrombosis,
- Enoxaparin, subcutaneously, 40 mg daily
- Identify and treat (if possible) precipitating causes such as hypertension, myocardial infarction, anaemia **or** thyrotoxicosis

REFER

All patients must be referred to a specialist when clinically stable for the identification and treatment of the underlying cause of the heart failure and for long-term maintenance therapy.

43. CARDIAC ARRHYTHMIAS

These are disorders of cardiac rate, rhythm and conduction. Based on the heart rate, they can be classified into bradyarrhythmias, when the heart rate is less than 60 per minute; and tachyarrhythmias, when the heart rate is greater than 100 per minute.

Bradyarrhythmias include sinus bradycardia, sinus pauses and atrioventricular blocks. The tachyarrhythmias can further be classified into supraventricular and ventricular arrhythmias, based on their site of origin. Tachyarrhythmias include atrial fibrillation, atrial flutter, paroxysmal supraventricular tachycardia, ventricular tachycardia and ventricular fibrillation.

Prior to drug treatment of a suspected cardiac arrhythmia, an ECG must be done to confirm the rhythm abnormality. It is dangerous to use an antiarrhythmic drug without doing an ECG. Refer symptomatic patients to hospital immediately. The choice of drug treatment depends on the type of arrhythmia and severity of symptoms.

CAUSES

- Rheumatic heart disease
- Hypertensive heart disease
- Thyrotoxicosis
- Cardiomyopathy
- Electrolyte abnormalities particularly hypokalaemia
- Ischaemic heart disease
- Pericardial disease
- Side effects of some drugs
- Post cardiac surgery
- Excessive ingestion of caffeine (e.g. in tea or coffee)

SYMPTOMS

- Palpitation
- Dizziness
- Chest discomfort
- Difficulty in breathing
- Sudden collapse
- Sudden death

SIGNS

- Fast pulse
 - Regular (sinus tachycardia or paroxysmal atrial tachycardia)
 - Irregularly irregular (atrial fibrillation, atrial flutter, frequent ventricular ectopics)

- Slow pulse
 - Regular (sinus bradycardia, complete heart block)
 - Irregular (sick sinus syndrome)
- Pulse deficit (apical rate faster than radial pulse rate)
 - Atrial fibrillation, atrial flutter

INVESTIGATIONS

- ECG
- Serum electrolytes
- Thyroid function tests
- Chest X-ray
- Ambulatory ECG (Holter)
- Echocardiography

TREATMENT

Treatment objectives

- To control the heart rate
- To restore sinus rhythm
- To control ventricular rate
- To prevent or treat associated complications
- To treat the underlying condition e.g. thyrotoxicosis
- To prevent thromboembolism

Non-pharmacological treatment

- Reassure the patient
- Avoid excessive intake of alcohol, coffee or tea (if these are possible precipitating factors)
- Massage of the carotid sinus on **one side** for a few seconds. This may terminate an attack of paroxysmal supraventricular tachycardia.
- If the duration is less than 48 hours, patients may need immediate cardioversion

Pharmacological treatment (Evidence rating: A)

Atrial fibrillation

- Digoxin, oral,
250 micrograms 12 hourly over 24-48 hours,
Maintenance dose,
250 micrograms daily

Alternative treatment or in combination with Digoxin

Atenolol, oral, (avoid in heart failure)

50-100 mg daily

Or

Bisoprolol, oral,

1.25-10 mg daily

Antiplatelet and anticoagulant therapy

- Aspirin, oral,
75-300 mg daily

Or

Unfractionated Heparin, IV,

5,000-10,000 units

Or

Low molecular weight Heparin e.g. Enoxaparin, subcutaneously,

1 mg/kg daily (100 units/kg) every 12 hours, and then refer patients to a specialist.

REFER

Refer all patients for specialist evaluation especially if the duration of the arrhythmia is greater than 48 hours.

44. CONGENITAL HEART DISEASE

Congenital malformation of the heart, loosely referred to as “Hole in Heart”, is quite a common malformation with an incidence of 8 out of 1000 live births. There are two main groups of congenital heart disease namely, acyanotic and cyanotic.

The acyanotic types include ventricular septal defect, atrial septal defect, patent ductus arteriosus as well as aortic stenosis, pulmonary stenosis and coarctation of the aorta. The cyanotic types are associated with a mixing of deoxygenated blood with oxygenated blood and include Tetralogy of Fallot (TOF) and Transposition of the Great Arteries (TGA).

Early recognition of the specific type and appropriate medical or surgical intervention is important in improving the quality of life and reducing morbidity from complications.

CAUSES

- Idiopathic
- Maternal infections due to viruses in early pregnancy, notably rubella
- Ingestion of alcohol during early pregnancy
- Smoking in early pregnancy
- Drug intake during early pregnancy

- Exposure to X-rays and other radiation during early pregnancy
- Maternal diabetes
- Prematurity
- Multiple pregnancy

SYMPTOMS

Acyanotic

- Easy fatigability
- Breathlessness
- Poor growth
- Poor feeding
- Cold sweats on head especially forehead
- In older children:
 - Puffy eyelids, swollen feet and/or distended abdomen
 - Exertion may lead to chest pains, syncope or sudden death

Cyanotic

- Blue tongue and fingernails (cyanosis) at birth or becoming worse with exertion in older children
- Easy fatigability and breathlessness
 - Interruption of sucking in babies during feeding
 - Squatting several times during play in toddlers
- Loss of consciousness and convulsions with deepening cyanosis (hypercyanotic attack)
- Poor growth

SIGNS

Acyanotic

- Systolic heart murmurs
- Signs of heart failure for moderate to severe lesions:
 - Tachycardia
 - Gallop rhythm
 - Tachypnoea
 - Dyspnoea
 - Weak thready pulse
 - Cold sweaty skin
 - Crepitations
 - Rhonchi
 - Puffy eyelids
 - Hepatomegaly

- Cardiomegaly
- Distended neck veins and ankle oedema (in older children)
- Radio-femoral pulse delay, suggests coarctation of the aorta
- Hypertension, suggests coarctation of the aorta

Cyanotic

- Cyanosis
- Finger clubbing
- Systolic heart murmur and thrill
- Tachypnoea
- Hypercyanotic attack
 - Deep cyanosis
 - Tachypnoea
 - Tachycardia
 - Loss of consciousness and/or convulsions
- Signs of heart failure present (see under “acyanotic”)

INVESTIGATIONS

- FBC
- Chest X-ray
- ECG
- Echocardiography

TREATMENT

Treatment objectives

- Early recognition of the problem
- To treat existing heart failure promptly
- Early surgical correction if indicated
- To prevent endocarditis with good oral and dental hygiene and antibiotic prophylaxis

Non-pharmacological treatment

- Ensure good nutrition

Pharmacological treatment

(Evidence rating: C)

- Oxygen to correct hypoxia
- Treatment of heart failure (see section on **Heart Failure**)
- For Tetralogy of Fallot
 - Propranolol, oral,
250 microgram-1 mg/kg 6-8 hourly (This relaxes the right infundibular obstruction and allows more blood flow into the lungs)

REFER

Refer all children with congenital heart disease to a paediatric cardiologist for further clinical assessment and management.

45. HYPERCYANOTIC ATTACK

This is a paediatric cardiac emergency. Attacks commonly occur in infants aged between 2-4 months and are precipitated by crying, feeding or defaecation. It can lead to death or long term complication of the central nervous system. Parents should be educated to recognise the clinical features of attacks and to give initial care.

CAUSES

- Underlying tetralogy of Fallot

SYMPTOMS

- Irritability
- Excessive crying
- Deep rapid breathing
- Increased severity of existing cyanosis

SIGNS

- Tachycardia
- Systolic murmur
- Coma
- Convulsions
- Hemiparesis

INVESTIGATIONS

- FBC
- Chest X-ray
- ECG
- Echocardiography

TREATMENT**Treatment objectives**

- To recognise the problem early
- To reverse obstruction
- To correct metabolic derangement in severe hypoxia
- To prevent complication and death from severe organ ischaemia

Non-pharmacological treatment

- Pick infant and hold over the shoulder and sooth gently or hold in knee chest position.

Pharmacological treatment (Evidence rating: C)

- Normal saline or Ringers lactate, IV, 20 ml/kg to run over 1 hour. Repeat if necessary.
- Oxygen, nasally to correct hypoxia
- Morphine, SC, 200 micrograms/kg 6 hourly
- Propranolol, IV, 500 micrograms/kg slowly over 1 minute

REFER

Hypercyanotic attack is an indication for early surgery. Refer to a paediatric specialist or cardiothoracic surgeon

46. RHEUMATIC FEVER

This is a febrile illness in which there is inflammation of several systems, but mainly the joints and heart. It is a major cause of permanent damage to the heart in developing countries. The disease occurs mainly in children of school going age. The onset of symptoms occurs 1-3 weeks after the throat infection. In Ghana, this illness may mimic malaria, typhoid fever, sickle cell disease, myocarditis and tuberculosis.

CAUSE

- It is a complication of untreated or inadequately treated Group A streptococcal infection of the throat.

SYMPTOMS

- Persistent fever
- Joint pain which moves from one joint to another (knees, ankles, wrists, elbows)
- Palpitations
- Easy fatigability
- Chest pain

SIGNS

- Fever
- Tenderness of the joint
- Swelling of the joint
- Carditis-rapid heart rate (>100/minute), murmur, heart failure, pericardial rub
- Skin rash
- Subcutaneous nodules over bony prominences

INVESTIGATIONS

- FBC (raised white cell count)
- ESR - raised
- Sickling status
- Chest X-ray (heart may be enlarged)
- Throat swab for culture
- Antistreptolysin O titre (if available)
- Electrocardiogram
- Echocardiogram

TREATMENT**Treatment objectives**

- To eradicate streptococcal throat infection
- To prevent recurrent episodes of rheumatic fever and further heart damage
- To treat heart failure if co-existent

Non-pharmacological treatment

- Admit patient. Bed rest until rheumatic activity subsides

Pharmacological treatment**(Evidence rating: C)**

- Phenoxyethyl penicillin (Penicillin V), oral,

Adults

500 mg 6 hourly for 10 days

Children

6-12 years;

250 mg 6 hourly for 10 days

1-5 years;

125 mg 6 hourly for 10 days

Alternative treatment

- Erythromycin, oral, (for patients allergic to penicillin)

Adults

500 mg 6 hourly for 10 days

Children

8-12 years;

500 mg 6 hourly for 10 days

3-8 years;

250 mg 6 hourly for 10 days

1-2 years;

125 mg 6 hourly for 10 days

- Aspirin, oral,

Adults

300-900 mg 4-6 hourly for 4-6 weeks

Children

1 month- 18 years;

25 mg/kg 6 hourly for 2 weeks

25 mg/kg 8 hourly for 4-6 weeks
and gradually withdrawn over
2 weeks

And in patients with carditis,

Add

- Prednisolone, oral,
Adults and Children
2 mg/kg daily for 2 weeks and then gradually taper off

PREVENTION

Prevent further episodes of streptococcal infection with

- Phenoxymethyl penicillin, oral,

Adults

250 mg 12 hourly

Children

6-12 years;

250 mg 12 hourly

1-5 years;

125 mg 12 hourly

Or

Benzathine Penicillin, IM,

Adults

1.2 M units monthly

Children

> 30 kg;

900,000 units monthly

< 30 kg;

600,000 units monthly

Or

For patients allergic to penicillin,

- Erythromycin, oral,

Adults

250 mg 12 hourly

Children

3-12 years;

250 mg 12 hourly

1-2 years;

125 mg 12 hourly

Continue until age 21 years or indefinitely if valvular damage present.

**Note**

Patients with rheumatic heart disease will require antibiotic prophylaxis against endocarditis prior to dental and other surgical procedures.

REFER

- Patients who have been treated for heart failure should be referred for further evaluation.
- Suspected rheumatic fever where facilities are not available for basic investigations.

47. PERICARDITIS

Pericarditis is inflammation of the pericardium.

CAUSES

- Viral
- Bacterial
- Rheumatic fever
- Post-cardiotomy
- Uraemia
- Autoimmune diseases

SYMPTOMS

- Dull or sharp precordial pain (worsens with lying down and improves with sitting and leaning forward)

SIGNS

- Fever
- Pericardial friction rub
- Distant heart sounds if there is a large effusion

INVESTIGATIONS

- FBC and ESR
- ASO titre
- ECG
- Chest X-ray
- Echocardiogram

TREATMENT**Treatment objectives**

- To relieve pain
- To treat underlying cause
- To prevent cardiac tamponade

Non-pharmacological treatment

- Bed rest

Pharmacological treatment**(Evidence rating: C)**

- Aspirin, oral,
Adults
15 mg/kg 6 hourly till signs of inflammation subside then withdraw slowly
- Prednisolone, oral, (for severe pericarditis or post-cardiotomy syndrome)
Adults
40 mg daily for 14 days and taper off
Children
2 mg/kg daily for 14 days and taper off

REFER

Patients with large effusions

48. COMMON COLD

This is a common viral infection of the nasopharyngeal mucosa. It is contagious and is spread by airborne droplets. The symptoms resolve without antibiotic treatment within a week. If the 'cold' lasts longer than a week and there is persistent fever and cough associated with increased phlegm or offensive nasal discharge there is the possibility of secondary bacterial infection of the respiratory tract or influenza. Occasionally, the common cold is complicated by otitis media in children. The common cold may also be the first presentation of influenza or measles. (See appropriate sections for treatment of complications).

CAUSES

- Rhinovirus group

SYMPTOMS

- Runny nose
- Blocked nose
- Slight fever
- Cough
- Muscle aches

SIGNS

- Low grade fever
- Runny nose

INVESTIGATIONS

- No investigations required

TREATMENT

Treatment objectives

- To relieve symptoms

Non-pharmacological treatment

- Rest
- Encourage lots of oral fluid intake

Pharmacological treatment (Evidence rating: A)

- Paracetamol, oral,

Adults

1 g 6-8 hourly

Children

10-15 mg/kg/dose 6-8 hourly

Or

Ibuprofen, oral,

Adults

200-400 mg 8 hourly

Children

50-100 mg 8 hourly

- Sodium Chloride 0.9%, nasal,
2 drops, into each nostril, to relieve congestion as required

REFER

Refer cases suspected to have measles or other complications to a paediatrician or physician for management.

49. PNEUMONIA

Pneumonia is an infection of the lung tissue caused by various bacterial species, viruses, fungi or parasites. Identification of the causative organism is the key to correct treatment. However, because of the serious nature of the infection, antibiotic treatment should be started immediately based on one's estimation of the most probable cause before subsequent laboratory confirmation of the causative agent.

A decision on the severity of illness which would indicate the need for hospital management may be based on the following;

- Patients at the extremes of age
- Severe shortness of breath (see signs below)
- Rapid pulse rate (120 per minute or more)
- Low BP < 90/60 mmHg
- Restlessness, confusion or excessive drowsiness
- Coexisting diseases such as heart failure, liver or renal diseases

CAUSES

- Community acquired pneumonia
 - *Streptococcus pneumoniae*
 - *Streptococcus pyogenes*
 - *Mycoplasma pneumoniae* -tends to occur in epidemics
 - *Haemophilus influenzae*

- *Staphylococcus aureus* in children during whooping cough, measles, or other viral epidemics
- *Staphylococcus aureus* in the elderly during 'flu epidemics
- Where aspiration may occur, as in stroke, drunken stupor or seizures, anaerobic organisms and *Staph. aureus* should be suspected
- Hospital acquired pneumonia
 - Gram-negative bacteria (including *Pseudomonas aeruginosa*)
 - *Staphylococcus aureus* - tends to be more drug resistant

SYMPTOMS

- Fever
- Cough productive or non-productive
- Sputum production rusty or blood stained, yellowish-green
- Pleuritic chest pain - worse on deep breathing or coughing
- Breathlessness
- Body aches

SIGNS

- Fast breathing (severe in children < 1 year if 50 breaths or more per minute, in 15 year olds 40 breaths per minute or more, and in adults 30 or more breaths per minute)
- Use of accessory muscles of respiration and flaring of the nasal margins
- Restricted movement of the affected side of the chest (due to pain)
- Fever
- Sweating
- Fast pulse rate
- Signs of consolidation or pleural effusion on chest examination
- Cyanosis
- Restlessness or confusion
- Low blood oxygen saturation by pulse oximetry

INVESTIGATIONS

- FBC
- Chest X-ray
- Sputum gram stain and culture
- Staining for acid-fast bacilli (if TB suspected)
- Blood culture and sensitivity
- Blood urea and electrolytes

TREATMENT**Treatment objectives**

- To treat the infection
- To prevent complications
- To identify patients at greater risk who require in-hospital management

Non-pharmacological treatment

- Nurse in comfortable position, usually on pillows or with head raised
- Sponging to control fever, especially in children < 5 years (who are at risk of febrile convulsions)
- Adequate oral hydration if it can be tolerated

Pharmacological treatment**(Evidence rating: A)****Ambulatory patient:**Adults

- Amoxicillin (Amoxycillin), oral,
1g 8 hourly for 7 days
If patient is allergic to penicillin give:
- Erythromycin, oral,
500 mg 6 hourly for 7 days
Or
Azithromycin, oral,
500 mg daily for 7 days
If the patient has received previous antibiotic treatment prior to consultation:
- Co-amoxiclav, oral,
1 g 12 hourly for 7 days
Or
625 mg 8 hourly for 7 days
Or
If allergic to penicillin *or* atypical organism suspected:
Erythromycin, oral,
500 mg 6 hourly for 7 days
Or
Azithromycin, oral,
500 mg daily for 7 days

Children

- Amoxicillin (Amoxycillin), oral,
5-18 years; 500 mg 8 hourly for 7 days

1-5 years;	250 mg 8 hourly for 7 days
6 months-1 year;	125 mg 8 hourly for 7 days

Or

If allergic to penicillin *or* atypical organism suspected:

Erythromycin, oral,

8-18 years;	250-500 mg 6 hourly for 7 days
2-8 years;	250 mg 6 hourly for 7 days
6 months-2 years;	125 mg 6 hourly for 7 days

Or

Azithromycin, oral,
10 mg/kg daily for 3 days,

Patients who are vomiting should be admitted and given IV antibiotics until oral medication can be tolerated.

Hospitalised patientAdult

- Give oxygen if available
- Co-amoxiclav, IV,
1.2 g 8 hourly, change to oral co-amoxiclav as in (treatment for **Ambulatory patient**) above when clinically improved.

Or

Ceftriaxone, IV,
2 g daily for 7 days,

Or

Gentamicin, IV,
80 mg 8 hourly added to IV co-amoxiclav as above

Children

- Ceftriaxone, IV,
50-80 mg/kg daily, (by infusion if 80 mg/kg)

Or

Cefotaxime, IV,
150-200 mg/kg daily, divided up into three 8 hourly doses

Or

Co-amoxiclav, IV,
30 mg/kg 8 hourly

Or

Co-amoxiclav, oral,

Children

≥12 years;	One 500/125 mg strength tablet 8 hourly
6-12 years;	10 ml of 400/57 mg suspension 12 hourly

1-6 years;	2.5ml of 250/62 mg suspension 8 hourly; dose doubled in severe infection
1 month-1 year;	0.25ml/kg of 125/31mg suspension 8 hourly; dose doubled in severe infection
< 1 month;	0.25 ml/kg of 125/31 mg suspension 8 hourly Or 2.5-5 ml of 400/57 suspension 12 hourly Or 1 g 12 hourly

Or

Cefuroxime, oral, (as cefuroxime axetil)

Children

≥ 12 years;	500 mg 12 hourly in lower respiratory-tract infections
2-12 years,	15 mg/kg (max. 250 mg) 12 hourly
3 months-2 years,	10 mg/kg (max. 125 mg) 12 hourly

**Note**

Prescribing of 1st, 2nd and 3rd generation fluoroquinolones (e.g. ciprofloxacin and levofloxacin) should generally be avoided in managing CAP because they are WHO recommended second line drugs for multi-drug resistant (MDR) tuberculosis.

REFER

Refer to the nearest hospital if no improvement i.e. fever remains high or patient is still breathless. If patient is already hospitalised then intravenous antibiotics should be considered and further investigations done.

50. ASTHMA

Asthma is a chronic inflammatory disease of the bronchial airways which manifests as recurrent episodes of wheeze, cough and shortness of breath which is reversible spontaneously or with treatment. It is characterised by increased sensitivity to many external agents. Asthma is episodic and may be associated with seasons like the rainy season or harmattan. Bronchial asthma occurs at all ages but peaks in childhood. It is classified as an allergic disease, which may be due to an external or intrinsic agent. The disease may be associated with a personal or family history of hay fever, eczema or urticaria.

CAUSES

- Allergens e.g. house dust and animal hairs
- Drugs e.g. beta-blockers such as propranolol, prostaglandin F_{2α} and aspirin

- Environmental e.g. air pollution, climatic changes, strong scents and smoke
- Infections-viral or bacterial
- Exercise
- Emotions and hyperventilation (excessive deep breathing usually due to anxiety)
- Occupational exposure to industrial chemicals, dust and drug manufacturing

SYMPTOMS

- Episodic breathlessness
- Tightness of the chest
- Cough - often nocturnal
- Wheeze
- Nocturnal symptoms - any of the symptoms waking up the patient at night

SIGNS

- Tachypnoea (fast breathing)
- Rhonchi/wheeze
- Use of accessory muscles of respiration

Features of a life-threatening attack are:

- Inability of patient to speak full sentences in one breath
- Rapid pulse > 110/minute (>130/minute in children 2-5 years)
- Rapid respiration > 30/minute (> 50/minute in children 2-5 years)
- Cyanosis
- Silent chest on auscultation
- Drowsiness or confusion
- Exhaustion
- Peak Expiratory Flow Rate (PEFR) is much lower than expected, less than 33-50%

INVESTIGATIONS

- FBC
- Stool examination
- Chest X-ray-for the exclusion of complications such as pneumomediastinum, pneumothorax, consolidation and other diagnoses
- Spirometry

TREATMENT**Treatment objectives**

- To relieve symptoms
- To prevent complications and recurrence

Non-pharmacological treatment

- Avoid triggers of an acute asthmatic attack
- Avoid smoking

Pharmacological treatment**(Evidence rating: A)****MANAGEMENT OF ACUTE SEVERE ASTHMA**

- Oxygen, intranasal or by mask,
In high concentration

Plus

- Salbutamol, nebulised,

Adults

2.5 -5 mg 6 hourly

Children

2.5 mg 6 hourly

Plus

- Aminophylline, IV, (slow bolus injection where patient is still distressed after 3-4 initial doses of nebulised salbutamol)

Adults

250 mg over 20 minutes and repeat after 30 minutes if necessary

Children

3-5 mg/kg over 20 minutes as a slow bolus injection or by infusion

⚠ Caution

Exercise caution when giving Aminophylline to adults who have been on Theophylline tablets as there is a high risk of cardiac arrhythmias, seizures (due to toxic blood levels). Avoid bolus injection; give slow infusion over 6-8 hours if needed.

Plus

- Hydrocortisone, IV, (to be given simultaneously with bronchodilators)

Adults

200 mg stat then 100 mg 6 hourly until clinical improvement,

Children

6-2 years;

100 mg 8 hourly

1-5 years;

50 mg 8 hourly

<1 year;

5 mg 8 hourly

Plus

- Prednisolone, oral, (start as a single dose at the same time as hydrocortisone, soon after breakfast)

Adults

30-40 mg daily

Children

> 5 years;

2-5 years;

< 2 years;

30-40 mg as a single daily dose for 3-5 days

20 mg as a single daily dose for 3-5 days

1-2 mg/kg daily as a single dose for 3-5 days

**Note**

Do not give any form of sedation.

If patient is improving -leave on maintenance therapy

- Continue with oxygen

Plus

- Prednisolone, oral, 30-40 mg daily (20-40 mg a day in children) until stable. Continue for 5-7 days, or may choose to tail off dose over 2 weeks

Plus

- Salbutamol, nebulised, 2-5mg 2-4 hourly

Or

Aminophylline, IV,

Adults

250 mg 6 hourly

Children

3-5 mg/kg 6-8 hourly over 20 minutes as a slow bolus injection

If patient is not improving

- Continue oxygen

Plus

- Salbutamol, nebulised, 2-5 mg more frequently every 15-30 minutes

Plus

- Aminophylline, IV,

Adults

250 mg in 500 ml of 5% Dextrose or 0.9% Sodium Chloride, 6 hourly

Children

3-5 mg/kg 6-8 hourly over 20 minutes as a slow bolus injection

Plus

- Hydrocortisone, IV,

Adults

200 mg 6 hourly

Children

6-12 years;

100 mg 8 hourly

1-5 years;

50 mg 8 hourly

<1 years;

25 mg 8 hourly

Plus

Prednisolone, oral,

Adults

30-60 mg daily

Children

Prednisolone, oral,

1-2 mg/kg daily (40 mg maximum dose)

Once patient is improving

- Change to oral steroids
- Wean off aminophylline and stop in 12-24 hours
- Reduce frequency of nebulised Salbutamol. Substitute with inhaled or oral Salbutamol after 24 hours.
- Give written and oral instructions on how to tail off oral steroids or steroids may be stopped after 7 days. In children, give Prednisolone 1-2 mg/kg for 3-5 days

REFER**After initial management refer:**

- Rapidly deteriorating patients
- Patients with poor response to acute management
- All discharged clients should be followed up in one week and refer patient to specialist clinics for continued care.

MANAGEMENT OF CHRONIC ASTHMA IN ADULTS AND CHILDREN OF SCHOOL GOING AGE

The key to preventing acute exacerbations is adequate management of chronic asthma.

Treatment objectives

- To alleviate symptoms
- To improve the quality of life of the patient
- To prevent crisis (acute attacks) or hospitalisation

- To prevent adverse effects from medications
- To prevent exacerbations

Non-Pharmacological treatment

- Involve patient in his/her management
- Avoidance of provoking factors where possible
- Selection of the best treatment available
- Step up treatment as needed for good control
- Refer early for specialist care after STEP 2

Pharmacological treatment

(Evidence rating: A)

STEP 1

- Reliever medication: Intermittent use of bronchodilators. Inhaled salbutamol, 100 microgram, 2 puffs as often as needed
- If inhaled beta agonists or oral bronchodilators are needed more than once daily then move to Step 2 where a doctor should be involved.

STEP 2

- Controller medication: regular 12 hourly use of:
- Inhaled Budesonide one puff 12 hourly;
Adults and Children > 10 years
200 microgram
Children < 10 years
100 microgram
- Inhaled Fluticasone MDI, 2 puffs 12 hourly;
Adults
125 or 250 microgram
Children
50 microgram
- Inhaled Beclometasone (Beclomethasone)
100 microgram; 2 puffs 12 hourly in both adults and children
- Plus**
- Reliever medication: inhaled Salbutamol 100 microgram 2 puffs as needed.

STEP 3

- Controller medication:
- Regular, 12 hourly (twice daily), use of inhaled combination ICS and long-acting beta-agonist (LABA).
- Fluticasone/salmeterol - doses 50/100 or 50/250; 1 puff 12 hourly (adults, children over 5 years)

- Budesonide/formoterol doses 80/4.5 (children over 5 years) or 160/4.5 (adults); 1-2 puffs 12 hourly

Plus

- Reliever medication: Inhaled salbutamol 100 microgram, 2 puffs as needed.

STEP 4: Refer to Asthma specialist clinic

- Controller medication: Increase dose of inhaled steroid in combination with LABA (from Step 3)
- Add on leukotriene antagonist, oral montelukast 10 mg daily (5 mg daily in children 6 years plus, or zafirlukast 20 mg twice daily (10 mg 12 hourly in children over 6 years),
- Modified-release Theophylline SR(10 mg/kg /day in children) restrict prescribing to specialists

Plus

- Reliever medication: inhaled Salbutamol as above.

STEP 5: Refer to Asthma specialist clinic

- Controller medication: Addition to Step 4 treatment of regular once daily Prednisolone, oral, starting with 30-40 mg daily and tailing down to a low maintenance daily dose.
In adults, prednisolone tailed off by 5 mg every third day, reducing to lowest dose possible without provoking attacks, usually 5-10 mg daily **or** alternate daily.
- **May add on oral** Salbutamol 4 mg 8-12 hourly
- Reliever medication: should be used at all steps as required.

STEPPING DOWN

Review treatment every 3-6 months with a view to stepping down treatment if client is symptom-free or has minimal symptoms (<1-2 times a week).

REFER

Refer clients who have recurrent acute exacerbations within a few days to weeks of each other for specialist care and review of their treatment.

When patient requires more than one course of oral prednisolone in 3 months refer for specialist care.

51. ACUTE BRONCHITIS

This refers to an acute infection of the bronchial mucosa. It is often found in association with upper respiratory tract infection. Most of the cases are viral and do not require antibiotics for treatment.

Antibiotics should however be prescribed if the patient is very ill or breathless or has an underlying illness like malnutrition, measles, rickets, anaemia, diabetes mellitus, chronic bronchitis, HIV/AIDS.

CAUSES

- Bacteria e.g. *Streptococci*, *Staph. aureus*, *H. influenza*
- Viruses e.g. Influenza virus

SYMPTOMS

- Initial dry cough, later productive
- Anterior chest pain aggravated by coughing
- Low grade fever

SIGNS

- Fever
- Rhinorrhoea
- Crepitations and rhonchi

INVESTIGATIONS

- FBC
- Sputum culture

TREATMENT

Treatment objectives

- To relieve symptoms
- To treat suspected bacterial infection

Non-pharmacological treatment

- Bed rest
- Keep well hydrated
- Give humidified air if possible

Pharmacological treatment

(Evidence rating: C)

- Paracetamol, oral,
Adults
500 mg-1g 6-8 hourly

Children

6-12 years;	250-500 mg 6-8 hourly
1-5 years;	120-250 mg 6-8 hourly
3 months-1 year;	60-120 mg 6-8 hourly

Plus

- Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 7 days

Children

6-12 years;	250 mg 8 hourly for 7 days
1-5 years;	125 mg 8 hourly for 7 days
<1 year;	62.5 mg 8 hourly for 7 days

Or

Co-amoxiclav, oral,

Adults

One 500/125 tablet 12 hourly

Children

> 12 years;	One 500/125 tablet 12 hourly for 7 days
6-12 years;	5 ml of 400/57 suspension 12 hourly for 7 days
1-6 years;	2.5ml of 400/57 suspension 12 hourly for 7 days
1month-1 year;	0.25ml/kg body weight of 125/31 suspension 8 hourly for 7 days
< 1 month;	0.25ml/kg body weight of 125/31 suspension 8 hourly for 7 days

**Note**

Double the dose of the above antibiotic in severe infections

For individuals allergic to penicillin:

- Erythromycin, oral,

Adults

250-500 mg 6 hourly 7 days

Children

8-18 years;	250-500 mg 6 hourly 7 days
2-8 years;	250 mg 6 hourly 7 days
6 months-2 years;	125 mg 6 hourly 7 days

Or

Azithromycin, oral,

Adults

500 mg once daily for 3 days

Children

10 mg/kg once daily for 3 days

REFER

Refer all complicated cases of acute bronchitis to a regional hospital.

52. CHRONIC BRONCHITIS

This is chronic inflammation of the bronchial mucosa due to irritants such as tobacco smoke. There is progressive worsening with age and eventually resulting in chronic respiratory failure. It is part of the syndrome of chronic obstructive pulmonary disease (COPD). It is aggravated by recurrent viral and bacterial infections.

CAUSES

- Cigarette smoking
- Industrial dust
- Chemical irritants

SYMPTOMS

- Cough with production of clear sputum
- Fever and production of thick offensive sputum purulent and copious during secondary bacterial infection
- Shortness of breath, with or without wheeze

SIGNS

Absence of signs does not exclude the disease

- Wheeze or rhonchi
- Reduced Peak Expiratory Flow Rate (PEFR) which does not increase with treatment

INVESTIGATIONS

- FBC
- Spirometry
- Chest X-ray
- Sputum culture

TREATMENT**Treatment objectives**

- To minimise or stop cough
- To reduce quantity of sputum produced
- To prevent or minimise wheeze and shortness of breath

Non-pharmacological treatment

- Smoking cessation, if patient is a smoker

Pharmacological treatment**(Evidence rating: C)**

- Mucolytic syrup containing acetyl cysteine:
10 ml 8 hourly - if thick viscid sputum
- Salbutamol, Inhaled, (via aerosol)
100 microgram (2 puffs) 12 hourly and as needed

Or

Ipratropium bromide, Inhaled,
20 microgram (2 puffs) 12 hourly and as needed

Antibiotics for secondary infection

- Amoxicillin (Amoxycillin), oral,
Adults
500 mg 8 hourly for 7 days

Or

Erythromycin, oral,

Adults
500 mg 6 hourly for 7 days

Or

Azithromycin, oral,

Adults
500 mg daily for 3 days

REFER

Refer all complicated cases for specialist care.

53. BRONCHIOLITIS

This is an acute viral infection of the bronchioles occurring in infants under 10 months of age which can lead to fatal acute respiratory failure. It tends to occur in epidemics during the cold seasons.

Bronchiolitis has a high mortality rate so it should ideally be treated in hospital.

CAUSES

- Viruses e.g. respiratory syncytial virus, parainfluenza virus

SYMPTOMS

- Onset often follows a cold
- Low grade fever
- Cough
- Breathlessness
- Wheezing

SIGNS

- Fast breathing
- Distension of nasal margins (alar flare)
- Intercostal recession
- On auscultation there are rhonchi and crepitations
- Cyanosis (blue discolouration of lips, tongues and finger tips) if severe

INVESTIGATION

- FBC
- Chest X-ray

TREATMENT**Treatment objectives**

- To avoid worsening of obstruction by thick secretions
- To prevent hypoxia
- To prevent and ensure prompt treatment of respiratory failure
- To detect and promptly treat heart failure
- To treat secondary bacterial infection

Non-pharmacological treatment

- Prop the child up or hold in a sitting position
- Keep well hydrated but avoid fluid overload

Pharmacological treatment**(Evidence rating: C)**

- Humidified air enriched with oxygen
- IV Fluid $\frac{1}{5}$ Normal Saline in 4.3 Dextrose (given to distressed infants who cannot suck)

Antibiotics (given to very sick infants with suspected secondary bacterial infection)

- Amoxicillin (Amoxycillin), oral,

Children

6-12 years;	250 mg 8 hourly for 7 days
1-5 years;	125 mg 8 hourly for 7 days
<1 year;	62.5 mg 8 hourly for 7 days

Or

Co-amoxiclav, oral,

Children

> 12 years;	One 500/125 tablet 12 hourly for 7 days
6-12 years;	5 ml of 400/57 suspension 12 hourly for 7 days

1-6 years;	2.5 ml of 400/57 suspension 12 hourly for 7 days
1 month-1 year;	0.25 ml/kg body weight of 125/31 suspension 8 hourly for 7 days
< 1 month;	0.25 ml/kg body weight of 125/31 suspension 8 hourly for 7 days

Double the dose in severe infections

For patients allergic to penicillin:

- Erythromycin, oral,
Children

8-18 years; 250-500 mg 6 hourly for 7 days

2-8 years; 250 mg 6 hourly for 7 days

6 months -2 years; 125 mg 6 hourly for 7 days

Or

Azithromycin, oral,
Children

> 6 months; 10 mg/kg once daily for 3 days

Close monitoring and possible intubation and ventilation may be required. Bronchodilators and corticosteroids are NOT effective and should not be given.

REFER

Refer all severely distressed infants to a regional hospital.

54. BRONCHIECTASIS

In bronchiectasis, the medium and smaller sized bronchi usually in the lower lobes become diseased and dilated. Their ciliated epithelium is then replaced by squamous cells. The mucus present becomes a site for chronic infection with the formation of large amounts of purulent and often offensive sputum.

CAUSES

- Childhood pneumonia such as whooping cough, post measles
- Post-pulmonary tuberculosis
- Chronic rhinosinusitis with post-nasal drip
- Fibrosing lung disease e.g. fibrosing alveolitis

SYMPTOMS

- Bouts of coughing over many months
- Copious offensive sputum (especially in the morning)
- Haemoptysis-in over one third of cases

- Fever
- Chest pain

SIGNS

- Weight loss
- Fever
- Clubbing
- Crepitations

INVESTIGATIONS

- FBC
- Sputum culture
- Chest X-ray
- CT scan of the chest after specialist review

TREATMENT

Treatment objectives

- To reduce cough and sputum production
- To prevent infective exacerbations

Non-pharmacological treatment

- Postural drainage
- Breathing exercises
- Improve nutrition

Pharmacological treatment

(Evidence rating: C)

- Co-amoxiclav, oral,

Adults

1 g 12 hourly for 10-14 days

Children

>12 years;

One 500/125 tablet 12 hourly
for 10-14 days

6-12 years;

5ml of 400/57 suspension 12 hourly for
10-14 days

1-6 years;

2.5ml of 400/57 suspension 12 hourly for
10-14 days

1 month-1 year;

0.25ml/kg body weight of 125/31
suspension 8 hourly for 10-14 days

< 1 month;

0.25ml/kg body weight of 125/31
suspension 8 hourly for 10-14 days

Double the dose in severe infections

For patients allergic to penicillin:

- Azithromycin, oral,
Adults
500 mg once daily for 7 days
Children
10 mg/kg once daily for 7 days

REFER

Refer all suspected cases to hospital for confirmation, sputum culture and sensitivity tests and specialist management.

55. LUNG ABSCESS

A lung abscess is a cavity within the substance of the lung filled with necrotic tissue and pus which occurs as a result of infection.

Antibiotic management should be considered upon diagnosis while awaiting confirmation of the causative organism by sputum culture.

CAUSES

- The aspiration of infected mucus or tissue from the nose, mouth or pharynx especially in alcoholics, epileptics, unconscious or anaesthetised patients and following dental procedures.
- Inadequately treated bacterial pneumonia (especially, gram negative bacteria, *Staphylococcus aureus*, *beta-haemolytic streptococci*). *Staphylococcus aureus* usually presents as multiple abscesses, especially in children.
- Presence of a foreign body within the lung either by inhalation or penetrative lung injury
- Obstruction of an airway by tumour
- Septic emboli from other infected areas of the body e.g. From septicaemia and endocarditis
- Tuberculosis

SYMPTOMS

- High swinging fever
- Breathlessness
- Cough, productive of copious amounts of foul smelling sputum.
- Haemoptysis
- Chest pains on breathing if associated with inflammation of pleura

SIGNS

- Fever
- Tachycardia
- Tachypnoea
- Chest wall tenderness
- Dull percussion note
- Poor air entry

INVESTIGATIONS

- FBC
- Chest X-ray (may see air fluid level in area of consolidation)
- Sputum culture
- Sputum AFB's
- Blood culture

TREATMENT**Treatment objectives**

- To clear abscess collection
- To treat underlying cause

Non-pharmacological treatment

- Chest physiotherapy - postural drainage
- Improve nutritional status

Pharmacological treatment**(Evidence rating: A)**

- Cloxacillin, IV,

Adults

500 mg 6 hourly for 14 days

Children

5-12 years;

250 mg 6 hourly for 14 days

1-5 years;

125 mg 6 hourly for 14 days

<1 year;

62.5 mg 6 hourly for 14 days

Plus

Gentamicin, IV,

Adults

40-80 mg 8 hourly for 14 days

Children

1-12 years;

2.5 mg/kg 8 hourly for 14 days

>1 year;

2.5 mg/kg 12 hourly for 14 days

Plus

Metronidazole, IV,

Adults

500 mg 8 hourly for 14 days

Children

7.5 mg/kg 8 hourly for 14 days

Alternative treatment

- Clindamycin, oral,

Adults

150-300 mg 6 hourly for 14 days

Children

3-6 mg/kg 6 hourly for 14 days

REFER

Refer to a specialist or higher level facility if abscess is not resolving on above treatment as surgery may be required to drain the abscess.

56. HEADACHE

Headache is caused by traction, displacement, inflammation, vascular spasm or distension of the pain sensitive structures in the head or neck. Headaches that are new in onset and clearly different from any the patient has experienced previously are commonly a symptom of serious illness and therefore demand prompt evaluation. The precipitating factors, associated symptoms and clinical findings on examination, together with the results of appropriate investigations, can provide a guide to the cause of the headache.

CAUSES

Acute onset

- Subarachnoid haemorrhage and other cerebrovascular diseases
- Infections e.g. malaria, typhoid fever, viral infections
- Meningitis or encephalitis
- Ocular disorders (glaucoma, acute iritis, refractive errors)
- Post-seizures
- Post-lumbar puncture
- Hypertensive encephalopathy
- Giant cell temporal arteritis

Subacute onset

- Lesions of the middle ear (otitis media, mastoiditis)
- Intracranial mass (tumour, subdural haematoma, abscess)
- Benign intracranial hypertension
- Trigeminal neuralgia
- Postherpetic neuralgia
- Severe Hypertension
- Atypical facial pain
- Medication overuse
- Post trauma
- Giant cell temporal arteritis

Chronic

- Migraine
- Cluster headache
- Tension headache
- Cervical spine disease
- Sinusitis
- Dental disease
- Psychogenic causes

SYMPTOMS

- Visual e.g. photophobia, flashes of light, floaters
- Aura e.g. visual, auditory, gustatory
- Accompanying features e.g. nausea, vomiting,
- Site of pain e.g. occipital, ocular, unilateral, bilateral
- Characteristics e.g. pulsating, throbbing, sharp, dull
- Relieving or exacerbating factors e.g. cough, coitus, lying flat

SIGNS

- Local tenderness
- Fever
- Neck stiffness
- Positive Kernigs
- Drowsiness
- Excessive lacrimation
- Conjunctival redness
- Papilloedema

INVESTIGATIONS

- FBC
- ESR
- Skull X-ray
- Cervical X-ray
- X-ray of the paranasal sinuses
- CT scan head if warranted
- Lumbar puncture if warranted

TREATMENT**Treatment objectives**

- To relieve pain
- To identify and treat underlying cause
- To prevent complications relating to the underlying cause
- To improve quality of life

Non-pharmacological treatment

- Relaxation techniques
- Stress avoidance
- Psychotherapy
- Identification and elimination of trigger factors

Pharmacological treatment**(Evidence rating: B)**

- Paracetamol, oral,

Adults

500 mg - 1 g 6-8 hourly

Children

6-12 years;

250-500 mg 6-8hourly

1-5 years;

120-250 mg 6-8hourly

3 months-1 year;

60-120 mg 6-8hourly

Or

Diclofenac, oral,

Adults

25-50 mg 8 hourly

Or

Ibuprofen, oral,

Adults

200-400 mg 12 hourly

Prophylaxis for chronic headaches

- Propranolol, oral,
40-80 mg daily (for migraine)

Or

Amitriptyline, oral,

10-25 mg nocte

Or

Carbamazepine, oral,

200 mg daily (for neurogenic pain)

REFER

Refer headaches not responding to treatment and those that are unexplained to a specialist

57. SEIZURES, EPILEPSY AND STATUS EPILEPTICUS

A seizure is a clinical event caused by a transient disturbance of cerebral function due to an abnormal paroxysmal neuronal discharge in the brain. If these episodes are recurrent over several months or years without an identifiable cause, they are commonly described as epilepsy. The term status epilepticus is used for repeated seizures which occur without the patient regaining consciousness between attacks.

A detailed description by a witness is key. Patients may sometimes describe the warning signals (termed a prodrome or aura) which they experienced before the event.

CAUSES

- Congenital, prenatal/perinatal injury
- Fevers, especially in children (aged 6 months to 6 years)
- Cerebral malaria
- Infections e.g. meningitis, TB, HIV, abscesses in the brain
- Metabolic causes: hypoglycaemia, hypocalcaemia, hyponatraemia, hyperosmolar diabetic state, uraemia, hepatic failure
- Idiopathic epilepsy
- Eclampsia
- Vascular diseases: Hypertensive encephalopathy, Stroke
- Space occupying lesions: Tumour or malformations of the brain
- Head Injury/Trauma
- Drugs and toxins: - alcohol, antidepressants, metronidazole, drug and alcohol withdrawal
- Degenerative diseases e.g. Dementia later in life
- Psychogenic: (see section on **Psychogenic Seizures**)

SYMPTOMS

- Loss of consciousness
- Tongue biting
- Foaming at the mouth
- Incontinence of stool and/or urine
- Aura (may include a strange gut feeling, somatosensory manifestations - visual, olfactory, gustatory or auditory e.g. strange smells/flashing lights)
- After a seizure, the patient may sleep for some time.

SIGNS

- A prodrome/aura with automatism (lip smacking, picking at items)
- Muscle twitching and movements which may be focal or generalized
- Post-ictal sleep
- Post-ictal confusion
- Todd's paralysis (stroke-like weakness) may rarely occur
- Examine carefully for evidence of neurological localizing signs, tongue laceration and evidence of trauma to the face or other parts of the body.

INVESTIGATIONS

- FBC, ESR
- Blood glucose
- BUE

- Calcium
- LFTs
- Chest X-ray, skull X-ray
- Electroencephalogram (EEG)
- CT scan (head)

TREATMENT

Treatment objectives

- To stop the seizure
- To treat underlying cause

Non-pharmacological treatment

Immediate emergency measures: If patient is seen convulsing:

- Ensure that the patient does not harm himself (moving person away from sharp objects etc), clothing about the neck should be loosened
- Ensure the airway is clear, remove any secretions or vomitus from the mouth or nose. Don't force a spoon or tongue depressor into mouth!
- Remove false teeth if present
- After convulsions cease, turn the patient into semi-prone position by turning the patient on the side, with one leg bent and the other leg straight
- Monitor fits (fits chart)

Pharmacological treatment

(Evidence rating: A)

Immediate emergency measures: If patient is seen convulsing:

- Oxygen, intranasal or by face mask, high concentration, to offset cerebral hypoxia
- Diazepam, IV,

Adults

10 mg slowly over 23 minutes (approximately 2.5 mg every 30 seconds)

Children

200-300 microgram/kg slowly over 23 minutes or if not possible then give the same injectable form (directly from the syringe) into the rectum after removing the needle. This may be repeated 10 minutes later if the fit continues.

EPILEPSY

Epilepsy is a disorder of the central nervous system (CNS) which is characterized by spontaneous recurrent seizures or the tendency to have seizures.

Epileptic seizures may be classified as follows:

- Generalized seizures
 - Grand mal (tonic-clonic) seizures
 - Petit mal (absence) seizures
 - Other types (atonic, myoclonic)
- Partial or focal seizures
 - Simple partial (consciousness not impaired)
 - Complex partial (consciousness impaired) eg temporal lobe seizures
 - Partial seizures with secondary generalization
- Status epilepticus

CAUSES

- [See section on Seizures](#)

SYMPTOMS

- [See section on Seizures](#)

SIGNS

- [See section on Seizures](#)

INVESTIGATIONS

- [See section on Seizures](#)

TREATMENT

Treatment objectives

- [See section on Seizures](#)

Non-pharmacological treatment

- [See section on Seizures](#)

Pharmacological treatment

(Evidence rating: A)

Anticonvulsant drug therapy:

Traditionally, a single seizure has been regarded as an indication for investigation and assessment, but not for drug treatment unless a second attack follows closely or based on the circumstances of the seizure.

Drug treatment should certainly be considered after two seizures and the type of drug depends on the type of seizure. The underlying abnormality must also be corrected if possible.

Guidelines for Use of Anti-epileptic drugs

- Begin with a single drug at the lowest dosage range
- If seizures not controlled, increase dose to upper limit of dosage range or until side-effects appear.
- If seizures are poorly controlled, change to a different drug by gradually reducing dose of initial agent while simultaneously introducing the new one. This usually takes 3-4 weeks.
- Try 3 single drugs before resorting to drug combinations, which help in only a minority of cases.
- Treatment can be stopped only after 2 years seizure free and after a full evaluation and discussion with patient.

Table 10-1 : Drug Treatment of Seizures

Type of Seizure	Drug Dose	
	Adult	Child
Generalized seizure		
Phenytoin (daily)	300-500 mg	3-5 mg/kg
Phenobarbital (daily)	60-180 mg	5-8 mg/kg
Primidone (2 times daily)	250-1000 mg	20-30 mg/kg
Carbamazepine (2 times daily)	400-1200 mg	10-20 mg/kg
Sodium valproate (2-3 times daily)	600-2000 mg	20-30 mg/kg
Generalized absence (petit-mal) seizure		
Sodium valproate (2-3 times daily)	600-2000 mg	20-30 mg/kg
Ethosuximide (daily)	500-1500 mg	250-500 mg
Partial seizure		
Carbamazepine (12 hourly)	400-1200 mg	20-30 mg/kg
Sodium valproate (2-3 times daily)	600-2000 mg	20-30 mg/kg

NB: where available slow release preparations are preferred



Note

DON'TS FOR EPILEPTIC PATIENTS

- Driving of a vehicle if not certified to be seizure free
- Swimming alone
- Working at heights
- Excessive alcohol ingestion
- Machine operation
- Cooking by open fire alone

STATUS EPILEPTICUS

Status epilepticus is said to exist when a series of seizures occur without the patient regaining consciousness between attacks. By definition such seizures are continuous and last more than 5 minutes. This condition is life-threatening.

Outcome of status epilepticus is influenced by the presence of the following conditions:

- High mortality: anoxia, multiple medical illnesses, sepsis
- Intermediate mortality: stroke, tumor, infection, trauma
- Low mortality: epilepsy plus precipitant (e.g. omitting antiepileptic drug), drug toxicity and interactions, alcohol withdrawal

CAUSES

- See section for Seizures

INVESTIGATIONS

- See section for Seizures

TREATMENT

Treatment objectives

- To maintain adequate airway, breathing and circulation
- To terminate the seizure and prevent recurrence
- To treat underlying cause

Non-pharmacological treatment

- See section for Seizures
- Insert a Brook's airway (oropharyngeal tube) to maintain airway

Pharmacological treatment

(Evidence rating: A)

- Oxygen, nasally or by face mask
- Diazepam, IV,

Adults

10 mg slowly over 2-3 minutes (not exceeding 2.5 mg every 30 seconds)

Children

200-300 microgram/kg slowly over 2-3 minutes or if not possible then give the same injectable form (directly from the syringe) into the rectum after removing the needle. This may be repeated 10 minutes later if the fit continues.

- If hypoglycaemia is suspected treat as appropriate for adult or child (see section on Hypoglycaemia)

If seizures continues

- Diazepam in Sodium chloride 0.9%, IV, 40-80 mg per litre to be infused over 6 hours. Give at 5 mg/minute until seizures stop or a total of 20 mg has been given or significant respiratory depression occurs.

If seizures still persist:

- Phenytoin, IV, only when ECG monitoring is available
20 mg/kg slowly at rate no greater than 50 mg/minute

Or

Phenobarbitone, IV,
20 mg/kg slowly

If seizures remain uncontrolled 60 minutes after they began:

- Contact anaesthetist to provide general anaesthesia and ventilate.
Transfer, if necessary, to a facility where this can be done

PSYCHOGENIC SEIZURES

(See section on **Psychiatric Disorders**)

REFER

Refer patients to a hospital specialist if seizures are intractable or refractory to treatment or if general anaesthesia and ventilatory support is required.

58. DIZZINESS AND BLACKOUTS

Dizziness is a word patient's use for a wide variety of complaints ranging from a vague feeling of unsteadiness to severe, acute vertigo. It is also frequently used to describe the light-headedness that is felt in panic and anxiety attacks, during palpitations and fainting episode (syncope) or in chronic ill health.

Like dizziness, "blackouts" is a vague, descriptive term implying either altered consciousness, visual disturbance or a sensation of falling. A careful history, particularly from an eye-witness, is essential.

Episodes of transient disturbance of consciousness and falls are common clinical problems. It is usually possible to distinguish between a fit (a seizure), an episode of fainting and other types of attack from the history given by the patient and the account of an eye witness.

CAUSES

Circulatory

- Vasovagal - (Fainting)
- Postural hypotension
- Acute haemorrhage
- Cardiac Arrhythmias
- Atrioventricular block with Stokes-Adams attacks
- Ventricular asystole, ventricular tachycardia, supraventricular tachycardia

- Vertebro-basilar Insufficiency
- **Cerebral**
- Transient Ischaemic Attacks
- Hysterical fainting/Hyperventilation

Others

- Cervical spondylosis
- Anaemia with hypoxia
- Hypoglycaemia
- Vertigo
- Unsteadiness of gait
- Epilepsy
- Side effects of some medications

SYMPTOMS

- These vary depending on the cause.

SIGNS

- These vary depending on the cause.

INVESTIGATIONS

- These vary depending on the cause.

TREATMENT

Treatment objectives

- To identify and appropriately manage the possible underlying cause(s)

Non-pharmacological treatment

- Place patients in the supine position to permit maximal cerebral blood flow, that is, in the supine position
- Raise legs up or raise foot end of the bed if necessary
- All tight clothing and other constrictions should be loosened
- Turn head to one side to prevent the tongue falling back thereby blocking the airway and to prevent aspiration
- Patients should not be permitted to rise until the sense of physical weakness has passed. They should be watched carefully for a few minutes after rising and not be permitted to drive or operate machinery immediately.

Pharmacological treatment

- (See appropriate sections for treatment of the various causes)

REFER

Refer to a higher level facility if the patient's condition does not improve.

59. THE UNCONSCIOUS PATIENT

Unconsciousness is a common clinical problem and may be associated with diseases of several organs in the body. The cause of unconsciousness is often not immediately evident, and a systematic approach to its diagnosis and management is therefore important. Obtain a history from accompanying relatives, friends, the police etc.

CAUSES**Adults**

- Infections e.g. meningitis, cerebral malaria
- Hypoglycaemia (diabetes-related or alcohol induced)
- Diabetic ketoacidosis
- Severe hypertension with encephalopathy
- Cerebrovascular Accident (CVA) or stroke
- Drug overdose e.g. alcohol, salicylates, barbiturates
- Electrolyte imbalance
- Epilepsy status epilepticus
- Head injury
- Major organ failure e.g. hepatic failure, renal failure and myocardial infarction

Children

- Infections e.g. meningitis, cerebral malaria
- Hypoxia from severe anaemia
- Epilepsy
- Hypoglycaemia
- Drug ingestion
- Poisoning e.g. Kerosene

SYMPTOMS

- Depends on the underlying cause (see appropriate section)

SIGNS

- Depends on the underlying cause (see appropriate section)

INVESTIGATIONS

- Hb, WBC, BF for MPs
- Blood glucose

- Urea and electrolytes
- Liver function tests
- Blood C/S
- Urine C/S
- ECG
- Drug screen, alcohol levels (if possible)
- Lumbar puncture
- CT scan head

TREATMENT

Treatment objectives

- To prevent complications e.g. aspiration, hypoxia
- To determine the underlying cause and manage it appropriately

Non-pharmacological treatment

- Examine the airway and ensure that it is clear
- Check for the presence, rate and rhythm of the pulses and monitor blood pressure
- Observe the respiratory rate and pattern
- Perform cardiopulmonary resuscitation if required
- Assess neurological status
 - Pupils (size, symmetry, reaction to light)
 - Limb movements, reflexes, and facial asymmetry
 - Check neck for stiffness
 - Fundoscopy
 - Smell breath
- Catheterise and monitor urine output if necessary
- Place the patient in a position that would prevent aspiration in case of vomiting or pass an NG tube if no contraindications exist
- Assess using the Glasgow Coma Scale (adults) or Blantyre Coma Scale (children)

Pharmacological treatment

For specific management of likely causes refer to the table on guidelines for the management of the unconscious patient.

REFER

Refer to a regional or teaching hospital for further definitive management if not responding to standard measures

Table 10-2 : Guidelines for the Management of the Unconscious Patient

Complaints	Diagnosis * (See appropriate section)	Action * (See appropriate section)
History of diabetes, use of oral anti-diabetic or ingestion of alcohol	* Hypoglycaemia	<ul style="list-style-type: none"> • *Test blood for glucose using test strip or glucose meter. • Give IV Glucose
History of ingestion of medication (tablets or liquid). There may be smell of alcohol or other substance on breath	Drug overdose. e.g. Alcohol, e.g. Paracetamol	<ul style="list-style-type: none"> • Support respiration • IV Glucose to prevent hypoglycaemia. <p>In chronic alcoholics</p> <ul style="list-style-type: none"> • Precede IV 5-10% glucose with added B vitamins • Gastric lavage, N-acetylcysteine, IV, 150 mg/kg over 15 minutes
Presence or absence of <ul style="list-style-type: none"> • history of diabetes; • polyuria, polydipsia . • hyperventilation • gradual onset of illness • evidence of infection • Urine sugar and ketone positive • Blood glucose > 18 mmol/l 	* Diabetic ketoacidosis	<ul style="list-style-type: none"> • See appropriate section
Fever, fits, headache, neck stiffness, altered consciousness etc.	* Meningitis or Cerebral Malaria	<ul style="list-style-type: none"> • *Treat with antibiotics and quinine until either diagnosis confirmed.

Table 10-2 (Continued): Guidelines for the Management of the Unconscious Patient

History of previous fits, sudden onset of convulsions; with or without incontinence.	* Epilepsy	<ul style="list-style-type: none"> • *Give Diazepam, IV, to abort fits and continue or start with anti-epileptic drug treatment
Patient with sudden onset of paralysis of one side of body.	* Stroke	<ul style="list-style-type: none"> • Check blood pressure and blood glucose. • If hypertensive, give anti-hypertensives to reduce BP slowly over several days
Patient with hypertension, headaches, seizures	* Hypertensive encephalopathy	<ul style="list-style-type: none"> • Check blood pressure • If very high, give oral or Parenteral Anti-hypertensives
Sudden onset associated with cardiac arrhythmia or emotional crisis.	Syncope	<ul style="list-style-type: none"> • Unconsciousness is usually brief. • Prompt awakening occurs. • Monitor vital signs
History of injury, or alcoholism, signs of trauma	Head Injury	<ul style="list-style-type: none"> • Treat lacerations • X-ray skull for fractures, CT scan
History of heavy alcohol ingestion over many years. History of jaundice and gradual onset of changes in sensorium	* Hepatic Failure	<ul style="list-style-type: none"> • Manage as hepatic encephalopathy

60. ATTENTION DEFICIT HYPERACTIVITY DISORDER

Attention Deficit Hyperactivity Disorder (ADHD) is a chronic lifelong condition usually starting from childhood. It is characterised by inattention, poor concentration and hyperactivity or impulsivity that interferes with functioning at home and school and in relationships. The symptoms of ADHD must be present most of the time and in at least 2 different settings, for example, at home and school. The child must have these symptoms for at least 6 months and they must be more prominent than others of their age for a doctor to consider the diagnosis.

CAUSES

- The exact cause is unknown. However, there may be a family history and sometimes difficulties with the child's birth

SYMPTOMS

The behaviour of the child may include the following;

- Easily distracted
- May not follow instructions or listen when spoken to
- Leaves tasks unfinished
- Makes careless mistakes
- Have trouble sitting still and run around at inappropriate times
- Tend to be clumsy and occasionally destructive

SIGNS

- The symptoms mentioned above may be observed by the health care practitioner during a consultation.

INVESTIGATIONS

- No specific investigations

TREATMENT

Treatment objectives

- To improve the child's behaviour and social integration

Non-pharmacological treatment

- Behavioural control parents, teachers and other caregivers should be taught to reward good behaviour, set fixed schedules and help the child organize everyday items and tasks

Pharmacological treatment (Evidence rating: B)

- Methylphenidate, oral,
Dosage schedule to be determined by specialist experienced in managing this condition

REFER

All children suspected to have ADHD should be referred to a child psychiatrist or paediatrician for full assessment and treatment

61. PSYCHOGENIC SEIZURES

Psychogenic seizures or pseudo seizures are non-epileptic seizures which mimic epilepsy but actually have an underlying psychological cause. In patients with this form of disorder, there may be a history of physical, sexual, psychological abuse. The symptoms may be precipitated by stress and the signs are often variable and may include resistance to eye opening upon examination.

TREATMENT

- Manage symptomatically

REFER

For further evaluation by psychologist or psychiatrist

62. INSOMNIA

Insomnia is the inability to obtain adequate sleep, irrespective of whether the patient has trouble getting to sleep, suffers frequent nocturnal arousals, or awakens too early. Assessing a complaint of sleep disorders requires a thorough history and clinical examination and specific sleep-wake history. Insomnia may suggest an underlying medical, psychological, psychiatric (especially depression) or environmental problem.

CAUSES

- Medicines e.g. Ephedrine, phenylephrine
- Caffeine-containing beverages e.g. coffee, tea,
- Alcohol
- Drugs of abuse e.g. cocaine, marijuana, amphetamines
- Underlying medical, psychological and environmental factors
- Anxiety disorder
- Depression

INVESTIGATIONS

- FBC
- LFTs
- BUE and creatinine
- Sleep study

TREATMENT**Treatment objectives**

- To manage any underlying cause
- To educate patient on variation of sleep patterns
- To reassure patient

Non-pharmacological treatment

Educate patient to adopt a lifestyle that promotes good sleep

- Have regular exercise
- Avoid strenuous exercise close to bedtime
- Establish good sleep hygiene i.e. a routine for 'winding down', going to bed and preparing for sleep
- Avoid alcohol and caffeine-containing beverages close to bedtime
- Ensure a comfortable and quiet environment for sleep
- Relaxation therapy
- Stimulus control treatment of sleep by going to go to bed only when sleepy and to get out of bed if sleep is interrupted

Pharmacological treatment**(Evidence rating: C)**

- Diazepam, oral,
5-10 mg at night

Treatment should normally be limited to less than 4 weeks because of the risk of dependency

REFER

Patients with chronic insomnia who fail to respond to treatment to a physician or psychiatrist.

63. THE ACUTELY DISTURBED PATIENT

The acutely disturbed patient presents in an excited, agitated or aggressive state. There may be perceptual changes like hallucinations and delusions that overwhelm the patient. Disorientation and alteration in consciousness are often prominent when the cause is organic.

CAUSES**Acute Functional Psychiatric Disorders**

- Mania or hypomania
- Acute schizophrenia
- Agitated depression
- Acute psychosis

Acute Organic Psychiatric Disorders

- Toxic psychosis secondary to drug intoxication with cocaine, marijuana, heroin etc.
- Delirium tremens (Acute Alcoholic Withdrawal Syndrome)
- Alcoholic Intoxication
- Infective causes e.g. typhoid, malaria, meningitis, encephalitis, acute hepatitis

SYMPTOMS

- Restless, agitated or even combative patient
 - Often brought in forcibly restrained by more than two people or the police
- Talking excessively and loudly, mute in some cases
- Disinhibition in behaviour or speech
- Hallucinations-auditory or visual
- Delusions-paranoid, grandiose or bizarre depending on particular condition

SIGNS

- Euphoria
- Lack of insight
- Pressure of speech
- Increased appetite
- Hyperactivity
- Increased sexual desire
- Over assertiveness
- Hallucinations- auditory or visual
- Delusions of grandeur
- Fever in organic disorders
- Physical aggression
- Destructiveness

INVESTIGATIONS

- Usually no specific investigations
- FBC and BF for MPs when there is fever

TREATMENT**Treatment objectives**

- To calm down the patient as quickly as possible using the safest drugs available without necessarily inducing sleep (Rapid tranquilisation)
- To treat underlying cause

Non-pharmacological treatment

- Restrain patient when necessary without causing injuries
- Talk to the patient in a firm but reassuring manner
- Avoid long periods of silence especially in paranoid patients

Pharmacological treatment**(Evidence rating: C)**

- Diazepam, IV, (for most patients)

Adults

10-20 mg slowly over 2-3 minutes (not exceeding 2.5 mg every 30 seconds)

Children

200-400 microgram/kg slowly over 2-3 minutes (repeat if necessary after 10 minutes)

Or

Diazepam, rectally, (repeat if necessary after 5 minutes)

> 4 years;	5-10 mg
1-3 years;	5 mg
< 1 year;	2.5 mg

Or

Lorazepam, IV/IM, (for most patients)

Adults

2-4 mg

Children

> 12 years;	500 microgram-2 mg
< 12 years;	500 microgram-1 mg

Or

Haloperidol, IV/IM, (for calming most patients without sedation)

Adults

5-10 mg hourly when required

Children

2.5-5 mg stat

Or

Chlorpromazine, IM, (for very agitated patients)

Adults

50-150 mg stat repeated after 30-40 minutes if necessary

Children

25-50 mg

Or

Olanzapine, IM,

Adults

10-20 mg

**Note**

Diazepam IV must be administered with care if the cause of the acute disturbance is organic. Never give chlorpromazine IV. It may lead to severe hypotension.

REFER

Refer all acutely disturbed patients to a psychiatrist

64. DEPRESSION

Depression is a mood disorder. It occurs in all age groups although the symptoms may be different in children. It has a tendency to recur, though some may become bipolar, when episodes of mania may also be observed. Most Ghanaian patients present mainly with bodily symptoms, sleep disturbances as well as morbid dreams and “worrying excessively”. They hardly mention a depressed mood unless they are asked specifically, and even then many deny or trivialise it as a consequence of acknowledged symptoms like headache or insomnia.

Most cases of suicide or attempted suicide are from depression. One should not dismiss or take for granted statements made by patients such as “I want to die”, “life is not worth living”, “I am fed up with life”. All cases of attempted suicide should be referred to a psychiatrist after initial management of the presenting complication e.g. self-inflicted accident or poisoning.

Recurrent depression or unipolar depression is treated differently (with antidepressants) from bipolar depression, which responds more to mood stabilizers.

CAUSES

- Genetic
- Familial
- Environmental
- Psychosocial factors
- Endocrine disorders e.g. hypothyroidism, Cushing's syndrome

SYMPTOMS

The diagnostic criteria for major depression relies on the presence of at least five of the following symptoms experienced every day for at least two weeks.

- Depressed mood
- Loss of interest or pleasure
- Significant weight loss or gain
- Insomnia or sleeping too much
- Psychomotor agitation or retardation
- Fatigue or loss of energy
- Feelings of worthlessness or excessive guilt
- Impaired thinking or concentration; indecisiveness
- Multiple bodily complaints
- Suicidal thoughts/thoughts of death
- Hallucinations/delusions of morbid themes in severe cases

In children

- Truancy or refusal to go to school
- Poor school performance
- Bedwetting in a previously 'dry' child
- Odd behaviour, aggression or defiance
- Irritability
- Appetite changes
- Some of the 'adult' symptoms

SIGNS

- Depressed mood
- Evidence of weight loss or obesity
- Agitation or retardation
- Hallucinations

INVESTIGATIONS

- FBC
- BUE and creatinine
- FBS
- Thyroid function and cortisol levels if indicated

TREATMENT

Treatment objectives

- To reduce symptoms
- To prevent disruption to normal life at home, work or school
- To prevent suicide

Non-pharmacological treatment

- Counselling
- Psychotherapy specifically Cognitive Behaviour Therapy
- Electroconvulsive therapy

Pharmacological treatment**(Evidence rating: A)**

- Fluoxetine, oral,
Adults and Children
> 8 years; 20-60 mg daily as a single dose in the morning

Or

Sertraline, oral,
Adults and Children

> 8 years; 50-100 mg daily as a single evening dose

Or

Imipramine, oral,
Adults

Initially, 25-50 mg, oral taken early evening once a day. Increase by 25mg every 3-5 days up to

150 mg orally at night by end of second week.

The patient's tolerance will determine the rate of increase and the maximum dose

Children

6-12 years; 5-15 mg 12 hourly

Or

Amitriptyline, oral,
Adults

Initially, 25-50 mg, oral, taken early evening once a day. Increase by 25 mg every 3-5 days up to 150 mg orally at night by end of second week.

The patient's tolerance will determine the rate of increase and the maximum dose

Children

6-12 years; 5-15 mg 12 hourly

**Note**

Give the maximum tolerable dose for at least 6 weeks before deciding a particular antidepressant is not effective.

After an episode of depression, continue antidepressants for at least 6 months, as there is a high risk of relapse in this period

If night sedation is required, Diazepam 5-10 mg or Lorazepam 1-2 mg orally may be given, in general, for not more than 2 weeks at a stretch to avoid dependence

- Stop antidepressants immediately if manic swing occurs.
- Admit patients with suicidal tendencies and keep under close observation.

REFER

Refer the following to a psychiatrist

- Patients with a typical, hysterical or phobic features
- Patients who do not respond to treatment
- Children suspected to suffer from depression

65. SCHIZOPHRENIA

Schizophrenia is probably the most severe and potentially disabling form of mental illness and occurs in about 1% of the people in every community worldwide. Schizophrenia may present as an acute or chronic illness. The clinical features include characteristic 'positive' or 'negative' symptoms, deterioration in social, work or interpersonal relationships and continued evidence of disturbed behaviour for at least 6 months. The clinical features may be numerous and can change over time. Psychosis associated with substance abuse and mood disorders with psychotic features may mimic schizophrenia.

CAUSES

- Cause is largely unknown
- Possible causes include;
 - Genetics
 - Birth defects
 - Environmental triggers
 - Illicit drugs

SYMPTOMS**'Positive' symptoms**

- Hallucinations
- Delusions
- Incoherent speech or illogicality
- Odd or disorganised behaviour
- Disorders of thought possession

'Negative' symptoms

- Poverty of speech or of content of speech
- Apathy
- Reduced social contact or withdrawal
- Flattened affect (showing little facial expressive responses)

Delusions may be persecutory (undue suspicion) or totally bizarre like being controlled or being made to feel emotions or sensations.

Hallucinations may involve any of the senses but auditory ones are most common; experienced as voices speaking clearly or in mumbled tones.

Disorders of thought possession include feeling of the patient's thoughts being accessible to others. Motor disorders often occur but are not essential for diagnosis

TREATMENT

Treatment of schizophrenia is best left to the psychiatrist though treatment for acute episodes can be started and follow up treatment continued by most health care givers.

Treatment objectives

- To abolish symptoms and restore functioning to the maximum level possible
- To reduce the chances of recurrence

Non-pharmacological treatment

- Supportive psychotherapy
- Rehabilitation

Pharmacological treatment

(Evidence rating: A)

Antipsychotic drugs are the mainstay of treatment.

Recommended antipsychotics:

In acute attack

- Olanzapine, IM or oral,
5-10 mg

Or

Chlorpromazine, oral or IM,
100-150 mg 6-8 hourly

Or

Haloperidol, IM, or oral,
5-10 mg 6-8 hourly

Maintenance

- Risperidone, oral,
1-4 mg once or twice daily

Or

Olanzapine, oral,
5-10 mg once or twice daily

Or

Chlorpromazine, oral,
100-600 mg daily in divided doses

Or

Haloperidol, oral,
5-20 g daily

Or

Fluphenazine decanoate, IM,
25 mg monthly

Or

Depot preparations for patients with recurrent or chronic illness aimed at improving compliance:

- Flupenthixol decanoate, IM,
40 mg monthly

Adjunct treatment

Antiparkinsonian drugs should only be used if reactions occur or when antipsychotics are administered at higher doses likely to cause reactions.

- Trihexyphenidyl (Benzhexol), oral,
2.5- 5 mg 8 24 hourly

Or

- Benztropine (Benztropine), oral,
1-2 mg 12-24 hourly

Or

- Biperidine, oral,
1-2 mg 8-24 hourly

Or

- Biperidine, IV,
2 mg slowly over 2-4 minutes for acute dystonic reactions

Or

- Promethazine hydrochloride, oral or IM,
25-50 mg

Or

Chlorphenamine (Chlorpheniramine), oral,
4-8 mg

Or

Diazepam, oral or IV,
5-10 mg (if given IV, to be administered slowly not exceeding 2.5 mg in 30 seconds)

Duration of Treatment

A clearly diagnosed schizophrenic patient must be on medication for at least 18 months after remission of symptoms for a first episode.

After two or more episodes especially if they follow within a year or two of each other treatment should probably continue for life although 'drug holidays' may be discussed from time to time.

REFER

Since a diagnosis of schizophrenia carries probable lifelong implications and treatment may be of life long duration:

- Refer after treatment of acute episode
- Refer recurrent cases
- Refer patients who cannot be controlled with drugs and may require Electroconvulsive Therapy.

66. BIPOLAR DISORDERS

Bipolar disorders are a form of mood disorder. This refers to a condition in which patients experience mood swings between the two extremes of mood disorder depression and mania. Bipolar Disorder is referred to in older literature as Manic-Depressive illness. It is important to note that the affected patient usually presents with **one** predominant mood state at a time, either Depression or Mania.

A single manic episode and a history of depression qualify for classification as Bipolar Disorder. A current episode of depression without a past manic episode or with a past history of depression is not diagnostic of Bipolar Disorder. Repeated depressive episodes are diagnosed as recurrent depression.

CAUSES

- The cause is not known but there is a tendency to run in families. Genetic factors seem to play a role.

TREATMENT

- Treatment is directed at the current episode i.e. either mania or depression and returning mood to normal.

MANIA and HYPOMANIA

The history may include past similar episodes of mania or depressive illness. Occasionally, substance (cocaine, marijuana, amphetamine) abuse may precipitate the condition. Thyrotoxicosis can mimic mania and must be excluded.

SYMPTOMS

- Persistently elevated mood euphoria, expansiveness, feeling 'high' or irritability.

- Overactivity and excessive talking
- Making of grandiose claims
- Reduced sleep
- Reckless spending and being overly generous
- Sexual disinhibition
- Increased appetite

SIGNS

- No typical physical signs, however, the symptoms listed above may be observed.

INVESTIGATIONS

- Usually no specific investigations
- Rarely thyrotoxicosis may mimic mania and must be excluded

TREATMENT

Treatment objectives

- To reduce the level of activity to a manageable state.
- To lower the elevated mood to a normal state.
- To abolish psychotic symptoms (delusions and hallucinations) if present.

Non-pharmacological treatment

- Psychotherapy

Pharmacological treatment

If significantly aggressive, manage as for acutely disturbed patient ([see section on 'The Acutely Disturbed Patient'](#)).

Otherwise start oral medication as soon as possible with:

- Risperidone, oral,
1-4 mg once or twice daily (maximum 8 mg daily)

Or

Olanzapine, oral,
5-10 mg once or twice daily (maximum 30 mg daily)

Or

Haloperidol, oral,
5-10 mg 12 hourly (maximum 20 mg daily)

Or

Chlorpromazine, oral,
50-200 mg 8-12 hourly

Plus

Lorazepam, oral,
2 mg 8-12 hourly

Or

Diazepam, oral,
5-10 mg for very restless patients

**Note**

Continue or resume definitive treatment with mood stabilizers e.g. Lithium, Carbamazepine or Valproic acid for known patients with bipolar disorder. Check blood levels of mood stabilizers where feasible. The benzodiazepines are withdrawn as soon as the patient is calm, but this should be done by slowly tapering the dose. The antipsychotics are continued at a dose just enough to control the symptoms and should be continued for at least 3-4 weeks.

REFER

- All patients suffering a first episode must be referred
- Non response of patients to treatment after one month
- All children

67. ALCOHOLISM

Dependence on alcohol and development of related problems is a common and often unrecognised disorder. Alcoholism is often associated with many physical health problems.

The greatest problem is the recognition and diagnosis of alcoholism since affected individuals are often in denial of their problem. They under-declare the amount and frequency of alcohol consumption and usually appear in hospital only with complications. The coexistence of other psychiatric illnesses like Depression with alcoholism is common.

CAUSES

- Genetic, familial and environmental factors are all important.

SYMPTOMS

These may be observed by relatives or co-workers

- Recurrent use of alcohol resulting in failure to fulfil major obligations at work, school or home.
- Recurrent use in situations where it is physically hazardous e.g. driving
- Continued use despite having persistent or recurrent social, legal or interpersonal problems caused by effects of alcohol
- Development of tolerance
- Withdrawal syndromes
- Taking increasingly larger amounts over longer periods than intended
- Previous unsuccessful attempts at stopping

SIGNS

- Reddening of lips
- Smooth red palms
- Painless enlargement of liver
- Bruises from minor accidents etc.
- Parotid gland enlargement

INVESTIGATIONS

- Mean Corpuscular Volume (MCV) is increased in majority of alcoholism patients
- Liver Enzymes (AST, ALT) are often increased
- Serum Gamma Glutamyltransferase (GGT) is increased in majority of alcoholics
- Ultrasound scan of liver

TREATMENT**Treatment objectives**

- To treat complications
- To achieve total abstinence from alcohol use

Non-pharmacological treatment

- Most alcoholics will benefit from joining groups like Alcoholics Anonymous or religious organisations that encourage abstinence from alcohol
- Adequate nutrition

Pharmacological treatment**(Evidence rating: A)****Uncomplicated Alcohol Dependence**

- Phase 1-Detoxification (Best achieved under in-patient conditions admit for one week)
Outpatient care possible for the highly motivated.
- Stop all alcohol use.
- Diazepam, oral, as follows:

1st week

Day 1:	10-20 mg 12 hourly
Day 2:	10-20 mg 12 hourly
Day 3:	5-10 mg 12 hourly
Day 4:	5-10 mg 12 hourly
Day 5:	10 mg at night

Day 6:	10 mg at night
Day 7:	5 mg at night

2nd week

5 mg once daily for 2-7 days then STOP.

Alternative treatment

- Chlordiazepoxide, oral,

Day 1:	50 mg 4 hourly
Day 2:	50 mg 6 hourly
Day 3:	25 mg 4 hourly
Day 4:	25 mg 6 hourly

If there is a history of concomitant benzodiazepine abuse, this may not be effective therefore consult a psychiatrist.

- Thiamine, oral, 50-100 mg daily
- Give Folic Acid, oral, 5 mg daily
- Give multivitamin and mineral preparations daily for about one month

68. ALCOHOL WITHDRAWAL SYNDROMES

These occur following sudden withdrawal from alcohol. They are often seen in patients admitted to hospital for other problems e.g. arising from accidents or physical illnesses, which keep them from drinking.

MINOR WITHDRAWAL (“SHAKES”)

Onset is usually from 12 to 18 hours after the last drink and peaks between 24-48 hours, but may occur earlier.

SYMPTOMS

- Insomnia, tremors, nausea, vomiting

SIGNS

- Increased pulse rate and blood pressure.

TREATMENT

- As for uncomplicated alcoholism. Without treatment, symptoms subside within a week, but may occasionally last longer.

ALCOHOLIC SEIZURES

Onset is between 7-36 hours after the last drink. It consists of sudden generalised seizures and occurs mostly in chronic alcoholics. It may precede delirium tremens

TREATMENT

(See section on treatment for **Delirium Tremens**)

ALCOHOLIC HALLUCINOSIS

Onset is within 48 hours of cessation of drinking. It consists of vivid unpleasant auditory hallucinations occurring in the presence of a clear sensorium.

TREATMENT

- As for uncomplicated withdrawal. If hallucination persists add Haloperidol 5 mg twice daily until symptoms settle.

ALCOHOLIC DELIRIUM TREMENS

This is the most dramatic withdrawal syndrome. Usually starts 2-3 days after drinking stops. On average, syndrome lasts 3 days but may continue for much longer. Without good supportive care and adequate treatment, Delirium Tremens is associated with significant mortality.

SYMPTOMS

- Disorientation
- Inappropriate behaviour
- Inappropriate communication
- Illusions
- Hallucinations

SIGNS

- Tremors
- Psychomotor agitation or retardation
- Sweating, vomiting
- Disorientation
- Intermittent visual, tactile or auditory hallucinations or illusions. Visual hallucinations are frequently of small objects or frightening animals on walls etc.
- Rise in body temperature $>38^{\circ}\text{C}$.
- Pulse $>100/\text{minute}$, Blood Pressure $>160/100\text{ mmHg}$

TREATMENT**Treatment objectives**

- To recognise and correct the underlying cause

Non-pharmacological treatment

- Seclusion of the patient and application of restraints as necessary

Pharmacological treatment (Evidence rating: A)

- Diazepam, IV, (administer slowly)

Day 1:	10 - 20 mg 6 hourly
Day 2:	10 - 20 mg 8 hourly
Day 3:	10 - 20 mg 12 hourly
Day 4:	5 - 10 mg 8 hourly
Day 5:	5 - 10 mg 12 hourly then stop

Alternative treatment

- Lorazepam, oral,

Days 1 to 3:	2 - 4 mg once daily
Days 4 and 5:	1 - 2 mg once daily

Withhold if patient is asleep or has slurred speech, ataxia, nystagmus or very sedated

- Thiamine, IM or IV, 100 mg stat before any IV Glucose load
- Sodium Chloride 0.9% in 5% Glucose, IV, and/or oral fluids, to ensure adequate hydration and electrolyte balance
- Haloperidol, IV, 5-10 mg daily if hallucinations occur. Discontinue when they cease.
- Phenytoin, oral, 100 mg 8 hourly for 5 days may be used if seizures persist and are not controlled by Diazepam alone.

REFER

Refer patients to a psychiatrist or clinical psychologist for consideration of disulfiram treatment and other options to assist long-term abstinence.

69. ANXIETY DISORDERS

Anxiety is a common symptom that occurs in all psychiatric disorders including depressive illness and most psychoses. Some patients have a mixture of anxiety and depressive symptoms, but pure states exist. Due to the similarity of symptoms, it may be difficult to differentiate an anxiety state from a minor depressive illness. Anxiety may also significantly overshadow many serious illnesses. It may be worthwhile to exclude any underlying physical disease especially hyperthyroidism, cardiac disease or hypertension.

Although there are various forms of anxiety disorders (generalised anxiety disorder, panic disorder, phobias, obsessive compulsive disorder, acute stress disorder, post traumatic stress disorder), the commonest seen in general practice are generalised anxiety disorders and panic disorders.

GENERALISED ANXIETY DISORDERS

In this condition, there is excessive anxiety and worry about events or activities, such as performance at school or work, occurring on most days, for at least 6 months.

CAUSES

- Life experiences
- Environmental factors
- Personality
- Genetics

SYMPTOMS

- Excessive anxiety and worry occurring on most days, for at least 6 months
- The anxiety or worry is associated with at least 3 of the following
 - Muscle tension (often reported as pain in various parts like neck, trunk or headaches)
 - Crawling and burning sensation around the body
 - Restlessness or feeling on edge
 - Being easily fatigued
 - Difficulty concentrating or mind going blank
 - Irritability
 - Sleep disturbance (difficulty falling asleep or frequent waking)
 - Palpitations

SIGNS

- Restlessness
- Sweating
- Anxious mood
- Tachycardia

INVESTIGATIONS

- No laboratory tests confirm the diagnosis. However, exclude underlying conditions, especially hyperthyroidism, pheochromocytoma, cardiac arrhythmias

TREATMENT

Treatment objectives

- To reduce anxiety
- To attain relief of somatic symptoms

Non-pharmacological treatment

- Reassurance about the absence of physical disease once they are ruled out
- Teach relaxation methods

- Encourage regular exercise
- Encourage healthy social activities
- Psychotherapy

Pharmacological treatment

(Evidence rating: B)

- Diazepam, oral,
2-5 mg 12 hourly for 2 weeks and gradually tailed off over the next 2 weeks. (Do not give for more than one month continuously)
- Propranolol, oral,
20-80 mg 12 hourly (especially when somatic complaints are prominent, avoid in asthmatics)
- Sertraline, oral,
50 mg as a single oral evening dose
- Amitriptyline, oral,
25-50 mg as a single oral evening dose

Alternative treatment

- Imipramine, oral,
25-50 mg as a single oral evening dose



Note

With the exception of diazepam, the other medications may be used for longer periods without fear of dependence

REFER

Referral to a psychiatrist is only necessary in severe cases not responsive to treatment.

PANIC DISORDERS

A panic disorder refers to a pattern of recurrent unexpected attacks of intense fear or discomfort over a discrete period. During attacks 4 or more of the symptoms listed below develop abruptly and reach a peak within 10 minutes. Panic disorders are accompanied by persistent concern about having another attack or worrying about implications of having an attack. In children especially, partial complex seizures may mimic panic attacks. Medications are required to treat panic disorders only if the attacks occur frequently enough to cause distress.

CAUSES

- Cause unknown
- Contributing factors:

- Stress
- Genetics

SYMPTOMS

- Fear of dying or going 'crazy'
- Palpitations, pounding heart or rapid heart rate
- Trembling or shaking
- Sensation of shortness of breath
- Feeling of choking
- Chest pain or discomfort
- Feeling dizzy, unsteady or faint
- Numbness or tingling sensations
- Chills or hot flushes
- Derealisation (feeling of unreality) or depersonalisation (feeling detached from oneself)
- Nausea or abdominal distress

SIGNS

- Tachycardia
- Tremors

TREATMENT

Treatment objectives

- To stop the attacks of panic or at least reduce the frequency and intensity of symptoms to a minimum.

Non-pharmacological treatment

- Rebreathing into a paper bag. (Do not use a polythene bag)
- Panic disorder patients should be advised to eliminate caffeine-containing foods e.g. coffee, tea, cola and chocolates, from their diet as they tend to worsen anxiety.
- Relaxation Training
- Cognitive Therapy

Pharmacological treatment

(Evidence rating: B)

- Diazepam, oral,
5-10 mg daily, for maximum of one week
- Fluoxetine, oral,
20 mg daily as single morning dose,

Or

Sertraline, oral,
50 mg daily as single evening dose

Or

Imipramine, oral,
Build up dose from 50 to 150 mg gradually as a single dose in late afternoon/evenings (Refer to section on treatment of depression)

Duration of treatment:

At least 6 weeks and should be continued for up to 6 months or more after attacks have remitted to prevent early relapse. Tail off slowly over a month or more.

REFER

- Children with symptoms suggestive of panic disorder should be referred to the paediatrician to exclude seizure disorder.
- Patients who do not respond to drug therapy should be referred for psychotherapy.
- Cognitive Therapy - Refer to Clinical Psychologists

A. BACTERIAL SKIN INFECTIONS

70. BOILS

A boil or furuncle is a deep bacterial infection of the hair follicles. A more superficial infection is termed folliculitis and a group of boils in an area is termed a carbuncle. Patients with recurrent boils or carbuncles should be screened for diabetes mellitus and/or immunodeficiency.

CAUSES

- Infection of the skin with *Staphylococcus aureus*

SYMPTOMS

- Single or multiple swellings on the skin which may discharge pus
- Painful swellings on the skin

SIGNS

- Purulent swellings on the skin in single or multiple areas of skin
- Swellings may be warm and/or tender

INVESTIGATIONS

- FBC
- Fasting blood glucose (if diabetes suspected)
- HIV status (if immunodeficiency suspected)

TREATMENT

Treatment objectives

- To treat infection
- To relieve pain
- To identify and treat any predisposing condition

Non-pharmacological treatment

- Incision and drainage - if boil becomes fluctuant and large
- Wound dressing

Pharmacological treatment

(Evidence rating: B)

- Flucloxacillin, oral,

Adults

250-500 mg 6 hourly for 7 days

Children

5-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

<1 year;

62.5 mg 6 hourly for 7 days

Alternative treatment

If patient is allergic to penicillin:

- Erythromycin, oral,
 - Adults
500 mg 6 hourly for 7 days
 - Children

6-12 years;	250 mg 6 hourly for 7 days
1-5 years;	125 mg 6 hourly for 7 days
< 1 year;	62.5 mg 6 hourly for 7 days
- Paracetamol, oral,
 - Adults
500 mg -1 g 6 to 8 hourly
 - Children

6-12 years;	250-500 mg 6 to 8 hourly
1-5 years;	120-250 mg 6 to 8 hourly
3 months-1 year;	60-120 mg 6 to 8 hourly

For folliculitis topical Mupirocin or antiseptic cream (Cetrimide) may be adequate.

REFER

Refer if the underlying condition requires further management.

71. IMPETIGO

This is a superficial bacterial skin infection, which is contagious. It is common in children. It may be associated with conditions such as scabies, eczema, lice infestation and herpes simplex infection. Its prevention involves good hygiene, regular hand-washing, trimming of fingernails to reduce breaking of the skin through scratching, and discouraging the sharing of towels and clothing.

CAUSES

- Skin infection with *Staphylococcus aureus* and/or *Streptococcus Pyogenes*.

SYMPTOMS

- Blisters and sores on the body or scalp.

SIGNS

- Superficial, fragile blisters and irregular spreading sores with shiny, yellow crusts.

INVESTIGATIONS

- Microscopy and culture of the exudate from the blisters (not routinely required except in recurrent cases).

TREATMENT**Treatment objectives**

- To eradicate infection
- To identify and treat any predisposing condition
- To prevent transmission

Non-pharmacological treatment

- Uncomplicated impetigo may be managed with antiseptic baths.

Pharmacological treatment**(Evidence rating: B)**

Mild and moderate cases:

- Flucloxacillin, oral,

Adults

250-500 mg 6 hourly for 7 days

Children

5-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

< 1 year;

62.5 mg 6 hourly for 7 days

Severe cases requiring admission: (parenteral Benzyl penicillin **Plus** Cloxacillin)

- Benzyl penicillin, IM or IV,

Adults

2 MU, 6 hourly for 7 days

Children

$\frac{1}{4}$ MU/kg 6 hourly

Plus

Cloxacillin, IV,

Adults

500 mg 6 hourly for 7 days

Children

2-10 years;

125 mg 6 hourly for 7 days

< 2 years;

62.5 mg 6 hourly for 7 days

Alternative treatment

If patient is allergic to penicillin:

- Erythromycin, oral,

Adults

500 mg 6 hourly for 7 days

Children

6-12 years;	250 mg 6 hourly for 7 days
1-5 years;	125 mg 6 hourly for 7 days
< 1 year;	62.5 mg 6 hourly for 7 days

REFER

Refer for hospitalization and treatment if cellulitis, osteomyelitis or septicaemia develops.

72. CELLULITIS AND ERYSIPELAS

This is a diffuse inflammation of the soft tissue under the skin. Usually it follows an infected wound or prick by a pin, nail, thorn, insect bite or cracks between the toes. Diabetes mellitus may be a predisposing factor.

CAUSES

- Bacterial infection by *Streptococcus pyogenes* (the commonest Cause) and *Staphylococcus aureus*.

SYMPTOMS

- Pain and/or swelling of the affected parts
- Fever
- Malaise
- Reddening or darkening of the overlying skin

SIGNS

- Swelling of affected part
- Localised tenderness
- Localised warmth
- Enlarged and tender regional lymph nodes
- Underlying pus
- Offensive wound
- Fever

INVESTIGATIONS

- FBC
- Fasting blood glucose
- Wound swab for culture and sensitivity, if discharging pus

TREATMENT**Treatment objectives**

- To relieve pain

- To control the infection
- To treat predisposing condition(s)

Non-pharmacological treatment

- Rest and elevate the affected part if possible
- Clean and dress any open wounds
- Carry out incision and drainage if pus forms

Pharmacological treatment

(Evidence rating: C)

- Paracetamol, oral,

Adults

500 mg -1 g 6 to 8 hourly

Children

6-12 years;

250-500 mg 6 to 8 hourly

1-5 years;

120-250 mg 6 to 8 hourly

3 months-1 year;

60-120 mg 6 to 8 hourly

- Amoxicillin, oral,

Adults

500 mg -1 g 6 to 8 hourly

Children

6-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

<1 year;

62.5 mg 6 hourly for 7 days

Plus

Flucloxacillin, oral,

Adults

250-500 mg 6 hourly for 7 days

Children

>10 years;

250-500 mg 6 hourly for 7 days

2-10 years;

125-250 mg 6 hourly for 7 days

<2 years;

62.5-125 mg 6 hourly for 7 days

Or

- Benzylpenicillin, IM / IV, (If severe enough to require admission),

Adults

2 MU, 6 hourly for 7 days

Children

¼ MU/kg 6 hourly

Plus

Cloxacillin, IV,

Adults

500 mg-1g 6 hourly for 7 days

Children

2-10 years;

125-250 mg 6 hourly

< 2 years;

62.5 mg 6 hourly for 7 days

2-8 years;

250 mg 6 hourly for 7 days

< 2 years;

125 mg 6 hourly for 7 days

REFER

Refer severely ill patients and those with complications such as septicaemia, large abscess and gangrene for admission and treatment

73. BURULI ULCER

This is a relatively painless indolent and necrotising ulcer with undermined edges. While it is known that this ulcer is caused by a bacterium, the mode of transmission remains unclear. However, trauma, insect bite and inhalation have been suggested.

No definite efficacious medication for the disease exists, even though a number of candidate drugs are at clinical drug trial stage. Currently, surgical excision of the early lesions is the treatment of choice. For this to be achieved it is important to educate the public on early recognition and early reporting of the disease.

CAUSES

- *Mycobacterium ulcerans*

SYMPTOMS

- Subcutaneous painless firm lesion
- Extensive skin ulceration

SIGNS

- **Nodule:** Painless firm lesion 1-2 cm in diameter situated in the subcutaneous tissue and attached to the skin.
- **Plaque:** Painless, well demarcated elevated and indurated lesions more than 2 cm in diameter with irregular edges.
- **Oedematous type:** Diffuse, extensive non-pitting swelling with ill-defined margins, often painful, with or without ulceration.
- Extensive ulceration

INVESTIGATIONS

- Wound swab for AFB's, bacterial cultures and sensitivity
- Skin biopsy for histopathology.

TREATMENT**Treatment objectives**

- To limit the extent of tissue destruction
- To prevent disability
- To treat both primary and secondary bacterial infection

Non-pharmacological treatment

- Complete excision of nodules, preferably with primary closure if possible.
- Skin grafting of ulcers if facilities are available.

Pharmacological treatment**(Evidence rating: C)**

- Cetrimide/chlorhexidine/povidone iodine, topical (for dressing of ulcers prior to skin grafting)

REFER

Refer to higher centres if nodulectomy is not possible or other stages of presentation are seen. Also refer cases for treatment with selected combinations of anti-tuberculous medications.

74. YAWS

Yaws is a chronic infection by a bacterium that affects mainly the skin, bone and cartilage. Most people affected are children under 15 years of age but adults are not exempt. It is transmitted mainly through skin contact with an infected person. A single skin lesion develops at the point of entry of the bacterium after 24 weeks. Without treatment, multiple lesions appear all over the body. The disease is rarely fatal however; it can lead to chronic disfigurement and disability in about 10% of affected individuals if left untreated. Treatment with antibiotics is curative and relapse is rare.

Overcrowding, poor personal hygiene and poor sanitation facilitate the spread of the disease.

CAUSES

- *Treponema pertenuis*

SYMPTOMS

- Raised skin lesions
- Painless skin ulcer
- Bone pain

SIGNS

- Papular skin lesions
- Painless skin ulcer with scab
- Deformities of the nose, bones
- Palmar or plantar skin thickening

INVESTIGATIONS

- VDRL

TREATMENT**Treatment objectives**

- To eradicate the organism and ensure cure
- To prevent spread of the infection
- To prevent long term complications

Non-pharmacological treatment

- None

Pharmacological treatment**(Evidence rating: A)**

- Erythromycin, oral,

Adults

500 mg 6 hourly for 15 days

Children

> 15 years;

500 mg 6 hourly for 15 days

8-15 years;

250 mg 6 hourly for 15 days

< 8 years;

7.5mg/kg 6 hourly for 15 days

Alternative treatment

Tetracycline, oral,

Adults

500 mg 6 hourly for 15 days

Children

> 15 years;

500 mg 6 hourly for 15 days

8-15 years;

250 mg 6 hourly for 15 days

Alternative treatment

Benzathine Penicillin, IM,

Adults

1.2 million units stat

Children

> 10 years;

1.2 million units stat

< 10 years;

600 000 units stat

**Note**

Benzathine penicillin is used in control elimination or eradication strategies in the community. In such situations contacts of cases are given half the dose of benzathine penicillin according to the age groups above.

Patients allergic to penicillins must be given erythromycin or tetracycline.

REFER

Refer intractable cases to the dermatologist.

B. FUNGAL SKIN INFECTIONS**75. SUPERFICIAL FUNGAL SKIN INFECTION**

This is a common fungal skin infection, usually found in children on the scalp and body (ringworm), skin folds, (armpits, groins and skin below the breast) as well as the hands, feet and nails.

CAUSES

- Microsporum
- Epidermophyton
- Trichophyton

SYMPTOMS

- Scaly patches on the skin
- Scaly bald patches of the scalp
- Distorted discoloured finger or toe nails

SIGNS

- Pale round scaly patches with thickened edges and clear centre on the skin
- Scaly bald patches of the scalp.
- Distorted discoloured nails
- Altered pigmentation of skin folds with maceration

INVESTIGATIONS

- Microscopical examination of skin scrapings treated with potassium hydroxide where possible

TREATMENT**Treatment objectives**

- To eradicate infection
- To prevent transmission

Non-pharmacological treatment

- Good basic hygiene
- Use of loose clothing
- Open footwear

Pharmacological treatment**(Evidence rating: C)**

- Benzoic acid compound ointment (Whitfield's ointment), topical, Apply twice daily to patches till clearance.

Or

Clotrimazole 1%, topical,

Apply twice daily to patches till clearance.

Or

Miconazole 1%, topical,

Apply twice daily to patches till clearance.

Or

Ciclopirox olamine 1%, topical,

Apply twice daily to patches till clearance.

**Note**

Avoid Whitfield ointment in flexures because it is an irritant.

Oral antifungal agent if rash is extensive or affects the nails or scalp

- Griseofulvin, oral, (for skin and scalp; 4 weeks, nails and hands; 6-9 months, toes; 9-12 months)

Adults

500 mg daily (double in severe infection)

Children

6-12 years;

250 mg daily

< 5 years;

125 mg daily

**Note****Griseofulvin**

Avoid pregnancy during and for 1 month after treatment; men should not father children within 6 months of treatment

Or

Terbinafine, oral,

Adults

250 mg daily for 2-4 weeks

(finger nails) or 2-6 weeks (toe nails)

Or

Itraconazole, oral,

200 mg 12 hourly for 7 days

**Note**

For finger nails, repeat same dose after 3 weeks (2 courses)

For toe nails repeat same dose twice after intervals of three weeks (3 courses)

REFER

Refer intractable cases to the dermatologist.

76. PITYRIASIS VERSICOLOR

This is a common contagious fungal infection of the skin. Avoid use of topical steroids in this condition. Use of appropriate anti-fungal medication usually results in complete clearance within a few weeks of treatment.

CAUSE

- *Pityrosporum orbicularis/Malassezia furfur*

SYMPTOMS

- Macular rash

SIGNS

- Diffusely scaly depigmented patches in the dark skin and hyperpigmented in the light skin
- Superficial scraping produces a white scaly characteristic patch

INVESTIGATIONS

- Same as for skin fungal infections. Microscopical examination of skin scrapings treated with potassium hydroxide where possible

TREATMENT**Treatment objectives**

- To eradicate infection
- To prevent transmission

Non-pharmacological treatment

- Good personal hygiene
- Avoid sharing bath towels, sponges and clothing

Pharmacological treatment**(Evidence rating: C)**

- Imidazole solution e.g. clotrimazole, miconazole, etc.
Apply daily till clearance

Or

Selenium sulphide shampoo,
Applied daily on moist skin till clearance

- Ketoconazole, oral,
200 mg daily for 2 weeks if extensive

Or

Itraconazole 200 mg 12 hourly for 1 week

REFER

Refer intractable cases to a dermatologist.

C. VIRAL SKIN INFECTIONS

77. HERPES SIMPLEX INFECTION

This is commonly called “cold sores” and usually occurs around the lips, gums and in adults the genitals, as well. Recurrence is common on previously affected skin areas.

CAUSE

- *Herpes simplex virus*

SYMPTOMS

- Itchy tingling sensation in localised area of skin
- Small swellings or blisters
- 'Flu-like' symptoms e.g. headaches, muscle pain, fatigue, malaise, fever

SIGNS

- Grouped vesicles or small blisters
- Pruritus
- Tenderness at site of vesicular eruption
- Fever

INVESTIGATIONS

- The diagnosis is clinical

TREATMENT

Treatment objectives:

- To relieve pain and discomfort
- To limit extent of disease spread in the immunocompromised and atopic eczema patients
- To prevent secondary infection

Non-pharmacological treatment

- No specific measures

Pharmacologic treatment

(Evidence rating: C)

- Antiseptic lotion, topical, e.g. (Gentian Violet), Apply to affected parts

- Acyclovir cream, topical,
Apply 4-6 hourly within 48 hrs of onset
- Treat pain and fever with Paracetamol
- Paracetamol, oral,
 - Adults
500 mg - 1 g 6 to 8 hourly
 - Children

6-12 years;	250-500 mg 6 to 8 hourly
1-5 years;	120-250 mg 6 to 8 hourly
3 months-1 year;	60-120 mg 6 to 8 hourly
- Acyclovir oral (for immunocompromised and atopic eczema patients)
- Acyclovir, oral,
 - Adults
800 mg 4-6 hourly for 5 days
 - Children

> 2 years;	800 mg 4-6 hourly for 5 days
< 2 years;	400 mg 4-6 hourly for 5 days

REFER

Refer cases complicated by encephalitis or eczema herpeticum to a specialist

78. HERPES ZOSTER INFECTION

This is an acute blistering viral infection of the skin. Severe eye damage may occur if the lesion affects the upper part of the face indicating involvement of the ophthalmic branch of the 5th cranial nerve.

Suspect Immunosuppression (e.g. HIV, malignancies) if the lesions are hemorrhagic or extensive. Occasionally the condition may be complicated by persistent pain in the involved areas (Post herpetic neuralgia) or encephalitis (Herpes zoster encephalitis).

CAUSE

- *Varicella-zostervirus*

SYMPTOMS

- Blisters involving one or more dermatomes
- Pain

SIGNS

- Painful blistering reaction involving one or more dermatomes of any part of the body

INVESTIGATIONS

- The diagnosis is clinical

TREATMENT**Treatment objectives**

- To provide adequate pain relief
- To prevent secondary bacterial infection
- To limit extent of disease spread in immunocompromised patients
- To prevent complications

Non-pharmacological treatment

- No specific measures

Pharmacological treatment**(Evidence rating: C)**

- Amitriptyline, oral,
25-50 mg daily

Or

Carbamazepine, oral,
100-300 mg daily

Plus

- Diclofenac, oral,
50 mg 8 hourly
- Antiseptic lotion, topical, e.g. (Gentian Violet),
Apply to affected parts
- Acyclovir 5% cream, topical,
Apply to lesions 4-6 hourly within 48 hrs of onset
- Acyclovir, oral, (for immunocompromised patients)

Adults

800 mg 4-6 hourly for 5 days

Children

> 2 years;

800 mg 4-6 hourly for 5 days

< 2 years;

400 mg 4-6 hourly for 5 days

REFER

Refer to hospital if lesions are haemorrhagic, extensive, affect the eyes or are recurrent.

79. CHICKEN POX

Chicken pox is a highly contagious viral illness that usually occurs in epidemics. Humans are the only source of infection. Person-to-person transmission occurs by direct contact with vesicular fluid from patients with the disease or by airborne spread from respiratory tract secretions. There is a risk of infection up to 21 days after contact with a person with chicken pox.

Complications include bacterial super-infection of skin lesions, pneumonia, central nervous system involvement (acute cerebellar ataxia, encephalitis), thrombocytopenia, and other rare complications such as glomerulonephritis, arthritis, and hepatitis. Chicken pox tends to be more severe in adolescents and adults than in young children and also in immunosuppressed patients e.g. patients on steroids.

Exposure to varicella-zoster virus (VZV) in utero during the second 20 weeks of pregnancy can result in inapparent varicella infection in early life without having had extrauterine chicken pox. Varicella infection can be fatal for an infant if the mother develops varicella from 5 days before to 2 days after delivery.

CAUSE

- *Varicella-zoster virus*

SYMPTOMS

- Skin rash
- Intense itching
- Mild headache
- Fever and malaise

SIGNS

- Extensive rash - lesions are groups of macules, papules and vesicles and crusting.

INVESTIGATIONS

- Diagnosis is mainly clinical

TREATMENT

Treatment objectives

- To relieve the intense itching
- To make patient comfortable while the disease runs its course
- To prevent or treat secondary infection

Non-pharmacological treatment

Adults

- Avoid scratching in adults and children if possible

Children

- Keep hands clean and nails clipped short in children
- Avoid scratching if possible
- Regular bathing with soap and water

Pharmacological treatment**(Evidence rating: C)**

- Calamine lotion, topical,
Adults and children
Apply liberally to the skin

- Paracetamol, oral,
Adults
500 mg -1 g 6 to 8 hourly
Children

6-12 years;	250-500 mg 6 to 8 hourly
1-5 years;	120-250 mg 6 to 8 hourly
3 months-1 year;	60-120 mg 6 to 8 hourly

Give antibiotics if lesions are super infected.

- Flucloxacillin, oral,
250-500 mg 6 hourly for 5-7 days

Or

In the case of penicillin sensitivity,

Erythromycin, oral,
500 mg 6 hourly for 5-7 days

Antihistamines may be given in severe cases of itching

- Cetirizine, oral, 10 mg daily,

Or

Promethazine hydrochloride, oral, to reduce the itching
25 mg 1 to 3 times daily *do adult dose only*

Children

Treat pain and fever with

- Paracetamol, oral,
10-15mg/kg/dose 6-8 hourly

**Note**

Avoid Aspirin in children less than 16 years of age because of risk of Reye's syndrome.

- Apply Calamine lotion 8-12 hourly to the skin
- Chlorpheniramine, oral, to relieve itching.

≥6 years;	2 mg 12 hourly
2-5 years;	2 mg 12 hourly
< 2 years;	1 mg 12 hourly

Or

Cetirizine, oral,

>6 years	10 mg daily in 1-2 divided doses
2-6 years	5 mg daily in 1-2 divided doses
1-2 years	250 microgram/kg 12 hourly

Antibiotics only if lesions are super infected.

- Flucloxacillin, oral,
125-250 mg 6 hourly for 5-7 days

If patient is allergic to penicillin, use

- Erythromycin, oral,

Children

6-12 years;	250 mg 6 hourly for 7 days
1-5 years;	125 mg 6 hourly for 7 days
< 1 year;	62.5 mg 6 hourly for 7 days



Note

Oral acyclovir is not recommended for routine use in otherwise healthy patients with varicella.

REFER

Refer when severe complications set in. Also refer patients who are at risk of developing a disseminated rash e.g. patients on steroid therapy, other immunocompromised states and the newborn whose mother has had a recent infection.

D. NON-SPECIFIC SKIN CONDITIONS

80. LARGE CHRONIC ULCERS

An ulcer or sore is a breach in the continuity of the skin and the underlying tissue.

CAUSES

- Infections and infestations e.g. buruli ulcers, yaws ulcers, tuberculous ulcers, guinea worm ulcers
- Non-specific ulcers e.g. traumatic, , diabetic, sickle cell,
- Malignant ulcers e.g. squamous cell carcinoma, melanoma, Kaposi's sarcoma

SYMPTOMS

- Pain
- Discharge, which may be offensive
- Severe disfigurement
- Disability

SIGNS

- Non-specific ulcers have sloping edges
- Buruli and tuberculous ulcers have undermined edges
- Yaws ulcers have punched out edges

- Malignant ulcers have raised everted edges
- Deformity of affected part
- Loss of sensation - associated with diabetes, leprosy, yaws or syphilis ulcers

INVESTIGATIONS

- FBC
- Sickling test
- Fasting blood glucose
- Wound swab for culture and sensitivity, Ziehl Nielsen staining
- VDRL/ RPR test
- X-ray of underlying bone
- Biopsy of ulcer

TREATMENT

Treatment objectives

- To deslough the ulcer and promote healthy granulation tissue formation
- To promote healing
- To treat any underlying cause

Non-pharmacological treatment

- Keep wound clean with normal saline solution. **Do not use Eusol**
- Change dressing each day
- Elevation of lower limb on sitting

Pharmacological treatment

(Evidence rating: C)

- Topical antiseptics such as Chlorhexidine or Cetrimide
- Specific antimicrobial treatment as indicated by culture and sensitivity results.
- Avoid topical antibiotics as there is insufficient evidence for their effectiveness.

REFER

- If ulcer fails to show signs of healing with above treatment
- If surgery is required e.g. skin grafting, excision or amputation
- Malignant ulcers

81. PRURITUS (ITCHING)

Pruritus or itching is a sensation that the patient instinctively attempts to relieve by scratching. Itching may accompany a primary skin disease or may be a symptom of a systemic disease. The cause of the itching should be identified and treated. If no skin disease is seen, an underlying systemic disorder or drug-related cause should be sought.

CAUSES

Skin diseases

- Scabies
- Contact dermatitis
- Pediculosis (body lice)
- Intertrigo
- Onchocerciasis
- Urticaria
- Insect bites (fleas, bed bugs)
- Lichen planus
- Dry skin (especially in the elderly) often causes severe generalized itching.
- Miliaria (prickly heat)
- Atopic eczema - (common in children)
- Dermatitis herpetiformis
- Idiopathic

Systemic conditions

- Obstructive liver disease (cholestasis)
- Uraemia (in renal failure)
- Malignancies e.g. lymphomas, leukaemias, polycythemia rubra vera
- Pregnancy - during the latter months of pregnancy itching may occur
- Drugs e.g. chloroquine and other antimalarial drugs
- Psychogenic - there is no obvious cause but itching occurs from the patient's mind
- Aquagenic pruritus (exposure to water)

SYMPTOMS

- Itching

SIGNS

- Itching, excoriations and scars
- Features of underlying conditions

INVESTIGATIONS

- FBC
- LFTs
- BUE and creatinine
- Stool RE

TREATMENT**Treatment objectives**

- To relieve symptoms
- To identify and treat underlying condition

Non-pharmacological treatment

- Avoid contact with substances known to cause itching
- Stop all medications and perfumery likely to cause itching
- Irritating clothing e.g. nylon should be avoided
- Counselling for psychogenic pruritus

Pharmacological treatment**(Evidence rating: C)**

- Chlorphenamine (Chlorpheniramine) maleate, oral,

Adults

4 mg 8 hourly (maximum dose 25 mg)

Children

6-12 years;

2 mg 8 hourly

2-5 years;

1 mg 8 hourly

1-2 years;

1 mg 12 hourly

< 1 year;

not recommended

Or

Cetirizine, oral,

Adults

10 mg daily

Children

> 6 years;

10 mg daily or 5 mg 12 hourly

2-6 years;

5 mg daily or 2.5 mg 12 hourly

- Calamine lotion, topical to skin,

Adults and Children

Apply liberally

Or

Crotamiton lotion 10%, topical to skin,

Adults

Apply every 8-12 hours

Children

> 3 years;

same as adult

< 3 years;

apply once daily

Table 12-1: Guidelines for the Treatment of Itching of specific causes

Cause	Treatment
Scabies	Apply 25% Benzyl benzoate over the whole body (except the face) after a warm bath; repeat on 2 subsequent days and wash off. Treat all contact cases in same manner simultaneously. Follow up with topical steroid (e.g. 1% Hydrocortisone) cream for the residual dermatitis reaction till resolution. (up to 2 weeks)
	<p>Note</p> <p>Infants (< 1 year) - use half strength dilution of Benzyl benzoate. Clothing or bed-lining used within 2 days of treatment should be washed and well dried or dry-cleaned.</p> <p>Sexual and household contacts should be similarly treated.</p>
Candidiasis	Topical imidazoles; (Clotrimazole, Miconazole) Or 1% Ciclopirox olamine for 2 weeks.
Miliaria (Prickly heat, heat rash)	Cooling and drying of the involved areas and avoiding conditions that induce sweating. Calamine or zinc oxide lotion is soothing.
Atopic eczema	Emollients (Aqueous cream or salicylic acid ointments) are necessary. Topical steroids may be used in acute flare-ups (see section on Dermatitis)
Urticaria	Oral antihistamines e.g. Chlorphenamine Or Cetirizine. (see section on Urticaria)
Contact dermatitis	Avoid exposure to offending agents. Topical corticosteroid (e.g. 1% hydrocortisone cream) is often required. (see section on Dermatitis)
Pediculosis	1% Lindane (gamma benzene hexachloride) in lotion form is effective. Repeat treatment after a week
Insect bites e.g. Fleas, bed bugs	Sources of infestation such as combs, hat, clothing or bedding should be decontaminated by thorough washing and ironing or
Pediculosis	1% Lindane (gamma benzene hexachloride) in lotion form is effective. Repeat treatment after a week dry cleaning, in scabies, pediculosis and bed bugs. Promethazine, oral, topical corticosteroid cream, with or without antiseptic cream

REFER

Refer to physician or skin specialist if condition is not improving.

82. URTICARIA (WEALS)

Urticaria refers to a transient, itchy swelling of the skin lasting less than 24 hours; when the duration of each episode is longer than 24 hours, it is termed vasculitic urticaria. When the whole reaction has occurred over a total period longer than 6 weeks then it is termed chronic urticaria. Urticaria may be the precursor to the development of shock and anaphylaxis in severe allergy.

CAUSES

- Allergic - foods, drugs, helminth infestations
- Non-allergic plants
- Idiopathic

SYMPTOMS

- Weals
- Itching
- Pruritus

SIGNS

- Weals
- Elevated area of skin after contact (dermographism)

INVESTIGATIONS

- FBC
- Stool RE
- Skin prick testing

TREATMENT**Treatment objectives**

- To provide immediate relief
- To prevent complications such as shock or asphyxiation

Non-pharmacological treatment

- Avoid contact with or further use of the suspected allergen

Pharmacological treatment**(Evidence rating: C)**

- Calamine or Crotamiton lotion for relief.
- Chlorphenamine (Chlorpheniramine), oral,

Adults

4 mg 8 hourly for 5 days

Or

Promethazine, oral or IM,

Adults

25-50 mg 12 hourly for 5 days

Children

12.5-25 mg 12 hourly for 5 days

Or

Cetirizine, oral,

Adults

10 mg daily

Children

> 6 years;

10 mg daily

2-6 years;

5 mg daily

**Note**

Never apply antihistamine topically continuously for longer than a week to avoid sensitization

REFER

Refer cases of chronic urticaria to an appropriate specialist

83. REACTIVE ERYTHEMA AND BULLOUS REACTIONS

These are allergic reactions characterized by erythema (compressible pigmentaton) with or without blistering of the skin and/or mucosa. The common types are erythema multiforme, Stevens Johnson syndrome and toxic epidermal necrolysis (TEN). With all these conditions, there could be accompanying extensive denudation of skin with consequent fluid and electrolyte loss and a risk of secondary bacterial infection. All three conditions should be considered as emergencies requiring intensive care.

Erythema multiforme presents as itchy, target-like, non-scaly reaction of the palms, soles, forearms and legs.

Stevens Johnson syndrome is characterized by erythema and blister formation which additionally involves the mucous membranes (conjunctiva, mouth, genitals etc).

Toxic epidermal necrolysis (TEN) is a generalized scalded type of skin reaction, often due to an allergic reaction to drugs. A similar reaction occurs in children termed staphylococcal scalded skin syndrome which is caused by *Staphylococcus aureus*.

CAUSES

- Viral infections e.g. *Herpes simplex virus* or retrovirus
- Reaction to drugs e.g. sulphonamides, penicillin
- Malignancy

SYMPTOMS

- Skin eruptions which may be bullous
- Itching

- Peeling of the skin
- Mouth and genital ulcers
- Eye discharge
- Fever
- General malaise

SIGNS

- Ulceration of skin and mucosal surface

INVESTIGATIONS

- FBC
- BUE and creatinine
- Skin swab for culture and sensitivity
- HIV serology

TREATMENT

Treatment objectives

- To maintain adequate hydration
- To maintain adequate nutrition
- To correct electrolyte imbalance
- To prevent secondary infection
- To identify, eliminate underlying cause and prevent further exposure to the causative agent or medicine

Non-pharmacological treatment

- Withdrawal of identifiable causative factors
- Maintenance of adequate input and output of fluid
- Rehydration by IV, nasogastric or oral routes
- Use a nursing cradle to prevent contact of ulcerated skin with contaminated linen.
- Early ophthalmological consultation for eye care

Pharmacological treatment

(Evidence rating: C)

Antibiotics

- Azithromycin, oral

Adults

500 mg daily for 3 days

Children

10 mg/kg once daily for 3 days

Or

Erythromycin, oral,

Adults

500 mg 6 hourly for 7 days

Children

6-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

< 1 year;

62.5 mg 6 hourly for 7 days

- Hydrocortisone, IV,

Adults100 mg 6 hourly until able to swallow **then** follow with prednisolone oralChildren4 mg/kg 6 hourly until able to swallow **then** follow with prednisolone oral

Prednisolone, oral,

Adults

40 mg daily as a single dose and taper off

Children

1 mg/kg and taper off

Adjunct treatment

- Prevent stress ulcers with proton-pump inhibitor or H₂ antagonist
- Relieve pain with Paracetamol, oral or if severe pethidine, IM (see section on Pain Management)
- Apply Gentian violet, Mercurochrome or topical antiseptic e.g. cetrimide to skin only.

REFER

Refer all patients to appropriate centres if local facilities are inadequate. Refer early to an eye specialist if eyes are involved.

84. ACNE VULGARIS (PIMPLES)

This is a disorder of the hair follicle and sebaceous gland which presents mainly in adolescence and usually resolves by late teens. Severe acne may require evaluation to exclude an underlying hormonal disorder. Food is not known to be responsible for acne vulgaris. Psychological disturbances may occur in this condition.

CAUSES

- Increased sebum secretion

- Abnormal keratinisation of the hair follicles(hereditary)
- Increased sensitivity of the sebaceous glands to male hormones,
- Presence of *Corynebacterium acne*
- Prolonged use of systemic and topical steroids
- Use of pomades e.g. cocoa butter

SYMPTOMS

- Pimples on face, and occasionally on the trunk, chest and shoulders
- Greasy skin

SIGNS

- Comedones (blackheads and whiteheads)
- Papules,
- Cysts
- Scars

INVESTIGATIONS

- None required

TREATMENT

Treatment objectives

- To improve cosmetic appearance
- To prevent complications particularly scarring
- To reassure patient

Non-pharmacological treatment

- Regular washing of affected skin areas with sulphur based soap and water
- Counselling of patients

Pharmacological treatment

(Evidence rating: A)

Mild to moderate cases:

- Benzoyl peroxide 5% lotion, topical,
Apply 12 hourly avoiding mouth, eyes and the mucous membranes

Or

Clindamycin solution 1%, topical,

Apply 12 hourly

Severe cases or non-responders to topical treatment

- Tetracycline, oral,
Adults
250 mg 12 hourly for a minimum of 6 weeks up to clearance, but not exceeding 6 months
Children
Not recommended
Or
Doxycycline, oral,
Adults
100 mg daily for a minimum of 6 weeks up to clearance, but not exceeding 6 months
Children
Not recommended

REFER

Refer patients not responding to above treatment to a dermatologist. Also refer when an underlying endocrine condition is suspected.

85. ECZEMA (DERMATITIS)

Eczema is an itchy reaction of the skin to a number of factors, either exogenous (e.g. contact dermatitis) or endogenous (e.g. seborrhoea and atopy). Papules, blisters (vesicles, pustules and bullae) and oozing characterise the lesions when acute. There is thickening (lichenification), prominent skin lines and scaling when chronic. There are three main types as follows:

Atopic Eczema

This presents as a remitting and relapsing itchy condition of the face, wrists, ankles, cubital and popliteal fossae. Onset is in childhood often with a familial background of atopy (asthma, hay fever, eosinophilia and similar skin problem).. Spontaneous resolution often occurs by teenage.

Seborrhoeic Eczema and Dandruff

This presents as a scaly weeping rash of the scalp, eyebrows, perinasal and periauricular skins; sometimes it presents as hypopigmented macules. It occurs in infancy, adolescence or adulthood. It may be associated with dandruff and *Pityrosporum ovale* infection. Extensive forms are associated with immunosuppressive states, particularly AIDS.

Contact Eczema

It may be an irritant (concentration dependent) or allergic (idiosyncratic) reaction to specific chemicals such as metals, rubber etc. In contrast to the endogenous types, the skin reaction is confined to the areas directly in contact with the offending chemical.

CAUSES

- Familial
- Atopy
- Reaction to metals, rubber, chemicals, drugs, foods etc
- Immunosuppression

SYMPTOMS

- Scaly weeping rash
- Hypo-pigmented macules
- Itching

SIGNS

- Erythema
- Vesicles
- Fissures
- Scaly rash
- Lichenification (thickened skin)

INVESTIGATIONS

- Closed patch testing (may be used for identification of allergens in contact eczema)

TREATMENT**Treatment objectives**

- To eliminate symptoms
- To identify and avoid predisposing factors

Non-pharmacological treatment

- Avoidance of identifiable precipitating factors

Pharmacological treatment**(Evidence rating: C)**

- Use emollients in atopic eczema e.g. Aqueous cream and 2% Salicylic acid ointment

- Hydrocortisone 1%, topical,

Adults and children

Apply thinly 12 hourly for a maximum of two weeks

Or

Betametasone (Betamethasone) valerate

Or

Methyl prednisolone aceponate

- Clotrimazole with or without 1% Hydrocortisone (in seborrhoeic eczema)

Apply 12 hourly

⚠ Caution

Very potent steroid creams e.g. Clobetasol propionate should only be used under specialist supervision

REFER

- Non-response to the above topical treatment
- For identification of allergen

86. INTERTRIGO

Inflammatory reaction in the skin folds e.g. armpit, groins and under the breasts. It is common in overweight and obesity.

CAUSES

- *Candida albicans* (monilia) and other fungi
- Eczema
- Psoriasis
- Erythrasma.

SYMPTOMS

- Pruritus
- Scaling

SIGNS

- Altered pigmentation (erythema)
- Maceration

INVESTIGATIONS

- FBC
- Swab for culture and sensitivity
- Fasting blood glucose

TREATMENT**Treatment objectives**

- To relieve symptoms and any associated discomfort
- To prevent secondary infection

Non-pharmacological treatment

- Wear loose cotton clothing for aeration of folds
- Weight loss

Pharmacological treatment**(Evidence rating: C)**

- Miconazole, topical,
Apply twice daily to affected areas

REFER

If not improving after 4 weeks.

87. DIABETES MELLITUS

Diabetes mellitus is characterised by persistently high blood glucose levels. Many adults with diabetes are asymptomatic. It is therefore necessary to exclude diabetes in all persons attending health facilities for routine medical examinations, out-patient review, elective and emergency admissions, surgical procedures and ante-natal care.

A diagnosis of diabetes is suggested when the fasting whole blood glucose level is 5.7 mmol/L or more and/or random blood glucose, taken 2 hours after a meal or 75 g glucose load (1.75 g/kg body weight in children), is 7.8 mmol/L or more.

Three common forms of diabetes are encountered in practice:

- Type 1 diabetes - formerly called insulin-dependent diabetes mellitus or juvenile diabetes
- Type 2 diabetes - formerly called non-insulin - dependent diabetes mellitus or maturity onset diabetes
- Gestational diabetes-diabetes developing during pregnancy in previously non-diabetic individuals. (see section on **Diabetes in Pregnancy**)

High blood glucose levels over a long period result in chronic complications such as blindness, kidney failure, nerve damage, strokes, heart attacks, limb gangrene (leading to amputation) and fertility or pregnancy-related problems. These complications can be prevented through periodic clinic reviews as well as eye and foot examinations accompanied by appropriate investigations.

CAUSES

- A defect in the action or secretion of insulin
- Environmental factors e.g. excessive calorie intake and lack of physical activity
- Genetic factors

SYMPTOMS

- No recognisable symptoms in many individuals
- Passage of large amounts of urine
- Thirst and excessive drinking of water
- Unexplained weight loss
- Blurred vision
- Recurrent boils
- Recurrent itching of the vulva
- Symptoms related to chronic complications (e.g. 'pins and needles' sensation or numbness in the hands or feet, foot gangrene, poor vision)

SIGNS

- No signs in most patients
- Lack of sensation in the feet or hands
- Foot gangrene
- Pedal oedema
- Impaired visual acuity
- Cataract
- Retinal changes

INVESTIGATIONS**Newly diagnosed patient**

- Fasting or random blood glucose
- Oral glucose tolerance test with 75 g glucose load (adults) or 1.75 g/kg body weight in children (if required to confirm diagnosis)
- Urine ketones
- Urine protein
- Blood urea, electrolytes and creatinine
- Fasting blood lipid profile (adults)
- Glycated haemoglobin (HbA_{1c})
- FBC
- ECG (adults)

Subsequent monitoring

- Blood glucose
 - Recorded results of regular self-monitoring of fasting and random tests at home by the patient using a glucose meter
 - Periodic fasting or random tests during clinic reviews
- Glycated haemoglobin (HbA_{1c})
 - at least three times a year, if available
- Blood lipid tests
 - annually, but more frequently if levels abnormal or on lipid-lowering medication
- Blood urea, electrolytes and creatinine
 - annually, but more frequently if levels abnormal
- Urine protein
 - annually

TREATMENT**Treatment objectives**

- To relieve symptoms
- To prevent acute hyperglycaemic complications i.e. ketoacidosis and the hyperosmolar state.

- To prevent treatment-related hypoglycaemia
- To achieve and maintain appropriate glycaemic targets
 - Fasting blood glucose between 4 - 6 mmol/L
 - 2-hour post-meal blood glucose between 4 - 8 mmol/L
 - Glycated haemoglobin 6.5 % or less
- To ensure weight reduction in overweight and obese individuals
- To prevent chronic complications of diabetes by maintaining
 - The glycaemic targets noted above
 - Blood pressure less than 130/80 mmHg
 - LDL-cholesterol less than 2.5 mmol/L

Non-pharmacological treatment

- Diet:
 - All patients with diabetes require diet therapy.
 - All patients (and close relations who cook or control their meals) must be referred to a dietician or diet nurse for individualized meal plans. In general, patients must;
 - Avoid refined sugars as in soft drinks, or adding sugar to their beverages. Artificial sweeteners and 'diet' soft drinks, which do not contain glucose, may however be used.
 - Be encouraged to have complex carbohydrates (e.g. kenkey, yam, plantain etc.) instead.
 - A day's diet must generally consist of;
 - Carbohydrates (60%), protein (15%) and fat (25%) mostly of plant-origin and low in animal fat.
 - A reduced total caloric content (portions) and an increase in the amount of fibre e.g. vegetables, fruits and cereals.
- Exercise
 - Regular, simple exercise e.g. 30 minutes brisk walking at least 3 days a week in ambulant patients
 - All advice on exercise must give consideration to the patient's age and the presence of complications and other medical conditions.

Pharmacological treatment (Evidence rating: A)



Note

Diet

- A diet plan must be part of all diabetes treatment programmes (see section on Non-pharmacological treatment above).
- Diet alone should be tried first in newly-diagnosed type 2 diabetes individuals with mild to moderate blood glucose elevation.

Oral Hypoglycaemic Medications

- When diet alone fails to achieve satisfactory control within 3 months, non-obese patients are preferably, but not compulsorily or exclusively, treated with a sulphonylurea, and obese patients with metformin.
 - Thiazolidinediones are additional oral medications which may be used either alone or in combination with metformin or a sulphonylurea in type 2 diabetics.
 - The starting dose of medication for any long-term treatment for diabetes must initially be low, with increments over several days or weeks according to results of blood glucose or glycated haemoglobin testing. Hypoglycaemia is a potential side-effect with insulin and all sulphonylureas. Metformin and thiazolidinediones when used alone do not induce hypoglycaemia.
 - Avoid metformin and long-acting oral anti-diabetic medications, such as glibenclamide in individuals with poor kidney and liver function (especially elderly patients).
 - Oral anti-diabetic medications should be avoided in Type 1 diabetes patients and should not be used during pregnancy and breast-feeding.
 - Sulphonylureas are best taken 15-30 minutes before meals.
 - Tolbutamide and Gliclazide are short-acting and are preferred in the elderly and those with mild kidney disease. In general sulphonylureas should be avoided in all patients with liver disease and used with care in kidney disease. The preferred alternative in these circumstances is insulin.
 - Individuals with Type 2 diabetes not responding to maximum tolerable doses of a sulphonylurea, metformin or a thiazolidinedione alone, could be given combined oral therapy with two or three oral anti-diabetic medications. However, two different products from the same group (e.g. Two sulphonylureas) should never be used together.
- Insulin**
- Insulin is always indicated in a patient who has been in ketoacidosis, in all Patients with Type 1 diabetes and in pregnant and breast-feeding women whether Type 1 or Type 2.
 - Insulin is indicated in Type 2 patients when oral anti-diabetic medications cease to be effective in controlling the blood glucose.
 - Insulin therapy is required temporarily in Type 2 patients during severe stress e.g. severe infections, acute myocardial infarction, surgical operations, trauma, hyperosmolar state.
 - Insulin therapy should usually begin with teaching the patient the correct technique for subcutaneous injections, the types of insulin and syringes, as self-injections are to be strongly encouraged.

Sulphonylureas

All sulphonylureas are of equal potency and efficacy and are best taken 30 minutes before meals.

- Glibenclamide oral, 2.5-10 mg as a single dose in the morning (If required, not more than 5 mg of Glibenclamide could additionally be given in the evening maximum total dose 15 mg per day)

Or

- Gliclazide, oral, 40-160 mg 12 hourly

Or

- Glimepiride, oral, 2-6 mg as a single dose in the morning

Or

- Tolbutamide, oral,
250 mg-1 g 8-12 hourly

Biguanides

- Metformin, oral,
500 mg-1 g 12 hourly with, or soon after, meals

Thiazolidinediones

- Pioglitazone, oral,
15-45 mg, as single daily dose

Or

- Rosiglitazone, oral,
4-8 mg, as single daily dose

Insulin

- Rapid-acting Insulin
 - Insulin aspart
 - Insulin lispro
- Short-acting Insulin
 - Regular insulin
- Intermediate-acting Insulin
 - Isophane (NPH) insulin
- Long-acting Insulin
 - Insulin glargine
 - Insulin detemir

Pre-mixed Insulin

- Regular insulin 30% PLUS NPH Insulin 70%

**Note**

- Insulin dose requirements vary from patient to patient irrespective of age and body weight.
- Most adults and pre-pubertal children require about 0.6-0.8 units/kg/day in divided doses, however, it is prudent to begin with lower doses and build this up with time to prevent hypoglycaemia.
- Insulin requirements increase during infections, puberty, periods of stress, accidental or surgical trauma, pregnancy.
- Insulin administered for day-to-day diabetes treatment is given subcutaneously, 30 minutes before a meal according to either of the following regimens;
 - Twice daily pre-mixed insulin before breakfast and dinner (preferred)
 - Twice daily isophane insulin PLUS twice daily regular insulin given together before breakfast and dinner
 - Three pre-meal regular insulin injections before breakfast, lunch and dinner PLUS isophane insulin at bedtime

REFER

Refer individuals with diabetes to a dietician or diet nurse.

Refer all pregnant women and children with diabetes, as well as diabetes patients who have any of the following to a regional or teaching hospital for specialist care:

- Persistently poor blood glucose control
- Poor blood pressure control
- Frequent diabetes-related admissions
- Visual impairment
- Foot ulcers or gangrene
- Persistent proteinuria
- Other chronic complications of diabetes

MANAGEMENT OF DIABETIC EMERGENCIES**HYPOLYCAEMIA**

Hypoglycaemia refers to a blood glucose level below the lower limit of the normal range (3.6-5.7 mmol/L) and may present with mild, moderate or severe clinical features. It is more common in the elderly, those with kidney function impairment as well as those on long-acting oral anti-diabetic medications or insulin. Severe hypoglycaemia (blood glucose < 2.2 mmol/L) may result in alteration of consciousness, fits, self-injury and various degrees of irreversible brain damage. Following successful treatment of hypoglycaemia, its cause must be determined and measures, including patient education and revision of anti-diabetic drug doses, should be taken to prevent its recurrence.

Hypoglycaemia should be treated as soon as it is suspected, especially if there is no means of quick confirmation of the blood glucose level. It is dangerous to await a laboratory test result. An immediate response to treatment is in itself diagnostic. A blood glucose test with a glucose meter is adequate. Successful treatment results in a prompt response and full recovery within 10-15 minutes.

CAUSES

- Excessive dose of any anti-diabetic medication i.e. insulin or oral hypoglycaemics
- Omitted or inadequate amount of food
- Unaccustomed physical over-activity
- Excessive alcohol intake

SYMPTOMS

- Dizziness

- Blurred vision
- Headaches
- Palpitation
- Sweating
- Shaking of the hands and body
 - Irritability and abnormal behaviour especially in children

SIGNS

- Sweating
- Tremors
- Tachycardia and bounding pulse
- Confusion
- Unconsciousness
- Convulsions

INVESTIGATIONS

- Random blood glucose (urgently done using a glucose meter)

TREATMENT

Treatment objectives

- To quickly bring the level of blood glucose within the normal range to prevent serious brain damage.
- To maintain the level of blood glucose within the normal range until the patient can begin eating normally.

Non-pharmacological treatment

Mild hypoglycaemia

- 2-3 teaspoons of granulated sugar or 3 cubes of sugar or ½ a bottle of soft drink to individuals who are conscious.
- A glass of milk or fruit drink and a tablespoonful of honey are also useful.
- The above measures should be followed immediately by a meal or snack.



Note

Do not give 'Diet' drinks. They do not contain glucose

Moderate hypoglycaemia

- Same as above but repeat after 10 minutes.
- If no improvement is observed, treat as for severe hypoglycaemia.

Pharmacological treatment

(Evidence rating: A)

Severe hypoglycaemia

Adults

Glucose 50%, IV, 25-50 ml over 1 to 3 minutes through a large vein, followed by 5-10% Glucose, IV, 500 ml, 4 hourly until the patient is able to eat normally.

Children

Glucose 10-20%, IV, 2-4 ml/kg body weight over 1 to 3 minutes through a large vein, followed by 5% Glucose, IV, according to total daily fluid requirement until the patient is able to eat normally

Alternative treatmentAdults

Glucagon, IV, IM or subcutaneous, 1 mg stat

Children

Glucagon, IV, IM or subcutaneous

> 8 years (or bodyweight over 25 kg);	1 mg stat
< 8 years (or bodyweight less than 25kg);	500 micrograms stat

REFER

If the patient remains unconscious exclude a stroke or other neurological deficit and medical conditions and treat as appropriate. If this is not possible, refer to a regional or teaching hospital.

DIABETIC KETOACIDOSIS

Diabetic ketoacidosis (DKA) is a condition in which there is a severe deficiency of insulin resulting in very high blood glucose which nonetheless is unavailable to the body tissues as a source of energy. Fat is therefore broken down as an alternative source of energy, releasing toxic chemicals called ketones as a by-product. Additionally there is severe dehydration and electrolyte imbalance. It is a common cause of death among diabetes patients in Ghana. It often occurs in type 1 diabetes patients but may also occur in type 2 diabetes.

CAUSES

- Previously undiagnosed and untreated diabetes
- Interruption of anti-diabetic therapy (usually for financial reasons or for alternative treatment)
- Stress of intercurrent illness (e.g. infection, myocardial infarction, stroke, surgery, complicated pregnancy etc.)

SYMPTOMS

- Excessive urination
- Excessive thirst and drinking of water
- Nausea, vomiting
- Abdominal pain

- Alteration in sensorium or collapse
- Symptoms of infection or other underlying condition

SIGNS

- Dehydration with dry skin, reduced skin turgor or sunken eyes
- Deep and fast breathing
- Low blood pressure
- Fast and weak pulse
- 'Fruity' breath (smell of acetone)
- Confusion, stupor or unconsciousness
- Evidence of infection, recent surgery, stroke etc.

INVESTIGATIONS

- Random blood glucose (usually >18 mmol/L)
- Urine glucose (usually >3+)
- Urine ketones (usually >2+)
- Blood urea and electrolytes (usually low potassium, however if in renal failure urea and potassium are high)
- Blood film for malaria parasites
- Full blood count (raised white cell count would suggest bacterial infection)
- Blood and urine cultures if indicated
- Chest X-ray - for pneumonia or tuberculosis.
- Electrocardiogram in older patients to exclude acute myocardial infarction as a precipitating factor

TREATMENT

Treatment objectives

- To replace the fluid losses
- To replace the electrolyte losses and restore acid-base balance
- To replace deficient insulin
- To seek the underlying cause and treat appropriately

Non-pharmacological treatment

- There is no place for Non-Pharmacological treatment in DKA

Pharmacological treatment

(Evidence rating: C)

See tables 13-1, 13-2 and 13-3 for insulin, intravenous fluids and potassium replacement regimes for managing diabetic ketoacidosis in adults and children.

Table 13-1: Regime for managing Diabetic Ketoacidosis in Adults

ADULTS	Blood Glucose & Urine Ketone Test Results	Intravenous Fluids		Soluble/Regular Insulin	Potassium Chloride Infusion
		Type Of Fluid	Rate of IV Fluid Infusion		
Initiating Management					
<p>Monitor blood glucose hourly</p> <p>Monitor urine ketones twice daily</p>	<p>Blood glucose ≥ 18 mmol/L</p> <p>or</p> <p>Urine ketones $\geq 2+$</p>	<p>Sodium chloride 0.9%</p>	<p>1st litre over first 30 minutes</p> <p>2nd litre over next 1hour</p> <p>3rd litre over next 4 hours</p> <p>4th litre over next 4 hours</p> <p>Subsequently, 1 litre every 6 hours or as required</p>	<p>Soluble/regular insulin, IV or IM, 10-20 units stat.</p> <p>Thereafter, Soluble/regular Insulin, IM, 5 units hourly</p> <p>Until</p> <p>Blood glucose ≤ 11 mmol/L</p>	<p>Start 2 hours after initiating insulin and sodium chloride infusion</p> <p>Check for adequate urine output (i.e. at least 30 ml/hour)</p> <p>Place 10-20 mmol Potassium chloride In 500ml sodium Chloride 0.9%</p> <p>Run the IV infusion over at least one hour</p>
Maintaining Management					
<p>Monitor blood glucose every 4 Hours</p> <p>Monitor urine ketones twice daily</p>	<p>Blood glucose ≤ 13 mmol/L</p>	<p>Glucose 5%</p> <p><i>This measure is necessary to prevent subsequent Hypoglycaemia</i></p>	<p>Continue Glucose 5%</p> <p>1 litre every 6 hours or to meet requirements</p>	<p>Soluble/Regular insulin subcutaneously by 'sliding scale'</p> <p>(see example of 'sliding scale' in the table below)</p>	<p>Repeat Potassium Chloride, IV infusion after 2 hours if necessary</p> <p>Check blood Potassium level twice daily</p> <p>Withhold Potassium Chloride if blood potassium level > 6 mmol/L</p>
Regular Management					
<p>Monitor blood glucose twice daily (pre-breakfast and pre-supper)</p>	<p>Blood glucose maintained between 6-11 mmol/L</p> <p>Urine ketones negative or trace</p>	<p>Patient eating normally (recommended diet)</p>		<p>Change from 'sliding scale'</p> <p>To twice Daily subcutaneous intermediate-acting insulin</p>	<p>Potassium chloride, oral, 1200 mg twice daily if required</p>

Table 13-2: Regime for managing Diabetic Ketoacidosis in Children

CHILDREN	Blood Glucose & Urine Ketone Test Results	Intravenous Fluids		Soluble/Regular Insulin	Potassium Chloride Infusion
		Type Of Fluid	Rate of IV Fluid Infusion		
Initiating Management	Blood glucose ≥ 18 mmol/L Or Urine ketones $\geq 2+$	Sodium Chloride 0.45%	1 st hour 15 ml/kg 2 nd hour 15 ml/kg 3 rd hour 7.5 ml/kg 4 th hour and subsequently, adjust fluid rate to meet requirements	Soluble/regular insulin, IV or IM, 0.15 unit/kg stat Thereafter, administer Soluble/regular insulin, IM, 0.1units/kg hourly Until Blood glucose ≤ 11 mmol/L	Start 2 hours after initiating insulin and Sodium Chloride Infusion Check adequate urine output (>30 ml /hour) Add 0.2 -0.4 mmol/kg (max. 10 mmol) in IV fluids. Run infusion over at least one hour
Maintaining Management					
Regular Management	Blood glucose ≤ 13 mmol/L	Sodium Chloride in 4.3% Glucose <i>This measure is necessary to prevent subsequent hypoglycaemia</i>	Set Infusion Rate to meet requirements	Soluble/regular insulin subcutaneously by 'sliding scale' (see example Of 'sliding scale' in the table below)	Repeat Potassium Infusion after 2 hours if necessary Check blood Potassium level twice Daily Withhold if blood level of potassium > 6 mmol/L
	Blood glucose maintained between 6 -11 mmol/L Urine ketones negative or trace	Patient eating normally (recommended diet)		Change from 'sliding scale' to twice daily subcutaneous intermediate-acting insulin	Potassium chloride, oral, if required

Table 13-3: Example of Sliding Scale Chart

Blood Glucose Result (following 4-hourly testing)	Corresponding Dose of Regular Insulin To Administer Subcutaneously	
	ADULTS	CHILDREN
< 6.0 mmol/L	No Insulin	No Insulin
6.1 - 9.0 mmol/L	4 units	0.06 units/kg
9.1 - 12.0 mmol/L	6 units	0.09 units/kg
12.1 - 15.0 mmol/L	8 units	0.12 units/kg
15.1 - 18.0 mmol/L	10 units	0.15 units/kg



Note

The example of the sliding scale given above is not a fixed standard. The requirement of insulin for each level of blood glucose measured differs from patient to patient. The corresponding insulin doses may therefore need to be adjusted **up or down** to suit each patient.

For both adults and children, continue the sliding scale, making appropriate adjustments to the doses of insulin, until the patient is eating normally and the urine is free of ketones. This may take on average between 12–72 hours.

Adjunct treatment

- Broad-spectrum antibiotics for suspected infections (refer to appropriate section)
- Treat malaria if suspected or confirmed
- Review fluid, insulin and potassium regimes frequently

REFER

If there are inadequate resources for managing the patient, start 0.9% Sodium Chloride, IV, and give initial dose of soluble/regular insulin IV or IM after confirming blood glucose and urine ketone levels and refer to a nearby regional or teaching hospital.

If the patient remains comatose or fails to pass adequate amounts of urine despite management, refer to a regional or teaching hospital for further care.

HYPEROSMOLAR NON-KETOTIC DIABETES STATE (HONK)

This state, which occurs primarily in Type 2 diabetes patients, is similar in its clinical presentation to diabetic ketoacidosis in many respects. A major difference, however, is the **absence** of a significant amount of ketones in the urine (usually trace or 1+) and the presence of severe dehydration. The management of this condition is similar to that of DKA.

88. THYROID DISORDERS

GOITRE

Goitre is a swelling of the neck due to enlargement of the thyroid gland. Goitres are usually benign but may occasionally be malignant. They could be associated with normal function of the thyroid gland as well as with abnormalities of thyroid hormone production. A reduction in production of thyroid hormones results in hypothyroidism while an excess results in hyperthyroidism or thyrotoxicosis. Abnormalities of thyroid hormone production may also occur in the absence of goitre.

Treatment of benign and malignant goitres may be surgical or non-surgical. This can be determined only by full clinical assessment and investigations. Treatment is not necessarily by increasing iodine intake e.g. in iodated salt. Excess iodine intake may actually be harmful.

CAUSES

- Simple non toxic goitre e.g. from iodine deficiency (endemic goitre)
- Hypothyroidism ([see section below](#))
- Thyrotoxicosis or Hyperthyroidism ([see section below](#))
- Thyroid neoplasm - benign or malignant

SYMPTOMS

- Swelling in the neck
- Breathing and swallowing difficulty, if large
- Symptoms of hypothyroidism ([see below](#))
- Symptoms of hyperthyroidism ([see below](#))

SIGNS

- Irregular or diffuse thyroid swelling
- Slow pulse (< 60 per minute) – associated hypothyroidism is likely; look for other signs
- Fast pulse (> 90 per minute) – associated thyrotoxicosis is likely; look for other signs

INVESTIGATIONS

- Thyroid function tests – free T₃, free T₄, TSH
- Thyroid ultrasound scan
- X-ray of the neck including thoracic inlet view

TREATMENT

Treatment objectives

- To assess and correct level of thyroid hormone production

- To reduce or prevent obstructive symptoms
- To identify thyroid neoplasms and manage appropriately

Non-pharmacological Treatment

- Subtotal thyroidectomy where indicated

Pharmacological treatment

(Evidence rating: A)

- Appropriate drug treatment of hypothyroidism or thyrotoxicosis ([see sections below](#))

REFER

Refer patients to a physician or surgical specialist where complications or malignancy are suspected.

HYPOTHYROIDISM

The body requires thyroid hormone for normal metabolism and growth. Hypothyroidism, which implies reduction in thyroid hormone production, has major consequences on intellectual development and growth in infants and children (cause of cretinism). In adults, it may be the cause of heart disease and dementia. Iodine replacement is not the treatment for hypothyroidism.

CAUSES

- Antibody-related thyroid gland destruction
- Surgical removal of the thyroid
- Pituitary lesions or surgery
- Congenital
- Severe iodine deficiency

SYMPTOMS

- Intolerance to cold environments
- Constipation
- Lethargy
- Weight gain
- Hair loss
- Dry skin
- Hoarse voice
- Memory loss
- Goitre may be present
- Abnormal menstrual periods and sub-fertility (in adult females)
- Poor growth, development and poor school performance in children

SIGNS**Neonate**

- Persistence of neonatal jaundice
- Excessive sleep
- Feeding problems

Children

- Cretinism (mental subnormality, short stature, large tongue, dry skin, sparse hair, protuberant abdomen, umbilical hernia, abnormal facies)

Adults

- Slow pulse (usually <60 per minute)
- Dry coarse skin
- Puffy face
- Pallor
- Hoarse voice
- Slow reflexes
- Dementia
- Goitre may be present

INVESTIGATIONS

- Thyroid function tests - free T_3 , free T_4 , TSH
- CT scan of the head only if pituitary cause suspected

TREATMENT**Treatment objectives**

- To correct level of thyroid hormones

Non-pharmacological treatment

- Surgical intervention for pituitary-related causes as indicated

Pharmacological treatment**(Evidence rating: A)**

- Levothyroxine, oral,

Adults

25-200 microgram daily (start with a low dose and adjust according to TSH levels)

Children

12-18 years;

25-100 microgram daily (start with a low dose and adjust according to TSH levels)

2-12 years;

5-10 micrograms/kg daily

< 2 years;

15 micrograms/kg daily

REFER

Refer diagnosed or suspected cases of all ages, especially children, with intellectual impairment or cardiac complications to a Regional or Teaching hospital.

HYPERTHYROIDISM (THYROTOXICOSIS)

Excess thyroid hormone in the blood results in thyrotoxicosis. If left untreated, significant weight loss and cardiac complications, including heart failure, may occur. Addition of extra iodine to the diet (e.g. as in iodated salt) is not the recommended treatment.

CAUSES

- Toxic multi-nodular goitre
- Grave's disease

SYMPTOMS

- Weight loss despite increased appetite
- Excessive sweating
- Heat intolerance
- Tremors
- Nervousness and irritability
- Menstrual irregularity and sub-fertility

SIGNS

- Staring or protruding eyes
- Tremors
- Moist palms
- Rapid pulse rate which may be irregular
- Heart failure
- Goitre often present but not always
 - Smooth and diffuse goitre in Grave's disease
 - Irregular goitre in toxic multi-nodular goitre.

INVESTIGATIONS

- Thyroid function tests free T_3 , free T_4 , TSH
- Thyroid ultrasound scan

TREATMENT

Treatment objectives

- To reduce thyroid hormone levels to normal
- To prevent or treat complications e.g. heart failure, ophthalmopathy

Non-pharmacological treatment

- Partial thyroidectomy

Pharmacological treatment**(Evidence rating: A)**

- Carbimazole, oral, (decrease dose when patient is euthyroid and adjust doses subsequently according to two-monthly thyroid function tests)

Adults

20-40 mg daily

Children

12-18 years;

10 mg 8 hourly

< 12 years;

250 micrograms/kg 8 hourly

Alternate treatment

Propylthiouracil, oral, (decrease dose when patient is euthyroid and adjust doses subsequently according to two-monthly thyroid function tests)

Adults

100 mg 8 hourly

Children

12-18 years;

100 mg 8 hourly

5-12 years;

50 mg 8 hourly

1- 5 years;

25 mg 8 hourly

1 month-1 year;

2.5-5 mg/kg 8 hourly

< 1 month;

2.5-5 mg/kg 12 hourly

Adjunct treatment

- Propranolol, oral, (avoid in asthmatics)

Adults

20 - 40 mg 8 hourly

Children

1 mg/kg (maximum 40 mg) 8 hourly

REFER

Refer all cases not responding to conventional treatment to specialists in a Regional or Teaching Hospital for further investigations and management.

89. ADRENAL INSUFFICIENCY

Adrenal insufficiency arises when the adrenal gland is destroyed by disease, or atrophies following pituitary failure or chronic corticosteroid use or abuse. In these situations the amount of cortisol, a major hormone produced from the adrenal gland, is insufficient to meet the body's needs

during periods of stress. The condition is associated with severe fluid and electrolyte imbalance and results in acute circulatory collapse. Acute adrenal insufficiency is a medical emergency.

CAUSES

- Sudden cessation of corticosteroid therapy after prolonged use
 - In patients on oral or topical corticosteroids, such as prednisolone, dexamethasone, hydrocortisone, cortisone, or preparations containing any of these drugs.
 - In patients, especially women who abuse corticosteroids for cosmetic reasons e.g. for skin bleaching or weight gain.
- Stress (e.g. infection, severe trauma, surgery, and dental procedures) in a patient with undiagnosed adrenal insufficiency or patients on chronic corticosteroid treatment.
- Pituitary failure from severe postpartum haemorrhage, pituitary surgery or tumour.
- Destruction of the adrenal gland by auto-antibodies (Addison's disease) or severe infections (e.g. tuberculosis, HIV, meningococcus).
- Congenital adrenal hyperplasia, in children

SYMPTOMS

- Nausea
- Vomiting
- Weakness
- Collapse
- Abdominal pain
- Diarrhoea
- Failure of lactation after delivery or post-partum haemorrhage (Sheehan's syndrome)

SIGNS

- Variable states of consciousness
- Dehydration
- Low or unrecordable blood pressure
- Darkening of oral mucosa, gums, skin, palms and soles in some patients
- Evidence of skin bleaching
- In children, ambiguous genitalia, short stature and failure to thrive

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Urine and blood cultures, if indicated

- Blood urea and electrolytes
- Blood glucose
- Plasma cortisol - morning sample

TREATMENT

Treatment objectives

- To correct the fluid and electrolyte imbalance
- To replace corticosteroids
- To identify cause and treat any precipitating factor

Non-pharmacological treatment

- None

Pharmacological treatment (Evidence rating: C)

Acute therapy

- Intravenous fluid replacement

Adults

0.9% Sodium Chloride in 5% Glucose (Dextrose Saline), IV, 1 litre 4-6 hourly

Children

0.45% Sodium Chloride in 5% Glucose, IV, according to total fluid requirement.

- Hydrocortisone, IV,

Adults

200 mg stat, followed by 100 mg, IV, 6 hourly until condition is stable

Children

6-12 years;

100 mg, IV, 6 hourly

1-5 years;

50 mg, IV, 6 hourly

Up to 1 year;

5 mg, IV, 6 hourly

Adjunct treatment

- Treat infection (e.g. malaria, pneumonia, UTI), if present or suspected, with appropriate medication.



Note

The IV hydrocortisone therapy may be required for several days. Do not rush to change to maintenance therapy. When the patient's condition is stable (i.e. normal BP, cessation of vomiting etc.) go on to maintenance therapy.

Maintenance therapy

For patients with previous or newly diagnosed adrenal or pituitary disease

- Prednisolone, oral,

Adults

5 mg morning and 2.5 mg evening each day

Children

140 micrograms/kg in 2 divided doses

Or

Hydrocortisone, oral,

Adults

20 mg morning and 10 mg evening each day

Children

560 micrograms/kg in 2 divided doses

For patients requiring steroids for previously diagnosed medical conditions (e.g. asthma)

Adults and Children: restart the previous doses of oral corticosteroids given for the condition.

For patients who abuse corticosteroids

Adults:

Restart oral corticosteroids (or replace topical corticosteroids with), Prednisolone, oral, 20-40 mg daily, and gradually taper off the dose over several months (e.g. reducing by 2.5 mg per month) and eventually discontinue.

**Note**

- Long-term corticosteroid therapy requires specialist supervision
- Patients on corticosteroids should report to a hospital if they become ill and should tell their doctor, dentist, nurse or pharmacist they are on corticosteroids
- Patients SHOULD NOT stop treatment if they become ill, have an infection or are undergoing a dental procedure. Rather a doubling of the regular doses of corticosteroids is needed
- Revert to hydrocortisone, IV for even minor surgical procedures including labour and delivery
- The dose of corticosteroids must be reduced gradually if treatment has been for longer than 3 weeks and is to be stopped
- Discourage the abuse of oral or topical corticosteroids.

REFER

All patients, including children, suspected to have adrenal insufficiency should be referred to a regional or teaching hospital for further assessment after resuscitation.

90. CUSHING'S SYNDROME

This condition results from high levels of cortisol in the blood and is associated with various changes in the body including the development of obesity, hypertension, diabetes and osteoporosis. The prolonged use or abuse (especially by women for cosmetic reasons) of oral or topical

corticosteroids such as prednisolone, dexamethasone, hydrocortisone or cortisone, or preparations containing any of these drugs, is also a cause.

CAUSES

- Pituitary tumour
- Adrenal tumour
- Prolonged and excessive intake or abuse of corticosteroids

SYMPTOMS

- Weight gain
- Excess body hair and acne
- Easy bruising of skin
- Menstrual irregularity and sub-fertility
- Weakness of the thigh muscles

SIGNS

- Rounded or 'moon' face
- Excess facial and body hair
- Acne
- Striae (purplish stretch marks)
- Thin skin from bleaching and steroid abuse
- Easy bruising and bleeding into the skin after venepuncture
- Hypertension
- Truncal obesity
- Prominent supraclavicular fat pads

INVESTIGATIONS

- Plasma cortisol (commonly elevated in pituitary and adrenal tumours, but low in corticosteroid use or abuse)
- Blood electrolytes (may show low potassium)
- Blood glucose (commonly elevated)
- Abdominal ultrasound scan may show an adrenal tumour
- CT scan (may show evidence of a pituitary or adrenal tumour)

TREATMENT

Treatment objectives

- To normalise plasma level of cortisol
- To correct electrolyte imbalance
- To correct plasma glucose
- To correct blood pressure
- To prevent complications of excess plasma cortisol

Non-pharmacological treatment

- Pituitary or adrenal surgery where tumours in the respective glands have been diagnosed.

Pharmacological treatment

- Treatment is dependent on the cause and requires specialized investigations. Manage hypertension and diabetes along standard lines (see appropriate sections) and refer patient for definitive treatment

REFER

Refer all suspected cases to an Endocrinologist or Specialist Physician in a Regional or Teaching Hospital for the appropriate investigations and management.

91. OVERWEIGHT AND OBESITY

Excess body weight has adverse effects on health and life expectancy. It is associated with conditions that cause early disability and premature death such as type 2 diabetes, high blood pressure (hypertension), heart disease, stroke, gout, breathing problems, gallstones, heartburn, arthritis, skin infections as well as colon, kidney and endometrial cancer. Being overweight or obese also increases the risk of developing deep vein thrombosis and pulmonary embolism as well as elevated blood cholesterol which increases the risk for heart attacks and strokes.

Overweight and obesity that predominantly affects the upper (truncal) part of the body, or results in excessive abdominal fat, is more commonly associated with one or more of the conditions listed above. Weight reduction often corrects, or helps to control, these associated conditions. Slimming medications and herbal preparations are rarely useful and should be discouraged. They may have harmful long-term effects.

CAUSES

- Excess intake of calories
- Lack of regular physical activity

SYMPTOMS

- There are no specific symptoms associated with obesity.

SIGNS

- There are no specific physical signs associated with obesity
- Excess body weight is determined either by assessing:
 - Body Mass Index (BMI), calculated by taking the patient's weight in kilograms and dividing it by the square of the height in metres

Or

 - Mid-abdominal (waist) girth, taken from a measurement of the abdominal circumference along a horizontal line between the lower curvature of the ribs and the upper curvature of the hip bones

BMI is classified as follows:

- 18.5-24.9 kg/m² - Ideal weight
- 25.0-29.9 kg/m² - Overweight
- 30.0-34.9 kg/m² - Obese
- > 35.0 kg/m² - Severely obese

Waist circumference is classified as follows:

Adult females:

- < 80 cm or 32 inches Ideal abdominal girth
- > 88 cm or 35 inches Abdominal obesity

Adult males:

- < 94 cm or 37 inches Ideal abdominal girth
- > 102 cm or 40 inches Abdominal obesity

INVESTIGATIONS

- Blood glucose
- Blood lipid profile
- Blood uric acid
- ECG

TREATMENT

Treatment objectives

- To ensure a loss of 10% of the initial body weight, within 6 months, at a rate of 2-4 kg per month.

TREATMENT

Treatment objectives

- To ensure a loss of 10% of the initial body weight, within 6 months, at a rate of 2-4 kg per month.

Or

- To attain the ideal BMI and/or abdominal girth
- To sustain the weight loss achieved

Non-pharmacological treatment

- Weight reducing diet, preferably under the supervision of a Dietician
- Regular physical activity comprising 30 minutes brisk walking, or equivalent activity, for a minimum of 3 days per week
- Appropriate management of any associated disorders

Pharmacological treatment

- Approved anti-obesity treatments are available but should only be given under specialist guidance

REFER

Individuals with severe and morbid obesity may require referral to a physician specialist and occasionally psychological counselling.

Individuals who gain weight rapidly over a short period may have an underlying hormonal disorder and will require referral to a physician or endocrinologist.

92. DYSLIPIDAEMIAS

Abnormally high levels of blood fats (lipids) are associated with increased morbidity and mortality from cardiovascular diseases such as strokes and ischaemic heart disease, particularly when associated with other risk factors such as smoking, obesity or overweight, type 2 diabetes and hypertension. There is ample clinical trial evidence that treatment of elevated blood lipids with appropriate medications (e.g. statins) is beneficial for preventing cardiovascular complications. Treatment may be lifelong and requires regular monitoring of liver and muscle enzymes (transaminases and creatine kinase) to forestall side effects. The commonly assessed blood lipid parameters are total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides. The blood lipid profile is considered abnormal (dyslipidaemia) if either total and LDL-cholesterol or triglycerides are above expected levels and/or HDL-cholesterol is lower than expected.

CAUSES

- High dietary intake of saturated fats (animal fat)
- Lack of physical activity
- Diabetes mellitus, especially if poorly controlled
- Obesity
- Metabolic syndrome (a combination of several disorders including obesity, hypertension, type 2 diabetes, dyslipidaemia)
- Hereditary factors
- Primary hypothyroidism
- Nephrotic syndrome

SYMPTOMS

- Usually none
- Abdominal pain due to pancreatitis associated with elevated Triglycerides

SIGNS

- Usually no
- Occasionally
- Whitish ring around the cornea (corneal arcus)

- Yellowish skin eruptions around the eyes (xanthelasma)
- Whitish blood sample (lipaemic blood).

INVESTIGATIONS

- Total cholesterol (TC), does not require a fasting blood sample, and may be requested alone as a screening test.
- A full blood lipid assessment, including TC, HDL cholesterol and triglycerides (TG), is best carried out on a fasting blood sample. (The result of LDL cholesterol is often calculated from the results of the 3 other tests).



Note

A full blood lipid profile should be obtained in patients with

- Coronary heart disease (CHD)
- Cerebrovascular disease (stroke and transient ischaemic attacks)
- Peripheral artery disease
- Diabetes mellitus
- Hypertension
- A family history of dyslipidaemia
- Other risk factors for CHD e.g. obesity, smoking etc.

TREATMENT

Treatment objectives

- To reduce the risk of cardiovascular events and cardiovascular-related deaths
- To reduce the risk of cerebrovascular events and cerebrovascular-related deaths
- To normalise the blood lipid profile to recommended target levels as follows:
 - For the general population and individuals without CHD or CHD risk equivalents: TC <5.2 mmol/L, LDL-C <3.4 mmol/L, TG <2.0 mmol/L
 - Patients with previous or symptomatic CHD or CHD risk equivalents (e.g. type 2 diabetes): TC <4.1 mmol/L, LDL-C <2.6 mmol/L, TG <1.7 mmol/L

Non-pharmacological treatment

- Dietary measures - A low calorie, low saturated fat (animal fat), high polyunsaturated fat (plant fat) diet is recommended under the supervision of a dietician.
- Weight reduction in patients who are overweight or obese.
- Reduction in alcohol consumption, where this is excessive.
- Regular physical activity or exercise tailored to the individual patient.

Pharmacological treatment**(Evidence Rating: A)**

All patients who remain outside the target values despite adequate dietary and exercise therapy and who require medications should be referred to the appropriate specialist.

Priorities for pharmacotherapy should be given to those individuals who are at the highest risk e.g. patients with pre-existing CHD, or CHD risk equivalents; namely, diabetes, stroke, transient ischaemic attacks and peripheral artery disease.

- Atorvastatin, oral,

Adults

10-20 mg daily

Or

Rosuvastatin, oral,

Adults

10 mg daily

Or

Simvastatin, oral,

Adults

20 mg at night

Regular physical activity or exercise tailored to the individual patient.

REFER

The timing and duration of lipid-lowering drug treatment as well as the monitoring of side-effects of the medications, albeit infrequent, requires patients to be followed up by family physicians and physicians or metabolic specialists familiar with the use of these agents. Refer if necessary.

93. GOUT

This condition results from the deposition of microcrystals of uric acid in the joints and periarticular tissues. It is characterised by pain and inflammation of the affected joints. It is often, but not invariably, associated with elevated blood uric acid levels. This implies that gout may be present even when the level of uric acid in the blood is normal, while patients with high levels of uric acid may not necessarily have attacks of gout. Acute symptoms are often precipitated by the consumption of alcohol and foods rich in purines e.g. red meat, sea foods, as well as trauma, surgery, starvation and infection. Persistent hyperuricaemia may be associated with uric acid crystal deposition in subcutaneous tissues (tophus) and in other tissues such as the kidneys and tendons.

CAUSES

- Inherited metabolic disorder
- Complications of other diseases e.g. haematological malignancies, chronic kidney disease
- Medicines e.g. thiazide and loop diuretics, cytotoxic drugs, pyrazinamide

SYMPTOMS

- Excruciating pain and swelling usually of a joint e.g. big toe, ankle, knee or wrist

SIGNS

- Affected joint is inflamed, swollen and tender

INVESTIGATIONS

- FBC, ESR
- BUE, creatinine
- Serum uric acid
- Blood glucose
- Serum lipids
- X-ray of affected joint

TREATMENT**Treatment objectives**

- To relieve pain immediately
- To reduce joint inflammation
- To prevent recurrent attacks and joint damage
- To prevent uric acid crystal deposition in soft tissues

Non-Pharmacological treatment

- Rest affected joint
- Identify and manage underlying or predisposing factors
- Weight reduction in obese or overweight individuals
- Dietary modification (low purine diet)

Pharmacological treatment**(Evidence rating: C)**Acute Gout

- Diclofenac, oral,
50 mg 8 hourly

Alternative treatment

- Naproxen, oral,
250-500 mg 12 hourly

Chronic gout

- Allopurinol, oral,
100-300 mg once daily
Reduce dose in renal or hepatic impairment

**Note**

Do not give allopurinol in the acute phase. It may worsen or prolong the attack. Start it only when pain is under control i.e. after approximately 2 weeks. NSAIDs are not to be given for maintenance therapy or prophylaxis.

REFER

Refer patients to a dietician for dietary modification and a weight reducing diet in the obese and overweight. Patients with co-morbid conditions such as type 2 diabetes, hypertension, dyslipidaemia etc. should be referred to a physician specialist.

94. ANTE-NATAL CARE

Antenatal care refers to the comprehensive care given to a pregnant woman to ensure that she goes through pregnancy, labour and the puerperium safely with the delivery of a healthy baby.

To this end a good history should be taken and physical examination should be done at each visit to identify problems that are likely to have an adverse effect on the pregnancy. It is important to keep accurate records of all findings. Any problems or risk factors identified should be treated. High risk pregnancies (pregnancies that are likely to have one or more risk factors) should be referred to a hospital or obstetrician for management.

Health education involving healthy behaviours, diet, exercise, danger signs in pregnancy, emergency preparedness and preparations for safe delivery is useful for all mothers.

Assessment of the mother at each ante natal visit:

- Does the mother look well or ill?
- Does she look well nourished?
- Is the mother anaemic?
- Is there oedema?
- Is weight gain appropriate? She should gain about half a kilogram per week. (Sudden weight gain or weight loss are both very worrying)
- Examine the chest / lungs for signs of infection.
- Examine the cardio-vascular system
 - Pulse
 - Blood pressure (the upper limit of normal is 140 mmHg for the systolic pressure and 90mmHg for the diastolic pressure)
 - Heart sounds
 - To exclude murmurs suggestive of cardiac disease
- Examine the abdomen for organ enlargement.
- Obstetric examination:
 - Uterine size: measure symphysio-fundal height in centimetres between 20 and 36 weeks gestation
 - Check the lie, presentation and position of the baby and the descent of the presenting part. At term the head of the baby should be above the pelvis.
 - Check the foetal heart sounds. Normal rate is 120 - 160 beats per minute.

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Sickling (if necessary Hb electrophoresis)

- G6PD activity
- Urine and stool analysis
- Screening tests for diabetes ([see below](#))
- Blood group and antibody screen
- VDRL test
- HBsAg test
- Voluntary counselling and testing for HIV infection.
- Ultrasound scan because of the high incidence of ruptured ectopic pregnancy a scan done very early in the pregnancy is advocated. Foetal anomaly scanning at 18-24 weeks is beneficial.

Screening tests for diabetes

- Test for urine glucose at each antenatal visit.
 - Glycosuria of 1+/2+ on 2 occasions or 3+/4+ on one occasion warrants a full oral glucose tolerance test (OGTT).
 - Those found to have a normal curve can be tested again later in pregnancy after 28-32 weeks.
 - Those with impaired glucose tolerance or frankly diabetic curves should have treatment.
- Fasting blood glucose test and 2-hour post-prandial blood glucose test must be done on all pregnant women at booking and also at 28-32 weeks

TREATMENT

Treatment objectives

- To ensure that the patient goes through pregnancy, delivery and the puerperium in good health
- To prevent anaemia
- To ensure delivery of a healthy baby

Non-pharmacological treatment

- Healthy balanced diet
- Avoid smoking and heavy alcohol intake
- Exercise
 - Mild to moderate exercise, preferably non-weight bearing, at least 3 times per week is to be encouraged
 - Avoid exercise in the supine position after the first trimester
 - Discontinue exercise when there is
 - Bloody discharge from the vagina,
 - Sudden swelling of the face ankles or hands,
 - Persistent severe headaches and or visual disturbances

- Faintness or dizziness
- Chest pain
- Unexplained abdominal pain
- Exercise is contraindicated in
- Pregnancy-induced hypertension
- Preterm rupture of membranes
 - Preterm labour
 - Incompetent cervix
 - Persistent second/ third trimester bleeding
 - Intra uterine growth retardation.

Pharmacological treatment

(Evidence rating: C)

- Ferrous sulphate, oral, 200 mg 8 hourly
- Folic acid, oral, 5 mg once daily
- Calcium, oral, 500 mg-1 g once daily



Note

Those with HB >11 g/dl may use any of the proprietary combination medicine on the market with at least 60 mg elemental Iron.

Malaria prophylaxis (see section on Malaria in Pregnancy)

- Sulphamethoxazole-Pyrimethamine (SP), oral, 3 doses, one month apart starting from week 16 (prophylactic treatment should not exceed week 36).

Tetanus prophylaxis

- Tetanol, IM, 0.5 ml: 1st dose from 20th week gestation; 2nd dose 1 (one) month after initial dose, if patient has not previously had anti-tetanus immunisation

A course of tetanus toxoid vaccinations should be given to all women according to the following schedule:

TT1-Give the 1st dose (0.5 ml, SC or IM) at any contact with a woman of child bearing age (15-45 years) including at the 1st antenatal visit.

TT2-Give the 2nd dose at least 4 weeks after TT1

TT3-Give the 3rd dose at least 6 months after TT2 or during a subsequent pregnancy

TT4 & TT5-One dose in each of 2 subsequent pregnancies to make up a total of five doses. No further doses will be necessary in subsequent pregnancies.

REFER

High risk pregnancies (i.e. pregnancies that are likely to have one or more risk factors) should be referred to a hospital or obstetrician for management and delivery.

High-risk pregnancies include:

- Bleeding at any time in the pregnancy before labour
- Young (<18 years) and older (>35 years) mothers in their first pregnancy
- Presence of medical conditions such as:
 - Severe anaemia
 - Sickle-cell disease
 - Hypertension
 - Diabetes mellitus
 - Heart disease
 - Asthma, chronic cough such as pulmonary tuberculosis and
 - Thyrotoxicosis
 - HIV positivity
- Women with more than 5 children (the grand multiparous mother)
- Past history of bleeding after delivery or retained placenta
- Abnormal presentation and position of the baby in the womb at term transverse lie or breech presentation
- Multiple pregnancies
- Prolonged pregnancy (when the pregnancy lasts longer than 42 weeks)
- Contracted pelvis (pelvis too small for the baby to be delivered safely per vaginam). This may be obvious when the mother is short (<154 cm) or has small feet (shoe size < 4½ UK)
- Big baby at term when the symphysis-fundal height is more than 39-40 cm at term or when the estimated foetal weight is 4 kg or higher
- Past history of stillbirths or babies who die within the first week of life, especially if they die of the same problem
- Past pregnancy history of miscarriages around the same gestational age
- Decrease in growth of the baby (fetal growth restriction) - uterine size smaller than the gestational age.
- Uterine size much bigger than the gestational age with one foetus present.
- Previous instrumental delivery (vacuum extraction or forceps delivery).
- Previous operation on the womb such as Caesarean section, myomectomy or when the uterus is repaired after perforation during D&C.
- Preterm labour (labour before 37 completed weeks).

95. HYPEREMESIS GRAVIDARUM

This refers to excessive vomiting during the early part of pregnancy. It is quite common. Often, no cause for the vomiting is found; however, it may also be associated with multiple pregnancy or molar pregnancy.

Hyperemesis gravidarum is a diagnosis of exclusion. It is important to rule out other causes of vomiting such as medical problems (e.g. malaria, gastritis, peptic ulcer disease, hepatitis, hypoglycaemia etc); surgical problems (acute appendicitis, bowel obstruction, cholecystitis etc) and gynaecological problems such as twisted ovarian cyst.

CAUSE

- Pregnancy

SYMPTOMS

- Excessive vomiting throughout the day
- Inability to eat or drink due to fear of vomiting
- Weight loss

SIGNS

- The patient appears miserable
- Dehydration (dry skin, dry tongue, sunken eyes in extreme cases)
- The pulse is rapid and thready in extreme cases
- The BP may be low (from hypovolaemia)
- Deep and fast (acidotic) breathing in extreme cases

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Sickling test
- Urinalysis and culture
- Blood urea and electrolytes
- Ultrasound examination of the pregnancy

TREATMENT

Treatment objectives

- To stop the vomiting.
- To rehydrate the patient
- To treat shock if present
- To treat associated conditions e.g. UTI, malaria etc.

Non-pharmacological treatment

- Mild cases can have treatment at home with frequent small meals alternating with fluid intake. Dry foods such as biscuits may be very helpful.

Pharmacological treatment**(Evidence rating: C)**Mild cases

- Promethazine (Teoclate or Hydrochloride), oral, 25-50 mg 8 to 12 hourly

Or

Metoclopramide, oral,
10 mg 8 to 12 hourly

Severe cases

- Normal saline, IV, (alternate with 5% Dextrose to meet requirements)

Or

Ringers lactate, IV, (alternate with 5% Dextrose to meet requirements)

- Promethazine hydrochloride, IM or IV, 25-50 mg 8-12 hourly (Maximum daily dose, 100 mg)

Or

Metoclopramide, IM or IV,
5-10 mg 8 hourly (body weight < 60 kg, give 5 mg. Do not exceed 500 microgram/kg in a day)

- Vitamins B Complex and Vitamin C, IV,

Or

Vitamin B1, B2, B3, B6 & Vitamin C, IV, once daily

REFER

Refer severe cases with dehydration and/or shock and metabolic disturbances to a hospital for intravenous fluid replacement and anti-emetic therapy.

96. HYPERTENSION IN PREGNANCY

Hypertension in pregnancy denotes a systolic blood pressure of 140 mmHg or higher and/or diastolic pressure of 90 mmHg or higher. The hypertension may predate the pregnancy.

CAUSES

- Pregnancy induced hypertension
 - Gestational hypertension (no proteinuria)
 - Pre-eclampsia (hypertension with proteinuria)

- Eclampsia (hypertension with proteinuria and fits)
- Chronic hypertension (existing before pregnancy)
 - Essential hypertension
 - Secondary hypertension
 - Renal hypertension
 - Hormonal
- Chronic hypertension with super-imposed pre-eclampsia or eclampsia

97. PRE-ECLAMPSIA

Pre-eclampsia is a disease specifically associated with pregnancy. It usually occurs in the second half of pregnancy and it is characterized by hypertension and proteinuria. The presence of pedal oedema or excessive weight gain may also be a feature of pre-eclampsia.

Blood pressure monitoring every 4 hours together with daily weighing of the patient are essential in the management of pre-eclampsia alongside the recommended investigations.

While blood pressure reduction is essential, lowering the blood pressure below 140/90mmHg may cause foetal distress and should be avoided.

CAUSES

The cause is unknown but the disease is more commonly associated with the following:

- Primigravidae
- Maternal age (women <18 or >35 years)
- Multiple pregnancies
- Hydatidiform mole
- Medical disorders e.g. polycystic ovaries, chronic hypertension, diabetes mellitus, kidney disorders
- First pregnancy with a new partner
- Previous history of pre-eclampsia
- Family history of pre-eclampsia

SYMPTOMS

- Patients with pre-eclampsia are often asymptomatic
- Swollen feet

SIGNS

Mild cases

- Systolic blood pressure between 140 and 159 mmHg
- Diastolic blood pressure between 90 and 109 mmHg
- Proteinuria of 1+ or 2+

- Pedal oedema
Severe cases
- Systolic blood pressure 160 mmHg or higher
- Diastolic blood pressure 110 mmHg or higher
- Proteinuria of 3+ or 4+
- Pedal or generalised oedema

INVESTIGATIONS

- FBC
- Serum Uric Acid
- BUE and Creatinine
- Urinalysis and culture
- Liver function tests
- Random blood glucose
- Daily assessment of urine proteins
- Ultrasound scan for close foetal growth monitoring

TREATMENT

Treatment objectives

- To reduce elevated blood pressure, but not less than 140/90mmHg
- To prolong the pregnancy as much as possible to allow the foetus to grow and mature for delivery
- To prevent foetal distress
- To prevent or treat any complications that may arise
- To prevent eclampsia

Non-pharmacological treatment

- Admit for bed rest if possible
- Encourage patients to lie on their sides to avoid supine hypotension

Pharmacological treatment

(Evidence rating: B)

Mild pre-eclampsia

There is no need for drug treatment of the hypertension unless the BP rises above 150 mmHg systolic or 100 mmHg diastolic or the patient becomes symptomatic of imminent eclampsia (see below).

- Methyldopa, oral,
250-500 mg 8 to 12 hourly
- Nifedipine retard, oral,
10-40 mg 12 hourly

- Nifedipine slow release, oral, 30-60 mg daily

SEVERE PRE-ECLAMPSIA AND IMMINENT ECLAMPSIA

This is an obstetric emergency and must be treated urgently. Treatment is the same as that of eclampsia ([see below](#)). These cases are best managed in hospital under the supervision of an obstetrician.

While blood pressure reduction is essential, lowering the blood pressure below 140/90mmHg may cause foetal distress and should be avoided.

BP monitoring must be carried out every 15-30 minutes until the BP is reduced and the patient is stable. Thereafter monitoring can be done by 2-4 hourly.

Daily weighing of the patient is essential.

SYMPTOMS

- Frontal headaches
- Vomiting
- Visual disturbances such as double vision (diplopia), blurred vision, flashes of light
- Epigastric pain
- Decrease in urine production (oliguria)

SIGNS

- Elevated blood pressure
- Liver tenderness
- Urine production of < 30ml/hour or < 400ml / 24 hours
- Increased tendon reflexes
- Presence of ankle clonus (occasionally)

INVESTIGATIONS

- FBC
- Blood clotting profile (bedside clotting time, prothrombin time, INR, APTT)
- Serum uric acid
- BUE and Creatinine
- Urinalysis and culture
- Liver function tests
- Random blood glucose
- Daily assessment of urine proteins
- Ultrasound scan for close foetal growth monitoring

TREATMENT**Treatment objectives**

- To reduce the blood pressure, but not lower than 140/90 mmHg
- To prevent the mother from suffering from complications of the hypertension such as a stroke
- To prevent fits/eclampsia
- To stabilise the patient and deliver her if eclampsia is imminent

Non-pharmacological treatment

- Early delivery of mother if eclampsia is imminent
- If the patient is not symptomatic and the pregnancy is less than 34 weeks allow pregnancy to continue if the foetal condition would allow
- If the pregnancy is 34 weeks or more consider delivery after stabilisation

Pharmacological treatment**(Evidence rating: C)**

Pre-hydration (without overloading) with

- Sodium Chloride 0.9%, IV,

Or

Ringer's lactate, IV,
300 ml over 30 minutes

- Hydralazine, IV,
5-10 mg slowly over 20-30 minutes

Or

Nifedipine, sublingual,
10 mg stat

Or

Labetalol, IV,
20 mg stat over at least 1 minute

- Repeat at 10-minute intervals if the BP remains > 160/110 mm Hg as follows: 40mg; 80mg; 80mg boluses to a cumulative dose of 220 mg
- When the BP < 160/110 mmHg commence an infusion of 40mg per hour.
- Double the infusion rate at 30-minute intervals until satisfactory response or a dose of 160mg per hour is attained.

Subsequently

- Nifedipine retard, oral,
20-40 mg daily

And/Or

Methyldopa, oral,
250-500 mg 8-12 hourly

- Magnesium sulphate, IV,
20 ml of the 20% solution (4 g)
And
Magnesium sulphate, IM,
10 ml of the 50% solution, (5 g) into each buttock (total of 10g)

REFER

Refer all cases of severe pre-eclampsia and imminent eclampsia promptly to a hospital or obstetrician after initiation of treatment.

When the “obstetrician” considers that the foetus is immature, the patient should be transferred to a hospital capable of looking after the immature baby.

98. ECLAMPSIA

Eclampsia occurs when the blood pressure rises rapidly associated with a convulsion which is similar to an epileptic fit (eclamptic fit), with tonic and clonic phases followed by coma. The fits are often repetitive and of short duration (60-90 seconds).

CAUSES

- As for pre-eclampsia

SYMPTOMS

- Fits
- Unconsciousness

SIGNS

- Fits
- Coma
- Elevated blood pressure
- Bleeding tendency

INVESTIGATIONS

- As for severe pre-eclampsia

TREATMENT

Treatment objectives

- To protect the patient from injury
- To prevent further fits
- To lower the blood pressure
- To prevent maternal mortality
- To deliver baby when stable

Non-pharmacological treatment**During a fit**

- Prevent patient from falling
- Prevent patient from biting tongue
- Maintain the airway by either holding up the chin or, if possible, inserting a mechanical airway to hold down the tongue
- The patient should be kept on her side and turned every hour to prevent aspiration pneumonitis, as she is likely to be unconscious or semi-conscious
- Artificial respiration may be required following general anaesthesia

After the fits

- Obtain IV access
- Catheterise the patient
- If no further fits after a few hours, deliver the foetus by the most appropriate method to ensure safety of both mother and baby.
- Caesarean section is done when there is foetal distress or the cervix is unfavourable for induction and when there are other problems precluding safe vaginal delivery.

Pharmacological treatment**(Evidence rating: A)**

- Sodium Chloride 0.9%, IV,
Or
Ringer's Lactate, IV,

Prevent further fits by giving the following:

- Magnesium Sulphate, IV,
20 ml of the 20% solution (4 g)

And

Magnesium Sulphate, IM,
10 ml of the 50% solution, (5 g) into each buttock (total of 10g)

**Note**

If fits recur within 20 minutes, do not repeat Magnesium Sulphate. However, if it occurs after 20 minutes, repeat IV Magnesium Sulphate 10 ml of the 20% solution (2 g) once if patient <70kg or twice the dose (4g) if patient is >70kg

If the fits cannot be controlled with Magnesium Sulphate,

Add

- Diazepam, IV,
10 mg slowly over 23 minutes (not exceeding 2.5 mg every 30 seconds)
- Hydralazine, IV,
5-10 mg stat

Followed By

- Hydralazine, IV infusion,
20-40 mg in 500 ml of Sodium Chloride 0.9%
Rate of infusion to be titrated against the blood pressure readings.

**Note**

If the Hydralazine infusion runs unattended profound hypotension may ensue. Hydralazine, IV, is best given as multiple bolus doses at 20-30 minute intervals till the BP is reduced. The diastolic pressure should not go below 90 mmHg as placental perfusion may be impaired with resultant foetal distress.

Or

- Labetalol, IV,
20 mg stat over at least 1 minute
- Repeat at 10-minute intervals if the BP remains > 160/110 mm Hg as follows: 40 mg; 80 mg; 80 mg boluses to a cumulative dose of 220 mg
- When the BP < 160/110 mmHg commence an infusion of 40mg per hour.
- Double the infusion rate at 30-minute intervals until satisfactory response or a dose of 160mg per hour is attained.
- Magnesium sulphate, IM, (maintenance dose)
10 ml of the 50% solution (5 g) into alternate buttocks every four hours and it is continued till 24 hours after the last fit or delivery.

**Note**

Toxicity to Magnesium sulphate presents as slowing or arrest of the heart beat and the respiration and loss of the deep tendon reflexes. Before giving a dose ensure that the following parameters are normal:

- Respiratory rate >12-16 per minute.
- Urine output 100 ml or more over the previous 4 hours.
- Presence of knee jerk or other deep tendon reflexes.

In case of toxicity to Magnesium Sulphate

- administer 10 ml of 10% Calcium Gluconate, IV, slowly
- Give assisted respiration

- Pethidine, IM,
100 mg stat
- And**
- Promethazine, IM,
25 mg (given intra-muscularly would relieve pain and quieten the patient)

REFER

Refer all cases of eclampsia immediately to a hospital or obstetrician. As much as possible set up an IV line of Sodium Chloride 0.9% or Ringer's

lactate and administer the IV dose of Magnesium Sulphate slowly at the health facility. Follow this with the IM dose and accompany the patient to the hospital

If the IV dose cannot be given, simply give the IM dose of 5 g into each buttock.



Note

Do not give furosemide (frusemide) as part of the treatment for the hypertension unless there is pulmonary oedema present.

Do not give ACE-inhibitor antihypertensives, such as captopril, as they may damage the developing foetus.

99. MALARIA IN PREGNANCY

See section on **Malaria**

100. ANAEMIA IN PREGNANCY

The WHO definition of anaemia in pregnancy is a haemoglobin concentration of less than 11 g/dL. It may have an adverse outcome on the pregnancy. It is associated with increased rate of miscarriage, preterm delivery, fetal growth restriction, fetal demise and increased perinatal loss. It is also associated with increased maternal mortality rate. It is a preventable problem in pregnancy.

CAUSES

- Physiological (due to blood volume expansion in pregnancy)
- Poor dietary intake of iron, folate and vitamin B₁₂
- Haemolytic disorders (e.g. sickle cell disease, G6PD defect)
- Malaria
- Infestations with hookworm, ascaris, schistosomes
- Chronic infections e.g. TB, UTI, HIV

SYMPTOMS

- Dizziness
- Swelling of feet
- General weakness
- Easy fatigability
- Palpitations
- Jaundice (with haemolytic anaemia)

SIGNS

- Mucosal pallor
- Jaundice (may or may not be present)
- Hepato-splenomegaly (may or may not be present)
- Heart failure in severe cases

INVESTIGATIONS

- FBC, peripheral blood film comment
- Blood film for malaria parasites
- Sickling and Hb electrophoresis
- G6PD activity
- Serum iron, total iron binding capacity, ferritin
- Stool analysis for hookworm ova
- Urinalysis for schistosome ova and urobilinogen

TREATMENT**Treatment objectives**

- To relieve symptoms.
- To improve haemoglobin level.
- To identify and treat underlying cause.

Non-pharmacological treatment

- The patient's diet is very important during pregnancy especially in the presence of anaemia.

Pharmacological treatment**(Evidence rating: C)**

- Ferrous sulphate, oral,
200 mg 8 hourly (This may be increased to 400 mg 8 hourly in severe cases if no gastric symptoms occur)
- Folic acid, oral,
5 mg daily
- Multivitamin, oral,
One tablet 8 hourly
- Parenteral Iron: For those with iron deficiency anaemia who are unable to tolerate oral iron, parenteral iron may be given. This should be given under careful observation and a small test dose should first be given (check product leaflet for test dose).

Examples of parenteral iron include:

- Iron dextran (5ml on alternate days for a maximum of six doses)

- Iron sucrose complex- daily dosing
Dose: Total Iron deficit calculation: $1.5 \times (12 \text{ g/dL} - \text{patient's Hb}) \times 250$ grammes
Parenteral Iron comes in 50 g/ml and can be given as IV or IM after a test dose



Note

Contra-indications to the use of parenteral iron like iron dextran includes asthma, renal or liver disease, previous pyelonephritis and reaction to the drug.

- In severe anaemia (Hb $<7\text{g/dL}$), blood transfusion may be necessary. One unit of blood increases the haemoglobin by approximately 1 g/dL . Use only screened blood for transfusion.
- In labour it is best to transfuse the patient.
- When there is heart failure the blood (packed cells) is transfused with Furosemide (Frusemide), IV, 20-40 mg. Partial exchange transfusion may be necessary if the Hb is 4 g/dL or less.

REFER

Refer patients with anaemia to a dietician or diet nurse. Treatment for severe anaemia (Hb $<7\text{g/dL}$) is best given in health facilities with blood transfusion capability

101. DIABETES MELLITUS IN PREGNANCY

Gestational diabetes refers to glucose intolerance of any degree that develops or is first recognized during the current pregnancy, irrespective of whether it resolves after delivery or not. It is associated with poor pregnancy outcomes. Many patients are asymptomatic. Screening is therefore mandatory. A fasting blood glucose test and 2-hour post-prandial blood glucose test must be done on all pregnant women at booking and also at 28-32 weeks ([see section on Antenatal Care](#)).

The management of diabetes mellitus in pregnancy involves a multi-disciplinary approach comprising a team of obstetricians, midwives, nurses, dieticians, physicians, anaesthetists and paediatricians.

CAUSES

- Pre-existing Type 1 diabetes mellitus
- Pre-existing Type 2 diabetes mellitus
- Gestational diabetes mellitus

SYMPTOMS

- Usually asymptomatic
- Previous history of large babies (>4kg)

SIGNS

- Fast growing foetus (as assessed by symphysio-fundal height being larger than the dates or by ultrasound scan)
- Presence of polyhydramnios

INVESTIGATIONS

- Ultrasound scan
 - At 16-22 weeks detailed scan to exclude major foetal anomalies.
 - From 32 weeks serial scans for growth assessment (i.e. biparietal diameter, head circumference, femur length, abdominal circumference or trunk diameter and weight estimation)
- FBC and sickling status
- Mid-stream specimen of urine monthly for:
 - culture and sensitivity test
 - urinalysis
- High vaginal swab for vaginal candidiasis
- Blood urea, electrolytes and creatinine
- Fasting blood glucose and 2-hour post-prandial blood glucose every 2-4 weeks
- Glycated haemoglobin (HbA_{1c}) 2-3 monthly

**Note**

There is no place for urine glucose estimation in the management of diabetes in pregnancy except for screening only. For those who can afford a glucose meter, it would be prudent to do a glucose profile every 2-4 weeks. This involves the recording of fasting blood glucose, pre-breakfast, pre-lunch, post-lunch, pre-dinner and post-dinner levels.

TREATMENT**Treatment objectives**

- To achieve normal blood glucose and glycated haemoglobin levels
- To reduce maternal and foetal complications
- To deliver a healthy baby
- To prevent neonatal morbidity

Non-pharmacological treatment**Diet**

- This is very important as some patients may improve on diet alone
- The diet must comprise 3 meals and 3-4 snacks
- Heavy meals must be avoided
- The diet is best taken care of by a dietician or diet nurse

Exercise

- Prior to embarking on an exercise programme, pregnant women with diabetes should discuss with their obstetrician or midwife to ensure that there is no contra-indication.
- Exercise is contraindicated in
 - Pregnancy induced hypertension
 - Preterm rupture of membranes
 - Preterm labour
 - Incompetent cervix
 - Persistent second/ third trimester bleeding
 - Intra uterine growth retardation.
- mild to moderate exercise, preferably non-weight bearing, at least 3 times per week is to be encouraged
 - Avoid exercise in the supine position after the first trimester
 - Discontinue exercise when there is
 - bloody discharge from the vagina
 - sudden swelling of the face ankles or hands
 - persistent severe headaches and or visual disturbances
 - faintness or dizziness
 - chest pain
 - unexplained abdominal pain

**Pharmacological treatment
(Evidence rating: A)**

BEFORE PLANNED PREGNANCY OR DURING PREGNANCY

- Ideally, an attempt must be made to optimise glycaemic control in known diabetics before they become pregnant, if necessary with insulin therapy.
- If diet alone cannot control the blood glucose level give insulin.
- Type 2 diabetic patients on oral medication who become pregnant should be switched to insulin treatment.
- Oral anti-diabetic agents should not be given during pregnancy and throughout lactation.
- Insulin requirements vary from patient to patient.
- Insulin therapy should usually begin with teaching the patient the correct technique for subcutaneous injections.
- Start with small doses (e.g. total daily dose of 6-10 units) of NPH insulin or premixed insulin (which has 30% of regular and 70% of NPH insulin), subcutaneously.

- Give approximately two-thirds of the total daily dose before breakfast and one-third before dinner.
- Adjust the insulin doses before breakfast and/or dinner by plus or minus 2 units according to results of blood glucose tests.
- Monitor insulin therapy with 24 weekly FBS and 2-hour post-prandial blood glucose up to 34 weeks then weekly till delivery.
- Keep fasting glucose levels between 4-6 mmol/L and 2-hour post-prandial glucose between 4-7 mmol/L.
- This is often achievable on an out-patient basis. However, some patients would need to be admitted to hospital for short periods to ensure good glycaemic control.

DELIVERY

- Deliver by 40 weeks if diabetes is well controlled and there are no complications. If complications exist then earlier delivery may be indicated
- Indications for Caesarean section include severe pre-eclampsia, previous caesarean section, advanced maternal age, malpresentation or foetal macrosomia
- If elective preterm delivery is necessary, confirm pulmonary maturity with amniocentesis (if facilities are available). There may be the need to mature the foetal lungs with corticosteroids **under specialist care**.
- Labour (induced or spontaneous) and Caesarean section are best supervised in hospital under specialist care.
- Insulin requirements during labour should be given according to a sliding scale ([see section on Diabetic ketoacidosis and Sliding scale](#)).
- Insulin requirements during Caesarean section and other operative procedures (using a sliding scale or Glucose-Potassium-Insulin infusion or GKI) should be discussed with the anaesthetist.

PUERPERIUM

- Insulin requirements reduce dramatically after delivery, hence, post-delivery insulin doses must be tailored to each individual patient's needs.
- Insulin may not be required in the first 24-48 hours for gestational and Type 2 diabetics. The blood glucose levels may reach up to 11 mmol/L without any problems.
- Check blood glucose 2 hourly. If level is > 6.0 mmol/L in Type I diabetes give insulin according to a sliding scale ([see section on **Diabetes mellitus**](#)).

- If patient does not require insulin again repeat OGTT at 6 weeks and if abnormal refer to a physician diabetic clinic.
- Encourage breast-feeding.
- Encourage contraception with progestins or sterilization.
- The baby needs special care and is best managed by a paediatrician/ neonatologist.
- Hypoglycaemia in the baby in the first few hours of birth is a major problem. It can be prevented by initiating early (within 2 hours) breast-feeding or Dextrose 10%, IV, 4 ml/kg body weight as bolus, followed by maintenance of 60 ml/kg body weight in 24 hours.

REFER

Refer to hospital for specialist care. For the convenience of patients shared care between specialist and medical officer may be appropriate.

102. CARDIAC DISEASE IN PREGNANCY

It is very important to diagnose cardiac disease early and to institute the correct management as early as possible if the excess morbidity and mortality associated with it are to be reduced. Cardiac disease may be present before the pregnancy or develop during the pregnancy or puerperium (peripartum cardiomyopathy). Pregnancy makes cardiac disease worse.

Some of the signs of pregnancy may mimic cardiac disease. Examples are the increasing pulse rate, collapsing pulse and the presence of cardiac murmurs and a slight rise in the jugular venous pressure. Therefore cardiac examination is essential in all antenatal patients.

Management involves a multi-disciplinary team including the obstetrician, neonatologist and physician. The management depends on the functional classification of the New York Heart Association (NYHA):

- | | | |
|-----------|---|--|
| Class I | - | Asymptomatic |
| Class II | - | Symptomatic with heavy work |
| Class III | - | Symptomatic with light work or light exercise. |
| Class IV | - | Symptomatic even at rest. |

CAUSES

- Rheumatic heart disease e.g. mitral incompetence and stenosis
- Hypertension
- Cardiomyopathy
- Anaemia
- Congenital heart diseases that have been successfully treated may also present in pregnancy

- Thyrotoxicosis

SYMPTOMS

- Asymptomatic
- Palpitations
- Easy fatigability
- Chest pain
- Dyspnoea - orthopnoea, paroxysmal nocturnal dyspnoea
- Cough
- Leg swelling

SIGNS

- Cardiac murmurs
- Other signs of cardiac disease depending on the type of lesion (see section on **Disorders of the cardiovascular system**)
- Presence of heart failure (See section on **Heart failure**)

INVESTIGATIONS

- FBC
- Blood urea and electrolytes
- Thyroid function test, if indicated
- Electrocardiogram
- Echocardiogram
- Other ante-natal investigations

TREATMENT

Treatment objectives

- To maintain good cardiac function throughout the pregnancy
- To prevent maternal and foetal complications as much as possible
- To prevent maternal death

Non-pharmacological treatment

Antenatal period

- Patients known to have cardiac disease must book early in hospital.
- Assess the severity of the disease early in pregnancy and at each antenatal visit.
- Refer to the cardiologist or specialist physician for advice. Further management should be between obstetrician and cardiologist/specialist physician
- Those in NYHA Class III & IV should be admitted to hospital till delivery. Those in Classes I and II are treated at out-patient level till 34 weeks when they are admitted.

- Heart disease by itself is not an indication for induction of labour.

Pharmacological treatment

Refer all patients needing treatment to a physician specialist or obstetrician. (see section on referral below).

REFER

All patients with cardiac disease must be referred to a specialist physician and obstetrician.

103. JAUNDICE IN PREGNANCY

Jaundice occurring in pregnancy may be a sign or symptom of a severe disease and should not be underestimated.

CAUSES

Obstetric

- Severe pre-eclampsia/eclampsia / HELLP Syndrome (Haemolysis, Elevated Liver enzymes, Low Platelets syndrome)
- Severe hyperemesis gravidarum
- Cholestatic jaundice of pregnancy
- Acute Fatty Liver of pregnancy

Non-obstetric

- Viral hepatitis
- Haemolytic jaundice malaria, sickle cell disease, G6PD defect, septicaemia, drugs and herbal medications
- Surgical causes of jaundice acute cholecystitis, cholelithiasis, obstructive jaundice

INVESTIGATIONS

- FBC, Blood film for malaria parasites, sickling status
- G6PD status
- Group and cross matching
- Blood urea, electrolytes, and creatinine
- Liver function tests
- Hepatitis B surface antigen
- Abdominal ultrasound scan with emphasis on the hepato-biliary system and pancreas

TREATMENT

- Depends on the underlying cause (**See appropriate sections**)

REFER

Severe cases of jaundice and those associated with abdominal pain must be referred to a physician specialist.

104. POST-PARTUM HAEMORRHAGE

Post-partum haemorrhage may be primary or secondary. Primary post-partum haemorrhage refers to bleeding of more than 500 ml from the genital tract within the first twenty-four hours of delivery or any amount of blood loss that result in haemodynamic compromise of the patient. It usually occurs during or immediately after the third stage of labour.

Secondary post-partum haemorrhage is defined as excessive vaginal bleeding occurring from twenty-four hours to six weeks after delivery. The bleeding may occur with the placenta retained or after its expulsion from the uterus. Postpartum haemorrhage becomes life threatening if the mother is already anaemic. Blood loss of more than 500 ml may lead to shock

CAUSES

- Retention of small pieces of placental tissue within the uterine cavity
- Uterine atony
- Infection within the uterine cavity (endo-myometritis)
- Genital tract trauma
- Clotting disorders

SYMPTOMS

- Excessive or prolonged vaginal bleeding
- Lower abdominal pains

SIGNS

- Bleeding from the genital tract
- Conjunctival pallor
- Rapid pulse
- BP may be low or normal
- Suprapubic tenderness.

INVESTIGATIONS

- FBC, sickling status
- Blood grouping and cross-matching
- Ultrasound scan

TREATMENT

Treatment objectives

- To identify cause of, and stop, bleeding as quickly as possible
- To correct hypotension

Non-pharmacological treatment

- If the woman shows any effects of severe blood loss, it may be necessary to explore the uterine cavity under anaesthesia and remove the contents.
- Exploration of the uterus should always be done gently since the uterine muscle will be soft and perhaps infected, and can easily be injured by sharp instruments. Provided the uterus is curetted gently and no damage is done the blood loss usually ceases soon afterwards and the patient may be discharged
- If such a haemorrhage occurs in association with the placenta retained in the uterus, the following should be the course of action:
 - Rub up a contraction by manual pressure on the uterine fundus
 - Pass a urethral catheter to empty the bladder
 - Attempt removal of the placenta by controlled cord traction as soon as a contraction is felt. If not successful await the next contraction and repeat the procedure
 - If the placenta cannot be expelled in this fashion, manual removal under anaesthesia is indicated
 - If the facilities for manual removal under anaesthesia are not immediately available refer to hospital.
- If bleeding continues or is heavy:
 - Transfuse a minimum of 2 units of blood
 - If the placenta has been delivered and is incomplete, explore the uterus
 - If the placenta is complete and the uterus is well contracted:

Examine the patient in the lithotomy position with adequate analgesia and/or anaesthesia, good lighting to check for and repair lacerations in the cervix or vagina with effective suturing using through-and-through sutures.

 - If the tear extends into the uterine body, effective suturing cannot be performed and repair will involve a laparotomy.
 - For ruptured uterus repair or hysterectomy is done
 - Surgical intervention including, rarely, hysterectomy may be needed to stop the bleeding if above treatments fail.
 - Check that blood is clotting. (5 ml of blood placed in a 10 ml round-bottomed glass tube should clot in 6 minutes). Platelet count and PTT may be done

- If the uterus is poorly contracted (atonic) and the placenta is out and complete,
- Continue the IV fluids, blood transfusion and oxytocics
- Employ interventions such as manual compression of the uterus and condom tamponade

Pharmacological treatment

(Evidence rating: C)

- Oxytocin, IM,
10 units stat
- **Or**
Misoprostol, oral/sublingual,
600 micrograms
- Subsequently, maintain uterine contractions by massaging the fundus and infusing:
 - Oxytocin IV, 10units in 500 ml 5% Glucose in sodium chloride 0.9%.
- Anaesthesia for manual removal of placenta
(Pethidine IV, 100mg and Diazepam IV, 10 mg **OR** Ketamine IM/IV bolus or infusion, 6-10 mg/ kg)
- Set up IV infusion of Sodium Chloride 0.9% to run in fast:
- First 1000 ml rapidly in 15-20 minutes. Give at least 2000 ml in first hour
- Aim to replace 2-3x the volume of estimated blood loss.
- If condition stabilizes then adjust rate to 1000 ml / 6 hrly.



Note

Avoid dextrans; they interfere with grouping and cross matching as well as with coagulation of blood

- If the uterus is poorly contracted (atonic) and the placenta is out and complete,
 - Misoprostol, oral/sublingual, 600 micrograms
 - Prostaglandin F2 alpha (if available) should be administered directly into the myometrium.

For mild blood loss, (which does not stop spontaneously)

- Amoxicillin (Amoxycillin), oral,
500 mg 8 hourly for 7 days

Plus

- Metronidazole, oral,
400 mg 8 hourly for 7 days

And

- Misoprostol, vaginal,
600 micrograms stat

Or

Oxytocin infusion,
20 mg in 1L of Normal Saline

Or

Ergometrine, oral,
250-500 microgram 8 hourly for 3 days

REFER

Refer if patient is not responding to treatment and the necessary facilities are not available.

105. POST-PARTUM PYREXIA

This refers to an oral temperature of 38°C or more on 2 or more occasions during the first 10 days of the puerperium excluding the first day.

CAUSES

- Malaria
- Puerperal sepsis
- Breast problems (engorgement, mastitis, abscess formation)
- Urinary tract infection
- Respiratory tract infection

SYMPTOMS

- Related to cause

SIGNS

- Related to cause

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Blood for culture and sensitivity
- Urine for culture and sensitivity
- High vaginal swab
- Fasting or Random Blood Glucose
- Pelvic scan to exclude retained products of conception or pelvic abscess

TREATMENT**Treatment objectives**

- To identify the underlying cause

Non-pharmacological treatment

- Uterine curettage for infection related to retained products of conception
- Encourage frequent emptying of breasts if cause is due to engorgement
- Incision and drainage for breast abscess

Pharmacological treatment**(Evidence rating: C)**

The treatment given depends on the cause (**See appropriate sections**).

The treatment for breast problems is as follows:

- Engorgement
Paracetamol, oral,
1 g 8 hourly as required
- Mastitis / abscess
Flucloxacillin, oral,
500 mg 6 hourly for 5-7 days
- Endometritis
Co-amoxiclav, IV,
600 mg-1.2g 8 hourly for 7 days

Plus

Metronidazole, IV,
500 mg 8 hourly for 7 days

Or

Co-amoxiclav, oral,
625mg - 1g 12 hourly for 7 days

Plus

Metronidazole, oral,
400 mg 8 hourly for 7 days

REFER

Refer all cases of septicaemia to hospital for management.

106. ANALGESIA IN LABOUR

Fear, anxiety and uncertainty may lower the pain threshold during labour. Adequate pain relief during labour results in less anxiety and good progress.

In the first stage of labour the uterine contractions are painful and patients may therefore require analgesia.

In the second stage of labour analgesia is required for instrumental delivery and when an episiotomy is given.

TYPES OF ANALGESIA

(Evidence rating: C)

During the first stage of labour

- Pethidine, IM,
50-100 mg
Plus
Promethazine, IM,
25-50 mg



Note

- Given IM, the maximum analgesic effect of Pethidine is obtained after 45 minutes and lasts for 3-4 hours. It is therefore best not to give it when delivery is anticipated within 4 hours i.e. up to 6-7 cm dilatation.
- If the baby is born within 6 hours of Pethidine administration it may have respiratory depression requiring narcotic antagonists such as Naloxone IM, 200 microgram stat. together with resuscitation with oxygen via a facemask or through an endotracheal tube and Ambu bag until the depression is reversed.
- However, Pethidine should not be withheld from patients who need analgesia when the cervix is already 6-7 cm dilated in which case 50-75 mg Pethidine with 12.5-25 mg. Promethazine may be given intravenously.
- The IV dose of Pethidine begins to act within 5 minutes and its duration of action is also very short.
- The maximum safe total dose of Pethidine is 400 mg in 24 hours.
- Promethazine is given to reduce the chances of vomiting and to potentiate the analgesic effect of Pethidine.

Inhalational

- Nitrous Oxide 50% / Oxygen 50%
This is used in the late first stage when delivery is expected within 1 hour. It is very safe, acts very quickly and is short acting.

Epidural

This procedure administered by an anaesthetist is a very effective way of reducing labour pains. When it is given in the first stage its use extends through the second stage of labour. It may be used for caesarean section and other operations.

During the second stage of labour

Local Anaesthetics (for episiotomy and pudendal block anaesthesia to facilitate instrumental delivery).

- Xylocaine (Lignocaine) 1%, with or without adrenaline, infiltrated in the perineum before an episiotomy. If not given before delivery it can be given before the repair of the episiotomy.

Anaesthesia for short obstetric procedures (for manual removal of placenta, repair of large vaginal and cervical tears)

- Pethidine, IM or IV, 1mg/kg slowly, (maximum 100 mg). Give Promethazine hydrochloride, IM, 25 mg stat if vomiting occurs.
Plus
- Diazepam, IV, 10 mg (at a rate of 1 mg every 2 minutes. Monitor respiratory rate closely. Stop if respiratory rate is less than 10/minute)

**Note**

Do not mix Pethidine and Diazepam in the same syringe

Alternative treatment

- Ketamine, IM, 6.5-13 mg/kg
Or
Ketamine, IV, 1-4.5 mg/kg
Or
Ketamine, IV infusion, (For longer procedures. Total dose should not exceed 0.52mg per kg) 1mg per ml of ketamine in dextrose 5% or normal saline (maintenance dose 10-45 microgram per kg per minute adjusted according to response)
- Atropine, IM, 0.6 mg as pre-medication
- Oxygen, by face mask, 6-8 L/minute
Plus
- Diazepam, IV, 10 mg to avoid hallucinations

**Note**

Ketamine is contraindicated in patients with high blood pressure (hypertension) and heart disease

107. PRETERM LABOUR IN PREMATURE DELIVERY

Pre-term labour refers to labour occurring before thirty-seven completed weeks resulting in premature delivery. The immature foetus is at risk of cerebral haemorrhage because the fragile cranial bones provide insufficient protection for the brain and there is increased susceptibility to infection and impaired clotting mechanisms. Risk factors include young age of mothers, poor socio-economic class and smoking.

CAUSES

- Infections e.g. pyelonephritis, malaria
- Incompetent cervix
- Multiple pregnancies
- Abruptio placentae
- Diabetes mellitus

SYMPTOMS

- Regular and painful uterine contractions or abdominal pains
- There may be “show”

SIGNS

- Small maturity
- Palpable regular uterine contractions
- Progressive effacement and dilatation of the cervix
- Ruptured membranes

INVESTIGATIONS

- FBC
- Fasting or Random Blood Glucose
- Ultrasound scan (for those not in established labour) for the gestational age, foetal lie and presentation, amniotic fluid volume (normal or reduced), placental site and estimation of the foetal weight

TREATMENT**Treatment objectives**

- To stop uterine contractions if foetus is not mature and labour not established
- To allow foetal growth and maturity if feasible
- To promote foetal lung maturity
- To allow labour to progress if it is already well established
- To treat any underlying cause (e.g. malaria, pyelonephritis)

**Note**

Treatment is best done in a hospital where the facilities can support the adequate care of the preterm neonate.

Non-pharmacological treatment

- Avoid sexual intercourse
- Bed rest
- Cervical suture inserted close to the level of the internal os for cases diagnosed as cervical incompetence

Pharmacological treatment**(Evidence rating: A)**

- Salbutamol, IV infusion, (as a tocolytic)
2.5 mg Salbutamol in 500 ml of Dextrose 5%. (This gives a concentration of 5 micrograms per ml).
Start infusion at 10 micrograms/minute (i.e. 2 ml/minute) and increase rate gradually to 45 micrograms/minute (i.e. 9ml/minute) until contractions cease, then gradually reduce the rate.

- Dexamethasone, IM, (for foetal lung maturation)
6 mg 12 hourly for 4 doses



Note

- AVOID Dexamethasone use when infection is present.
- Dangers of steroid use include susceptibility to infection, fluid retention and pulmonary oedema and maternal postpartum collapse.
- Use Dexamethasone and Salbutamol only between 24-33 weeks of gestation

REFER

Refer the mother if the clinic cannot adequately care for the immature neonate. It is better to transfer the foetus in-utero to the referral centre.

108. PREMATURE RUPTURE OF THE MEMBRANES

This is the rupture of the membranes before the onset of labour. The two types are pre-term (before 37 completed weeks) and term (before 37 weeks, but ≥ 1 hour before onset of labour).

CAUSES

- Premature labour
- Trauma

SYMPTOMS

- Gush or leakage of fluid from the vagina.

SIGNS

- Speculum examination reveals a clear fluid issuing from the cervical os or pool of fluid in the posterior vaginal fornix
- In the presence of chorioamnionitis
 - fever
 - purulent vaginal discharge
 - maternal tachycardia
 - uterine tenderness

INVESTIGATIONS

- FBC
- Sterile speculum examination including swab for culture
- Ultrasound scan (if available) for the gestational age, foetal lie and presentation, amniotic fluid volume (normal or reduced), and the placental site. Estimate the foetal weight.
- Urinalysis and culture

TREATMENT**Treatment objectives**

- To prevent infection
- To prevent labour if possible

Non-pharmacological treatment

- Bed rest

Pharmacological treatment**(Evidence rating: C)**

- Amoxicillin (Amoxycillin), oral,
500 mg 8 hourly for 7 days

Plus

- Metronidazole, oral,
400 mg 8 hourly for 7 days

Or

Co-amoxiclav, oral,
625mg - 1g 12 hourly for 7 days

REFER

Refer patients to hospital or specialist for further management if necessary.

109. DYSMENORRHOEA

Dysmenorrhoea refers to cyclical lower abdominal pain associated with menstruation. The pain is thought to result from uterine contractions. It may be primary or secondary indicating the absence or presence, respectively, of an identifiable underlying cause.

CAUSES

- Uterine fibroids
- Chronic pelvic infections e.g. Chlamydial infections
- Endometriosis

SYMPTOMS

- Lower abdominal pain that is cramping or colicky in nature but may be dull and constant
- Pain may radiate to the lower back or legs
- Nausea, vomiting, headaches and dizziness may sometimes be associated with the pain

SIGNS

- No typical physical signs

INVESTIGATIONS

- FBC
- Sickling
- Pelvic ultrasound scan to rule out pelvic lesions such as fibroids.

TREATMENT

Treatment objectives

- To relieve pain
- To treat underlying cause

Non-pharmacological treatment

- None

Pharmacological treatment

(Evidence rating: A)

Mild cases

- Aspirin, oral,
600 mg 8 hourly

Or

Paracetamol, oral,
1g 6 to 8 hourly

Severe cases

- Ibuprofen, oral, 200-400 mg 8 hourly
- **Alternative treatment**
- Mefenamic acid, oral, 500 mg 8 hourly

REFER

Refer to a gynaecologist if pain interferes with normal activity especially if simple treatment is ineffective.

110. ABORTION

Abortion refers to the expulsion of the foetus and other products of conception before the 28th week of pregnancy. It may be spontaneous (threatened, inevitable, incomplete, complete or missed) or induced (therapeutic, criminal or septic).

After appropriate treatment and discharge from hospital, it is recommended that patients report back to hospital if there is lower abdominal pain, fever, vaginal bleeding and malodorous discharge.

CAUSES

- Infections e.g. malaria, UTI, bacterial vaginosis etc.
- Foetal abnormalities
- Incompetent cervix
- Chronic illness e.g. diabetes, thyroid disorders, sickle cell disease etc.
- Interference of the pregnancy with medications (oral / parenteral / douches) or instrumentation
- Trauma

THREATENED ABORTION**SYMPTOMS**

There is usually scanty to moderate painless vaginal bleeding. There may be mild discomfort.

SIGNS

- The uterine size is compatible with the gestational age.
- There is no cervical effacement or dilatation.

INVESTIGATIONS

- FBC and sickling
- Ultrasound scan (confirms viable foetus in utero with closed cervix)

TREATMENT**Treatment objectives**

- To maintain a viable pregnancy to term if possible

Non-pharmacological treatment

- Explain the condition to the patient.
- Bed rest at home or hospital.
- To abstain from sexual intercourse.
- To report back if bleeding or pain increases.

Pharmacological treatment

- None

INEVITABLE ABORTION**SYMPTOMS**

- There is lower abdominal pain associated with heavy bleeding. There may also be painless loss of liquor per vaginam.

SIGNS

- The cervix is dilated with the membranes bulging.
- There may be loss of liquor.
- The uterine size is compatible with the gestational age.
- There may be signs of shock pallor, collapsed peripheral vessels, rising pulse with reducing volume, falling BP and cold clammy skin.

INVESTIGATIONS

- FBC and sickling
- Blood grouping and cross matching
- Ultrasound scan (shows the foetus dead or alive).
 - Cervix may be dilated with membranes bulging through it.
 - In instances associated with loss of liquor there may be oligohydramnios.
 - Ultrasound is necessary only if the diagnosis is in doubt.

TREATMENT**Treatment objectives**

- To resuscitate patient
- To relieve pain
- To allow the patient to abort (assist uterine contractions if weak)
- To evacuate the retained products of conception from the uterus.
- To determine cause of abortion if recurrent.

- To prevent infection with antibiotic prophylaxis

Non-pharmacological treatment

- Keep the patient nil by mouth.
- Evacuation of the uterus is done by either of the following techniques after the expulsion of the foetus or before the expulsion of the foetus if it is less than 12-14 weeks size.
 - Manual Vacuum Aspiration (MVA) with or without paracervical block anaesthesia
- **Or**
- Uterine curettage under general anaesthesia especially when the uterine size is larger than 12-14 weeks size.

Pharmacological treatment

(Evidence rating: C)

- IV fluids and blood transfusion as necessary.
- Pethidine, IM,
75-100 mg stat. Followed by 50-100mg 8 hourly

And

- Promethazine hydrochloride, IM,
25 mg stat
- Oxytocin, IV,
10-20 units/litre of Normal saline

Or

- Misoprostol, oral,
600 micrograms stat
- Amoxicilin, oral,
500 mg 8 hourly
- Metronidazole, oral
500 mg 8 hourly

INCOMPLETE ABORTION

SYMPTOMS

- The patient may complain of the passage of large clots and/or the foetus and some products per vaginam.

SIGNS

- Shock-pallor, collapsed peripheral vessels, fast pulse, falling BP and cold clammy skin.
- Uterine size is smaller than the dates.
- Cervix is dilated with the foetus already aborted.

- Whole placenta or parts thereof may be palpable within the uterine cavity.

INVESTIGATIONS

- FBC and sickling
- Blood grouping and cross matching,
- Ultrasound scan (to be requested if doubt exists in the diagnosis - especially in early pregnancies)

TREATMENT

Treatment objectives

- To resuscitate patient
- To evacuate the retained products of conception from the uterus
- To prevent infection with antibiotic prophylaxis
- To determine cause of abortion, if recurrent
- To prevent risk of Rhesus incompatibility in future pregnancies

Non-pharmacological treatment

- Digital curettage may be done during vaginal examination to remove as much of the placental tissue as possible. This helps to minimise the haemorrhage but it may be uncomfortable or painful to the patient.
- Arrange for surgical evacuation of the retained products of conception under general anaesthesia or manual vacuum aspiration (MVA) with or without anaesthesia.
- To abstain from sexual intercourse for at least 2 weeks
- Counselling and psychological support

Pharmacological treatment

(Evidence rating: C)

- IV fluids and blood transfusion as necessary.
- Ergometrine, IM/IV, 500 microgram stat
- Oxytocin, IV, 20 units into 1 L of Sodium Chloride 0.9% and infuse at 30-60 drops per minute

Or

- Misoprostol, oral, 600 micrograms stat
- Anti D Rh Immune Globulin 250 Units (150 mg), IM, stat within 72 hours. (Given to Rh (D) Negative women)

- Amoxicilin, oral,
500 mg 8 hourly
- And**
- Metronidazole, oral,
500 mg 8 hourly

COMPLETE ABORTION

SYMPTOMS

- Cessation or reduction of vaginal bleeding following heavy bleeding with passage of clots and/or the foetus and placenta.
- Absence of pain

SIGNS

- The uterus is smaller than the gestational age.
- The cervix is closed and firm.

INVESTIGATIONS

- FBC
- Blood grouping and cross matching
- Ultrasound scan: To confirm empty uterine cavity

TREATMENT

Treatment objectives

- To assess for and manage anaemia if present

Non-pharmacological treatment

- Counselling and psychological support

Pharmacological treatment

- Resuscitate patient if necessary
- Treat anaemia if present
- Follow up review in two weeks.

SEPTIC ABORTION

This is a life threatening complication of abortion. Most often a history of criminal interference with the pregnancy is obtained.

It may further lead to complications such as septic shock, uterine damage, peritonitis, haemorrhage, disseminated intravascular coagulation (DIC), acute renal failure, adult respiratory distress syndrome, tetanus or gas gangrene.

CAUSES

- Infected retained products of conception

SYMPTOMS

- Severe lower abdominal pain
- Fever
- Vomiting
- Headache
- Offensive, bloody vaginal discharge

SIGNS

- Fever
- Tachycardia
- Peritonism
- Retained products of conception

INVESTIGATIONS

- FBC, Sickling, Platelet count
- Clotting Screen
- Blood grouping and cross matching
- Blood culture and sensitivity
- Urine culture and sensitivity
- Endo-cervical swab for culture and sensitivity
- Blood urea and electrolytes.
- Chest and abdominal X-ray (to exclude foreign body, gas under the diaphragm suggesting uterine perforation)
- Abdomino-pelvic ultrasonography (for intra-abdominal and pelvic abscesses, peritonitis and gas in the pelvis)

TREATMENT**Treatment objectives**

- To resuscitate patient
- To treat infection
- To evacuate uterus
- To provide counseling

Non-pharmacological treatment

- Evacuate the retained products of conception. Do gentle digital curettage followed by the instrumental curettage under general anaesthesia within 6 hours of initiation of antibiotic therapy. Extreme care is needed in order not to perforate the uterus (if it has not been perforated already).

- Psychological support and family planning counselling.

Pharmacological treatment
(Evidence rating: C)

- IV fluids and blood transfusion as necessary.
- Ampicillin, IV,
1-2 g 6 hourly for 24-72 hours

Plus

- Gentamicin, IV,
80 mg 8 hourly for 5 days

Plus

- Metronidazole, IV,
500 mg 8 hourly for 24-72 hours
- Switch over from IV to oral therapy when appropriate. Continue with Gentamicin, IM or IV,
80 mg for at least 5 days. (The culture and sensitivity test results will direct the antibiotic therapy)

- Pethidine, IM,
100 mg 4-6 hourly

With

Promethazine, IM,
25 mg 8-12 hourly

Allow to abort or set up Oxytocin drip if the foetus is still in-situ. Careful evacuation of the uterus must be done as risk of uterine perforation is high.

Tetanus prophylaxis

- Tetanol, IM,
0.5 ml stat
- Human Immune Tetanus Globulin (Tetagam), IM,
250-500 units stat

MISSED ABORTION

This refers to foetal death in-utero before 28 weeks gestation.

SYMPTOMS

- There is reversal of the symptoms of pregnancy
- There may be recurrent bloody vaginal discharge
- Absent maternal perception of foetal movements (if quickening has already occurred)

SIGNS

- Uterus is smaller than dates
- Foetal heart tones are not heard either with the Pinards stethoscope or with a foetal Doppler device such as Sonicaid.

INVESTIGATIONS

- FBC, Sickling
- Blood grouping and cross matching,
- Blood film for malaria parasites if necessary
- Blood clotting profile for the larger pregnancies.
- Pregnancy test
- Ultrasound scan
- Fasting Blood Sugar

TREATMENT**Treatment objectives**

- To make patient fit for uterine evacuation
- To ensure safe uterine evacuation
- To establish cause of foetal death if possible

Non-pharmacological treatment

- First Trimester (<12 weeks): Evacuation of the uterus by suction curettage (manual or with machine) is preferred for first trimester cases. This must be done gently to avoid uterine perforation. The procedure must be covered adequately with oxytocics, as haemorrhage can be a problem
- Hysterotomy may be indicated where induction fails or is contraindicated.

Pharmacological treatment**(Evidence rating: C)**

- IV fluids and blood transfusion if necessary
- Misoprostol, oral or vaginal, 400 micrograms stat. at least 3 hours prior to suction curettage (will facilitate curettage and prevent damage to cervix)
- Misoprostol can be used to both ripen cervix and facilitate evacuation of the uterus

12-24 week gestation:

200 micrograms, vaginal, 12 hourly until expulsion or 400 micrograms, oral, 4 hourly until expulsion

4-12 week gestation:

800 micrograms, vaginal or sublingual, every 24 hours for two days

Table 15-1 : Misoprostol Dosages for Reproductive Health

Indication	Dosage	Notes
Induced abortion (0-12 weeks)	800 microgram vaginally 12 hourly	Ideally used 48 hours after mifepristone, oral, 200 mg.
Missed abortion (0-12 weeks)	800 microgram vaginally 3 hourly Or 600 microgram sublingually 3 hourly	Give 2 doses and leave to work for 1-2 weeks (unless heavy bleeding or infection)
Incomplete abortion (0-12 weeks)	600 microgram orally stat	Leave to work for 2 weeks (unless heavy bleeding or infection).
Induced abortion (13-24 weeks)	400 microgram vaginally 3 hourly (maximum 5 doses)	Use 200 microgram only in women with caesarean scar. Ideally used 48 hours after mifepristone, oral, 200 mg.
Intrauterine fetal death (>24 weeks)	13-17 weeks: 200 microgram 6 hourly 18-26 weeks: 100 microgram 6 hourly 27-43 weeks: 25-50 microgram 4 hourly	with previous caesarean section
Induction of labour (live fetus >24 weeks)	25 microgram vaginally 4 hourly Or 50 microgram orally 4 hourly Or 20 microgram oral solution 2 hourly	Do not use if previous caesarean section.
PPH treatment	600 microgram orally or sublingually stat.	Limited evidence for benefit use conventional oxytocics first
Cervical ripening prior to instrumentation	400 microgram vaginally 3 hours before procedure	Use for insertion of intrauterine device, surgical termination of pregnancy, dilatation and curettage, hysteroscopy

stat = single dose taken immediately, PPH = postpartum haemorrhage

- Oxytocin drip may be used for induction where other cervical ripening methods (e.g. Foleys catheter balloon) are used.
- There is a higher incidence of DIC in this category of missed abortions and the platelet count and the blood clotting profile should be checked and adequate preparation made (with blood grouped and crossmatched, fresh frozen plasma and IV fluids) before the abortion procedure.

- Where medication abortion is being done patient should be admitted in hospital during the period.



Note

Oxytocin used together with misoprostol must be done with extreme caution as risk for uterine rupture is great.

INDUCED ABORTION

This refers to the deliberate termination of pregnancy. Termination of pregnancy is requested for and done for reasons permissible by law either through a surgical procedure or by pharmacological means.

Under the current provisions for Ghana, an induced abortion may be carried out legally only under the following conditions:

- In case of rape, defilement or incest
- Threat to the physical and mental health of the mother
- Presence of foetal abnormality
- Mental retardation of the mother

Patients given a pharmacological option for abortion will need to be monitored closely for completeness of the abortion process. They should be informed to report back immediately in cases of profuse or heavy vaginal bleeding, fever, offensive vaginal discharge.

TREATMENT

Treatment objectives

- To ensure that legal requirements for termination are met
- To ensure safe abortion
- To provide family planning counselling after the procedure

Non-pharmacological treatment

- Preabortion Counselling - explore the reasons for the abortion request to ensure that it meets the legal and medical requirements and provide information of other care options and on available abortion methods.
- Surgical
 - 4-12 week gestation
 - Manual Vacuum Aspiration
 - Dilatation and curettage
 - > 12 weeks gestation
 - Cervical ripening followed by dilatation and evacuation

Pharmacological treatment

4-12 week gestation

- Misoprostol, vaginal or sublingual, 800 micrograms every 24 hours for two days
Or
- **Where available give Mifepristone 200 mg daily for 48 hours before use of Misoprostol**
12-24 weeks gestation
- Misoprostol, vaginal,
200 micrograms 12 hourly until expulsion
Or
Misoprostol, oral,
400 micrograms 4 hourly until expulsion
Or
Where available give Mifepristone 200 mg daily for 48 hours before use of Misoprostol

REFER

For all types of abortion, refer early for specialist care if the uterus is found to be perforated or if complications are severe.

111. ABNORMAL VAGINAL BLEEDING

This refers to bleeding which deviates from the normal menstrual pattern (in terms of the amount, duration or interval). Abnormal menstrual patterns and bleeding are common in young adolescents and women within the ages of 45-50 years. No cause may be found on investigation as it is mostly due to immaturity of the ovaries and its pituitary controls. Bleeding may be mild or severe and life threatening.

The causes are multiple and may be related to age of the patient. Postmenopausal bleeding is said to occur when a woman who has stopped having menstruation for 6-12 or more months begins to bleed per vaginam.

Treatment is directed at the cause found.

CAUSES**Young Adolescents**

- Dysfunctional uterine bleeding.
- Complications of pregnancy
- Coital lacerations including rape and defilement.
- Accidental traumatic lesions of vulva and vagina.

Women of Child Bearing Age

- Complications of pregnancy, including ectopic pregnancy and Choriocarcinoma

- Coital lacerations
- Use of hormonal methods of contraception or intrauterine contraceptive device (IUCD)
- Cervical cancer
- Fibroids
- Dysfunctional bleeding.

Peri- Menopausal Women

- Dysfunctional bleeding.
- No cause may be found on investigation as it is mostly due to aging of the ovaries.
- All other causes listed for women of childbearing age also apply.

Post-Menopausal Women

- Pelvic cancers such as cervical cancer, endometrial cancer, vaginal or vulva cancer and ovarian tumours
- Withdrawal from oestrogen therapy
- Atrophic vaginitis/endometritis
- Coital tears
- Urethral caruncle
- Occasionally bleeding from the rectum and urethra may be confused with genital tract bleeding

INVESTIGATIONS

- FBC, platelet count, sickling
- Blood clotting screen e.g. Prothrombin time, INR
- Pelvic ultrasound scan (to rule out pelvic lesions)
- Urine analysis
- Diagnostic dilatation and curettage (DD & C) for women of child bearing age and postmenopausal women

TREATMENT

Treatment objectives

- To find the cause of bleeding
- To stop the bleeding
- To replace the blood lost

Non-pharmacological treatment

- Vaginal coital tear - suturing in theatre
- Inevitable or incomplete abortion - uterine evacuation

Pharmacological treatment (Evidence rating: C)

Dysfunctional uterine bleeding:

Mild cases, control bleeding with;

- Norethisterone acetate, oral,
5 mg 8 hourly for 10-12 days
- Life threatening bleeding, admit patient to hospital and resuscitate with IV fluids and possibly blood transfusion. Control bleeding with
- Oestrogen, oral,
1.25-2.5 mg daily for 10-12 days
When the bleeding is controlled continue treatment with
- Norethisterone, oral,
5 mg 8 hourly for 10-12 days

Or

Medroxyprogesterone Acetate, oral,
5 mg 8 to 12 hourly for 10-12 days

Or

Low dose oral contraceptive pill for 3-6 cycles.



Note

If heavy menses return, the tablets can be continued for as long as necessary.
Atrophic vaginitis responds to vaginal oestrogen cream treatment such as conjugated oestrogen cream.

REFER

Refer pelvic cancers and other causes of abnormal uterine bleeding early to a gynaecologist for early detection and treatment which may involve radical surgery, radiotherapy and chemotherapy.

112. FEMALE INFERTILITY

Primary infertility is said to occur when a couple has never achieved a pregnancy despite at least one year of uninterrupted and adequate unprotected sexual intercourse. Secondary infertility implies that there has been a previous pregnancy. It is often necessary to evaluate both partners simultaneously and to elicit a menstrual history, a past history of pelvic inflammatory disease (PID) and sexually transmitted infections (STIs), contraception and other significant past medical history.

CAUSES

Female factors

- Failure of ovulation
 - Polycystic ovarian syndrome

- Hyperprolactinaemia
- Pelvic factors
 - Tubal disease
 - Pelvic adhesions
 - Uterine fibroids
 - Endometriosis
- Cervical factors
- **Male factors**
- Oligospermia
- Azoospermia
- Penile and testicular abnormalities

SYMPTOMS

- Inability to achieve pregnancy

SIGNS

- Absence of secondary sexual characteristics
- Testicular abnormalities e.g. varicoceles
- Galactorrhoea
- Abdominal masses from uterine fibroids or ovarian masses

INVESTIGATIONS

- FBC, Sickling
- Blood glucose
- Hystero-Salpingogram (best done under fluoroscopic guidance).
- Semen analysis
- Serum progesterone level in mid-luteal phase (day 21-23 of menstrual cycle) to check for ovulation
- Thyroid function tests
- Further hormonal studies e.g. Serum LH, FSH, Serum Testosterone, Prolactin to be done by specialist

TREATMENT

Treatment objectives

- To treat the underlying cause of the infertility if possible
- To achieve pregnancy within the shortest possible time

Non-pharmacological treatment

- Counselling
- Tubal surgery where needed
- In-vitro-fertilization and embryo transfer where indicated

Pharmacological treatment**(Evidence rating: A)****Failure of ovulation**

- Clomifene citrate, oral,
50 mg daily for 5 days, starting between the 2nd and 5th day of the menstrual cycle
If treatment is not successful (i.e. pregnancy not achieved within 3 cycles) it is better to refer for specialist care.

Hyperprolactinaemia

- Bromocriptine, oral,
1.25 mg nocte with the evening meal or at bedtime for one week.
Increase the dose weekly to 2.5mg 8 to 12 hourly.

**Note**

Patients taking clomifene (clomiphene) citrate need careful supervision best done by a specialist.

Clomifene may cause severe ovarian hyperstimulation syndrome which may ultimately result in the patient's death in the absence of a high-dependency care unit.

REFER

Refer patients with tubal disease or who require ovulation induction to a gynaecologist. Also refer male partners with poor semen analysis results to a urologist

113. MENOPAUSE

Menopause refers to the point in time when permanent cessation of menstruation occurs usually due to loss of ovarian function. The age at onset is usually between 45 and 55 years. It may however occur earlier. A woman is considered to be menopausal if there is no menstruation for a period of at least 6-12 months in the absence of pregnancy. It is associated with physical, emotional and psychological upheaval of varying intensity in the affected individual. Sixty percent of menopausal women may be asymptomatic.

CAUSES

- Natural onset due to the age of the individual
- Due to surgical removal of the ovaries (bilateral oophorectomy)
- Pelvic irradiation.
- Premature
 - Ovarian failure
 - Pituitary damage from primary post-partum haemorrhage (PPH) (Sheehan's syndrome)
- Cytotoxic (anticancer) therapy

SYMPTOMS

- Hot flushes (heat or burning in the face, neck and chest with resultant sweating).
The flushes may be associated with
 - Palpitations
 - Faintness
 - Dizziness
 - Fatigue
 - Weakness
- Emotional and psychological problems include:
 - Mood changes
 - Depression
 - Anxiety
 - Nervousness
 - Irritability
 - Loss of libido
- Atrophic changes in the genital tract may give rise to the following:
 - Increased frequency of micturition and dysuria.
 - Stress incontinence (urinary incontinence with coughing or straining).
 - Vaginal dryness and dyspareunia

SIGNS

- No specific physical signs

INVESTIGATIONS

- Hormone tests if available (serum LH, FSH, Oestradiol)
- Routine investigations e.g. FBC, blood glucose, lipid profile
- Tests to exclude pregnancy

TREATMENT

Treatment objectives

- To control symptoms e.g. severe hot flushes, atrophic vaginitis and recurrent cystitis
- To prevent osteoporosis especially in individuals with premature menopause
- To prevent cardiovascular morbidity

Non-Pharmacological treatment

- Counselling and reassurance.
- Encourage active lifestyles, exercise and regular physical checkups for common medical problems.

Pharmacological treatment (Evidence rating: A)

In women with intact uterus

- Conjugated oestrogens and progestogen (28 tablets each containing conjugated oestrogens-625 micrograms and 12 tablets each containing norgestrel - 150 micrograms)
1 conjugated oestrogen tablet daily continuously, and 1 norgestrel tablet daily on days 17-28 of each 28-day treatment cycle; subsequent courses are repeated without any interval

In women with previous hysterectomy

- Conjugated oestrogens
625 microgram daily

Caution

Women with intact uterus should never be given oestrogens alone. Current evidence suggests that hormone replacement therapy in the menopause does not prevent coronary heart disease or strokes.

HRT increases the risk of venous thrombo-embolic phenomena, breast cancer and endometrial cancer after prolonged use and should therefore be given for the shortest possible time whenever indicated.

- Topical vaginal oestrogen cream, to be applied daily

REFER

Refer cases with osteoporosis or severe unremitting symptoms to a specialist.

114. CARCINOMA OF THE CERVIX

See section on **Common Malignancies**

115. ACUTE GLOMERULONEPHRITIS

This is a disease characterised by damage to the glomerular filtration apparatus which causes protein and blood to leak into the urine. Mechanisms for the glomerular damage may be immune-mediated through deposition of immune complexes or localisation of antibodies.

CAUSES

- Infections
 - Post streptococcal infections
 - Pharyngeal infection
 - Skin sepsis (impetigo)
 - Infected scabies
 - Other bacterial Infections e.g. Salmonella, Brucella
 - Hepatitis B virus, Hepatitis C virus, Yellow Fever, HIV
 - Parasitic e.g. Toxoplasma, Trypanosoma, Schistosoma, Malaria
- Systemic lupus erythematosus
- Systemic vasculitis

SYMPTOMS

- A history of preceding infection
- Generalized oedema most marked around the eyes
- Breathlessness
- Anorexia, sometimes associated with vomiting and abdominal pain
- Fever
- Seizures
- Urinary abnormalities: oliguria <400 ml/24hours, haematuria

SIGNS

- Oedema
- Oliguria (urine volumes <400 ml/day)
- Hypertension
- Haematuria
- Dark coloured urine.
- Acute heart failure
- Coma

INVESTIGATIONS

- Urinalysis
 - Sediment shows erythrocytes, leukocytes and a variety of casts including erythrocyte casts

- Proteinuria usually less than 2 g/24 hours but may be in the nephrotic range
- FBC
- BUE and Creatinine
- Throat cultures (in children may be useful)
- Chest X-ray (may show pulmonary oedema)
- ECG
- Immunology
 - ASO (antistreptolysin O) titres

TREATMENT

Treatment objectives

- Identify and stop the cause of renal injury
- Prevent and control complications

Non-pharmacological treatment

- Bed rest
- Diet: Protein and salt restriction
- Control Fluid and acid- base balance:

Adults

Control fluid retention by restricting daily fluid intake to 800 ml plus previous day's urine output.

Children

Restrict fluids to 400 ml/m² of body surface area and previous day's urine output.

Pharmacological treatment

(Evidence rating: C)

Post Infectious Glomerulonephritis

- Furosemide (Frusemide), oral, IV, 40 mg daily, increasing to 2 g daily in adults
- Treat all active infections

REFER

All patients with complications of renal failure, severe cardiac failure and hypertensive encephalopathy that arise following post infectious glomerulonephritis to a physician specialist or a nephrologist.

Patients with other causes such as lupus nephritis or systemic vasculitis, who need more intensive investigations, including renal biopsy, should be referred to a physician specialist or a nephrologist.

116. NEPHROTIC SYNDROME

Defined by proteinuria in excess of 3-3.5g daily accompanied by hypoalbuminaemia, oedema, hyperlipidaemia and hypercoagulable state.

CAUSES

- Primary Glomerular Disease
 - Minimal change disease (MCD); - supposedly common in children,
 - Focal and segmental glomerulosclerosis (FSGS)
 - Membranous nephropathy
 - Membranous proliferative glomerulonephritis (MPGN)
- Infections
 - Viral-Hepatitis B and C, HIV, Infectious mononucleosis, Cytomegalovirus
 - Bacterial (Post streptococcal infection)
 - Parasitic (*Plasmodium malariae* malaria, *Schistosoma mansoni*, Filariasis)
- Associated with Systemic Diseases
 - Diabetes mellitus
 - Systemic Lupus Erythematosus
 - Amyloidosis
 - Vasculitides
- Drug Related
 - Gold, Mercury
 - Lithium
 - Captopril
 - Diamorphine (Heroin)

SYMPTOMS

- Early morning facial puffiness
- Generalized body swelling
- Foamy appearance of urine
- Weight gain (unintentional)
- Poor appetite

SIGNS

- Periorbital, peripheral, genital oedema
- Ascites
- Pleural effusion
- Protein malnutrition particularly in children with long standing diseases

INVESTIGATIONS

- Urinalysis
- Plasma proteins
- Serum lipids
- Fasting blood glucose
- Serology - Hepatitis B, C, HIV
- Hb electrophoresis

TREATMENT**Treatment objectives**

- To relieve symptoms
- To treat of underlying condition
- To prevent and manage complications
- To delay progressive kidney damage

Non-pharmacological treatment

- Restrict salt intake
- Adequate protein diet; 0.6-0.8 g/kg body weight of high class protein per day

Pharmacological treatment**(Evidence rating: C)**

- Furosemide (Frusemide), oral,
40 mg daily, increasing to 2 g daily in divided doses in adults

Or

Bendrofluazide, oral,
2.5 mg daily increasing to 5 mg once daily

Or

Metolazone, oral,
2.5 mg to 20 mg once daily

Plus

- Lisinopril, oral,
5mg at night

Plus

- Corticosteroids in children and selected adults with minimal change nephrotic syndrome. (This treatment should be given by specialists).

REFER

All patients to a physician specialist or nephrologist.

117. ACUTE RENAL FAILURE (ACUTE KIDNEY INJURY)

The term acute renal failure has been changed to acute kidney injury (AKI) since the year 2004. The proposed classification or staging system for AKI is now based on the RIFLE (**R**isk, **I**njury, **F**ailure, **L**oss of kidney function, **E**nd stage disease) criteria, as follows:

An abrupt reduction (within 48 h) in kidney function manifesting as an absolute increase in serum creatinine level of ≥ 26.4 micromol/L (0.3mg/dl), or a percentage increase in serum creatinine level of $\geq 50\%$ (1.5 - fold from baseline), or a reduction in urine output (documented oliguria of < 0.5 ml/kg/h for > 6 h). These criteria should be applied in the context of the clinical presentation and following adequate fluid resuscitation where applicable.

Studies have shown that preventive therapy or medical interventions performed during the early stages of AKI provide the greatest chance for minimising the extent of injury. Hence early preventive treatment and early diagnosis of AKI are imperative for patients with AKI regardless of the cause.

Table 16-1: Classification for Acute Kidney Injury, based on modification of RIFLE Criteria.

Stage	Serum creatinine criteria	Urine output criteria
1	Increase of ≥ 26.4 micromol	< 0.5 ml/kg/hour for > 6 hours (0.3mg/dL), Or to 150-200% of baseline
2	Increase to > 200 -300% of baseline (> 2 -3 fold)	< 0.5 ml/kg/hour for > 12 hours
3	Increase to $> 300\%$ of baseline	0.3ml/kg/hour for 24hours (> 3 -fold; Or serum creatinine > 354 micromol/L [4.0mg/dL] with an acute rise of at least 44micromol/L (0.5mg/dL) Or anuria for 12hours

CAUSES**Obstetric**

- Septic abortion
- Post-Caesarean section
- Eclampsia
- Postpartum Haemorrhage (PPH)
- HELLP (**H**aemolysis **E**levated **L**iver Enzymes **L**ow **P**latelet) Syndrome

Gynaecological

- Bilateral ligation of ureters following abdominal hysterectomy

Medical

- Acute Glomerulonephritis
- Haemolysis due to:
 - Malaria
 - Infection
 - Herbal medicines
 - Typhoid fever
- Diarrhoea, vomiting and dehydration

Surgical

- Haemorrhage
- Peritonitis
- Acute Pancreatitis
- Obstructive uropathy
- Burns

SYMPTOMS

- Nausea and Vomiting
- Oliguria
- Anuria
- Nocturia
- Oedema
- Decreased appetite
- Metallic taste in mouth
- Hiccups
- Change in moods
- Flank pain
- Fatigue
- Diarrhoea

SIGNS

- No specific findings in acute tubular necrosis

INVESTIGATIONS

- Urinalysis
- BUE, creatinine, uric acid
- Blood culture
- Urine culture
- Abdominal/Renal ultrasound scan to exclude urinary tract obstruction
- Plain X-ray of abdomen

TREATMENT**Treatment objectives**

- To recognise and correct reversible causes
- To prevent further renal injury
- To maintain a normal electrolyte and fluid volume milieu

Non-pharmacological treatment

- Nutrition: Give protein of high biological value at 40 g protein/day
- Strict fluid input and output chart
- Daily weighing
- In adults restrict fluid intake to 600 ml plus previous day's output
- Beware of hyperkalaemia - avoid potassium containing foods e.g. banana

**Pharmacological treatment
(Evidence rating: C)****Treatment of fluid losses**

- Correct fluid losses vigorously and early with appropriate fluid replacement as follows:
 - 0.9% Sodium Chloride, IV, in cases of diarrhoea and vomiting
 - Blood transfusion in severe bleeding
 - Plasma replacement in cases of severe burns
- Give Furosemide (Frusemide), IV, 80mg when fluid volume has been replaced adequately

Treatment of hyperkalaemia

- Calcium gluconate 10%, IV, 10-20 ml over 2-5 minutes
- Sodium Bicarbonate, IV, 8.4% 44 mEq, IV, over 5 minutes

**Note**

Do not mix calcium gluconate and bicarbonate in the same delivery system

- Regular Insulin, IV, 10 units in 50-100 ml Glucose 50%

Treatment of hypertension crises/encephalopathy
see section on **Hypertension**.

REFER

All patients with clinical indications for dialysis e.g. those with;

- Congestive heart failure
- Electrolyte abnormalities (hyponatraemia, hyperkalaemia) not controlled by conservative means

- Severe metabolic acidosis (bicarbonate less than 10 mmol/L after bicarbonate treatment)
- Real or impending uraemic symptoms (seizures, pericarditis)
- Hypertensive Crises/Encephalopathy

118. CHRONIC KIDNEY DISEASE

Kidney damage for >3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR manifest by either:

- Pathological abnormalities; or
- Markers of kidney damage, including abnormalities in the composition of the blood or urine abnormalities in imaging tests

Or

GFR < 60mL/minute/1.73m² for ≥ 3 months, with or without kidney damage

The “other evidence of chronic kidney damage” may be one of the following:

- Persistent microalbuminuria;
- Persistent proteinuria
- Persistent haematuria (after exclusion of other causes, e.g. urological disease);
- Structural abnormalities of the kidneys demonstrated on ultrasound scanning or other radiological tests, e.g. polycystic kidney disease, reflux nephropathy;
- Biopsy-proven chronic glomerulonephritis (most of these patients will have microalbuminuria or proteunuria, and/or haematuria)

CAUSES

- Hypertensive renal disease
- Glomerulonephritis
- Pyelonephritis
- Diabetes mellitus
- Obstructive uropathy
- Renal calculi
- Polycystic kidney disease

SYMPTOMS

- None in the early stages. Symptoms occur only in advanced renal failure.
- Reduced concentration

- Anorexia, nausea, vomiting
- Gastrointestinal bleeding
- Hiccups
- Breathlessness on exertion
- Thirst
- Nocturia, polyuria
- Muscle Cramps
- Paraesthesia
- Pruritus
- Insomnia

SIGNS

Early Signs

- Earlier stages detected through laboratory tests in serum creatinine and estimation of GFR
- Measurement of albumin creatinine ratio
- Screening of asymptomatic individuals at increased risk could allow early detection of CKD i.e. hypertension, Diabetes Mellitus, history of glomerulonephritis.

Late Signs

- Lethargy
- Bleeding tendency
- Pallor
- Hypertension
- Pericarditis
- Peripheral neuropathy
- Peripheral oedema
- Asterixis (flapping tremor)
- Increased skin pigmentation / excoriation

INVESTIGATIONS

- Hb, WBC, Sickling, Platelet Count, Blood film comment
- Urea, Electrolytes
- Creatinine
- Calcium, Phosphate
- Alkaline phosphatase
- Lipids
- Urinalysis
- Chest X-ray
- Fasting blood glucose

TREATMENT**Treatment objectives**

- To detect chronic kidney disease early in susceptible individuals.
- To control hypertension
- To control blood glucose
- To treat other underlying causes
- To prevent complications and further worsening of kidney function

Non-pharmacological treatment

- General health advice e.g. smoking cessation
- Avoid nephrotoxins e.g. NSAIDs, Herbal medication
- Strict fluid input and output chart
- Water and electrolyte balance
 - Daily intake of daily urine output + 600 ml (for insensible losses)
 - Restrict salt intake
 - Restrict dietary protein to < 40 g protein/day
- Daily weighing
- Beware of hyperkalaemia - avoid potassium containing foods e.g. banana

**Pharmacological treatment
(Evidence rating C)**

- Furosemide, oral /IV,
40-120 mg daily

Treatment of hypertension

See section on Hypertension

Treatment of anaemia

See section on Anaemia

Treatment of hyperkalaemia

- 10% Calcium gluconate, IV,
10-20 ml over 2-5 minutes

Plus

- Sodium Bicarbonate, IV,
8.4% 44mEq, over 5 minutes

**Note**

Do not mix calcium gluconate and bicarbonate in the same delivery system

Plus

- Regular Insulin, IV,
10 units in 50-100 ml Glucose 50%

REFER

Refer all patients with predisposing factors and complications to a physician specialist or nephrologist for further definitive management of chronic kidney disease.

119. URINARY TRACT INFECTION

This refers to any bacterial infection of the urinary tract.

Congenital abnormalities of the genito-urinary tract predispose children to UTI. If UTI is proven in children, the patient will need referral for further evaluation of the genito-urinary tract in a hospital, e.g. Abdominal ultrasound, micturating cystourethrogram, intravenous pyelography etc.

CAUSES

- Ascending infection by organisms of the gut flora following bacteraemia or septicaemia
- Urinary obstruction e.g. enlarged prostate in adult males, posterior urethral valves in infants/children

SYMPTOMS

- Frequent painful urination
- Haematuria
- Cloudy/foul smelling urine
- Vomiting
- Suprapubic pain
- Fever
- In children,
 - Fever may be persistent and unexplained
 - There may be feeding problems, diarrhoea, and failure to thrive as well

SIGNS

- Fever
- Loin tenderness
- Suprapubic tenderness
- Foul smelling urine

INVESTIGATIONS

- FBC
- Mid-stream specimen of urine for microscopy, culture and sensitivity (re-culture urine after treatment)
- Abdominal ultrasound scan in children if indicated

TREATMENT**Treatment objectives**

- To relieve symptoms
- To eradicate causative agent
- To prevent complications
- To identify patients with abnormalities of the genito-urinary tract

Non-pharmacological treatment

- Liberal oral fluids to encourage good urinary output
- Personal hygiene and proper cleaning after defecation

Pharmacological treatment**(Evidence rating: C)**

In mild/moderate cases

- Ciprofloxacin, oral,

Adults

500 mg 12 hourly for 7 days

- Co-amoxiclav, oral,

Children

12 years and above; one 500/125 tablet 12 hourly for 7 days

6-12 years; 5 ml of 400/57 suspension 12 hourly for 7 days

1-6years; 2.5 ml of 400/57 suspension 12 hourly for 7 days

1month-1 year; 0.25ml/kg body weight of 125/31 suspension 8 hourly for 7 days

Neonates; 0.25 ml/kg body weight of 125/31 suspension 8 hourly for 7 day

Or

Cefuroxime, oral,

Children

12-18 years; 250 mg 12 hourly for 5-7 days

2-12 years; 15 mg/ kg 12 hourly (maximum 250 mg) for 5-7 days

3 months-2 years; 10 mg/kg 12 hourly (maximum 125 mg) For 5-7 days

In severe cases

- Ciprofloxacin, IV,

Adults

200 mg 12 hourly for 7 days

Or

Gentamicin, IV,

Adults

40-80mg for 7 days

Or

Ceftriaxone, IV,

Adults

1-2g daily for 7 days

- Amoxicillin (Amoxycillin), IV,

Children

1 month-18years;	20-30 mg/kg 8 hourly (maximum 500 mg) for 5-7days
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Neonates (dose doubled in severe infection)

7-28 days;	30 mg/kg 8 hourly for 5-7days
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< 7 days;	30 mg/kg 12 hourly for 5-7days
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Plus

Gentamicin, IV, (slow intravenous injection over at least 3 minutes)

Children

12-18years;	2 mg /kg 8 hourly
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1month-12years;	2.5 mg/kg 8 hourly
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Or

Cefuroxime, IV,

Children

1 month-18 years;	20 mg/kg 8 hourly maximum 750mg, (increase to 40-50 mg/kg maximum 1.5g 6-8 hourly in severe infections)
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Neonates (double the dose in severe infections, IV route only)

21-28 days;	25 mg/kg 6 hourly
-------------	-------------------

7-12 days;	25 mg/kg 8 hourly
------------	-------------------

< 7days;	25 mg/kg 12 hourly
----------	--------------------

Treatment will depend on severity of infection as well as the age of the patient

REFER

Refer patients who are very ill, patients with recurrent UTI or patients with persistent haematuria and congenital abnormalities to the appropriate specialist.

120. ACUTE CYSTITIS

Acute cystitis is an acute inflammation of the bladder. Women are affected 10 times more than men due to the shortness of their urethra compared to that of men. 40%-50% of all women will develop cystitis in their lifetime.

The ascending faecal-perineal-urethral route is the primary mode of infection. Occasionally sexually transmitted organisms are involved. If the patient has been recently married, suspect honeymoon cystitis.

CAUSES

- *E coli* (about 80%)
- *Staphylococcus saprophyticus*
- Klebsiella
- Proteus
- Gonococcus
- Enterococci

SYMPTOMS

- Low grade fever
- Frequency
- Nocturia
- Urgency
- Dysuria
- Haematuria
- Cloudy, foul smelling urine
- Low back and suprapubic pain

SIGNS

- Low grade fever
- Suprapubic tenderness
- Haematuria

INVESTIGATIONS

- Urinalysis
- Mid-stream urine for culture and sensitivity
- Imaging of urinary tract in recurrent or persistent cases to exclude anatomical abnormalities, lower urinary tract obstruction etc.
- Fasting Blood glucose
- Urethrocystoscopy in selected cases

TREATMENT**Treatment objectives**

- To eradicate infection
 - To prevent recurrence and complications
- To relieve pain

Non-pharmacological treatment

- Liberal oral fluids to encourage good urinary output
- Pre-coital and post-coital emptying of the bladder
- Personal hygiene and proper cleaning after defaecation

Pharmacological treatment**(Evidence rating: A)**

- Ciprofloxacin, oral,
500 mg 12 hourly for 3-5 days

Or

Nitrofurantoin, oral,
50-100 mg 6 hourly for 3-5 days.

Three day therapy is effective in uncomplicated cystitis in women

Or

Cefuroxime, oral,
500mg 12 hourly for 3-5 days

Recommended in symptomatic cystitis and UTI in pregnancy

- Mist. Potassium citrate, oral,
10 ml 8 hourly if urine is acidic (pH of 6 or below)
To reduce bladder pain and dysuria.

- Paracetamol, oral,
500 mg-1g 6 to 8 hourly when required

Or

Diclofenac sodium, oral,
50 mg 8 hourly when required

REFER

Refer all cases which require cystoscopy and all cases of persistent haematuria, recurrent cystitis or bacterial resistance to the specialist.

121. BACTERIAL PROSTATITIS

Prostatitis is inflammation of the prostate. Bacterial prostatitis may present as an acute condition which may either be sexually transmitted or result from urethral reflux of infected urine into the prostatic ducts, spread from the rectum or spread from the bloodstream.

If inadequately treated this may progress to chronic prostatitis.

CAUSES

- Gram-negative bacterial infections e.g. from *E. coli*, *Pseudomonas*, *Streptococcus faecalis*
- Sexually transmitted infections e.g. from *Gonococcus* and *Chlamydia*.

SYMPTOMS

Acute

- Fever
- Chills
- Low back and waist pain
- Urinary urgency and frequency
- Nocturia
- Dysuria
- Difficulty in urination
- Haematuria

Chronic

- Low back and waist pain
- Urinary urgency and frequency
- Nocturia
- Difficulty in urination
- Haematuria

SIGNS

Acute

- Swollen and tender prostate on Digital Rectal Examination (DRE). (Avoid prostatic massage as this could lead to septicæmia).
- The rectum feels “hot” from the inflammation.

Chronic

- Findings on DRE may be normal

INVESTIGATIONS

- Urinalysis and culture
- FBC, ESR
- Blood culture
- Expressed prostatic secretions for culture and sensitivity (in chronic prostatitis only)

TREATMENT

Treatment objectives

- To relieve pain and fever
- To control infection

Non-pharmacological treatment

- Bed rest
- Hydration
- Hospitalisation may be required in severe cases or when the condition is complicated by acute urinary retention.
- Suprapubic cystostomy for acute urinary retention. (Urethral catheterisation should be avoided).

Pharmacological treatment**(Evidence rating: C)**

- Sodium chloride 0.9%, IV, as required in severe systemic infections.
- Ibuprofen, oral,
400 mg 8 hourly when required

Or

Diclofenac, oral,
75 mg 12 hourly when required

- Lactulose, oral,
10-15 ml 12 hourly and adjust dose accordingly
- Ciprofloxacin, oral,
750 mg 12 hourly for 14 - 21 days

Plus

- Doxycycline, oral,
100 mg 12 hourly for 14 - 21 days

**Note**

Initial therapy with parenteral antibiotics is indicated in severe cases
Follow up should be for at least 4 months

REFER

Refer all cases of chronic prostatitis for specialist care.

122. BENIGN PROSTATIC HYPERPLASIA

This refers to benign enlargement of the prostate gland. The average age at which this occurs is about 66 years. The two main aetiological or risk factors are aging and the presence of testosterone. There is no correlation between sexual activity and the aetiology. Depending on the severity of symptoms, treatment may be pharmacological (drug therapy) or surgical.

Drugs used include alphaadrenergic blockers (e.g. terazosin) and those that suppress testosterone production (e.g. finasteride). Their use will cause shrinkage of the prostate and relief of the attendant obstruction. A combination of these two classes of medications may produce better response than either used alone in some patients.

CAUSES

- Causes are unknown

SYMPTOMS

Lower Urinary Tract Symptoms (LUTS), previously referred to as prostatism:

Obstructive

- Hesitancy - delay in initiating urination
- Poor/ weak urinary stream
- Straining
- Terminal dribbling
- Sensation of incomplete bladder emptying
- Urinary incontinence (overflow)
- Urinary retention
 - Acute retention-sudden, painful over-distension of the bladder due to inability to void urine
 - Chronic retention-bladder distension which is painless, gradual in onset and associated with some inability of the patient to completely empty the bladder on voiding

Irritative

- Frequency by day or night (nocturia)
- Urgency
- Urge incontinence

SIGNS

- Enlarged prostate gland on rectal examination
 - Findings are a firm, smooth, non-tender gland with palpable median sulcus. The rectal mucosa moves freely over the prostate which has well defined edges.
- Tender bladder when in acute urinary retention
- Non-tender bladder in chronic retention
- Uraemic signs (e.g. drowsiness, confusion etc.)
- Palpable kidneys in hydronephrosis

INVESTIGATIONS

- FBC
- Blood urea, electrolytes and creatinine
- Prostate specific antigen (PSA)
- Urinalysis
- Urine (mid stream) for culture and sensitivity
- Abdominal and pelvic ultrasound

- Transrectal ultrasound (TRUS) of the prostate if available

TREATMENT

Treatment objectives

- To identify and correct associated complications which may be life-threatening
- To relieve the obstruction to urinary flow

Non-pharmacological treatment

- Patients with very mild symptoms which are not bothersome may be put on a programme of monitoring (watchful waiting) through regular checkups.
- For acute retention of urine
 - Urethral catheterisation
 - Suprapubic cystostomy if urethral catheterisation fails. **Then refer.**
 - Suprapubic needle puncture and aspiration/drainage of urine to partially decompress the bladder and relieve pain, when suprapubic cystostomy is delayed.
- For definitive treatment
 - Prostatectomy

Pharmacological treatment

(Evidence rating: A)

Patients with mild symptoms:

- Terazosin, oral,
2 to 10 mg at night. Initial start dose of 1 mg at night; this may be doubled at weekly intervals according to response up to a maximum of 10 mg

Or

Tamsulosin, oral,
400 microgram once daily

Or

Alfuzosin SR, oral,
10 mg daily



Note

These medications may have side effects such as lowering of blood pressure and dizziness. They are therefore recommended to be taken at night.

- Finasteride, oral,
5 mg daily



Note

Treatment is indefinite for all the medications above

REFER

Refer patients with moderate to severe symptoms to a Urologist or Surgical specialist.

123. CARCINOMA OF PROSTATE

See section on **Common Malignancies**

124. ERECTILE DYSFUNCTION

It means the persistent inability of a man to achieve an erection which is adequate in terms of hardness and duration for satisfactory sexual intercourse. So long as a man can achieve a hard enough erection to permit vaginal penetration, with a long enough “staying power” to perform the sexual act till ejaculation is attained, he is judged to be potent. The number of “rounds” per session is irrelevant.

The condition may be classified as primary (never been able to attain and/or maintain an erection for satisfactory sexual intercourse) or secondary, where impotence occurs in men who have previously had a satisfactory sexual performance.

CAUSES**Psychogenic**

- Anxiety
- Depression
- Stress
- Marital conflict

Organic

- Vasculogenic: arterial insufficiency/occlusion; venous incompetence
- Neurogenic: peripheral neuropathy; spinal cord lesions
- Traumatic: penectomy; pelvic fracture (with urethral rupture); perineal trauma
- Endocrine: diabetes mellitus, hypogonadism; hyperprolactinaemia; pituitary, adrenal and thyroid disorders
- Drugs: e.g. antihypertensives, antidepressants
- Post-operative: Cystectomy, Radical Prostatectomy; Abdominoperineal resection
- Inflammation; urethritis; prostatitis
- Mechanical: congenital penile abnormalities; Peyronies disease
- Endurance related: heart/renal/liver failure; pulmonary insufficiency
- Post-priapism

SYMPTOMS

- Inability to achieve erection
- Inability to sustain erection
- Reduced sexual desire

SIGNS

- Features related to underlying causes
- Hypogonadal features e.g. gynaecomastia, lack of male sexual characteristics
- Penile plaques (Peyronies disease)

INVESTIGATIONS

- FBC and sickling status
- Lipid profile
- Urinalysis
- Fasting blood glucose
- Serum prolactin
- Serum LH, FSH and testosterone

TREATMENT**Treatment objectives**

- To determine causative factors and treat appropriately
- To restore sexual potency

Non-pharmacological treatment

- Patients should avoid excessive alcohol consumption, cigarette smoking, recreational drug abuse and excessive weight gain
- Psychosexual counseling

Pharmacological treatment

- Treatment should be directed at underlying cause. e.g. change or discontinue medication, if found to be the cause, in consultation with the patient's physician
- Drugs for erectile dysfunction e.g. Sildenafil, Tadalafil or Vardenafil must only be used under specialist care.

REFER

Referral to a specialist centre is necessary for proper evaluation and management in most cases.

125. MALE INFERTILITY

Infertility is the failure of a couple to achieve conception within 12 months of adequate unprotected coitus. About one third of cases of infertility result from pathologic factors in men, one third from factors in both men and women and one third from factors in females. Male causes therefore account for 50% of infertility. About 15% of all married couples experience reproductive difficulties.

CAUSES

For practical purposes the main causes can be divided into three:

- Treatable causes
- Potentially treatable causes
- Untreatable causes

Table 16-2 : Causes of Male Infertility

Treatable causes	Potentially treatable causes	Untreatable causes
Varicocele	Idiopathic	Congenital abnormalities e.g. absence of both testis and chromosomal abnormalities
Infections of testis, epididymis, urethra, prostate	Undescended testis	Bilateral testicular atrophy
Ejaculatory dysfunction	Gonadotoxins (drugs, radiation)	
Erectile dysfunction	Blockage of vas deferens	
Hyperprolactinaemia		
Hypogonadotropic hypogonadism		

SYMPTOMS

- Patients usually complain of their wives' inability to give them a child. Such patients are quite often very apprehensive, frustrated and reluctant to undergo investigations.
- Symptoms suggestive of history of STI, UTI, mumps, genital, pelvic or inguinoscrotal surgery and injuries.

SIGNS

- Absence of male secondary sexual characteristics
- Gynaecomastia
- Examine external genitalia to assess:

- Testes: presence or absence, size and consistency
- Epididymis: thickening
- Vas deferens: absence, thickening
- Varicoceles
- Inguinoscrotal region: scar from previous herniorrhaphy
- Penis: size, curvature, hypospadias, epispadias
- Urethra: discharge, meatal stenosis, stricture

INVESTIGATIONS

- FBC and sickling
- Semen analysis
- Urinalysis
- Fasting blood glucose
- Specific investigations relating to various causes e.g. scrotal ultrasound
- Specialised investigations e.g. hormonal profile done by specialists
- Evaluation of female partner by gynaecologist

TREATMENT

Treatment objectives

- To improve fertility potential
- To achieve pregnancy with partner

Non-pharmacological treatment

- Sexual counselling
- Smoking cessation
- Reduction in alcohol intake
- Avoid local (scrotal) exposure to excessive heat, cold and chemicals
- Avoid tight underwear. Use of boxer shorts and cotton briefs (not silk/nylon) is recommended. (This reduces heat around the testes to promote spermatogenesis)

Pharmacological treatment

- This is best provided under specialist care.

REFER

Refer all cases that require special investigation, pharmacological or surgical treatment to specialist.

126 . HAEMATURIA

This is the passage of blood in the urine. Certain drugs and food products may colour urine red and these should be differentiated from haematuria. Examples of such substances are rifampicin and rhodamine B food colouring used in cakes, cookies and soft drinks. Occasionally vaginal bleeding may be mistaken for haematuria.

CAUSES

- Vesical schistosomiasis (Bilharzia)
- Benign prostatic hyperplasia (BPH)
- Carcinoma of prostate, bladder and kidney
- Urinary tract infection
- Trauma
- Urinary calculi
- Medical causes e.g. sickle cell disease, acute glomerulonephritis and anticoagulant therapy

SYMPTOMS

- Blood in the urine (on initiation, mixed with the urine, or at the end of passing urine)
- Pain/discomfort on passing urine
- Lower urinary tract symptoms (LUTS)
- Loin pain

SIGNS

- Pallor
- Abdominal masses e.g. kidney, bladder
- Low or suprapubic tenderness from urinary tract infection or calculus

INVESTIGATIONS

- FBC and sickling status (Hb electrophoresis if sickling test is positive)
- Blood urea, electrolyte and creatinine
- Urinalysis
- Urine culture and sensitivity
- Abdominal and pelvic ultrasound

TREATMENT

Treatment objectives

- To treat underlying cause
- To arrest bleeding

Non-pharmacological treatment

- High fluid intake is advised in order to prevent clot formation in the urinary bladder
- If patient presents with clot retention, then catheterise and refer

Pharmacological treatment**(Evidence rating: A)**

Definitive treatment will depend on the cause.

Urinary Schistosomiasis

- Praziquantel, oral,

Adults and Children

40 mg/kg as a single dose

Urinary Tract Infection

- Give appropriate antibiotics (see section on **Urinary Tract Infection**)

REFER

Refer all other cases as well as those with persistent haematuria for appropriate investigations.

127. URINARY SCHISTOSOMIASIS

This is a water-borne disease caused by penetration of the skin or mucous membranes by the early stages of the causative organism (*Schistosoma haematobium*) which in the adult form settles in the blood vessels of the urinary bladder resulting in the common presentation of haematuria.

This disease is common in Ghana with several endemic areas along the lakes, slow-flowing rivers and irrigation systems. The commonest body sites affected are the bladder, ureters and pelvic organs. Prevention entails avoiding contact with infested water.

Chronic infestation may lead to severe anaemia, ureteric stricture and hydronephrosis as well as carcinoma of the bladder.

CAUSE

- *Schistosoma haematobium*

SYMPTOMS**Initial**

- Itching and redness of skin at site of penetration of parasite
- Fatigue, low grade fever, excessive sweating and headache

Later

- Terminal haematuria
- Painful urination (dysuria)

- Lower abdominal pain (bladder pain)

SIGNS

- Pallor
- Palpable kidney from hydronephrosis due to ureteric stricture
- Palpable bladder from bladder cancer or retention of urine due to clots or bladder neck stenosis

INVESTIGATIONS

- FBC
- Urine for red blood cells, pus cells, and schistosoma ova (mid-day urine specimen preferably taken after physical exercise is ideal)
- Midstream urine for culture in associated urinary tract infections
- Imaging: Ultrasound scan; Intravenous urogram (IVU) may show calcification of bladder, ureters, hydronephrosis and hydroureters

TREATMENT

Treatment objectives

- To eliminate the causative organism
- To manage the complications

Non-pharmacological treatment

- Avoid repeated exposure to infested water bodies if possible

Pharmacological treatment

(Evidence rating: A)

- Praziquantel, oral,
Adults and Children
40 mg/kg as a single dose
- Treat anaemia if present (see section on Anaemia)

REFER

Refer patient after adequate treatment if:

- Haematuria persists
- Symptoms of urinary infection persist
- Complications like hydronephrosis, bladder mass, retention of urine, severe wasting and severe anaemia are present

128. SCROTAL MASSES

These are swellings found in the scrotum.

CAUSES

These could be divided into two:

- Painless scrotal swellings
 - Testicular tumour
 - Inguinoscrotal hernia
 - Hydrocele
 - Hydrocele of spermatic cord
 - Spermatocele/epididymal cysts
 - Varicocele
 - Epididymal tumours
 - Chronic epididymoorchitis
- Painful Scrotal Swellings
 - Testicular torsion
 - Acute epididymitis (STI or non-STI related)
 - Acute epididymoorchitis
 - Strangulated inguinoscrotal hernia
 - Testicular tumour (usually painless except rapidly growing type or tumour necrosis)
 - Varicoceles are occasionally accompanied by pain/discomfort

SYMPTOMS

- Swelling and/or pain of scrotum or its contents
 - Sudden onset e.g. torsion of testis
 - Gradual onset e.g. spermatocele, hydroceles
 - Gradual onset becoming suddenly painful e.g. obstructed hernia
- Fever, may be present in infections e.g. Acute epididymitis and acute epididymoorchitis

SIGNS

- Tender or non-tender swelling restricted to the scrotum (except a hernia which may extend into the inguinal area)
- Fever may be present in infections
- Transillumination for cystic swellings e.g. hydroceles and spermatoceles
- Hard swelling e.g. Tumour

INVESTIGATIONS

- Ultrasound scan with or without colour doppler
- Laboratory investigations are tailored towards cause and specific treatment

TREATMENT**Treatment objectives**

- To make an accurate diagnosis to ensure appropriate treatment
- To relieve pain
- To prevent complications

Non-pharmacological treatment

- Surgery: elective or emergency
- Emergency surgery within 6 hours is required for testicular torsion to salvage the testis

**Pharmacological treatment
(Evidence rating: B)****For sexually transmitted infection**

- Ciprofloxacin, oral,
500 mg single dose
Plus
Doxycycline, oral,
100 mg 12 hourly for 10 days
Or
Ceftriaxone, IM,
250 mg single dose
Plus
Doxycycline, oral,
100 mg 12 hourly for 10 days

REFER

Refer all emergency cases and those suspected to be tumours to a urologist or surgical specialist

129. THE EMPTY SCROTUM

This refers to the absence of testis (es) in the scrotum/hemiscrotum. Ten percent of cases are bilateral. Seventy-five percent of full term infants with undescended testes and 90% of premature infants would have spontaneous descent of testes from the intra-abdominal site by the age of one year. Persistent undescend of the testis is associated with an increased risk of malignancy. All health workers who see neonates and children should do routine examination of the scrotum and testis to prevent late presentations and complications.

CAUSES

- Undescended testes
 - Unknown/idiopathic; most cases are congenital
 - Premature birth
 - Genetically inherited diseases
 - Associated with anomalies like Prune Belly syndrome and hypospadias
- Ectopic testis
- Retractable testis
- Severe atrophy
- Orchiectomy
- Agenesis of the testes (rarely)

SYMPTOMS

- Absence of one or both testes
- In children, parents or the health worker may notice this at birth

SIGNS

- Absent testis in both supine and upright positions

INVESTIGATIONS

- Ultrasound scan of abdomen, pelvis and inguinal canal

TREATMENT**Treatment objectives**

- To decrease potential for cancer
- To improve fertility
- To repair hernia
- To decrease risk of torsion
- To avoid social and psychological complications

Non-pharmacological treatment

- Surgical intervention before two years of age. (All ectopic testes should be operated because they will not descend)

Pharmacological treatment**(Evidence rating: A)**

- Human chorionic gonadotropin (hCG) for undescended testis in neonates/infants. This is contraindicated in ectopic testis.

REFER

Refer patients aged over one year with no evidence of testicular descent to a urologist or surgical specialist

130. PRIAPISM

This refers to a spontaneous, prolonged, persistent, usually painful erection which is unwanted. It is commonly seen as a prolongation of nocturnal penile tumescence (NPT) or early morning erection. This is a well known complication of sickle cell disease. Patients are usually shy and reluctant to come to the hospital due to stigmatisation. Late presentation is therefore common and herbal medicine applications and spiritual remedies may have been tried to relieve symptoms prior to being seen in hospital. Early reversal within 24-48 hours may reduce the high impotence complication rate of 50%. Although the occurrence is usually in adults, it may periodically occur in older children.

CAUSES

- Idiopathic or unknown in 60% of cases
- Other causes are:
 - Leukaemia
 - Sickle cell disease and thalassaemia
 - Penile trauma
 - Spinal cord injury
 - Pelvic infections
 - Pelvic tumour
 - Iatrogenic e.g. Intracavernosal prostaglandin E₁ for impotence, Sildenafil citrate, psychotropics e.g. chlorpromazine
 - Drugs e.g. marijuana and herbal concoctions

SYMPTOMS

- Painful persistent erection

SIGNS

- Erect, tender penis
- Clinical signs of sickle cell disease

INVESTIGATIONS

- FBC, blood film comment
- Sickling status - Hb electrophoresis
- Urinalysis

TREATMENT**Treatment objectives**

- To relieve pain
- To ensure early relief of penile congestion

- To prevent complications

Non-pharmacological treatment

- Maintain adequate hydration
- Surgery

Pharmacological treatment

(Evidence rating: C)

- Sodium Chloride 0.9%, IV,
Adults
1 L 6 hourly and liberal oral fluids
Children
500 ml 6 hourly and liberal oral fluids
- Pethidine, IM,
Adults
100 mg 8 hourly if required

Children

1 mg/kg 8 hourly if required

And

Diazepam, IV,

Adult

10 mg stat (given slowly over 13 minutes) then refer

Children

0.03 mg/kg stat (given slowly over 13 minutes) then refer

REFER

Patients not responding to conservative management should be promptly referred to a urologist or surgical specialist.

131. POSTERIOR URETHRAL VALVES

These valves or folds of tissue are congenital obstructing membranes within the lumen of the urethra. It affects between 1 in 5,000 - 8,000 males. It is the commonest cause of congenital bladder outlet obstruction. They obstruct urinary outflow from the bladder but permit easy urethral catheterisation. Because the condition is congenital, secondary changes in the bladder and upper urinary tract are advanced at birth. Some patients may be born with severe renal impairment or develop one soon after birth if recognition is delayed. Most patients present as neonates or infants. Occasionally presentation is late in childhood. All male newborn babies should be closely watched to ensure good stream of urine. Prenatal diagnosis is possible using ultrasound.

CAUSES

- Congenital valves or folds within the lumen of the urethra

SYMPTOMS

- Poor urinary stream
- Crying while voiding
- Straining to void with dribbling of urine
- Failure to thrive
- Fever
- Poor feeding
- Abdominal distension

SIGNS

- Voiding dysfunction
- Palpable bladder and kidneys
- Respiratory distress
- Signs of sepsis e.g. Fever
- Azotaemia
- Poor physical growth/growth retardation

INVESTIGATIONS

- FBC
- Blood urea, electrolytes and creatinine
- Urinalysis
- Urine culture
- Abdominal ultrasound
- Micturating cysto-urethrogram

TREATMENT**Treatment objectives**

- To prevent and treat renal failure
- To remove obstructing valves

Non-pharmacological treatment

- Prompt bladder decompression and continuous drainage to protect the upper tract from back pressure damage. This is preferably done by vesicostomy in most infants. Indwelling catheters should be avoided in most cases due to complications and death from septicaemia
- Surgical removal or destruction of the valve

Pharmacological treatment**(Evidence rating: A)**

- Treatment of urinary tract infections (see appropriate section)

REFER

Refer immediately after diagnosis for specialist evaluation and treatment

132. URINARY TRACT CALCULI

These are crystal-like objects, which form in various parts of the urinary tract. They consist mainly of mineral salts i.e. crystal forming ions. Some of the common stone-types include calcium oxalate, calcium phosphate, magnesium ammonium phosphate and uric acid. Majority of stones less than 5 mm in diameter will pass spontaneously.

CAUSES

- Hypercalcaemia
- Hyperuricaemia
- Hyperoxaluria
- Urinary stasis and obstruction
- Urinary tract infection: struvite (infection) stones
- Foreign body including urinary catheter and suture material
- Idiopathic hypercalciuria
- Dehydration
- Immobilisation especially in the elderly
- Inborn errors of metabolism e.g. Cystinuria

SYMPTOMS AND SIGNS

Table 16-3 : Symptoms and Signs of Urinary Tract Calculi

LOCATION OF CALCULI	SYMPTOMS	SIGNS
Kidney/Ureter	<ul style="list-style-type: none"> • Loin Pain • Ureteric colic • Sudden acute agonizing paroxysmal pain, which begins in the loin, then radiates around the flank towards the bladder and scrotum/testis in the male and labium majus in the female. May be associated with nausea, vomiting and sweating. • Haematuria 	<ul style="list-style-type: none"> • Signs may be few but tenderness in the loin and abdomen would be felt during a painful attack. • Sometimes there may be associated abdominal distension and fever if there is super-added infection. • A hydronephrotic kidney may be palpable.

Table 16-3 (Continued): Symptoms and Signs of Urinary Tract Calculi

Bladder/Urethra	<ul style="list-style-type: none"> • Suprapubic pain • Frequency • Urgency • Haematuria <p>Strangury An uncontrollable and often painful desire to pass urine which results in little or no urine (may be blood-stained) being voided. Retention of urine</p>	<ul style="list-style-type: none"> • Suprapubic tenderness • Palpable bladder (from retention or a large stone) • Hard urethral lump (impacted stone) • Haematuria
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INVESTIGATIONS

- Urinalysis
- Urine culture
- Blood urea, electrolytes and creatinine
- Serum uric acid, calcium
- Plain X-ray of abdomen
- Ultrasound scan of abdomen
- Intravenous urogram
- Retrograde ureteropyelogram
- CT scan
- Stone analysis

TREATMENT

Treatment objectives

- To control pain during acute attack
- To aid passage of the calculus or ensure complete removal of calculus
- To remove large stones
- To prevent recurrence if the cause is known

Non-pharmacological treatment

- Encourage oral fluid intake (2-3 L daily in an adult) and avoid dehydration
- Avoid low calcium diet (it encourages increased oxalate excretion)
- Diet-therapy
- Manage acute urinary retention due to bladder or urethral stones by urethral catheterisation or suprapubic cystostomy respectively

Pharmacological treatment (Evidence rating: B)

- Pethidine, IM,
100 mg 4 hourly as required

Or

Diclofenac, IM,
75 mg or by suppository, 100 mg 12 hourly

- Hyoscine butylbromide, IV,
20 mg 8 hourly

Or

Mebeverine, oral,
135 mg 8 hourly may be useful

⚠ Caution

Avoid morphine as it may cause further ureteric spasm and worsening of symptoms

- Give antibiotics if urinary tract infection is present. ([see section on Urinary Tract Infection](#))

REFER

Refer to a Regional or Teaching hospital for definitive treatment after initial management.

133. URETHRAL STRICTURE

This refers to a narrowing or complete obstruction of the urethral lumen due to fibrosis (scarring). It is the second commonest cause of retention of urine in Ghana and the most common in young males usually resulting from previous inadequately treated STI. The commonest site is the anterior urethra i.e. bulbar and penile urethra in males. It may be complicated by periurethral abscess, superficial extravasation of urine and urethrocutaneous fistulae.

CAUSES

- Gonococcal or non-gonococcal urethritis
- External trauma e.g. road traffic injuries, falls.
- Urethral instrumentation e.g. catheterisation, endoscopy.
- Congenital strictures (rare)

SYMPTOMS

- Lower Urinary Tract Symptoms [LUTS] e.g. poor urinary stream, split stream, frequency and dysuria, post-void dribbling, incomplete emptying of bladder
- Urinary(overflow) incontinence
- Urinary retention (acute or chronic)

SIGNS

- There may be none
- Bladder may be palpable if there is retention
- Kidney may be palpable in hydronephrosis

- Localized induration may be felt along the urethra
- Failure of catheterisation this heightens the suspicion of a stricture

INVESTIGATIONS

- Urinalysis
- Urine culture and sensitivity
- Blood urea, electrolytes and creatinine
- Retrograde urethrogram
- Antegrade urethrogram provided a suprapubic catheter is in place
- Uroflowmetry
- Urethrocystoscopy

TREATMENT

Treatment objectives

- To relieve symptoms and prevent complication
- To treat underlying cause

Non-pharmacological treatment

- Try catheterisation a gentle attempt is made to pass a urethral catheter, which will be held up, at the site of stricture. Confirmation of site of obstruction is still needed
- If catheterization fails and patient in acute retention
- Suprapubic cystostomy or suprapubic needle puncture and aspiration (try this procedure if facilities for suprapubic cystostomy are lacking). Aspirate as much urine as possible to decompress the bladder and relieve pain before referral
- Definitive treatment is surgical. In most cases referral to a specialist centre will be necessary

Pharmacological treatment

- None

REFER

Refer to specialist for further investigations prior to definitive treatment

134. VASECTOMY (MALE STERILISATION)

Vasectomy is a permanent male contraceptive method which is a simple, short and safe surgical procedure. It is carried out by trained surgeons usually under local anaesthesia after careful counselling and informed consent.

Vasectomy is the most effective male family planning method. Involving males in issues of reproductive health and family planning has several benefits with a positive impact on society. Vasectomy should be encouraged for appropriate clients. It is less invasive and simpler than female sterilisation.

Misconceptions

- Vasectomy is ligation of the vas deferens and NOT CASTRATION
- Vasectomy does not affect erection
- Vasectomy does not affect ejaculation and orgasm. There would be normal ejaculation but the semen does not contain spermatozoa
- Vasectomy does not work immediately. A back-up method of contraception is necessary for up to 20 ejaculations, 3 months after the procedure or until examination of semen shows no sperm
- After vasectomy males will still require the use of condoms to prevent sexually transmitted infections including HIV-AIDS

Effectiveness rates of various male contraceptive methods:

- Vasectomy - 99.85%
- Male condom 86%
- Withdrawal method 81%

Preoperative requirements

- Detailed counselling and informed consent
- Medical history
- Physical examination
- Laboratory investigations e.g. Hb, sickling, urinalysis

REFER

Clients should be referred to a Family Planning Unit or Urologist for the procedure.

135. ACUTE EPIDIDYMOORCHITIS

This is an acute inflammation of the epididymis and testis usually due to a bacterial infection. It may follow ascending infection from the urethra (including STIs), instrumentation/catheterisation and genito-urinary surgery. It is a known complication of mumps. Poorly managed acute epididymoorchitis may be complicated by septicaemia, abscess formation, chronic epididymoorchitis, secondary hydrocele, infertility and Fournier's gangrene.

CAUSES

- Mumps virus
- *Escherichia coli*
- Chlamydia
- Gonococcus
- Staphylococcus
- Streptococcus
- Pseudomonas
- *Mycobacterium tuberculosis*

SYMPTOMS

- Fever
- Scrotal/testicular pain
- Scrotal swelling
- Urethral discharge
- Dysuria
- Malaise

SIGNS

- Fever
- Tender and swollen hemiscrotum
- Inflamed epididymis and testis
- Secondary hydrocele
- Positive Prehn's sign (lifting of scrotum towards pubic symphysis in the palm relieves pain)

INVESTIGATIONS

- Urinalysis
- Urine culture and sensitivity first catch of urine preferred to midstream urine
- FBC and ESR
- Blood culture and sensitivity
- Scrotal ultrasound/MRI

TREATMENT**Treatment objectives**

- To relieve symptoms
- To eradicate the infection
- To prevent recurrence
- To prevent complications e.g. abscess and sterility

Non-pharmacological treatment

- Bed rest
- Scrotal support
- Surgical drainage of abscess
- Avoid unprotected sex until treatment and follow up
- Trace and treat sexual contacts

Pharmacological treatment

- Ciprofloxacin, oral,
Adult
500 mg 12 hourly for 7-10 days
Children
5-15 mg/kg 12 hourly for 7-10 days
Plus
- Doxycycline, oral,
100 mg 12 hourly for 4 weeks in cases of sexually transmitted infections
Or
Azithromycin, oral,
Adult
500 mg daily for 3 days
Children
10mg/kg daily for 3 days
Alternative treatment
- Norfloxacin, oral,
400 mg 12 hourly
Plus
Doxycycline or Azithromycin (as above).
- Diclofenac sodium, oral,
50 mg 8 hourly
Or
Ibuprofen, oral,
400 mg 8 hourly

REFER

Refer all cases of persistent fever and complications to the surgical specialist or urologist.

136. TESTICULAR TORSION (TORSION OF SPERMATIC CORD)

This is cessation of blood supply to the testis due to twisting of the cord. This is a medical emergency that needs to be recognized before the cardinal signs and symptoms are fully manifest as prompt surgery saves the testes.

Delay in treatment could result in testicular atrophy, abnormal sperm count leading to infertility/sterility.

It can be classified into intra-vaginal torsion which constitute more than 95% and extra-vaginal torsion which is usually found in infants. About 50% of torsion occurs during sleep and early in the morning. It is rare in older children and adults but common in children under 15 years.

CAUSES

- Undescended testis
- Bell-clapper malformation
- Horizontal lie of testis/inversion of testis
- Long mesorchium
- Trauma
- Spasm of cremaster muscles

SYMPTOMS

- Sudden onset of acute severe pain in one testicle or recurrent pain which resolves spontaneously (recurrent torsion and detorsion)
- Lower abdominal pain on affected side
- Nausea and vomiting
- No urinary symptoms
- No fever

SIGNS

- Swollen, tender and abnormal position of testis and epididymis. Shortened & twisted cord.
- Oedema/reddening of scrotal wall
- Right testis -twisted clockwise
- Left testis -twisted anticlockwise
- Prehn's sign is absent (elevation of scrotum in the palm towards the Pubic symphysis does not relieve pain)

Table 16-4: Distinguishing between Torsion and Epididymoorchitis

Parameter	Torsion	Epididymoorchitis
Age	<15years	>15 years/sexually active
Onset of pain	Sudden/early morning	Gradual
History of coitus	Usually absent	Usually present
Fever	Absent	Present
Urinary symptoms	Absent	Present
Urethral discharge	Absent	Present in STIs

Table 16-4 (Continued): Distinguishing between Torsion and Epididymoorchitis

Position of testis	Changed	Unchanged
Swelling	Testis	Epididymis and testis
Prehn's sign	Absent/negative	Present/positive
Blood supply: doppler test	Reduced	Normal or increased
Treatment	Surgical	Non surgical

INVESTIGATIONS

- Urinalysis
- FBC
- Doppler stethoscope
- Colour Doppler Ultrasound Scan
- ^{99m}Tc -pertechnetate scintillation scan (90-100% accurate)

TREATMENT

Treatment objectives

- To have surgical intervention within 6 hours of onset
- To surgically explore all doubtful cases
- To prevent testicular loss

Non-pharmacological treatment

- Emergency surgery is the standard treatment
If surgery is delayed then manual detorsion should be carried out carefully to prevent loss of testis.
 - Manual detorsion procedure-under local anaesthesia (see below) and standing at the foot of bed untwist: Right testis anticlockwise, Left testis- clockwise
 - Emergency surgery should follow this procedure as soon as possible.

Pharmacological treatment

(Evidence rating: C)

- Lignocaine 1%, into the spermatic cord on both sides - for cord block anaesthesia
10-20ml

REFER

Refer as soon as possible (if surgical intervention is not available) to a surgeon or urologist. Beware testicular torsion has potential medico-legal implications.

137. FOURNIER'S GANGRENE

It is an acute fulminant polymicrobial necrotising fasciitis or gangrene affecting the scrotum and sometimes extending to the perineum, penis

and lower abdomen. It is also called idiopathic gangrene of the scrotum.

The synergistic infections of anaerobic and aerobic bacteria coupled with obliterative arteritis results in the extensive gangrene. The risk factors include diabetes mellitus, HIV/Immunosuppression, perineal abscess/infection of scrotum and contents, trauma, extravasation of urine, periurethral abscess and urethral stricture/calculi. The complications of Fournier's gangrene include septicaemia, extravasation of urine, exposure of testes and fistula formation

CAUSES

- *Staphylococcus*
- Microaerophilic *Streptococcus*
- *E. coli*
- Fusibacteria
- *Clostridium welchii*
- Bacteroides

SYMPTOMS

- Acute onset of painful anterior scrotal swelling in previously healthy tissue
- Fever

SIGNS

- Fever
- Prostration
- Rapidly progressing gangrene
- Foetid odour
- Sharp demarcation between 'dead' tissue and healthy tissue
- Crepitus on palpation of affected tissue
- Testis is usually spared
- Urinary extravasation
- Presence of risk or predisposing factors

INVESTIGATIONS

- Wound culture and sensitivity
- Serum culture and sensitivity
- Urinalysis
- FBC and ESR
- Grouping and cross-matching
- Fasting blood glucose
- HIV screening

- Plain X-ray of pelvis will reveal gas in affected tissue

TREATMENT

Treatment objectives

- To resuscitate patient
- To treat the infection
- To manage concomitant risk factors
- To salvage the testes
- To prevent/treat complications

Non-pharmacological treatment

- Surgical intervention
 - Radical Debridement
 - Reconstructive Surgery:
 - Testis Buried In Upper Thigh Temporarily To Prevent Dessication
 - Skin Grafting and reconstruction of scrotum.
 - Myocutaneous Flaps
- Nutrition Supplement
- Wound Care
- Management of diabetes mellitus if present

Pharmacological treatment

(Evidence rating: C)

- IV fluids and haemotransfusion
- Gentamicin, IV,
80 mg 8 hourly
 - Plus**
 - Ampicillin, IV,
500 mg 6 hourly
 - Plus**
 - Metronidazole, IV,
500 mg 8 hourly
 - Or**
 - Cefuroxime, IV,
750 mg 8 hourly
 - Plus**
 - Metronidazole, IV,
500 mg 8 hourly
- Hyperbaric Oxygen

REFER

Refer all cases with septicaemic shock to specialist after resuscitation and all those who require reconstructive surgery.

CHAPTER 17: SEXUALLY TRANSMITTED INFECTIONS

Sexually Transmitted Infections (STIs) are a major public health problem. They cause acute morbidity in adults and may result in long-term complications such as urethral stricture, infertility, ectopic pregnancy, cervical cancer, foetal wastage, prematurity, low birth weight, ophthalmia neonatorum and congenital syphilis. Their control is the corner stone in improving reproductive health and reducing Human Immunodeficiency Virus (HIV) infections.

Comprehensive management of STI is important and comprises prompt and effective case detection and treatment. However, owing to the lack of laboratory equipment and manpower in primary care facilities where most patients first present, an accurate diagnosis is often not possible. Also with most STIs, one cannot usually tell which organism is causing the infection from the history and physical examination alone. Multiple infections also occur, with each needing to be treated. Failure to treat one infection adequately may result in the development of serious complications.

A more practical approach in managing STI is to base treatment on a 'syndromic diagnosis' which identifies all STI that could cause a particular symptom or sign and provide treatment for each of them simultaneously.

The common clinical syndromes associated with STI include urethral discharge, vaginal discharge, lower abdominal pain, inguinal lymphadenopathy (buboes) and ano-genital ulcers.

In dealing with patients with STI, privacy and confidentiality, especially with the history taking and examination, are paramount.

Education and counselling of STI patients and concurrent management of their partners provide additional opportunities to reduce the risk of STI in the community.

138. URETHRAL DISCHARGE IN MALES

This is the presence of exudate from the anterior urethra, sometimes causing urethral discomfort on urination.

CAUSES

- *Neisseria gonorrhoea* (Gonococcal urethritis)
- *Chlamydia trachomatis* (Non-gonococcal urethritis)
- *Mycoplasma genitalum*

SYMPTOMS

- Urethral discharge
- Dysuria or discomfort on urination
- Genital sore

SIGNS

- Urethral discharge (gentle milking of the urethra may reveal the discharge if it is not initially visible)

INVESTIGATIONS

- Urethral swab culture and sensitivity (if available)

TREATMENT**Treatment objectives**

- To treat gonorrhoea and chlamydia urethritis simultaneously
- To prevent further transmission to sexual partners.
- To treat both partners simultaneously as much as possible
- To prevent development of complications and sequelae
- To reduce risk of HIV infection

Non-pharmacological treatment

- None

Pharmacological Treatment**(Evidence Rating: C)**For Gonorrhoea:

- Cefixime, oral, 400 mg stat

Or

Ciprofloxacin, oral, 500 mg stat

Or

Ceftriaxone, IM, 250 mg stat

PlusFor Chlamydia and Mycoplasma:

- Doxycycline, oral, 100 mg 12 hourly for 7 days

Or

Tetracycline, oral, 500 mg 6 hourly for 7 days

Or

Erythromycin, oral, 500 mg 6 hourly for 7 days

**Note**

Patients have to be counselled to complete treatment even when symptoms subside. All sexual partners of the patient within the last 3 months need to be seen and treated.

If the urethral discharge persists after treatment, repeat treatment and counsel the patient if it is due to non-adherence to therapy or re-infection.

REFER

In cases of treatment failure, refer the patient to a health facility where microbiological culture and antimicrobial sensitivity tests can be done on the urethral discharge.

PERSISTENT OR RECURRENT URETHRAL DISCHARGE

This may occur due to drug resistance, poor treatment compliance or re-infection following treatment for an STI. In some cases persistence of urethral discharge may be due to infection with *Trichomonas vaginalis*.

CAUSES

- *Neisseria gonorrhoeae*, *Chlamydia trachomatis* or *Mycoplasma genitalum* following drug resistance, poor compliance or re-infection after treatment
- *Trichomonas vaginalis*

TREATMENT**Treatment objectives**

- To re-treat for gonococcal or non-gonococcal urethritis if suspected to be due to previous poor treatment compliance or re-infection
- To treat infection with *Trichomonas vaginalis*
- To prevent transmission to sexual partners
- To treat both partners simultaneously as much as possible
- To prevent development of complications and sequelae
- To reduce risk of HIV infection

Non-pharmacological treatment

- None

Pharmacological Treatment**(Evidence Rating: C)**

- Metronidazole, oral, 400 mg 12 hourly for 7 days

Or

Metronidazole, oral, 2g stat

Or

Tinidazole, oral, 2g stat

**Note**

The treatment regimen with metronidazole or tinidazole assumes that effective therapy for gonorrhoea, chlamydia and mycoplasma has been taken in full by the patient.

REFER

Refer all cases of treatment failure to a health facility where microbiological culture and antimicrobial sensitivity tests can be done on the urethral discharge.

139. VAGINAL DISCHARGE

While a vaginal discharge is a notable clinical feature of an STI, not all forms of vaginal discharge are abnormal or indicative of an STI. A vaginal discharge may be associated with a physiological state such as menses or pregnancy, or with the presence or use of foreign substances in the vagina.

Careful history taking should reveal whether a vaginal discharge might be the result of chemical vaginitis, due to topical self-medication, repeated douching with abrasive substances or indeed an STI.

A change in the characteristics of a woman's vaginal discharge either in colour, odour or amount or the presence of additional symptoms and signs may indicate a need for medical attention. STIs causing a vaginal discharge may result in serious pelvic inflammation with sequelae such as ectopic pregnancy and infertility.

A careful risk assessment (see note below) of women with a vaginal discharge may help identify appropriate treatment regimens based on the most likely aetiology of the vaginal discharge. Other considerations for selecting treatment include pregnancy status and patient discomfort.

CAUSES

- STI-related
 - *Neisseria gonorrhoea*
 - *Chlamydia trachomatis*
 - *Trichomonas vaginalis* green or yellow, smelly, bubbly or frothy discharge associated with itching
 - Herpes simplex virus following extensive first episode of infection
- Non STI-related
 - Candidiasis - white, lumpy or thick discharge associated with itching
 - Bacterial vaginosis grey or white, fishy smelling discharge, especially after sexual intercourse
 - *Gardnella vaginalis*
 - Foreign bodies
 - Herbal preparations

SYMPTOMS

- Vaginal discharge -change in colour, odour, consistency or amount
- Vulval itching
- Vulval swelling
- Pain on urination
- Lower abdominal or back pain

SIGNS

- Vaginal discharge
- Vulval swelling
- Vulval erythema
- Lower abdominal tenderness
- Cervical excitation tenderness
- Cervical mucopus or erosions (on speculum examination)

INVESTIGATIONS

- High vaginal swab for microscopy, culture and sensitivity (if available)

TREATMENT**Treatment objectives**

- To identify and treat non-STI vaginitis
- To assess STI risk and treat STI-related infections appropriately
- To prevent complications and sequelae
- To treat both partners simultaneously as much as possible

Non-pharmacological treatment

- Ensure good peri-anal and genital hygiene
- Encourage use of loose cotton underwear
- Keep underwear dry
- Avoid douching with herbal or chemical preparations
- Avoid medicated soaps

**Pharmacological Treatment
(Evidence rating: C)****Note****Risk Assessment**

Parameters used in the risk assessment for cervicitis are:

- Patient's partner is symptomatic (i.e. partner has a urethral discharge)
- Patient is less than 21 years old
- Patient is single
- Patient has more than one sexual partner
- Patient has had a new sexual partner in the last 3 months

The risk assessment is said to be positive and treatment for cervicitis is Recommended if

- The answer to (i) is yes or
- The answer to any 2 of items (ii) - (v) is yes.

If a woman has a vaginal discharge with no positive risk factor, treat for vaginitis alone.

If she has a vaginal discharge, and a positive risk factor, treat for both vaginitis and cervicitis.

If the risk factor is negative treat for vaginitis only as follows;For Vaginitis:Treatment for trichomoniasis and bacterial vaginosis

- Metronidazole, oral, 400 mg 8 hourly for 5 days (contraindicated during the 1st trimester of pregnancy)

Or

Metronidazole, oral, 2 g stat (contraindicated during the 1st trimester of pregnancy)

Or

2% Clindamycin cream, topical (preferred in pregnancy)

PlusTreatment for candidiasis

- Clotrimazole, vaginal tablets, 200 mg inserted into vagina at night for 3 days

Or

Miconazole vaginal tablets, 200 mg inserted into vagina at night for 3 days

Plus

Clotrimazole cream, applied twice a day (for vulval irritation)

If risk factor assessment is positive, treat for vaginitis as above and for cervicitis;

For Cervicitis:Treatment for gonorrhoea

- Cefixime, oral, 400 mg stat

Or

Ciprofloxacin, oral, 500 mg stat. (avoid in pregnancy)

Or

Ceftriaxone, IM, 250 mg stat

PlusTreatment for chlamydia

- Doxycycline, oral, 100 mg 12 hourly for 7 days (avoid in pregnant and nursing mothers)

Or

Tetracycline, oral, 500 mg 6 hourly for 7 days (avoid in pregnant and nursing mothers)

Or

Erythromycin, oral, 500 mg 6 hourly for 7 days

REFER

Refer all cases of recurrent vaginal discharge and/or treatment failures to a health facility where speculum examination can be carried out and microbiological culture and antimicrobial sensitivity tests can be done on the vaginal discharge.

140. LOWER ABDOMINAL PAIN IN WOMEN

Lower abdominal pain in a woman may have several causes. These include pelvic inflammatory disease (PID), ruptured ectopic pregnancy and septic abortion. The latter two are surgical emergencies which require extreme urgency in their management (See sections on '**Ectopic Pregnancy**' and '**Abortions**'). PID is caused by organisms which may be STI-related or other bacteria that ascend from the lower genital tract and produce inflammation of the uterus, fallopian tubes and other structures in the pelvis. However, after excluding ectopic pregnancy, STI-related organisms are the most likely cause of lower abdominal pain in a sexually active woman who has not recently delivered a baby, or has no past or recent history of uterine instrumentation.

The presence of intrauterine contraceptive devices favours the development of PID particularly in the month following insertion.

CAUSES

- STI-related
 - *Neisseria gonorrhoea*
 - *Chlamydia trachomatis*
 - Anaerobic bacteria
- Non STI-related
 - Ectopic pregnancy
 - Septic abortion
 - Post partum sepsis
 - Foreign body including IUD

SYMPTOMS

- Fever
- Lower abdominal pain
- Pain with sexual intercourse (dyspareunia)
- Vaginal discharge
- Dysuria or urethral discomfort

SIGNS

- Vaginal discharge
- Tenderness on moving the cervix (cervical excitation) on bimanual vaginal examination
- Lower abdominal tenderness
- Adnexal tenderness
- Adnexal masses

INVESTIGATIONS

- Pelvic ultrasound
- High vaginal swab culture and sensitivity

TREATMENT**Treatment objectives**

- To treat for gonorrhoea, chlamydia and anaerobic bacterial infection
- To relieve pain and inflammation

Non-pharmacological treatment

- Remove IUD, if present, 3 days after initiation of drug therapy

Pharmacological Treatment**(Evidence rating: C)**Out-Patients

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

Plus

- Doxycycline, oral, 100 mg 12 hourly for 14 days

Plus

- Metronidazole, oral, 400 mg 12 hourly for 14 days

In-Patients

- Ceftriaxone, IM, 250 mg daily for 3 days

Plus

- Doxycycline, oral, 100 mg 12 hourly for 3 days

Plus

- Metronidazole, oral, 400 mg 12 hourly for 3 days

Followed by

- Doxycycline, oral, 100 mg 12 hourly for 14 days

Plus

- Metronidazole, oral, 400 mg 12 hourly for 14 days

Adjunctive Treatment

Pain relief

- Diclofenac, oral, 50 mg 8 hourly

Or

Mefenamic acid, oral, 500 mg 8 hourly

REFER

Refer to the gynaecologist or surgeon.

141. GENITAL ULCER

A genital ulcer is a break in the continuity of the skin of the genitalia. They may be painful or painless and are frequently accompanied by inguinal lymphadenopathy. They increase a patient's susceptibility to HIV infection. Ulcers may be covered by the foreskin of the penis in uncircumcised males. A thorough examination will therefore require asking the patient to gently retract the foreskin for careful inspection of the glans penis, coronal sulcus, frenum and urethral meatus.

Latex gloves must be worn at all times during examination of genital ulcers.

CAUSES

- *Herpes simplex*
- *Treponema pallidum* (syphilis)
- *Haemophilus ducreyi* (chancroid)
- *Calymmatobacterium granulomatis* (granuloma inguinale)
- Lymphogranuloma inguinale
- Secondarily infected post-traumatic ulcers

SYMPTOMS

- Genital ulcer
- Urethral discharge

SIGNS

- Herpes simplex
 - Multiple, recurrent vesicular lesions (Herpes simplex)
- Syphilitic ulcers
 - Often single, painless and indurated lesions with a clear base and well-defined edges
 - Occasionally multiple, painful, non-indurated or have a purulent base
 - Discrete, firm, painless, inguinal lymphadenopathy a week after the primary lesion
 - Primary ulcer usually heals within six weeks, usually without leaving a scar.
- Chancroid
 - Painful with undermined ragged edges
 - The base is covered with a purulent exudate and easily bleeds to touch
 - Several ulcers may coalesce to form serpiginous lesions
 - Lymphadenopathy is usually unilateral and may become fluctuant
- Granuloma inguinale
 - Begins with a small papule that progresses into an enlarging granulomatous ulcer

- Ulcer usually painless, indurated and beefy red and easily bleeds with trauma
- Edges are well defined
- Healing is not spontaneous and is accompanied by extensive scarring
- Lymphogranuloma inguinale

INVESTIGATIONS

- VDRL (if available)
- TPHA (if available)

TREATMENT

Treatment objectives

- To treat small ulcers and vesicles, especially if recurrent for *Herpes simplex*
- To direct initial management of all ulcers at both syphilis and chancroid

Non-pharmacological Treatment

- Keep lesions dry and clean

Pharmacological Treatment

(Evidence rating: C)

For Herpes simplex:

- Acyclovir, oral, 200 mg 4-6 hourly for 7 days (5 doses daily)

Or

Acyclovir, oral, 400 mg 8 hourly for 7 days

Plus

- Povidone iodone, Mercurochrome or Gentian violet solution, topical, to paint lesions

For Syphilis:

- Benzathine Penicillin G, IM, 2.4 million units (mega units) in 2 divided doses during one clinic visit; give one injection in each buttock

Or

Aqueous Procaine Penicillin, IM (by deep injection),

1.2 million units (mega units) daily, for 10 days

Alternative Treatment (for persons allergic to penicillin):

- Doxycycline, oral, 100 mg 12 hourly for 14 days

Or

Tetracycline, oral,

500 mg 6 hourly for 14 days

Or

Erythromycin, oral, 500 mg 6 hourly for 14 days

For Chancroid:

- Ceftriaxone, IM, 250 mg stat

Or

Azithromycin, oral, 1g stat

Or

Ciprofloxacin, oral, 500 mg 12 hourly for 3 days

Or

Erythromycin, oral, 500 mg 6 hourly for 7 days

REFER

If the ulcer worsens or does not improve after treatment refer to a health facility with microbiology support to exclude other causes.

142. SCROTAL SWELLING

Scrotal swellings can be caused by trauma, torsion of the testis, infections, (e.g. epididymitis, orchitis) or tumours. Infective causes of scrotal swelling may be STI-related which can lead to infertility if not effectively treated.

Testicular torsion is a surgical emergency and has to be excluded by a careful history and physical examination. If present this requires immediate surgical referral (Also see section on '**Scrotal Masses**').

CAUSES

- STI-related
 - *Chlamydia trachomatis*
 - *Neisseria gonorrhoea*
 - *Treponema pallidum* (very rarely)
- Non STI-related
 - Torsion
 - Mumps virus (mumps orchitis)
 - Tuberculosis
 - Tumours

SYMPTOMS

- Scrotal pain
- Scrotal swelling
- Urethral discharge
- Dysuria
- Frequency of micturition
- Fever

SIGNS

- Scrotal tenderness
- Scrotal swelling, oedema and/or erythema
- Urethral discharge
- Fever

INVESTIGATIONS

- Urethral swab for culture
- Urine culture and sensitivity
- Ultrasound scan of the scrotum

TREATMENT**Treatment objectives**

- To provide pain relief
- To identify and treat STI and non-STI related causes appropriately

Non-pharmacological treatment

- Bed rest
- Scrotal support until inflammation and fever subside

Pharmacological Treatment**(Evidence Rating: C)**For Gonorrhoea

- Cefixime, oral, 400 mg stat.

Or

Ciprofloxacin, oral, 500 mg stat

Or

Ceftriaxone, IM, 250 mg stat

PlusFor Chlamydia

- Doxycycline, oral, 100mg 12 hourly for 7 days

Or

Azithromycin, oral, 1g stat

Or

Erythromycin, oral, 500 mg 6 hourly for 7 days

Adjunctive treatment

Pain relief

- Diclofenac, oral,
50 mg 8 hourly

Or

Mefenamic acid, oral,
500 mg 8 hourly

REFER

Refer all cases of testicular torsion, scrotal trauma and tumours urgently to a surgical specialist or urologist.

All STI related causes not responding to treatment should be referred to a urologist.

143. INGUINAL BUBO

Inguinal and femoral buboes are localized enlargement of lymph nodes in the groin area, which are usually painful and may be fluctuant. They are sexually transmitted and must be distinguished from non-sexually transmitted local or systemic infections which may cause inguinal lymphadenopathy.

Inadequate treatment of buboes can lead to rupture with formation of chronic fistulae and scarring. When associated with genital ulcers appropriate treatment for the latter must also be provided (See section on '**Genital Ulcers**').

CAUSES

- *Chlamydia trachomatis* (Lymphogranuloma venereum)
- *Haemophilus ducreyi* (Chancroid)

SYMPTOMS

- Painful or painless inguinal swelling(s)

SIGNS

- Inguinal swellings
 - unilateral or bilateral
 - tender or non-tender
 - fluctuant
 - suppurating
- Genital ulcer

INVESTIGATIONS

- No investigations required, in view of the syndromic approach
Recommended in managing STIs

TREATMENT**Treatment objectives**

- To relieve pain
- To relieve swelling
- To treat for lymphogranuloma venereum and chancroid

Non-pharmacological treatment

- Aspiration of fluctuant buboes using a wide bore needle through

adjacent healthy skin every second or third day. An incision and drainage should not be attempted. If buboes persist, the patient should be referred.

- Sequelae such as strictures and/or fistula may require surgery.

Pharmacological treatment

(Evidence Rating: C)

For Lymphogranuloma Venereum (LGV) and Chancroid

- Doxycycline, oral, 100 mg 12 hourly for 14 days

Or

Azithromycin, oral, 1 g stat

Or

Erythromycin, oral, 500 mg 6 hourly for 14 days

REFER

Refer patients with sequelae such as strictures and fistulae to a surgical specialist.

Also refer all patients with persistent or recurrent buboes.

144. GENITAL WARTS

Genital warts are flesh-coloured, painless, lesions that may be very small and even flat, or may appear in large clusters with several finger-like projections.

In women, genital warts can grow on the vulva and walls of the vagina, in the ano-genital area and the cervix. In men, they may occur on the tip or shaft of the penis, the scrotum or the anus. Genital warts can also develop in the oral cavity of a person who has had oral sexual contact with an infected person.

Certain types of the virus causing genital warts have been found to cause carcinoma of the cervix.

Genital warts are highly infectious. Latex gloves must be worn at all time during examination of genital warts. Suspicious lesions should be painted with weak acetic acid solution (vinegar). This turns the warts whitish on the background of the normal skin. Although useful, this is not a specific test.

CAUSES

- Human papilloma virus

SYMPTOMS

- Usually no symptoms
- Small swellings in the ano-genital region
- Itching or discomfort in the genital area

- Rarely bleeding after sexual intercourse in women

SIGNS

- Small, flesh-coloured swellings in affected area, several together have a cauliflower shape

INVESTIGATIONS

- Acetic acid solution (vinegar) test

TREATMENT

Treatment objectives

- To eliminate the warts

Non-pharmacological treatment

- Protect normal skin with vaseline (paraffin) while applying Podophyllin.
- External genital and perianal warts should be washed thoroughly 1 to 4 hours after application of Podophyllin.
- Cryotherapy with liquid nitrogen, solid carbon dioxide, or a cryoprobe. Repeat applications every 1-2 weeks.
- Electrosurgery
- Surgical removal

Pharmacological Treatment

(Evidence Level: C)

- Podophyllin 10-25% tincture, topical, applied directly to the warts avoiding normal skin tissue. Repeat treatment at weekly intervals until complete resolution.

Or

Trichloroacetic acid (TCA) (80-90%) applied carefully to the warts avoiding normal tissue, followed by powdering of the treated area with talcum powder to remove unreacted acid.

- Treatment should be repeated at weekly intervals until complete resolution.



Note

Do not use TCA during pregnancy and lactation. Do not use Podophyllin or TCA on cervical warts.

REFER

All patients with cervical warts and those not responding to treatment must be referred for specialist consultation.

Acquired Immune Deficiency Syndrome (AIDS) is a late stage of infection with the Human Immune Deficiency Virus (HIV). It can affect both adults and children often predisposing them to opportunistic infections and certain malignancies. Co-infection with tuberculosis (TB) and Hepatitis B are particularly frequent in HIV infected individuals and must be screened for in all cases.

The causative organism is transmitted either through sexual contact (male to female or male to male) with an infected person, transfusion of HIV contaminated blood or blood products, use of contaminated needles and surgical instruments, traditional scarification, tattoos and circumcision practices both in males and females using contaminated instruments, or from mother to baby through the placenta, during delivery or through breast milk.

The virus is not transmitted by everyday social contact such as hugging or kissing, through food or water or by mosquitoes and other biting insects. A patient infected with HIV may remain healthy for many years but can still pass on the infection.

AIDS is mainly diagnosed clinically and confirmed by a positive HIV test. In infants and children, a diagnosis of AIDS requires the presence of at least 2 major signs (see below) associated with at least 2 minor signs, in the absence of known causes of immunosuppression such as severe malnutrition, cancer or other recognised conditions. The test for HIV antibody must additionally be positive.

In adults, a diagnosis requires the presence of at least 2 major signs associated with at least 1 minor sign (see below), in the absence of other known causes of immunosuppression. The test for HIV antibody must additionally be positive.

HIV infection is currently not curable. The only way to stop the spread of the infection is by preventive methods. For persons living with HIV infection (PLHIV), anti-retroviral therapy (ART) is available country-wide at accredited centres at the regional and district level in both public and private health care facilities to which all diagnosed patients must be referred.

CAUSES

- Human Immunodeficiency Virus

SYMPTOMS

- Persistent cough
- Persistent or recurrent diarrhoea
- Weight loss

- Skin rashes
- Persistent or recurrent fever
- Mouth ulcers

SIGNS

Infants and Children

Major Signs

- Weight loss
- Abnormally slow growth or failure to thrive
- Chronic diarrhoea > 1 month
- Prolonged fever > 1 month

Minor Signs

- Generalized lymphadenopathy
- Oro-pharyngeal candidiasis
- Repeated common infections (otitis media, pharyngitis)
- Persistent cough
- Generalized dermatitis
- Confirmed maternal HIV infection

Adults

Major Signs

- Weight loss of more than 10% of body weight
- Chronic diarrhoea > 1 month
- Prolonged fever > 1 month (intermittent or constant)

Minor Signs

- Persistent cough for > 1 month
- Generalized pruritic dermatitis
- Recurrent herpes zoster
- Oro-pharyngeal candidiasis
- Chronic progressive and disseminated herpes simplex infection.
- Generalized lymphadenopathy



Note

Apart from the above criteria, the presence of generalised Kaposi sarcoma, pneumocystis pneumonia (PCP) or cryptococcal meningitis in an HIV positive patient is sufficient in itself for the diagnosis of AIDS.

INVESTIGATIONS

- Blood test for HIV antibodies
- Screen for TB
- Hepatitis B surface antigen
- CD4 count

- FBC
- Liver Function Test

TREATMENT

Treatment objectives

- To make the patient feel clinically better
- To produce sustained and durable suppression of viral load
- To reduce HIV-related morbidity and mortality
- To restore or preserve immune function and prevent opportunistic infection

Non-pharmacological treatment

- Prevention of HIV infection is by promoting safe sexual practices through abstinence, faithfulness to one's partner and the use of condoms.

Pharmacological Treatment (Evidence Rating: A)

See National Guidelines for Anti Retroviral Therapy (ART) in Ghana for guidance



Note

Anti-retroviral drugs are potentially toxic and should only be prescribed by trained teams which have experience with their use and the facilities to monitor patients.

OCCUPATIONALLY ACQUIRED HIV INFECTION

Health care workers (HCW) are at risk of acquiring HIV infection at the work place due to contact with body fluids from patients which may contain the virus. To prevent this from happening, HCW need to adopt universal precautions in providing care to all patients and in the handling of all body fluids. This includes careful disposal of all sharp objects e.g. needles and scalpels, and the use of protective gloves and eye glasses.

Exposures at the work place that place put HCW at risk of HIV infection include percutaneous injury e.g. needle stick injury or cut with sharp object, contact of mucous membranes (e.g. eyes) with body fluids, contact of non-intact skin i.e. chapped or abraded skin or that afflicted with dermatitis with body fluid, prolonged contact of intact skin with body fluids and deep injury with a sharp instrument contaminated with blood products.

Not all exposures to HIV contaminated body fluids end up in HIV infection. It is estimated that the risk of transmission after percutaneous injury is 0.3% and 0.09% after mucous membrane exposure. The risk after skin exposure is less than 0.1 %. The majority of exposures therefore do not lead to infection.

Thus, in the management of an exposed health care worker, it is important to evaluate the type of exposure (percutaneous, mucous membrane or skin), source material (blood, peritoneal fluid, urine etc.), severity of exposure (depth of injury, size of exposed surface, quantity of body fluid, integrity of skin) and HIV status of the source material. The highest risk exposures are from a large volume of blood (e.g. deep injury with large diameter hollow needle previously in source patient's vein or artery) and when the source patient is HIV positive.

Health facilities need to keep a log book of records of such accidental exposures and periodically audit the records and plan preventive strategies to forestall such accidents.

Post exposure prophylaxis (PEP) with anti-retroviral therapy, when given within 24-48 hours of exposure (preferably within 1-2 hours), may be able to prevent infection.

The antiretrovirals used may potentially have adverse effects, and PEP does not always work. In consideration for the initiation of PEP therefore, issues regarding nature and type of exposure as well as HIV serological status of the source patient need to be addressed. When the serological status of the source patient is not immediately known, PEP if deemed necessary, should be started, pending HIV antibody testing of the source patient after appropriate counselling. However, if the test results come back negative, the PEP may be stopped. Otherwise it should be continued for 4 weeks.

HCW taking PEP should be counselled, among other things, on adherence to treatment, potential side effects of the medications, safe sex practices as well as the fact that PEP may not prevent HIV infection at all times.

PEP needs to be initiated quickly when there is a recognised risk. Health facilities are therefore encouraged to keep emergency stocks of PEP medication and designate a responsible official who can be called upon at all times to evaluate the risk and counsel exposed health care workers and start PEP.



Note

Assessment of exposure risk

Very low risk exposure

- Splash of body fluids or blood on intact skin for a very short period only

Low risk exposure:

- Exposure to a small volume of blood or blood-contaminated fluids from asymptomatic HIV-positive patients with low viral load
- An injury with a solid needle
- Any superficial injury or mucocutaneous exposure

High risk exposure:

- Exposure to a large volume of blood or potentially infectious fluid
- Exposure to blood or blood contaminated fluids from a patient with a high viral titre i.e. in the AIDS phase or early sero-conversion phase of HIV infection
- Injury with a hollow bore needle
- Deep and extensive injury exposure
- Drug resistance in source patient

INVESTIGATIONS**Baseline tests:**

- Full blood count
- Liver and renal function tests
- Hepatitis B surface antigen
- HIV serology or PCR if available

Two weeks later:

- Full blood count
- Liver and renal function tests

Six weeks later:

- HIV serology

Three and six months later:

- HIV serology

TREATMENT**Treatment objectives**

- To prevent transmission of HIV infection after accidental occupational exposure

Non-pharmacological treatment

- Wash exposed areas immediately with soap and water
- Flush mucous membranes with water

**Note**

There is no evidence that the use of antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk of HIV transmission.

**Pharmacological Treatment
(Evidence rating: A)**Adults

Very low risk exposure:

- See non-pharmacological treatment above

Low risk exposure:

- Zidovudine, oral, 300 mg 12 hourly for 28 days

Plus

- Lamivudine, oral, 150 mg 12 hourly for 28 days

High risk exposure:

- Zidovudine, oral, 300 mg 12 hourly for 28 days

Plus

- Lamivudine, oral, 150 mg 12 hourly for 28 days

Plus

- Nelfinavir, oral, 750 mg 8 hourly (or 1250 mg 12 hourly) for 28 days

Or

Lopinavir/Ritonavir, oral, 400 mg/100 mg 12 hourly for 28 days

Children

Give Post Exposure Prophylaxis (PEP). However, note that doses are different from adults. Contact National Aids Control Programme (NACP) for updated recommendations.

REFER

Refer all HCW with positive HIV serology at baseline testing at time of exposure, and all HCW negative at baseline but who subsequently seroconvert, for counselling and appropriate management at an accredited ART centre.

145. FEVER

Fever is a common complaint, which is usually related to an infection of viral, bacterial or parasitic origin. It may be a valuable guide to the diagnosis and severity of infections.

Fever is defined as an axillary temperature above 37.5 °C, read after keeping the thermometer in place for 3 minutes. Fever above 38 °C in children and adults often needs urgent attention, especially if the patient is restless or delirious. Not every fever is due to malaria or typhoid. Every fever should be investigated and treated appropriately. A thorough history, physical examination and appropriate investigation would usually reveal the cause of the fever.

In neonates and the elderly, severe infections may not be accompanied by a fever. In infants and young children, fever may be associated with: Convulsions, Collapse or Coma. (See table below for possible differential diagnoses and appropriate action)

CAUSES

- Viral infection
- Bacterial infection
- Fungal infections
- Parasitic infestations
- Haematological malignancies e.g. lymphoma, leukaemia

SYMPTOMS

- Chills, rigors

SIGNS

- Temperature > 37.5 °C
- Evidence of dehydration e.g. sunken eyes
- Evidence of underlying conditions
- Tachypnoea
- Tachycardia

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Rapid diagnostic test for malaria if microscopy not available
- Cultures of urine, blood, sputum, ear, throat, wound, cerebrospinal fluid

TREATMENT**Treatment objectives**

- To reduce body temperature to normal
- To relieve symptoms
- To treat the underlying cause of the fever (see guidelines below)

Non-pharmacological treatment

- Keep the patient well hydrated with fluids e.g. water, fruit juices, light porridge, “rice-water” or coconut milk.
- Maintain nutrition, continue breast-feeding in babies.
- Sponge the child with lukewarm water (pour it over them and leave it to dry on the skin).

Pharmacological treatment**(Evidence rating: A)**

- Paracetamol, oral,

Adults

1 g 6 8 hourly

Treat the cause of the fever appropriately (see appropriate section)

Children

10-15 mg/kg/dose. May repeat dose 6-8 hourly as necessary

**Note**

DO NOT give Aspirin to children under the age of 16 years.

Control convulsions with diazepam (see section on **Seizure Disorders**)**Table 19-1: Guidelines for the Treatment of the Patient with Fever**

Complaints	Diagnosis * (See Appropriate section)	Action * (See appropriate section)
Rigors, fever (occasionally periodic), sweating, general malaise, joint pains	* Malaria	* Take a blood film or perform rapid diagnostic test for malaria parasites and treat appropriately
Rigors, fever, sweating, general malaise, altered sensorium	* Cerebral Malaria	* Take a blood film or perform rapid diagnostic test for malaria parasites and treat appropriately
Headache, vomiting, drowsiness, stiff neck, seizures	* Meningitis	* Do not delay treatment while awaiting results of lumbar puncture.

Table 19-1 (Continued): Guidelines for the Treatment of the Patient with Fever

Complaints	Diagnosis * (See Appropriate section)	Action * (See appropriate section)
Cough, brown sputum, rapid breathing, pain on deep breathing	* Pneumonia	* Give appropriate antibiotic
Increased frequency of urination and/or painful micturition, loin pain	* Urinary tract infection	Do urine examination plus culture and sensitivity; Give appropriate antibiotic
Fever, constipation or diarrhoea (may be with blood), headache, abdominal pain, general malaise	* Typhoid	Start appropriate treatment
Warm, swollen, painful, reddish looking limb	* Cellulitis or impetigo	Give appropriate antibiotic
Fever in a child with cough, sore throat and red ear drums	Otitis media	Give appropriate antibiotic
Fever during pregnancy with loin pain	Pyelonephritis	Take sample for urine culture and sensitivity and give appropriate antibiotic
Pain in a bone (usually a limb bone), painful to touch	* Osteomyelitis	X-ray the affected part; treat as for osteomyelitis
Jaundice preceded by feeling unwell, anorexia, low grade Fever	Viral hepatitis	Do liver function tests, Hepatitis B surface antigen; treat conservatively, bed rest
Headache, body ache, runny nose, sneezing	Common cold or influenza	Give Paracetamol if required
Long standing fever, weight loss, chronic diarrhoea, lymphadenopathy	Acquired immunodeficiency syndrome	Manage as appropriate (see section on HIV)
Sore throat or pain on swallowing	Tonsillitis and pharyngitis	Manage as appropriate

REFER

Fever persisting for more than 10 days in spite of treatment should be considered as pyrexia of unknown origin (PUO) and should be referred for further investigation

146. TUBERCULOSIS

This is a disease caused by the bacterium *Mycobacterium tuberculosis*. It may affect any part of the body but the commonest site is the lung. When the lung is affected, the patient is said to have pulmonary TB.

Other sites affected include the spine, urinary tract, the brain, joints, bone, abdomen and lymph nodes. Pulmonary TB patients who have acid-fast bacilli (AFB) in their sputum smears (said to have smear-positive TB) are more infectious than TB patients who do not have AFB in their sputum (smear negative TB). Bovine TB is acquired by drinking unpasteurized cow's milk and manifests as abdominal TB.

Tuberculosis is spread through airborne droplets when a patient coughs, spits or sneezes. Persons with lowered resistance to infection, like HIV/AIDS patients, are especially at risk of developing TB. It may be the initial illness in a patient with AIDS. There should be a high index of suspicion in patients who are HIV positive since they tend not to have the typical symptoms and signs of TB, or have features such as fever, weight loss and diarrhoea which could be attributed to AIDS.

TB diagnosis and treatment in Ghana is free in both public and private health facilities.

CAUSES

- *Mycobacterium tuberculosis*
- *Mycobacterium bovis* (bovine TB)
- *Mycobacterium africanum* I and II

SYMPTOMS

Adults

- Cough that lasts for more than 2 weeks
- Chest pain
- Loss of weight
- Loss of appetite
- Blood stained sputum
- Fever
- Evening or nocturnal sweating



Note

Suspect tuberculosis in a case of a productive cough of at least two weeks standing. Initiate laboratory investigations for TB. Empirical antibiotic treatment for pneumonia may be prescribed while awaiting the sputum smear result.

Children

- Malnourished and chronically ill children
- Persistent low grade fever (lasting 2-3 weeks)
- Weight loss
- Failure to thrive

- Fatigue, malaise, poor appetite
- Irritability
- Chest pain and cough
- Vomiting
- Impaired consciousness (TB meningitis)



Note

Suspect tuberculosis in any child with severe malnutrition who is showing poor response to dietary treatment

SIGNS

- Weight loss
- Clinical signs of pneumonia, pleural effusion, lung collapse/ fibrosis
- Lymphadenopathy-matted / discharging

INVESTIGATIONS

- 2 sputum tests for the presence of acid fast bacilli (AFB)
- Chest X-ray
- FBC
- ESR
- Mantoux test-ulcerates, of >10mm in children and >15-20mm in adults
- Mycobacterial culture and drug sensitivity test (available at all Public Health and Reference Laboratories and some Regional Hospitals)
 - Sputum
 - CSF
 - Specimen from other extra pulmonary sites
- HIV screening
- CD4 count and viral load in HIV positive patients



Note

Patients with negative smears should have:

- Repeat sputum smear and request for a chest xray
- If all investigations, including chest X-ray, do not suggest TB, prescribe two weeks of adequate antibiotic treatment

TREATMENT

Treatment objectives

- To cure the disease
- To prevent further transmission
- To prevent the development of drug resistance
- To offer psychosocial support
- To investigate close contacts

Where a child is affected, always check adult contacts with productive cough.

Non-pharmacological treatment

- Counselling
- Good nutrition
- Adequate rest - give them at least a month off work
- Admission for severely ill patients

Pharmacological treatment

(Evidence rating: B)

There are two main types of treatment regimes:

- Standard regimen
- Retreatment regimen

TB treatment is a Directly Observed Therapy (DOT) where the patient is observed daily by a treatment supporter or a health worker to take the TB drugs.

Standard regimen

Six months treatment - 2 months intensive phase, followed by 4 months continuation phase for both adults and children (Category I)

- For newly diagnosed smear positive, smear negative and extrapulmonary TB
 - Refer to the pink card (TB 01) for guidance on dosing by weight
 - It consists of an intensive phase of four drugs; Rifampicin (R), Isoniazid (H), Pyrazinamide (Z) and Ethambutol (E) in a fixed dose combination taken daily for 2 months.
 - For adults, each tablet contains H 75 mg, R 150 mg, Z 400 mg & E 275 mg and 2-5 tablets given a day depending on weight.
 - For children a regimen containing H 30 mg, R 60 mg, Z 150 mg & E 100 mg is recommended. (if this regimen is yet to be introduced by the national TB programme, give ½ to 2 tablets of H75R 150 and Z400 mg depending on the weight of the child)
 - For children weighing 30 kg or over, give adult category I
 - This is followed by a continuation phase of Isoniazid and Rifampicin (HR in a tablet called Rifinah) for both adults (H75R150) and children (H30R60).



Note

To prevent the development of drug resistance to Rifampicin, it is recommended that RIFINAH (Isoniazid + Rifampicin) is used. Prescribing Rifampicin alone must be discouraged.

- During the Continuation Phase the patient must swallow all the oral drugs preferably on an empty stomach under direct observation.
- The patient needs to be under close supervision by a health worker or any responsible person or member of the community with support from health staff during the full duration of treatment.

Retreatment Regimen:

This is for:

- Relapse
- Treatment failure
- Patients who defaulted and who return after >1 month and are smear positive (and some smear negative patients who have defaulted for longer)
- All other previously treated patients
- Retreatment consists of an initial intensive phase of five drugs; Rifampicin, Isoniazid, Pyrazinamide and Ethambutol (HRZ&E) daily for 3 months (doses as discussed above), with Streptomycin added for the first 2 months only.
- Streptomycin, IM,
 - Adults
500 mg - 1 g daily (depending on weight)
 - Children
15 mg/kg daily for 2 months
- Then follows a continuation phase with Isoniazid, Rifampicin and Ethambutol daily for a further 5 months for both adults (H75/R150/E275) and children (H30R60/E100)
- Monitoring: During the course of the treatment, all pulmonary TB patients should have repeat sputum smears examined after 2 (or 3 months if retreatment), 5 and 6 (or 8) months to confirm conversion to negative smear (refer to NTP guidelines).

Prevention of Tuberculosis

- For the individual:
 - BCG immunization of new-born or at first contact
 - Isoniazid in new-born babies of mothers with tuberculosis and children with a BCG abscess.
- For the community
 - Seek out and treat infective TB cases. Encourage affected community members to seek treatment.
 - Improve housing and nutritional status

- Examine close contacts of infectious cases.
- Good nutrition, refrain from alcohol and smoking
- Avoid contracting HIV infection

REFER

Refer all suspected TB cases to a public or accredited private health care facility. TB diagnosis and treatment in Ghana is free in both public and private health facilities.

147. MENINGITIS

This is an infection of the coverings of the brain, and is most commonly caused by bacteria. Other causative organisms are viruses, fungi and protozoa. One type, cerebrospinal meningitis (CSM), caused by *Neisseria meningitides*, is common in the northern and upper regions of Ghana, and usually occurs in epidemics during the harmattan season. This type is contagious and usually presents with a short history. The presentation may sometimes be confused with cerebral malaria.

CAUSES

- Bacterial
 - *Neisseria meningitides*
 - *Streptococcus pneumoniae*
 - *Haemophilus influenza*
 - *Mycobacterium tuberculosis*
 - *Staphylococcus aureus*
 - *Escherichia coli* in neonates
- Viruses
- Protozoa e.g. *Toxoplasma* in HIV-AIDS
- Fungi e.g. *Cryptococcus neoformans*

Adults and older children:

SYMPTOMS

- Fever
- Neck pains
- Severe headaches
- Photophobia
- Coma
- Convulsions
- Vomiting

SIGNS

- Fever
- Neck stiffness
- Positive Kernig's sign
- Altered consciousness

Children less than 1 year old:**SYMPTOMS**

- Fever
- Irritability
- Refusal to eat
- Poor sucking
- Vomiting
- Drowsiness and weak cry
- Focal or generalized convulsions after which the child is sleepy
- Presence or absence of neck stiffness
- Lethargy
- Bulging fontanelle
- Coma

SIGNS

- Neck may be retracted and arched backwards
- Presence or absence of fever
- Bulging fontanelle
- Coma
- Hypotonia/ hypertonia
- Convulsion

INVESTIGATIONS

- FBC
- Blood film for malarial parasites (to exclude cerebral malaria)
- Lumbar puncture
- Blood culture and sensitivity

TREATMENT**Treatment objectives**

- To identify and eradicate the causative organisms
- To prevent complications
- To prevent spread to contacts

Non-pharmacological treatment

- Reduce fever in children with tepid sponging
- Maintain good nutrition
- Feed through a nasogastric tube if patient is in coma
- Keep the airway clear

**Note**

With epidemic meningitis the Local and Regional Health Authorities need to be informed urgently

Pharmacological treatment**(Evidence rating: A)**

- Ceftriaxone, IV/deep IM,

Adults

2-4 g daily for 7-10 days

Children

> 12 years;

2-4 g daily for 7-10 days

<12 years;

50-80 mg/kg for 10 - 14 days

Neonates;

20-50 mg/kg once daily for 21 days

Alternatively and in cerebrospinal meningitis (CSM) epidemics

- Benzylpenicillin, IV,

Adults

4 MU 4 hourly for 14 days

0.2 MU/kg 6 hourly for 14 days

Plus

- Chloramphenicol, IV,

Adults

1 g 6 hourly for 14 days

Children

25 mg/kg 6 hourly for 14 days

All treatment should be intravenous initially for a minimum of 7 days and should be started without delay. This may be subsequently changed to oral therapy with significant clinical improvement.

Prophylaxis for CSM

Prophylactic treatment is recommended for patients 2 days prior to discharge and also for their close contacts

- Ciprofloxacin, oral,

Adults

500 mg as a single dose (Avoid in Pregnancy)

Children

5-12 years;

250 mg as a single dose

Or

Ceftriaxone, IM,

Adults

250 mg as a single dose

Children

< 12 years;

125 mg as a single dose

**Note****Role of steroids**

Dexamethasone started together with the first dose of the appropriate antibiotic has been found to lead to major reduction in hearing loss and death in both children and adults. Give IV 4-10 mg 6 hourly for 5-7 days.

(Evidence rating B)**Table 19-2 : Empirical Antibiotic Therapy for suspected Bacterial Meningitis in Adults**

Age	Pathogens	Empirical treatment	Alternatives
< 50 years	Meningococcus, Pneumococcus, Haemophilus Influenza	Ceftriaxone	Meropenem, Chloramphenicol, Fluoroquinolones
>50 years	Pneumococcus, Listeria, Gram-negative bacilli	Ceftriaxone Plus Ampicillin	Trimethoprim / sulfamethoxazole +Fluoroquinolone
Hospital- Acquired	Staphylococci, Gram-negative bacilli, Pneumococcus	Ceftazidime	Meropenem

REFER

Refer all patients not responding to treatment within the first 48 hours to a regional hospital.

148. TYPHOID FEVER

Typhoid fever (enteric fever) is a severe bacterial illness which occurs where sanitary conditions are poor permitting contamination of food or water with faeces. The bacteria which are spread by the faeco-oral route invade the intestinal wall and spread through the bloodstream to all organs. They are passed into the stool and urine of infected patients. They may continue to be present in the stool of asymptomatic carriers, who are persons who have recovered from the symptoms of the disease but continue to carry the bacteria.

If improperly treated typhoid fever may result in complications such as intestinal perforation with peritonitis (presents as severe abdominal pain,

tenderness, rebound tenderness and guarding), bloody stools from ulcerated Peyer's patches, acute psychosis and severe intravascular haemolysis leading to acute renal failure especially in G6PD deficiency.

Public education on good personal hygiene, hand washing and appropriate disposal of solid waste would often prevent the disease. Screening of food handlers by carrying out stool cultures to exclude carrier status and safe handling of food, fruits and vegetables are also helpful preventive measures.

CAUSES

- *Salmonella typhi* and *paratyphi*

SYMPTOMS

- Fever which increases gradually to a high fever and persists for weeks (fever does not respond to antimalarials)
- Constipation in the early stages
- Abdominal pain and diarrhoea in the second week of illness
- Severe headache
- Dry cough
- Psychosis and confusion in 10% of adults

SIGNS

- High fever with a relatively slow pulse rate (occasionally pulse is fast especially with myocarditis or intestinal perforation)
- Abdominal tenderness
- Hepato-splenomegaly (tender)
- Mental confusion
- Signs of chest infection (pneumonitis)

INVESTIGATIONS

- FBC, differential, blood film for malaria parasite (to exclude malaria)
- Blood culture
- Stool culture
- Urine culture
- Widal test -usually unreliable



Note

- Diagnosis of typhoid fever is based on a strong clinical suspicion backed by
 - blood cultures, positive during first 10 days of fever
 - stool cultures, positive after tenth day up to fourth or fifth week
 - urine cultures, positive during second and third week
- The above tests are superior to the Widal test, which is unreliable and rarely useful in confirming a diagnosis of typhoid fever

- A Widal test with 'O' titres of 1/160 or less seldom suggests typhoid fever in the absence of positive blood and stool cultures
- The Widal test, if done, must be repeated after 10 days
- A two-fold or more increase in titre on the repeat test increases the possibility of typhoid
- A positive Widal test may occur in non-specific febrile illnesses (anamnestic reaction) and autoimmune disease
- More than 10% of patients with typhoid fever have a negative Widal test

TREATMENT

Treatment objectives

- To eradicate the infection
- To treat the disease in the patient
- To prevent transmission of infection to other people.

Non-pharmacological treatment

- Sponging to reduce body temperature if required

Pharmacological treatment

(Evidence rating: B)

- Ciprofloxacin, oral,

Adults

500 mg 12 hourly for 14 days

Children

10 mg/kg 12 hourly for 14 days

Or

Ciprofloxacin, IV, may be given in severely ill patients who cannot take oral medication. Revert to oral medication as soon as clinically indicated.

Adults

200 mg 12 hourly

Children

10 mg/kg 12 hourly



Note

Ciprofloxacin should be used with caution in children. Ciprofloxacin may rarely cause tendinitis. At the first sign of pain or inflammation, patients must discontinue treatment and alternative treatment (e.g. Azithromycin/Ceftriaxone) started.

Alternative treatment

- Azithromycin, oral,

Adults

500 mg - 1 g daily for 7 days

Children

10-20 mg/kg for 7 days

- Ceftriaxone, IV,

Adults

2-4 g daily for 7 days

Children

100 mg/kg per day

**Note****Treatment of healthy carriers:**

- May require treatment with one or even two different medications over a period of 4-6 weeks
- Amoxicillin, oral,

Adults

1 g 8 hourly

Children

6-12 years;

500 mg 8 hourly

1-5 years;

250 mg 8 hourly

REFER

- Very ill patient with intestinal perforation or intravascular haemolysis
- If peritonitis is suspected give IV fluids, IV antibiotics, give instructions for "nil per os" and transfer patient to a hospital where surgery can be performed
- If situation remains unchanged after adequate course of treatment

149. MALARIA

Malaria is a very common infection in Ghana. It follows the introduction of protozoan malaria parasites into the blood stream by the bite of a female Anopheles mosquito. Malaria is a major cause of significant morbidity and mortality especially among children under 5 years of age, pregnant women (sometimes with adverse foetal and maternal outcomes), patients with sickle cell disease and visiting non-resident Ghanaians and expatriates.

Based on the clinical severity, cases of malaria are categorized as either 'uncomplicated' or 'severe'. A diagnosis of malaria can be suspected based on the patient's symptoms and the physical findings at examination. However, for a definitive diagnosis to be made laboratory tests must demonstrate the malaria parasites or their components since the clinical presentation of the condition is similar in many respects to other common diseases such as typhoid fever, urinary tract infection, septicemia, Pneumonia and meningitis in both adults and children and measles, otitis media, tonsillitis, etc. in children.

In Ghana, diagnosis is progressively being shifted from clinical to laboratory confirmation as the basis for treatment. Rapid diagnostic tests may be used to confirm a diagnosis if microscopy (blood film) is not available.

Preventive measures in the community mainly target elimination of the insect vector or prevention of mosquito bites while additional chemoprophylaxis is required for vulnerable individuals.

The development of resistance of malaria parasites to anti-malarial medications is a matter of major public health concern. The practice of 'over-diagnosis' of malaria by healthcare practitioners and patients alike, with its attendant over-treatment and sometimes partial or incomplete treatment, leads to over-exposure of the parasites to the anti-malarial drug (drug pressure), thus promoting development of resistant strains of the parasite.

It is therefore necessary to obtain laboratory confirmation of a diagnosis of malaria. Exceptions to this guideline are children under 5 years and cases of suspected severe malaria where laboratory confirmation is not immediately possible. A combination of anti-malarial drugs is preferred to monotherapy as this helps to prevent the development of drug resistance. A complete course of medications at the correct dosages must be given in all cases of malaria.

CAUSES

- *Plasmodium falciparum*

UNCOMPLICATED MALARIA

SYMPTOMS

- Fever
- Chills
- Rigors
- Sweating
- Headache
- Generalized body and joint pain
- Nausea and or vomiting
- Loss of appetite
- Abdominal pain (especially in children)
- Irritability and refusal to feed (in infants)

SIGNS

- Fever
- Splenomegaly

- Pallor
- Jaundice

INVESTIGATIONS

- Microscopy - thick and thin blood films for malaria parasites
- Rapid diagnostic test (RDT) - if microscopy is unavailable
- FBC
- Sickling

TREATMENT

Treatment objectives

- To avoid progression to severe malaria
- To limit the duration of the illness
- To minimize the development of drug resistant parasites

Non-pharmacological treatment

- In children, tepid sponging to reduce body temperature

Pharmacological treatment (Evidence Rating: A)

- Artesunate-Amodiaquine, oral, (see tables 19-3, 19-4, and 19-5)

Alternative Treatment (Reserved for patients not tolerating Artesunate-Amodiaquine)

- Artesunate-Lumefantrine, oral, (see table 19-6)

Or

Dihydroartemisinin-Piperaquine, oral, (see table 19-7)

Table 19-3 : Artesunate + Amodiaquine Co-Blistered Tablets (Regimen for once daily dosing)

Weight	Age	Artesunate (50 mg tablets) Number of Tablets To Be Given			Amodiaquine (150 mg base tablets) Number of Tablets To Be Given		
		Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
		5-10 kg	< 1 yr	½	½	½	½
11-24 kg	1-6 yr	1	1	1	1	1	1
24-50 kg	7-13 yr	2	2	2	2	2	2
50-70 kg	14-18 yr	3	3	3	3	3	3
>70 kg	> 18 yr	4	4	4	4	4	4



Note

The dose in mg/body weight is: Amodiaquine 10mg/kg + Artesunate 4mg/ kg, taken as a single dose daily for three (3) days, after meals.

Table 19-4 : Artesunate and Amodiaquine Co-Blistered Tablets (Regimen for twice daily dosing)

Weight	Age	Artesunate (50 mg tablets) Number of Tablets To Be Given						Amodiaquine (150 mg base tablets) Number of Tablets To Be Given					
		Day 1		Day 2		Day 3		Day 1		Day 2		Day 3	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
5-10 kg	< 1 yr	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
11-24 kg	1-6 yr	½	½	½	½	½	½	½	½	½	½	½	½
24-50 kg	7-13 yr	1	1	1	1	1	1	1	1	1	1	1	1
50-70 kg	14-18 yr	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½
>70 kg	> 18 yr	2	2	2	2	2	2	2	2	2	2	2	2

**Note**

The dose in mg/body weight is: Amodiaquine 10mg/kg + Artesunate 4mg/ kg, taken as two divided doses daily for three (3) days, after meals.

Table 19-5 : Artesunate and Amodiaquine Fixed Dose Combination (Standard Regimen, using the 3 available dosing strengths)

Weight	Age	Artesunate (AS) + Amodiaquine (AQ) Fixed Dose Combination* Number of Tablets To Be Given			
		Tablet Dosing Strength	Day 1	Day 2	Day 3
<8 kg	2-11months	AS: 25 mg AQ: 67.5 mg	1	1	1
9-17 kg	1-5 yrs	AS: 50 mg AQ: 135 mg	1	1	1
18-35 kg	6-13 yrs	AS: 100 mg AQ: 270 mg	1	1	1
> 36 kg	> 13 yrs	AS: 100 mg AQ: 270 mg	2	2	2

**Note**

Each tablet contains both Artesunate (AS) and Amodiaquine (AQ), at the dosages indicated. The product packaging clearly indicates which dosing strength applies to which age group. The *maximum daily dose of Artesunate/Amodiaquine is 200mg/600mg.*

Table 19-6 : Artemether and Lumefantrine (Recommended Dosing Regimen)

		Artemether (20 mg) + Lumefantrine (120 mg) Number of Tablets To Be Given					
Weight	Age	Day 1		Day 2		Day 3	
		First Dose	Second Dose (after 8hrs)	AM	PM	AM	PM
< 5 kg	< 6 mo	Not recommended for patients under 5 kg					
5-15 kg	6mo-3 yr	1	1	1	1	1	1
15-25 kg	3-8 yr	2	2	2	2	2	2
25-35 kg	8-12 yr	3	3	3	3	3	3
>35 kg	>12 yr	4	4	4	4	4	4

Table 19-7 : Dihydroartemisinin and Piperaquine (Recommended Dosing Regimen)

		Dihydroartemisinin (40 mg) / Piperaquine (320 mg base) Number of Tablets To Be Given		
Weight	Age	Day 1	Day 2	Day 3
		5-10 kg	< 1 yr	¼
11-15 kg	1-3 yr	½	½	½
16-24 kg	4-6 yr	1	1	1
24-35 kg	7-10 yr	1¼	1¼	1¼
36-50 kg	11-13 yr	1½	1½	1½
50-70 kg	14-18 yr	2	2	2
>70 kg	> 18 yr	3	3	2

SEVERE MALARIA

Delay in diagnosis or inappropriate treatment of uncomplicated malaria can lead to the rapid development of severe or 'complicated malaria.' It mostly occurs in children under 5 years of age, pregnant women and non-immune individuals. The events causing most deaths in severe malaria are related to cerebral involvement (cerebral malaria), severe anaemia, hypoglycaemia, severe dehydration, renal failure and respiratory acidosis.

The diagnosis of severe malaria is based on clinical features and confirmed with laboratory testing. While confirmation of the diagnosis is necessary treatment must be started promptly and not withheld while confirming the diagnosis.

Not all cases of severe malaria have high parasitaemia and initial blood film examination may be negative.

SYMPTOMS

- Inability to take in fluids (or breast milk in children)
- Repeated profuse vomiting
- Dark or 'cola-coloured' urine
- Passing of very little urine
- Difficulty in breathing
- Generalised weakness, inability to walk or sit without assistance
- Altered consciousness (change of behaviour, confusion, delirium, coma)
- Repeated generalized convulsions

SIGNS

- Hyperpyrexia (axillary temperature $>38.5^{\circ}\text{C}$)
- Extreme pallor (severe anaemia)
- Marked jaundice
- Circulatory collapse or shock (cold limbs, weak rapid pulse)
- Tachypnoea (Rapid breathing)
- Crepitations on chest examination
- Sweating (due to hypoglycemia)
- Haemoglobinuria (dark or 'cola-coloured' urine)
- Oliguria
- Spontaneous unexplained heavy bleeding (disseminated intravascular coagulation)
- Altered consciousness (change of behaviour, confusion, delirium, coma)

INVESTIGATIONS

- FBC
- Blood film for malaria parasites - thick and thin blood films
- Rapid diagnostic tests (only in exceptional cases, if microscopy is not available)
- Random blood glucose
- BUE and creatinine
- Blood grouping and cross-matching
- Lumbar puncture in the convulsing or comatose patient to exclude other conditions

TREATMENT

Treatment objectives

- To give specific anti-malarial treatment parenterally to ensure adequate blood-serum concentrations of the drug and rapid clearance of parasitaemia
- To provide urgent treatment for life threatening problems e.g. convulsions, hypoglycaemia, dehydration, renal impairment
- To provide appropriate supportive care

Non-pharmacological treatment

- Place patient in a position to prevent aspiration in unconscious patients and during seizures.

Pharmacological Treatment (Evidence Rating: A)

Treatment to be initiated prior to referral to a hospital

- Quinine, IM, 10 mg/kg (see table 19-8)
- **Or**
- Artemether, IM, 3.2 mg/kg as a loading dose (to be completed)
- **Or**
- Artesunate, rectal, (see tables 19-9, 19-10)



Note

How to Give Intramuscular Quinine

Intramuscular Quinine in Young Children:

- Weigh the child.
- Prepare a Quinine dilution of 50 mg/ml: Use a 10 ml sterile syringe and needle to draw up 5 mls of sterile water for injection or saline (no dextrose). Then into the same syringe draw up 300 mg (1ml) from an ampoule of Quinine. The syringe now contains 50 mg Quinine per ml.
- The dosage is 10 mg (0.2 ml) per kg or body weight every 8 hours. Calculate the volume to give based on body weight. (For examples of body weights and doses in children <30 kg, see Table 19-8).
- Administer by intramuscular injection to the thigh. If the diluted volume exceeds 3 ml, inject half the dose into each thigh.

Intramuscular Quinine In Adults:

- Use a Quinine dilution of 100 mg/ml. To prepare this, draw 2 mls of Quinine 600 mg and add 4 mls of sterile water or saline (not dextrose).
- The dosage is 10 mg/kg body weight of Quinine given 8 hourly by deep IM injection, to a maximum dose of 600 mg.
- Small adults (weighing less than 60 kg) should be weighed to calculate the correct dose. Larger adults will simply receive the maximum dose (600 mg).
- If the required volume is more than 5 ml, divide it into two and inject at separate sites.

Table 19-8 : Dosing Regimen for Quinine IM Injection in young Children

Weight	Volume of Quinine Dihydrochloride Injection (50 mg/ml dilution)
< 5	1.0 ml
5.1-7.5	1.5 ml
7.6-10.0 kg	2.0 ml
10.1-12.5kg	2.5 ml
12.6-15.0kg	3.0 ml
15.1-17.5 kg	3.5 ml - half to each thigh
17.6-20.0 kg	4.0 ml - half to each thigh
20.1-22.5 kg	4.5 ml - half to each thigh
22.6-25.0 kg	5.0 ml - half to each thigh
25.1-27.5 kg	5.5 ml - half to each thigh
27.6-30.0 kg	6.0 ml - half to each thigh

**Note**

The dosage for IM Quinine is 10 mg (0.2 ml) per kg of body weight every 8 hours.

Table 19-9 : Rectal Artesunate (Pre-Referral Treatment in Children)

Weight	Age	Artesunate Dose	Regimen
5 - 8 kg	<1 yr	50	One 50 mg suppository
9 - 19 kg	1 - 1½	100	Two 50 mg
20 - 29 kg	1½ - 5	200	One 200 mg
30 - 39 kg	6 - 13	300	Two 50 mg and one 200 mg suppositories
>40 kg	> 14	400	Two 200 mg suppositories

Table 19-10 : Rectal Artesunate (Pre-Referral Treatment in Adults)

Weight	Artesunate Dose	Regimen
40 - 50 kg	400 mg	Two 200 mg suppositories
60 - 80 kg	800 mg	Four 200 mg suppositories
> 80 kg	1200 mg	Six 200 mg

Treatment in Hospital

- Quinine, IV, by slow infusion over 4-8 hours

Adults and Children

10 mg/kg (maximum dose 600 mg), placed in 5-10 ml/kg of dextrose saline or in 5% dextrose and infused over 4-8 hours. Repeat infusion 8 hourly until patient can swallow, then change to Quinine, oral, 10mg/kg (maximum dose 600 mg), 8 hourly to complete 7 days treatment.

Or

- Quinine, IM,

Adults and Children

10 mg/kg (maximum dose 600 mg), 8 hourly until patient can swallow, then change to Quinine, oral, 10mg/kg (maximum dose 600 mg), 8 hourly to complete 7 days treatment.

**Note**

Quinine, IV, should always be given by a slow infusion, **never** by bolus intravenous injection as this may cause severe hypotension.

- **Alternative treatment**

Artemether, IMAdults and Children

3.2 mg/kg stat,

Followed 8 hours later by

1.6 mg/kg

Subsequently (24 hours after initiation of treatment)

1.6 mg/kg once daily for up to 5 days

Followed by (when patient can take oral medications)

A full 3-day course of oral artemisinin combination therapy (ACTs)

(See tables **19-3, 19-4, 19-5, 19-6 and 19-7**).

**Note**

Artemether should not be given in the first trimester of pregnancy unless there are no suitable alternatives. In most other respects, however, the treatment of severe malaria in pregnancy shall be the same as the treatment of severe malaria for the general population.

REFER

Refer all cases of malaria that fail to respond to the recommended anti-malarial medications, or patients who are diagnosed as having severe malaria, promptly for hospitalization. Appropriate drug treatment, as shown in the tables (**19-8, 19-9, and 19-10**), must be initiated prior to transferring the patient.

If referral is not possible immediately, continue the treatment regimen as shown above for severe malaria until referral is possible.

MALARIA IN PREGNANCY

Treatment of Uncomplicated Malaria in Pregnancy

First Trimester

- Quinine, oral, 10 mg/kg (max 600 mg) 8 hourly for 7 days

Or

- Quinine, oral, 8 mg/kg

Plus

Clindamycin, oral, 5 mg/kg, 8 hourly for 3 days. Clindamycin should be administered with food and copious amounts of water.



Note

The drug of choice for uncomplicated malaria for pregnant women in the first trimester is oral Quinine. ACTs are not recommended for use in the first trimester. However their use should not be withheld in cases where they are considered to be life saving, or where other antimalarials are considered to be unsuitable.

Second and Third Trimesters

- Quinine, oral, 10 mg/kg (max 600 mg) 8 hourly for 7 days

Or

Artesunate-Amodiaquine, oral, (see adult dosage in Tables 19-3 and 19-4)

Or

Artemether-Lumefantrine, oral, (see adult dosage in Tables 19-6)

Treatment of Severe Malaria in Pregnancy

- **All trimesters:**

Quinine, IV or IM, (see section on Treatment of Severe Malaria above) until the patient can take oral preparations

- **Second and third trimesters:**

Quinine, IV or IM, (see section on Treatment of Severe Malaria above) until the patient can take oral preparations

Or

Artemether, IM, may be used as an alternative to Quinine (see section on Treatment of Severe Malaria above).

Intermittent Preventive Treatment in Pregnancy

Intermittent Preventive Treatment in Pregnancy (IPTp) consists of giving the fixed-dose combination medication Sulphadoxine-Pyrimethamine (SP) in treatment doses at predefined intervals after quickening (16 gestational weeks).

In Ghana, the national malaria control strategy reserves SP for the purpose of intermittent preventive treatment only. To prevent the development of drug resistance, SP is not to be used for other purposes such as treatment of acute attacks of malaria.

- Sulphadoxine, oral, 500 mg

Plus

- Pyrimethamine, oral, 25 mg
(Co-administered as directly observed therapy (DOT) during routine antenatal visits on at least 3 occasions)

First Dose: First ANC visit after quickening (i.e. after 16 weeks of gestation.)

Second Dose: At least one month after the first dose.

Third Dose: At least one month after the second dose.

Fourth Dose: May be given, provided it is at least one month after the last dose and at least one month before anticipated delivery.



Note

Pregnant women with the following conditions shall be exempted from using SP:

- First trimester of pregnancy (<13 weeks gestation)
- G6PD enzyme deficiency
- Severe liver disease or unexplained recurrent jaundice
- Known allergy to any sulpha drugs or allergy to pyrethamine
- History of previous reaction to SP
- Recent treatment with a sulpha drug such as co-trimoxazole (within 4 weeks)
- Post-dates pregnancy (gestation beyond 36 weeks)
- Breastfeeding
- Acute case of malaria (treat as above)

Owing to antagonism between folic acid and SP, folic acid supplementation should be delayed and started one week after SP administration.

For additional information on IPTp and malaria in pregnancy, refer to the latest Ghana Health Service training manuals and guidelines on the subject.

150. WORM INFESTATION (INTESTINAL)

Infestation with worms is very common. Poor hygiene or contact of bare skin with soil in which the worm or its eggs live predisposes individuals to infestation.

CAUSES

- Hookworm
- Ascaris
- Strongyloidiasis
- Tape worm

- Thread worm
- Whip worm

SYMPTOMS

- Generalised Itching - when the larvae are in the bloodstream
- Perianal itching - threadworm
- Dry cough and wheeze-when the larvae pass through the lungs
- Abdominal discomfort /pain
- General weakness and easy fatigability
- Passage of worm(s) in the stool
- Vomiting of worms

SIGNS

- Large distended abdomen in children
- Anaemia
- Wheezing
- Poor physical growth in children
- Features of malnutrition

INVESTIGATIONS

- Stool for routine examination

TREATMENT

Treatment objectives

- To eliminate the worms
- To treat the complications of infestation e.g. anaemia, malnutrition

Non-pharmacologic treatment

- Ensure proper nutrition
- Proper hand washing with soap and water

Pharmacological treatment

(Evidence rating: B)

Table 19-11 : Pharmacological Treatment of Worm Infestations

Worm	Treatment	Note
Hookworm	<ul style="list-style-type: none"> • Mebendazole, oral, <u>Adults and children >12 months</u> 100 mg 12 hourly for 3 days Or 500 mg as single dose 	Not recommended for children below 12 months and in pregnant women

Table 19-11 (Continued): Pharmacological Treatment of Worm Infestations

	<p>Or</p> <ul style="list-style-type: none"> Albendazole, oral, <u>Adults and children >12 months</u> 400 mg as a single dose <u>Children below 12 months</u> 200 mg as a single dose 	Not recommended during pregnancy
Ascaris	<ul style="list-style-type: none"> Mebendazole, oral, <u>Adults and children above 12 months</u>; 100 mg 12 hourly for 3 days Or 500 mg as single dose 	Not recommended for children below 12 months and in pregnant women
	<p>Or</p> <ul style="list-style-type: none"> Albendazole, oral, <u>Adults and children above 12 months</u> 400 mg as a single dose <u>Children below 12 months</u> 200 mg as a single dose 	Not recommended during pregnancy
Whipworm	<ul style="list-style-type: none"> Mebendazole, oral, <u>Adults and children above 12 months</u>; 100 mg 12 hourly for 3 days Or 500 mg as single dose 	Not recommended for children below 12 months and in pregnant women
	<p>Or</p> <ul style="list-style-type: none"> Albendazole, oral, <u>Adults and Children above 12 months</u> 400 mg as a single dose <u>Children below 12 months</u> 200 mg as a single dose 	Not recommended during pregnancy
Threadworm	<ul style="list-style-type: none"> Mebendazole, oral, <u>Adults and children above 12 months</u>; 100 mg 12 hourly for 3 days Or 500 mg as single dose 	Not recommended for children below 12 months and in pregnant women

Table 19-11 (Continued): Pharmacological Treatment of Worm Infestations

Worm	Treatment	Note
	<p>Or</p> <ul style="list-style-type: none"> Albendazole, oral, <u>Adults and Children above 12 Months</u> 400 mg as a single dose <u>Children below 12 months</u> 200 mg as a single dose 	Not recommended during pregnancy Repeat treatment after three weeks
Strongyloides	<ul style="list-style-type: none"> Tiabendazole (Thiabendazole), oral, Adults 1.5 g 12 hourly for 3 days Children 25 mg/kg 12 hourly for 3 days 	
Tapeworm	<ul style="list-style-type: none"> Nicosamide, oral, <u>Adults and children above 6yrs;</u> 2g as a single dose <u>Children < 2 years;</u> 500 mg as a single dose <u>2-6 years;</u> 1 g as a single dose Chew tablets 2 hours before a meal 	
	<p>Or</p> <ul style="list-style-type: none"> Praziquantel, oral, <u>Adults and children;</u> 10-20 mg/kg as a single dose. For treatment of anaemia and malnutrition see appropriate sections. 	

REFER

Refer patients with intestinal obstruction from a heavy load of suspected worm infestation to a surgical specialist.

151. OPHTHALMIA NEONATORUM

See section on **Neonatal Conjunctivitis**

152. XEROPHTHALMIA

This condition is common in children. It is associated with inadequate intake of foods that contain Vitamin A. It is a common cause of blindness in children.

It is important to prevent this condition by examining the eyes of all sick and malnourished children. The diet of children should include foods that contain Vitamin A. (dark green leafy vegetables e.g. nkontomire, yellow fruits and vegetables, palm oil, milk, eggs). Breast-feeding should be encouraged till 18 months to 2 years.

CAUSES

- Vitamin A deficiency
- protein calorie malnutrition
- measles
- malabsorption states

SYMPTOMS

- Poor night vision (in the early stages)

SIGNS

- Dry conjunctiva
- Grey sclera
- Conjunctival folding (wrinkling)
- Keratomalacia (cloudy cornea, soft and ulcerates easily)

INVESTIGATIONS

- Nil

TREATMENT

Treatment objectives

- To correct vitamin A deficiency
- To prevent blindness in patients with measles and malnutrition

Non-pharmacological treatment

- Discourage mothers from putting any drugs in the eye unless Prescribed by a clinician

Pharmacological treatment

(Evidence rating: C)

Give Vitamin A to children as soon as the illness is diagnosed and also in patients with measles and malnutrition.

Table 20-1: Dose of Vitamin A for Xerophthalmia

Time	Vitamin A Dose	
	Infant (6-11 months)	Children (1-6 years)
Immediately	100,000 IUnits	200,000 IUnits
Following day	100,000 IUnits	200,000 IUnits
One week later	100,000 Iunits	200,000 Iunits

REFER

Refer all established cases of xerophthalmia to an eye specialist if the condition is severe with an uneven or bulging cornea.

153. FOREIGN BODY IN THE EYE

Foreign bodies refer to specks of dust, small insects or other tiny objects that get into the eyes. The foreign body may be either in the conjunctival sac, on the cornea or inside the eyeball (intraocular). A history of the likely nature of the foreign body aids in its detection and removal. The foreign body may be seen by careful inspection of the cornea or conjunctival sac. Good light is needed and a magnifying glass may be required to detect corneal foreign bodies.

CAUSES

- specks of dust,
- small insects or
- other tiny objects

SYMPTOMS

- Feeling of something in the eye which may be irritating
- Sudden discomfort or severe pain
- Watering of the eye
- Red eye(s)
- Photophobia i.e. intolerance to light
- Inability to open the eye

SIGNS

- Evidence of foreign body
- Conjunctivitis
- Tearing of the eyes
- Photophobia i.e. intolerance to light
- Chemosis
- Sub-conjunctival haemorrhage
- Irregular pupil
- Hyphema

INVESTIGATIONS

- X-ray of the orbit - if metallic foreign body

TREATMENT**Treatment objectives**

- To remove superficial foreign bodies
- To treat associated injury
- To prevent complications

Non-pharmacological treatment

- Look on the eyeball and under the eyelids to find the foreign body and carefully remove it using a cotton bud or saline irrigation with a syringe. (Do not attach needle to syringe)
- If the foreign body is under the upper eyelid, evert the eyelid and remove the foreign body.
- If the foreign body cannot be removed, apply topical antibiotic, pad the eye and **REFER** to an eye specialist clinic.

**Note**

Do not attempt to remove intraocular foreign bodies. Refer to an eye specialist.

Pharmacological treatment**(Evidence rating: C)**

- 1% Chloramphenicol eye ointment. (After removal of foreign body)
- Paracetamol, oral, if there is pain

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;

250-500 mg 6-8 hourly

1-5 years;

120-250 mg 6-8 hourly

3 months-1 year;

60-120 mg 6-8 hourly

REFER

Refer patients with corneal foreign bodies, intraocular foreign bodies, persistent pain and redness of the eye to the eye specialist.

154. RED EYE

Infections, allergies and injuries inflame the eye and cause a red eye. Acute red eye may have a history of injury to the eye or there may be no history of injury.

History of injury is straight forward. There may be a foreign body on the cornea or on the conjunctiva, under the eyelid. A blunt injury may cause a subconjunctival haemorrhage or bleeding into the anterior chamber (hyphaema).

CAUSES

- Conjunctivitis
- Corneal ulcer or keratitis
- Acute iritis
- Acute glaucoma

Acute red eye with no history of injury

Table 20-2 : Characterising Acute Red Eye with no history of Injury

	Acute Conjunctivitis	Corneal Ulcer	Acute Iritis	Acute Glaucoma
Onset	Sudden	Sudden	Sudden	Sudden
Pain	Discomfort	Painful lids	Painful	Severe pain
Discharge	Purulent or Muco-purulent	Watery	Watery	Watery
Vision	Normal	May be reduced	Reduced	Grossly reduced
Eyelids	Swollen or sticky	Swollen	Usually normal	Severely Swollen
Redness	Red away from cornea	Red around the cornea	Bright red around cornea	Dull red all over
Cornea	Clear	Grey or grey-white patch	Hazy	Cloudy

INVESTIGATIONS

- FBC
- Conjunctival swab for culture and sensitivity

TREATMENT**Treatment objectives**

- To treat the infection and prevent blindness, in the case of acute conjunctivitis and corneal ulcer
- To relieve pain and redness and refer immediately to the specialist for urgent management to prevent blindness, in the case of acute iritis and acute glaucoma

Non-pharmacological treatment**Acute conjunctivitis**

- Frequent (2 hourly) washing of face and eyes to get rid of discharge
- Keep hands away from the eye
- Don't share towels with others
- Small children should be kept away from school, camp and swimming

Pharmacological treatment**(Evidence rating: C)****Acute conjunctivitis**

- 1% Tetracycline ointment,
8 hourly for 72 hours.

Or

0.5% Chloramphenicol, eye drops,
2 hourly for 48 hours.

If improving, reduce chloramphenicol eye drops to 6 hourly for 7 days.

Corneal ulcer

- 1% Tetracycline eye ointment and refer to the specialist immediately.

REFER

Refer corneal ulcer, acute iritis and acute glaucoma immediately to the eye specialist. Also refer acute conjunctivitis which shows no improvement after 48 hours of treatment.

155. CONJUNCTIVITIS

Conjunctivitis is any inflammation of the conjunctiva.

The different types of conjunctivitis are:

- Bacterial Conjunctivitis
- Viral Conjunctivitis
- Trachoma
- Allergic Conjunctivitis e.g. vernal conjunctivitis

Table 20-3 : Summary of the Common Causes and Management of Conjunctivitis

Type	Age and Background of Patient	Corneal Ulcer	Acute Iritis	Acute Glaucoma
Bacterial	All ages	Muco-purulent	1-2 weeks	Antibiotics eye drops
Viral	All ages	Watery	1-8 weeks	Symptomatic only
Trachoma Allergic (Vernal)	All ages, but associated with dirty, dry, dusty and poor environment	Slightly muco-purulent	1 month -1 year +	Tetracycline eye ointment Azithromycin tablets
	Children and adolescent	Stringy mucus	Chronic, intermittent	Mast cell stabilizing agents e.g. sodium cromoglycate 2%

TRACHOMA

It is a chronic keratoconjunctivitis which primarily affects the superior and inferior tarsal conjunctiva and cornea. It is a disease of poor hygiene and poverty. If not treated it will lead to blindness.

WHO Grading of Trachoma

1. TF at least five follicles in the upper tarsal conjunctiva. Indicates active disease and need for treatment
2. TI intense inflammation. Need for urgent treatment
3. TS - scarring stage. Old infection, now inactive
4. TT trachoma trichiasis. Need surgical treatment
5. CO - corneal opacities. Visual loss from previous infection

CAUSE

- *Chlamydia trachomatis*

SYMPTOMS

- Red eye
- Eye discharge
- Decreased vision

SIGNS

- Irritable red eye
- Mucopurulent discharge
- Follicles in the upper tarsal conjunctiva
- Conjunctival scarring
- Ectropion (in-turning of eye lids)

- Trichiasis (rubbing of eyelashes on cornea)
- Corneal opacities in older children and adults
- Decreased visual acuity

INVESTIGATIONS

- Nil

TREATMENT

Treatment objectives

- To identify infection early
- To prevent complications

Non-pharmacological treatment

- Regular washing of face
- Good water and sanitation
- Surgical correction of in-turning of eye lashes

Pharmacological treatment

(Evidence rating: A)

- 1% Tetracycline eye ointment
To be applied 6-12 hourly for 6 weeks
- Azithromycin, oral,

Adults

1g as a single dose

Children - above 6 months of age

10 mg/kg as a single dose

REFER

Refer patients with WHO stage 2 and above to the eye specialist.

156. GLAUCOMA

Glaucoma is the second leading cause of preventable blindness in the world. It occurs when the intraocular pressure (IOP) exceeds the ability of the affected eye to tolerate it. The higher the IOP the greater the risk of loss of vision. Glaucoma may produce severe loss of vision and blindness without prior warning symptoms and must therefore be screened for in all adults beyond the age of 40 years, especially those with a positive family history.

There are various types of glaucoma but the commonest in Ghana is Primary Open Angle Glaucoma (POAG).

CAUSES

- Blockage of drainage of aqueous from the anterior chamber

SYMPTOMS

- Gradual loss of vision

SIGNS

- Rise in intra ocular pressure
- Atrophy and cupping of the optic nerve head (optic disc)
- Loss of vision (visual field defect)

INVESTIGATIONS

- Measurement of Intraocular pressure

TREATMENT**Treatment objectives**

- To normalise intraocular pressure
- To prevent deterioration of vision
- To prevent progression of the disease

Non-pharmacological treatment

- Surgery-trabeculectomy or laser treatment

Pharmacological treatment

- Timolol 0.5%, eye drops,
12 hourly

Or

Levobunolol 0.5%, eye drops,
12 hourly

Or

Pilocarpine 1-4%, eye drops,
6 hourly

- Acetazolamide, oral,
250 mg 12 hourly
- Latanoprost, eye drops, 50 microgram/ml
Once daily at night

Or

Bimatoprost, eye drops, 300 microgram/ml

**Note**

It is important to note that treatment for glaucoma is life-long.

REFER

Refer all suspected cases of glaucoma to the ophthalmologist for assessment and initial treatment.

157. CATARACT

It is the opacity of the crystalline lens of the eye. It is the leading cause of blindness worldwide.

CAUSES

- Old age
- Trauma to the eye
- Inflammation within the eye
- Metabolic conditions especially diabetes mellitus
- Congenital

SYMPTOMS

- Disturbance of vision
- Haloes around light especially at night during driving
- Double vision

SIGNS

- Lens opacity
- Reduced visual acuity

INVESTIGATIONS

- Fasting blood sugar
- FBC

TREATMENT**Treatment objectives**

- To improve vision

Non-pharmacological treatment

- Use of spectacles
- Surgical removal of cataract

Pharmacological treatment

- Nil

REFER

Refer all cases to the eye specialist.

158. STRIDOR

Stridor is a characteristic noise in the inspiratory phase of breathing. This occurs when there is an obstruction of the upper airway from the nasopharynx down to the trachea and main bronchi.

CAUSES

- Inflammatory obstruction
 - Viral or bacterial infection (infectious croup)
 - Inhalation of hot fumes (as in fire outbreaks)
 - Angioneurotic oedema
- Retropharyngeal abscess
- Inhalation of a foreign body
- Congenital malformation of the larynx e.g. laryngomalacia

The most common cause of stridor is infectious croup which is a very common ailment in infants and preschool child (3 months-5 years). The two main types of stridor are subglottitis (viral croup or laryngotracheobronchitis (LTB)) and acute epiglottitis.

SUBGLOTTITIS (VIRAL CROUP OR LARYNGOTRACHEOBRONCHITIS)

The obstruction is usually in the subglottic area but may involve the trachea and the bronchi. This is a viral illness and the preceding illness is like common cold. Measles may be complicated by LTB

SYMPTOMS

- Low grade fever
- Hoarse voice
- Barking cough
- Breathing difficulty
- Restlessness

SIGNS

- Stridor
- Low grade fever
- Restless apprehensive child when obstruction is severe
- Hoarse voice with troublesome barking cough
- Laboured breathing e.g. suprasternal, supraclavicular, substernal and intercostals retractions
- Tachypnoea
- Cyanosis in severe obstruction
- Reddened throat

INVESTIGATIONS

- Sputum culture-to confirm organism
- Lateral soft tissue x ray of neck to exclude foreign body in the air way.
- Chest X-ray

TREATMENT

Treatment objectives

- To avoid aggravation of the obstruction with thick or crusted secretions by ensuring good hydration
- To ensure early and timely relief of obstruction

Non-pharmacological treatment

- Admit all but the mildest cases for close monitoring of respiratory rate, pulse and temperature
- Nurse in humidified environment
- Offer oral fluids liberally
- Give parenteral fluids to very sick patients who cannot drink
- Give humidified oxygen to restless and distressed children
- Reduce procedures to the essential minimum to ensure maximum rest for the child
- Establish the airway by intubation or tracheostomy in severe obstruction

Pharmacological treatment

(Evidence rating: C)

In severe obstruction

- Hydrocortisone, IV,
Children
4mg/kg 6 hourly for 2-3 days



Note

Steroids are most useful when given within 6 hours of onset of symptoms.
Antibiotics should be given in suspected secondary bacterial infection
Cough syrups containing opiates and atropine are contraindicated

In superimposed bacterial infection

- Cloxacillin, IV,

5-12 years;	250 mg 6 hourly for 7 days
1-5 years;	125 mg 6 hourly for 7 days
< 1 year;	62.5 mg 6 hourly for 7 days
- Plus
- Gentamicin, IV,

1-12 years;	2.5 mg/kg 8 hourly for 7 days
> 1 year;	2.5 mg/kg 12 hourly for 7 days

Plus

- Metronidazole, IV,
7.5 mg/kg 8 hourly for 7 days

Alternative treatment

- Cefuroxime, IV,
20 mg/kg 8 hourly

Plus

Metronidazole, IV,
7.5 mg/kg 8 hourly for 7 days

REFER

Refer cases with severe obstruction and complications to a Paediatrician.

ACUTE EPIGLOTTITIS

This is an acute and life threatening infection in which the epiglottis and surrounding tissue become acutely inflamed and oedematous causing severe obstruction of the upper airways. The disease tends to run an extremely rapid course (4-6 hours) to respiratory failure and death.

It is more common in children, however, the incidence has reduced due to the current immunisation schedule with the pentavalent vaccine.

CAUSES

- *Haemophilus influenzae* type B
- *Streptococcus pyogenes* and *S pneumoniae*
- *Staphylococcus aureus*

SYMPTOMS

- Sudden onset of high fever
- No preceding common cold
- Drooling of saliva due to severe sore throat and dysphagia
- Breathing difficulty

SIGNS

- Extremely ill and toxic child
- Fever
- Head is held forward to extend the neck
- Breathing difficulty with suprasternal, supraclavicular, substernal retractions
- Weak voice (not hoarse)
- Reduced air entry on auscultation
- Stridor
- Cyanosis in very sick children
- Swollen and reddened epiglottis

**Note**

Examination of the throat (must be done only in the presence of a doctor capable and ready to intubate) would show markedly swollen and reddened epiglottitis.

INVESTIGATIONS

- FBC
- Blood culture
- Lateral soft tissue X-ray of the neck

TREATMENT**Treatment objectives**

- To treat bacteraemia
- To relieve obstruction as soon as possible

Non-pharmacological treatment

- Admit all children with suspected acute epiglottitis to hospital for close observation
- Alert anaesthetist/ENT specialist to assist with the establishment of airway if necessary

Pharmacological treatment**(Evidence rating: B)**

- Cefuroxime, IV,

Adults

750 mg-1.5 g 8 hourly

Children

25 mg/kg 8 hourly

Plus

- Metronidazole, IV,

Adults

500 mg 8 hourly for 72 hours

Children

7.5 mg/kg 8 hourly for 7 days

Alternative treatment

- Cefotaxime, IV,
50 mg/kg 8 hourly for 72 hours

Or

Co-amoxiclav, IV,

Adults

1.2 g 8 hourly, increased to 1.2g 6 hourly in more serious infections

Children

12-18 years;

1.2g 8 hourly, increased to 1.2g 6 hourly
in more serious infections

3 months-12 years;

30 mg/kg 8 hourly, increased to 30 mg/kg
6 hourly in more serious infections

1-3 months;	30 mg/kg 8 hourly
<u>Neonates</u>	
7-28 days;	30 mg/kg 8 hourly
Preterm and < 7 days;	30 mg/kg 12 hourly



Note

Treatment should be changed to oral antibiotics when appropriate and continued for a total of 7 days.

REFER

Refer all patients immediately if there is no expertise available for intubation or tracheostomy

159. RETROPHARYNGEAL ABSCESS

This refers to collection of pus in the retropharyngeal space.

CAUSES

- Suppuration of retropharyngeal lymph nodes following severe Bacterial infection of nasopharynx
- Rarely osteomyelitis of cervical vertebrae from **tuberculosis**
- Group A -haemolytic Streptococcus and *Staphylococcus aureus* are the common pathogens.

SYMPTOMS

- High fever
- Sore throat
- Difficulty in swallowing
- Hyperextension of neck
- Laboured and noisy breathing

SIGNS

- Hyperpyrexia
- Laboured respiration with intercostal retractions
- Stridor
- Bulge in the posterior pharyngeal wall
- Reddened throat, large and inflamed tonsils

INVESTIGATIONS

- Lateral soft tissue X-ray of neck
- Chest X-ray to exclude tuberculosis

TREATMENT**Treatment objectives**

- To treat infection
- To relieve the obstruction by draining the abscess
- To relieve pain

Non-pharmacological treatment

- Incision and drainage of pus under general anaesthesia

Pharmacological treatment**(Evidence rating: C)**

- Paracetamol, oral,

Adults

500 mg-1g 4-6 hourly

Children

6-12 years;

250-500 mg 4-6 hourly

1-5 years;

120-250 mg 4-6 hourly

3 months-1 year;

60-120 mg 4-6 hourly

- Cefuroxime, IV,

Adults

750mg-1.5g 8 hourly 72 hours

Children

25mg/kg 8 hourly 72 hours

Plus

- Metronidazole, IV,

Adults

500mg 8 hourly for 72 hours

Children

7.5 mg/kg 8 hourly for 72 hours

Followed by

- Cefuroxime, oral,

Adults

500 mg 12 hourly for 7 days

Children

12-18 years;

250 mg 12 hourly for 7 days

2-12 years;

15 mg/kg (maximum 250 mg)

12 hourly for 7 days

3 months-2 years;

10 mg/kg (maximum 125 mg)

12 hourly for 7 days

Plus

- Metronidazole, oral,
Adults
400 mg 8 hourly for 7 days
Children
7.5 mg/kg 8 hourly for 7 days

REFER

Refer to ENT specialist for incision and drainage.

160. PHARYNGITIS AND TONSILLITIS

This is an infection of the throat and tonsils. Most sore throats are due to viral infections and should NOT be treated with antibiotics as they subside within 35 days. However, it is important to diagnose streptococcal pharyngitis since it may give rise to abscesses in the throat (retropharyngeal and peritonsillar abscess) as well as complications that involve organs like the kidneys and the heart. Streptococcal throat infections require treatment with antibiotics in order to reduce the complications noted above.

CAUSES

- Viruses
- Hemolytic streptococcus
- Other gram positive bacteria

SYMPTOMS

- Fever
- Difficulty in swallowing
- Sore throat
- Running nose or cough

SIGNS

- Reddened throat
- Enlarged and reddened tonsils
- Palpable tonsillar lymph glands (at the angle of the mandible)
- Signs specific to streptococcal pharyngitis are:
 - Painful enlarged tonsillar lymph glands
 - Absence of signs suggesting viral nasopharyngitis (running nose, cough, red eyes)
 - Whitish exudate at the back of the throat as well as whitish tonsillar exudate
 - Sustained high grade fever
 - Occasionally, the rash of scarlet fever

INVESTIGATIONS

- FBC to exclude leukaemia
- Monospot test to exclude glandular fever
- Throat swab for culture and sensitivity

TREATMENT**Treatment objectives**

- To relieve symptoms
- To recognise streptococcal throat infection and treat accordingly
- To relieve pain

Non-pharmacological treatment

- Use warm, salty water gargles

Pharmacological treatment**(Evidence rating: A)**

- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;

250-500 mg 6-8 hourly

1-5 years;

120-250 mg 6-8 hourly

3 months-1 year;

60-120 mg 6-8 hourly

Or

Ibuprofen, oral,

Adults

200-400 mg 8 hourly

Children

100-200 mg 8 hourly

In patients with streptococcal pharyngitis and tonsillitis,

- Amoxicillin (Amoxycillin), oral,

Adults

500 mg 6 hourly for 10 days

Children

6-12 years;

250 mg 6 hourly for 10 days

1-5 years;

125 mg 6 hourly for 10 days

< 1 year;

62.5 mg 6 hourly for 10 days

Or

- Crystalline Penicillin, IV,

Adults and children above 12 years

2 MU 6 hourly

Children 1-12 years $\frac{1}{24}$ MU/kg (25 mg/kg) 6 hourly**Or**Co-amoxiclav, IV,
30 mg/kg**Or**

Co-amoxiclav, oral,

Adults

1 gram 12 hourly for 7 days

Children

> 12 years;

One 500/125 strength tablet, 8 hourly
5 ml of 250/62 suspension 8 hourly; dose
doubled in severe infection, **Or** 5 ml of
400/57 suspension 12 hourly

6-12 years;

1-6 years;

5 ml of 125/31 suspension 8 hourly; dose
doubled in severe infection, **Or** 2.5 ml of
400/57 suspension 12 hourly

1 month-1 year;

0.25 ml/kg of 125/31 suspension
8 hourly; dose doubled in severe
infection

Neonate;

0.25 ml/kg of 125/31 suspension 8 hourly

**Note**

Do not give Co-trimoxazole for acute streptococcal throat infections.

If patient is allergic to penicillin, use

- Erythromycin, oral,

Adults

500 mg 6 hourly for 10 days

Children

2-8 years;

250 mg 6 hourly for 10 days

0-2 years;

125 mg 6 hourly for 10 days

Or

Azithromycin, oral,

Adults

500 mg daily for 3 days

Children

10 mg/kg daily for 3 days

REFER

Refer patients with recurrent tonsillitis, retropharyngeal and peritonsillar abscess to an ENT specialist.

161. ACUTE SINUSITIS

This is an infection of the air spaces in the bones of the head which are connected to the nose, so that infections in the nose e.g. colds, catarrh can spread to these spaces. This infection does not occur in children less than 6 years because their air spaces are not well developed.

CAUSES

- Acute infective rhinitis (common cold)
- Swimming in dirty waters
- Dental infection or dental extraction
- Fractures involving the sinuses
- Nasal obstruction from polyps
- Allergic rhinitis

SYMPTOMS

- Cough
- Nasal congestion
- Pressure in the face and head
- Frontal headaches
- Postnasal drip

SIGNS

- Yellow or green thick nasal discharge, which may be foul smelling
- Pain and tenderness
- Halitosis
- Persistent fever
- Pain above and below the eyes, when patient bends over or when these areas are tapped lightly.

INVESTIGATIONS

- FBC
- X-ray of paranasal sinuses (will reveal opacification or airfluid in the affected paranasal sinuses)

TREATMENT

Treatment objectives

- To reduce symptoms of pain and fever
- To treat infection
- To encourage drainage of sinuses

Non-pharmacological treatment

- Drink a lot of water
- Steam inhalation may be effective in promoting drainage of the blocked sinus
- If dental focus of infection is present, extract tooth under antibiotic cover

Pharmacological treatment**(Evidence rating: B)**

- Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 10 days

Children

6-12 years;

250 mg 8 hourly for 10 days

1-5 years;

125 mg 8 hourly for 10 days

< 1 year;

62.5 mg 8 hourly for 10 days

- Co-amoxiclav, oral,

Adults

625 mg 12 hourly for 7 days

Children

>12 years;

One 500/125 tablet 12 hourly for 10 days

6 -12 years;

5 ml of 400/57 suspension 12 hourly for 10 days

1-6 years;

2.5 ml of 400/57 suspension 12 hourly for 10 days

1 month-1 year;

0.25 ml/kg of 125/31 suspension 8 hourly for 10 days

Neonates;

0.25 ml/kg of 125/31 suspension 8 hourly for 10 days

Double the dose in severe infections

For patients with penicillin allergy,

- Erythromycin, oral,

Adults

500 mg 6 hourly for 10 days

Children

20-50 mg/kg 6 hourly for 10 days

Or

Azithromycin, oral,

Adults

500 mg daily for 3 days

Children

10 mg/kg daily for 3 days

- Paracetamol, oral, (to relieve pain if present)

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;	250-500 mg 6-8 hourly
1-5 years;	120-250 mg 6-8 hourly
3 months-1year;	60-120 mg 6-8 hourly

REFER

Refer all complicated cases of sinusitis to the ENT specialist.

162. ACUTE OTITIS MEDIA

This is an infection of the middle ear, which communicates with the throat. Therefore it may, especially in children, follow a common cold or a sore-throat or measles infection. It is important in a febrile child to look for it and treat it. Untreated or poorly managed cases may lead to complications such as mastoiditis, chronic otitis media, deafness, meningitis and brain abscess.

Viral infections resulting in common cold (Rhinitis), sinusitis, pharyngitis and tonsillitis, influenza infections and nasopharyngitis are precursors to bacterial infections.

CAUSES

- *Haemophilus influenza*
- *Haemolytic streptococcus*
- *Streptococcus pneumonia*
- *Staphylococcus aureus*

SYMPTOMS

- Fever
- Sudden and persistent ear ache
- Purulent discharge from the ear
- Vomiting
- Diarrhoea
- Crying and agitation
- Impaired hearing

SIGNS

- Red eardrum
- Discharging ear
- Pain on touching the ear

- Occasionally inflamed throat
- Perforated eardrum

INVESTIGATIONS

- FBC
- Ear swab for culture and sensitivity

TREATMENT

Treatment objectives

- To relieve symptoms
- To ensure prompt and adequate antibiotic therapy
- To prevent chronicity and other complications

Non-pharmacological treatment

- Drink lots of fluid
- Continue to feed the child
- Surgical repair / drainage of ear drum
- Wicking the ear to prevent re-infection

Pharmacological treatment

(Evidence rating: B)

- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;

250-500 mg 6-8 hourly

1-5 years;

120-250 mg 6-8 hourly

3 months-1 year;

60-120 mg 6-8 hourly

- Amoxicillin, oral,

Adults

500 mg 8 hourly for 10 days

Children

6-12 years;

250 mg 8 hourly for 10 days

1-5 years;

125 mg 8 hourly for 10 days

< 1 year;

62.5 mg 8 hourly for 10 days

Or

Co-amoxiclav, oral,

Adults

625 mg 12 hourly for 7 days

Children

>12 years;

One 500/125 tablet 12 hourly for 10 days

6 -12 years;	5 ml of 400/57 suspension 12 hourly for 10 days
1-6 years;	2.5 ml of 400/57 suspension 12 hourly for 10 days
1 month-1 year;	0.25 ml/kg of 125/31 suspension 8 hourly for 10 days
Neonates;	0.25 ml/kg of 125/31 suspension 8 hourly for 10 days

Double the dose in severe infections

If allergic to Penicillin,

- Erythromycin, oral,

Adults

250 mg 6 hourly for 10 days

Children

2-8 years; 250 mg 6 hourly for 10 days

Up to 2 years; 125 mg 6 hourly for 10 days

Or

Co-trimoxazole, oral,

Adults

960 mg 12 hourly for 7 days

Children

6-12 years; 480 mg 12 hourly for 7 days

6 months-5 years; 240 mg 12 hourly for 7 days

6 weeks-5 months; 120 mg 12 hourly for 7 days



Note

Re-assess after 5 days. If pain is still severe or pus discharge still present, repeat otoscopy, send swab of discharge for bacteriological examination and change to alternative antibiotic therapy.

Alternative treatment

- Cefuroxime, oral,

Adults

250 mg 12 hourly for 5 days

Children

125 mg 12 hourly for 5 days

Or

Azithromycin, oral,

Adults

500 mg once daily for 3 days

Children

10 mg/kg once daily for 3 days

REFER

Refer patient to ENT specialist if there is no response after 10 days of treatment.

163. CHRONIC OTITIS MEDIA

This is a chronic infection of the middle ear with perforation of the tympanic membrane and pus discharging from the ear for more than 2 weeks. There is usually no fever and pain. Acute re-infection associated with fever and pain is usually related to an obstruction to drainage through the perforated drum with secondary infection by streptococci, pneumococci or gram negative organisms,

A chronically draining ear can only heal if it is dry. Drying the ear is time-consuming for both the health worker and the mother but it is the only effective measure.

CAUSES

- Complication of acute otitis media
- Secondary Bacterial infections
 - pseudomonas aeruginosa,
 - proteus vulgaris
 - pneumococci

SYMPTOMS

- Chronic ear discharge (otorrhoea)
- Hearing loss

INVESTIGATIONS

- Ear swab for culture and sensitivity

TREATMENT**Treatment objectives**

- To keep the ear dry
- To treat any acute exacerbations

**Note**

Do not prescribe antibiotics if the eardrum has been ruptured for more than 2 weeks as secondary infection with multiple organisms, usually occurs. This makes oral antibiotic therapy much less effective.

Non-pharmacological treatment

- Frequent wicking to keep ear dry at least 4 times a day
 - Roll a piece of clean absorbent gauze into a wick and insert carefully into the child's ear. Leave for one minute then remove and replace with a clean wick.
 - If bleeding occurs, drying the ear should be stopped temporarily.
 - Nothing should be left in the ear between wicking.
 - Avoid swimming or getting the inside of the ear wet.
- Re-assess weekly to ensure that the mother is drying the ear correctly
- Check for mastoiditis.

Pharmacological treatment**(Evidence rating: C)**

- If acute re-infection occurs give treatment as for acute otitis media

REFER

Refer all chronically discharging ears to the ENT Specialist.

164. EPISTAXIS

This is a symptom which refers to bleeding from the nose.

CAUSES

- Picking of the nose, especially when there is an upper respiratory tract infection
- Trauma
- Nasopharyngeal neoplasms
- Hypertension
- Bleeding disorders
- Atrophic rhinitis

INVESTIGATIONS

- FBC
- Sickling
- Coagulation screen

**Note**

If the epistaxis is due to nose-picking or nasal infection then investigations are not necessary.

TREATMENT

Treatment objective

- To stop epistaxis
- To prevent recurrence
- To detect shock and replace blood if necessary

Non-pharmacological treatment

- Sit patient up and flex head to prevent blood running down throat
- Pinch soft side of nose for 10 minutes (patient must breathe through mouth)
- Apply ice-pack to nose

Pharmacological treatment

(Evidence rating: C)

- Adrenaline on cotton wool, topical, (as nose pack)
1:1000 solutions
If bleeding persists, the anterior nares should be packed with;
- Sterile liquid paraffin on ribbon gauze, (as nose pack)

REFER

Refer patients with recurrent or severe epistaxis, epistaxis which cannot be arrested and epistaxis suspected to be due to causes other than nose picking or nasal infection to the ENT specialist.

165. GINGIVITIS AND STOMATITIS

These are inflammatory conditions involving the gums and mucosa of the oral cavity.

CAUSES

- Bacterial, from poor oral hygiene
- Viral e.g. herpes simplex, measles
- Vitamin deficiency
- Chemicals
- Allergic reaction

SYMPTOMS

- Sore mouth
- Bleeding gums especially after brushing
- Pain while swallowing
- Cracks at the corners of the mouth
- Poor appetite
- Nausea

SIGNS

- Hyperaemic buccal mucosa and gums
- There may be ulcers present

INVESTIGATIONS

- FBC
- Mouth swab

TREATMENT

Treatment objectives

- To relieve pain and inflammation

Non-pharmacological treatment

- Clean the mouth with gauze soaked in saline especially after eating
- Frequent mouth rinse with saline especially after each meal
- Advise the patient or the mother of the child on a good diet, keep good oral hygiene by brushing teeth at least twice daily.

If calculus already present, refer to a dental hygienist for scaling and polishing of the teeth.

Pharmacological treatment

(Evidence rating: C)

If the ulcers look infected

- Amoxicillin, oral,

Adults

500 mg 8 hourly for 5 days;

Children

6-12 years;

250 mg 8 hourly for 5 days

1-5 years;

125 mg 8 hourly for 5 days

< 1 year;

62.5 mg 8 hourly for 5 days

And

Metronidazole, oral,

Adults

400 mg 8 hourly for 5 days

Children

7-10 years;

200 mg 8 hourly for 5 days

3-7 years;

100 mg 8 hourly for 5 days

1-3 years;

50 mg 8 hourly for 5 days

Or

Co-amoxiclav, oral,

Adults

625 mg 12 hourly for 7 days

Children

>12 years;

One 500/125 tablet 12 hourly for 7 days

6-12 years;

5 ml of 400/57 suspension 12 hourly
for 7 days

1-6 years;

2.5 ml of 400/57 suspension 12 hourly
for 7 days

1 month-1 year;

0.25 ml/kg of 125/31 suspension
8 hourly for 7 days

Neonates;

0.25 ml/kg of 125/31 suspension
8 hourly for 7 days

REFER

Refer extensive and ulcerative gingivitis to a dental specialist.

166. DENTAL CARIES

In otherwise healthy individuals, dental caries i.e. holes occurring in any tooth are entirely preventable.

CAUSES

- Poor oral /dental hygiene

SYMPTOMS

- Usually asymptomatic
- Toothache precipitated by hot, cold or sweet foods or drinks
 - Pain may be intermittent or severe, sharp and constant if the nerve endings are exposed

SIGNS

- A hole or black spot may be visible on any surface of a tooth
- Tenderness on percussion of the affected tooth

TREATMENT**Treatment objectives**

- To relieve pain
- To fill cavities
- To educate on good dental hygiene

Non-pharmacological treatment

- Regular dental reviews
- Regular cleaning of teeth especially after eating

Pharmacological treatment**(Evidence rating: C)**

- Paracetamol, oral,

Adults

500 mg-1 g 6-8hourly

Children

6-12 years;

250-500 mg 6-8hourly

1-5 years;

120-250 mg 6-8hourly

3 months-1 year;

60-120 mg 6-8hourly

Or

Ibuprofen, oral,

Adults

200-400 mg 8 hourly

Children

100-200 mg 8 hourly

REFER

Refer patient to a dentist for definitive treatment.

167. DENTAL ABSCESS

In this condition there is a collection of pus around the affected tooth, which may spread into the surrounding tissue.

CAUSES

- Poor oral and dental hygiene
- Dental caries

SYMPTOMS

- Fever
- Feeling unwell
- A constant throbbing pain in the affected tooth

SIGNS

- Fever
- A swelling of the gum around the affected tooth leading to facial swelling
- Pus may be seen discharging from the gum around the affected tooth

INVESTIGATION

- X-ray of affected tooth
- FBC
- Fasting blood sugar

TREATMENT

Treatment objectives

- To relieve pain
- To treat infection

Non-pharmacological treatment

- Frequent mouth rinse with saline or antiseptic mouthwash

Pharmacological treatment

(Evidence rating: C)

- Paracetamol, oral,
Adults
 500 mg-1 g 6-8 hourly

Children

6-12 years;

1-5 years;

3 months-1 year;

250-500 mg 6-8 hourly

120-250 mg 6-8 hourly

60-120 mg 6-8 hourly

Or

Ibuprofen, oral,

Adults

200-400 mg 8 hourly

Children

100-200 mg 8 hourly

- Amoxicillin, oral,

Adults

500 mg 8 hourly for 7 days

Children:

6-12 years;

250 mg 8 hourly for 7 days

1-5 years;

125 mg 8 hourly for 7 days

<1 year;

62.5 mg 8 hourly for 7 days

Plus

- Metronidazole, oral,

Adults

400 mg 8 hourly for 7 days

Children

100-200 mg 8 hourly for 7 days

Alternative treatment

- Clindamycin, oral,

Adults

150-300 mg 6-8 hourly for 7 days

Children

3-6m g/kg 6 hourly for 7 days

REFER

Refer immediately to a dental surgeon after initiation of treatment.

168. ORAL THRUSH (CANDIDIASIS)

It mainly affects the very young, the very old or those whose immunity is impaired. It occurs more frequently in HIV/AIDS patients, the malnourished, diabetics, patients on long term antibiotics and corticosteroids.

CAUSE

- *Candida albicans*

SYMPTOMS

- White patches in the mouth
- Burning sensation in the mouth.

- Difficulties in swallowing
- Breast fed babies may refuse to suck

SIGNS

- White patches in the mouth

INVESTIGATIONS

- FBC
- Fasting blood glucose
- HIV status if indicated

TREATMENT

Treatment objectives

- To eradicate infection
- To identify and treat any underlying condition

Non-pharmacological treatment

- Oral hygiene and toileting

Pharmacological treatment

(Evidence rating: B)

- Nystatin, oral, (as a suspension)

Adults

100,000 units 6 hourly after food for 14 days

Children

100,000 units 6 hourly after each feed for at least 10 days

Make sure it is spread well in the mouth.

Alternative treatment

- Miconazole, oral, (as a gel)

Adults and Children

2.5ml smeared on the oral mucosa

REFER

Refer if there is suspicion of an underlying illness e.g. Diabetes, immunosuppression.

169. LOW BACK PAIN

Low back pain is a common presenting complaint especially among the elderly. It may be a mild, transient symptom or chronic and disabling complaint.

There are many causes of low back pain several of which can be determined with reasonable accuracy from a good clinical history and physical examination. In some patients however, no cause will be found and these people are described as having non-specific back pain. Acute ligamentous (sprain) lesions and muscular strain are usually self-limiting.

Whereas most back pain may not represent serious problems, clinical features that may suggest that the back pain may be serious include, recent onset, weight loss, anaemia, localized pain in the dorsal spine, fever and symptoms elsewhere e.g. chronic cough.

Some back pain may be psychogenic. In such cases management is by reassurance and treatment of depression if appropriate. Mild analgesics may be prescribed however, addictive medications e.g. narcotic analgesics must be avoided. Physical therapy may be helpful.

CAUSES

- Acute ligamentous (sprain) lesions
- Muscular strain
- Chronic osteoarthritis
- Back strain due to poor posture worsened by mechanical factors like overuse, obesity and pregnancy.
- A protruding or ruptured intervertebral disk
- Traumatic ligament rupture or muscle tear
- Fracture
- Infection (e.g. tuberculosis or septic discitis)
- Malignancy e.g. metastases, multiple myeloma or spinal tumour, prostatic carcinoma
- Congenital abnormalities e.g. abnormal intervertebral facets, sacralization of L-5 transverse process
- Spondylolisthesis - i.e. Slipping forward of a vertebra upon the one below
- Narrowed spinal canal from spinal stenosis
- Psychogenic pain: The back is a common site of psychogenic pain. Inconsistent historical and physical findings on sequential examination may make one suspicious of this diagnosis
- Fibromyalgia, connective tissue diseases

SYMPTOMS

- Back pain

Table 22-1 : Points of Distinction between Inflammatory and Mechanical Back Pain

	Inflammatory	Mechanical
ONSET	Gradual	Sudden
WORST PAIN	In the morning	In the evening
MORNING STIFFNESS	Present	Absent
EFFECT OF EXERCISE	Relieves pain	Aggravates pain

SIGNS

- Pallor
- Localized pain in the dorsal spine

INVESTIGATIONS

- FBC, Sickling
- ESR
- Plain spine X-rays

TREATMENT**Treatment objectives**

- To relieve pain
- To relieve muscle spasm if present
- To identify underlying cause and manage appropriately

Non-pharmacological treatmentAcute back pain

- Bed rest on a firm mattress, in a comfortable position with hips and knees flexed to relieve muscle spasm
- Local heat and massage
- Weight reduction in the obese

Chronic back pain

- Weight reduction in the obese
- Improve muscle tone and strength through physiotherapy
- Improve posture
- Surgical procedures depending on the cause e.g. in disc disease or spinal stenosis

Pharmacological treatment**(Evidence rating: B)**For mild pain

- Ibuprofen, oral, 400 mg 8 hourly

For severe pain

- Diclofenac, IM, 75 mg 12 hourly by deep IM injection

Or

Diclofenac slow release, oral, 75mg 12 hourly

Or

Diclofenac, rectal or orally, 50 mg 8 hourly

Chronic pain

Analgesics are given for pain as above. Avoid narcotic analgesics.

REFER

Refer patients not responding to initial treatment or who have systemic symptoms to an orthopaedic specialist.

170. OSTEOARTHRITIS

This is a degenerative joint disease that damages the articular cartilage leading to reactive new bone formation. Weight bearing joints (hips, knees), cervical and lumbar spine and the metacarpo-phalangeal and distal-interphalangeal joints of the hands are commonly affected. Osteoarthritis is more common in females than males.

CAUSES

- Ageing
- Trauma
- Obesity

SYMPTOMS

- Pain at initiation of exercise (walking)
- Morning stiffness which improves with exercise
- Diminution of joint movement

SIGNS

- Crepitus on moving affected joint(s)
- Heberden's nodes and deformed joints in the hands
- Joint swelling, warmth and effusions (knee especially)

- Osteoarthritis of cervical and lumbar spine may lead to muscle weakness in hands and legs respectively (myelopathy)

INVESTIGATIONS

- FBC
- ESR - mildly elevated
- X-ray of affected joints - narrowing and irregularity of the joint space

TREATMENT

Treatment objectives

- To relieve pain
- To prevent and manage deformities
- To educate patient

Non-pharmacological treatment

- Encourage weight reduction if obese or over weight
- Increase physical activity, specific exercise, physiotherapy
- Weight supports (crutches, walking sticks or frames)

Pharmacological treatment

(Evidence rating: C)

- Ibuprofen, oral,
200-400 mg 8 hourly

Or

Diclofenac sustained-release/retard, oral,
75 mg 12 hourly

Or

Diclofenac suppository,
100 mg 12 hourly



Note

Topical NSAID therapy e.g. Diclofenac gel gives relief when used in the short term. It is best used for short periods (2-3 weeks) during flare-ups in the disease. Long term use of oral NSAIDs e.g. Ibuprofen and Diclofenac increases the risk of peptic ulcer disease.

A proton pump inhibitor e.g. omeprazole or H₂-blocker e.g. ranitidine, should be given if treatment is going to exceed 2 weeks.

A proton pump inhibitor e.g. omeprazole or H₂-blocker e.g. ranitidine, should be given if treatment is going to exceed 2 weeks.

Patients with heart failure and chronic kidney disease should not be given NSAID's. Instead, they should have alternatives such as paracetamol 1g 8 hourly or tramadol 50 mg 8 hourly.

- Omeprazole, oral,
20 mg at night daily
- Or**
- Ranitidine, oral,
300 mg at night daily

REFER

Refer severe cases to an orthopaedic specialist for long term management. Also refer other complications such as lumbar spinal stenosis, cervical spondylosis and nerve compression for specialist management.

171. RHEUMATOID ARTHRITIS

This is a chronic systemic autoimmune inflammatory disease characterised mainly by symmetrical inflammation of the synovial tissue of joints resulting in destruction of the joints and peri-articular tissues. It occurs more commonly in young and middle-aged women. The symptoms fluctuate widely with periods of remission and exacerbation. Other organs such as the lungs, kidneys, eyes and the haematopoietic system may occasionally be affected.

Rheumatoid Arthritis should be treated as early as possible with disease modifying anti-rheumatic drugs (DMARDs) to control symptoms and delay disease progression.

CAUSES

- Autoimmune disease

SYMPTOMS

- Pain and swelling in small joints of the hands and wrists for several weeks
- Morning joint stiffness
- Fever
- Weight loss, lethargy, depression
- Polymyalgia - systemic illness with muscle pain, minimal joint involvement and explosive overnight joint pain

SIGNS

- Spindle-shaped fingers, often symmetrical
- Limitation of small joint movement
- Joint deformities e.g. ulnar deviation at wrists, finger deformities
- Carpal tunnel syndrome
- Synovitis swelling and tenderness over joints
- Anaemia - normocytic normochromic in character
- Rheumatoid nodules
- Muscle wasting around affected joints if long standing
- Dry eyes
- Peripheral sensory neuropathy

- Depression
- Cardiac and pulmonary involvement

INVESTIGATIONS

- Rheumatoid Factor
- Antinuclear antibodies (ANA)
- FBC
- ESR
- X-ray of affected joints

TREATMENT

Treatment objectives

- To reduce pain, swelling and stiffness
- To prevent deformities
- To delay disease progression and onset of long term complications

Non-pharmacological treatment

- Rest of affected joints
- Physiotherapy

Pharmacological treatment (Evidence Level: B)

- Diclofenac, oral,
50 mg 8 hourly or as required

Or

Diclofenac sustained-release/retard, oral,
75 or 100 mg 12 hourly, or as required

Or

Diclofenac suppositories,
100 mg 12 hourly, or as required (no more than twice in a day)

REFER

Refer all suspected cases to a physician specialist for definitive management.

172. JUVENILE RHEUMATOID ARTHRITIS

Rheumatoid arthritis in children may present in one of three forms:

- Systemic onset arthritis (Still's disease)
- Polyarticular onset arthritis
- Rheumatoid factor negative
- Rheumatoid factor positive

- Pauci-articular onset arthritis

CAUSES

- Autoimmune disease

Systemic Onset Arthritis

This may occur at any age (mostly at 2-4 years old). It may also occur in young adults (early 20s).

SYMPTOMS

- Joint pain
- Malaise

SIGNS

- Swinging fever
- Rash maculo-papular, especially on the torso
- Lymphadenopathy common
- Hepato-splenomegaly may be present
- Arthritis involving multiple joints

Polyarticular Onset Arthritis

This typically involves five or more joints; usually the small joints. Rheumatoid factor is positive in older girls in whom the disease course is similar to the adult type.

Pauci-articular Onset Arthritis

Commonest type of juvenile rheumatoid arthritis (50%)

SYMPTOMS

- Joint pain

SIGNS

- Less than five joints affected
- Usually asymmetrical; large joints of lower extremities. Occasionally single joint (proximal interphalangeal joint) and swollen knee may be the only joints affected.
- There is a high tendency to develop uveitis

INVESTIGATIONS

- FBC, differential
- ESR
- Rheumatoid factor
- X-ray of affected joints

- Anti Nuclear Antibodies (ANA)- often positive in pauci-articular
- Slit lamp examination to be done every six months- for pauci-articular

TREATMENT

Treatment objectives

- To control inflammation and pain
- To prevent deformities and growth retardation
- To control extra articular complications

Non-pharmacological treatment

- Physiotherapy to maintain full joint movement
- Psychotherapy

Pharmacological treatment

(Evidence rating: A)

- Ibuprofen, oral,

Adult

400 mg 8 hourly

Children

>7kg;

10 mg / kg 6-8 hourly

Or

Diclofenac gel, topical,

Apply 12 hourly

REFER

All suspected cases should be referred to a Paediatrician.

173. SYSTEMIC LUPUS ERYTHEMATOSUS

Systemic lupus erythematosus (SLE) is a multisystem autoimmune disease of unknown aetiology. It is commoner in women and occurs at a peak age of 15-25 years.

This is a complex disease with variable presentations, progression of disease and prognosis. It is characterized by remissions and flares. Due to the systemic nature of the disease there is a need for the involvement of multiple medical specialists in the care of these patients.

CAUSES

- Autoimmune

SYMPTOMS

- Malaise, weight loss
- Fever

- Hair loss
- Joint pain

SIGNS

- Arthritis
- Anaemia
- Lymphadenopathy
- Alopecia
- Photosensitive skin eruptions (butterfly rash on the nose bridge and cheeks)
- Oedema from renal involvement
- Psychiatric manifestations

INVESTIGATIONS

- FBC
- ESR
- LE cells
- Anti DNA antibodies
- Antinuclear antibodies (ANA)
- BUE, Creatinine
- Urinalysis

TREATMENT

Treatment objective

- To relieve symptoms
- To suppress manifestations

Non-pharmacological treatment

- Adequate rest
- Avoidance of exposure to sunlight in photosensitive patients

Pharmacological treatment

(Evidence rating: C)

- Ibuprofen, oral,
400 mg 8 hourly

REFER

Refer all patients for physician specialist care.

174. ACUTE SEPTIC ARTHRITIS

This is acute inflammation of joints, usually big joints, following bacterial infection. The majority are due to non-gonococcal bacteria whereas the remaining cases may follow gonorrhoeal infection. Good prognosis depends on early initiation of appropriate antibiotic treatment which should begin immediately diagnosis is suspected while ensuring that samples are taken for appropriate investigations.

Antibiotic treatment, including initial parenteral and subsequent oral preparations, must be continued for a total of 6 weeks.

NON-GONOCOCCAL ARTHRITIS

CAUSES

- *Staphylococcus aureus* in majority of cases
- *Streptococcus pyogenes* and *Pneumococci*
- *Haemophilus influenzae* in infants
- *Salmonella* in sickle cell disease

SYMPTOMS

- Sudden onset. Large joints usually affected
- Pain
- Fever
- Restriction of movement of limbs

SIGNS

- Fever
- Joint abnormalities
 - warm to touch
 - tender
 - swollen with effusion
 - limitation of movement

INVESTIGATIONS

- FBC
- Sickling /Hb Electrophoresis
- ESR
- Aspiration of joint effusion (fluid is turbid with polymorphs) for Gram stain and culture
- Blood culture
- Urethral swab

TREATMENT**Treatment objectives**

- To relieve pain
- To treat infection
- To prevent joint damage

Non-pharmacological treatment

- Rest affected joint e.g. splinting or traction during acute phase
- Joint aspiration

Pharmacological treatment**(Evidence rating: C)**

- Cloxacillin, IV,

Adults

500 mg 6 hourly for up to 2 weeks

Children

5-12 years;

250 mg 6 hourly

1-5 years;

125 mg 6 hourly

>1 year;

62.5 mg 6 hourly

Followed by

Flucloxacillin, oral,

Adults

500 mg 6 hourly

Children

5-12 years;

250 mg 6 hourly

1-5 years;

125 mg 6 hourly

>1 year;

62.5 mg 6 hourly

Alternative treatment

- Clindamycin, IV/oral,

Adults

150-300 mg 6-8 hourly

Children

3-6 mg/kg 6 hourly

In children with sickle cell disease and suspected Salmonella infection,

Add

Ciprofloxacin, oral,

10 mg/kg 12 hourly

- Paracetamol, oral,

Adults

500 mg-1g 6-8 hourly

Children

10mg/kg 6-8 hourly

Or

Ibuprofen, oral,

Adults

400 mg 8 hourly

Children

10 mg/kg 8 hourly

REFER

Refer patients with large or loculated effusions to specialist for joint aspiration.

GONOCOCCAL ARTHRITIS

In gonococcal arthritis, joint involvement may be asymmetrical and polyarticular.

The symptoms and signs are similar to those of non-gonococcal arthritis. Additional features include rash (macular, vesicular or pustular), tenosynovitis and urethral discharge.

CAUSES

- *Neisseria gonorrhoeae*

INVESTIGATIONS

- Culture of urethral discharge, skin or genital lesions

TREATMENT**Treatment objectives**

- To relieve pain
- To treat infection
- To prevent joint damage

Non-pharmacological treatment

- Rest the affected joint e.g. by splinting or traction during the acute phase
- Joint aspiration

Pharmacological treatment**(Evidence rating: C)**

- Ciprofloxacin, oral,
Adult
500 mg 12 hourly for 14-21 days

Or

Cefotaxime, IV,

Adult

1 g 12 hourly

Children

50 - 75 mg/kg 12 hourly

Neonates

25 mg/kg 12 hourly



Note

Because of high prevalence of co-existent chlamydia infection concomitant therapy with oral doxycycline 100 mg 12 hourly should be provided for 10-14 days

REFER

Refer to appropriate specialist if not responding to treatment.

175. OSTEOMYELITIS

This is infection of bone. It is a blood-borne infection from a septic focus or following trauma.

However, direct infection of the bone may also occur in fractured bones that communicate with the exterior (i.e. compound fractures). It may be acute or chronic. It is common in children and individuals with sickle cell disease.

Pharmacological treatment with antibiotics should be by the parenteral route for two weeks followed by the oral route for 4 weeks.

CAUSES

- *Staphylococcus aureus* (commonest organism)
- E. Coli
- Proteus
- Pseudomonas
- *Haemophilus influenza* (in children)
- Streptococcus (common in sickle cell disease)
- Salmonella (common in sickle cell disease)

SYMPTOMS

- High fever, >38°C
- Pain in the affected part
- Unwillingness to move the affected part

SIGNS

- Limited voluntary movement of affected part
- Local swelling, warmth and tenderness
- Definite fluctuant abscess over a bone
- Anaemia especially in patients with sickle cell disease

INVESTIGATIONS

- FBC, ESR
- X-ray of the affected bone (may be normal initially but new bone formation in the line of the elevated periosteum is seen after 10 to 14 days of onset)
- Blood culture or pus for culture if possible

TREATMENT**Treatment objectives**

- To relieve pain
- To eradicate infection
- To prevent complications e.g. pathological fractures, chronic osteomyelitis

Non-pharmacological treatment

- Splinting of affected limb in Plaster of Paris (POP) back slab or othersuitable splint
- Tepid sponging
- Surgery where indicated

Pharmacological treatment**(Evidence rating: C)**

- IV fluids and blood transfusion if indicated
- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;	250-500 mg 6-8hourly
1-5 years;	120-250 mg 6-8hourly
3 months-1 year;	60-120 mg 6-8hourly

- Cloxacillin, IV,

Adults

250-500 mg 6 hourly

Children

6-12 years;	250-500 mg 6 hourly
-------------	---------------------

1-5 years; 125-250 mg 6 hourly
 <1 year; 62.5 mg 6 hourly

Alternative treatment

- Clindamycin, oral, IM or IV,

Adults

150-300 mg 6 hourly

Children

3-6 mg/kg 6 hourly

In sickle cell disease patients

Add

- Ciprofloxacin, IV,

Adults

200-400 mg 12 hourly

Children

5-18 years;

10 mg/kg (maximum 400 mg) 8 hourly

1 month -5 years;

4-8 mg/kg 12 hourly

Or

Ciprofloxacin, oral,

Adults

500-750 mg 12 hourly

Children

10 mg/kg 12 hourly

REFER

Refer patients with the following problems to an orthopaedic surgeon;

- Patients not responding to treatment (persistent fever and pain after 2 days)
- Fluctuant abscess that requires drainage
- Complications e.g. pathological fracture, chronic osteomyelitis

176. WOUNDS

A wound is a break in the skin, usually caused by injury. It may bleed, may be contaminated with dirt and other foreign matter and may be associated with broken bones. It may be small or large and may be deep or superficial. It may become infected and the infection may spread.

CAUSES

- Mechanical agents e.g. cuts from cutlass or knife, gunshot, accidents, burns
- Chemical agents e.g. strong acids or alkalis, other corrosive chemicals
- Wounds may follow snake or insect bites, animal or human bites

SYMPTOMS

- Local pain
- Bleeding
- Discharge of pus if infected. Pus may be offensive

SIGNS

- Local swelling and tenderness
- Look for other injuries e.g., head, chest, abdomen, bone, nerves
- Determine the physical characteristics of the wound e.g. site, size, shape and depth

INVESTIGATIONS

- Hb if patient has bled
- Group and cross-match blood if indicated
- X-ray of injured part may be required
- Wound swab for culture and sensitivity if wound is infected

TREATMENT

Treatment objectives

- To control bleeding
- To relieve pain
- To prevent or treat infection
- To protect against tetanus
- To promote wound healing

Non-pharmacological treatment

- Apply sterile pressure dressing to bleeding site and raise the injured part to control bleeding.

A tourniquet may be applied if bleeding is profuse and cannot be controlled by pressure. If a bleeding vessel can be identified, it should be ligated.

- Bleeding from a tooth socket - put a small piece of sterile gauze in the socket and ask the patient to bite on it.

Pharmacological treatment

(Evidence rating: C)

- Tetanus prophylaxis for all potentially contaminated wounds, followed by booster doses of tetanus toxoid as appropriate (see section on Immunization).
- Paracetamol, oral,
 - Adults
500 mg-1 g 6-8 hourly
 - Children

6-12 years;	250-500 mg 6-8 hourly
1-5 years;	120-250 mg 6-8 hourly
3 months-1 year;	60-120 mg 6-8 hourly
- IV fluids and blood transfusion as required.



Note

WOUND MANAGEMENT

Immediate closure of wounds is good, but this is not advisable if the wound is dirty or likely to become infected e.g. gunshot wounds, animal and human bites and wounds over 24 hours old. They should not be sewn up.

Wash hands well and wear sterile gloves. Clean the wound with antiseptic solution. Scrub dirty wounds with antiseptic solution and irrigate with dilute hydrogen peroxide and saline.

If there are bits of gravel, glass or dirt in the wound, remove them gently. Lift up all flaps of skin, clean under them, excise all dead tissue and cover the wound with sterile gauze. Anaesthesia may be required.

Do not use Eusol, which is both irritant and exposes patient to unnecessary borate levels. Dress infected wound as often as needed with normal saline or povidone iodine lotion.

Take wound swab for culture and sensitivity test if possible and start Amoxicillin (Amoxycillin) while waiting for results of wound culture

- Amoxicillin (Amoxycillin), oral,
 - Adults
500 mg 8 hourly
 - Children

6-12 years;	250 mg 8 hourly
1-5 years;	125 mg 8 hourly
1 year;	62.5 mg 8 hourly

REFER

Complicated wounds (e.g. wounds associated with fractures, division of tendons, blood vessels and nerves).

177. TETANUS

Tetanus is a disease caused by a bacterium which produces a neurotoxin responsible for the clinical features. These bacteria live predominantly in the soil, so it is easy to get this infection whenever a break in the skin is not cleaned properly. Noise, bright light, touching the body or moving part of the body will trigger muscle spasms in tetanus.

Neonatal tetanus is tetanus that affects a newborn. Infection is usually via the umbilical cord if it is not kept clean or if non-sterilised instruments or dressings are used. Cut umbilical cord with sterile instrument, clean with methylated spirit (alcohol) and leave uncovered.

To prevent tetanus in patients with potentially contaminated wounds (tetanus prone wound), provide adequate wound toileting (see section on Wounds) and also provide tetanus prophylaxis (see section on Immunization).

A tetanus-prone wound is one sustained more than 6 hours before surgical treatment or any interval after puncture injury or is contaminated by soil/manure or shows much devitalised tissue or is septic or is associated with compound fractures or contains foreign bodies

Diagnosis of tetanus is clinical, and no laboratory investigations are required. Always admit a suspected case of tetanus or neonatal tetanus

CAUSES

- *Clostridium tetani*

SYMPTOMS

- Baby cannot suck
- Constipation
- Spasms
- Stiff body

SIGNS

- Umbilicus may be infected
- Irritability
- Blue (cyanosed) tongue and lips during spasms
- Sardoniac smile (mocking smile)
- Lock jaw (cannot open the mouth)
- Opisthotonus (stiff arched back)
- Rigid abdomen

INVESTIGATIONS

- No confirmatory test

TREATMENT

Treatment objectives

- To prevent further spasms
- To eliminate *Clostridium tetani* to stop further toxin production
- To neutralising circulating toxin
- To provide adequate hydration and nutrition
- To provide supportive care till spasms cease completely

Non-pharmacological treatment

- Maintain a clear airway
- Avoid noise, bright light and unnecessary examination of the patient
- Clean the infected umbilicus or wound with soap and water or antiseptic solution (see section on **Wound management**)
- Surgical debridement of the wound

Pharmacological treatment

(Evidence rating: C)

- Benzylpenicillin, IV,

Adults

50,000 units/kg stat, then 4 MU 6 hourly for 5 days

Children

50,000 units/kg 6 hourly for 5 days

Neonates

250,000 units 6 hourly for 7 days

Plus

Gentamicin, IV,

7.5 mg 12 hourly

Alternative treatment:

- Metronidazole, IV,

Adults

500 mg 8 hourly for 7-10 days

Children

7.5 mg/kg 8 hourly for 7 to 10 day

If allergic to penicillin:

- Erythromycin, oral,

Adults

500 mg 6 hourly for 7 days

Children

8- 12 years;	250-500 mg 6 hourly for 7 days
2-8 years;	250 mg of syrup 6 hourly for 7 days
< 2 years;	125 mg of syrup 6 hourly for 7 days

Plus

- Human Tetanus Immunoglobulin, IM,

Adults and Children

150 units/kg (or 3000-6000 units), divide and inject dose into two sites

Neonates

500 units, divide and inject dose into two sites

Or

Anti-tetanus serum, IV and IM, (following a test dose 150 units)

Adults and Children

20,000 units (Half of the dose is given IV and half IM)

Neonates

5000 units (Half of the dose is given IV and half IM)

Control of spasmsAdults

- Chlorpromazine, IM, 50 mg 4-8 hourly

Plus

- Diazepam, IV or IM 10 mg 3-6 hourly when required

Or

Phenobarbital (Phenobarbitone), IM,

200 mg 8-12 hourly, gradually reduce sedation after about 2 weeks

Children

- Chlorpromazine, IM or oral (via nasogastric tube), 12.5-25 mg 8 hourly

Plus

- Phenobarbital (Phenobarbitone)-IM or oral (via nasogastric Tube), 5 mg/kg stat, then 2.5 mg/kg 12 hourly

Or

Diazepam, IV/IM/nasogastric tube/ suppository, 3-10 mg 3-6 hourly when required

Neonates

- Chlorpromazine, IM or oral (via nasogastric tube), 7.5 mg 8 hourly

Plus

Phenobarbital (Phenobarbitone), IM or oral (via nasogastric tube), 30 mg stat then 7.5 mg 12 hourly

Or

Diazepam, IV/IM or oral (via nasogastric tube), 2 mg 3-6 hourly when required

Tetanus Immunization

- Start immunization before discharge from hospital in all patients because tetanus infection does not provide immunity against future episodes
- An adult who has received a total of 5 doses of tetanus toxoid is likely to have life-long immunity
- A course of tetanus toxoid vaccinations should be given to any previously unimmunised patient older than 2 years of age. Dose: 0.5 ml, IM or deep SC, repeat at 4 weeks and 8 weeks (primary course)
- If 10 or more years (5 or more years for children below age 15 years) have elapsed since primary course or last booster, give booster dose of 0.5 ml
- In tetanus-prone wounds start the primary course in the non-immunised patient. A booster dose may be given if more than five years have elapsed since the last dose
- Survivors of neonatal tetanus should follow the normal schedule for 5 in 1 immunisation
- Previously unimmunised children below the age of 2 years should receive 3 doses of 5 in 1 at intervals of four weeks

Tetanus immunization in pregnancy

See section on **Antenatal Care**

REFER

Refer patients to a specialist if spasms cannot be controlled.

178. BITES AND STINGS

SNAKE BITE

Most snake bites are non poisonous. Vipers are the commonest cause of poisonous snake bites in tropical Africa. Others are the cobras and water snakes. All cases of snake bites (venomous/non-venomous) should be observed for at least 6 hours. Identify the type of snake if possible. Don't rely too much on fang marks; however multiple fang marks usually indicate a non-poisonous bite whereas one or two fang marks suggest a poisonous bite. It is important to determine whether envenomation has occurred. The role of tourniquets and incision over the site of the bite are controversial issues and are to be avoided.

CAUSES

- Snakes

SYMPTOMS

- Pain
- Bleeding
- Swelling
- Fainting
- Dark-coloured urine
- Headache
- Muscle ache
- Fear
- Loss of consciousness

SIGNS**(Poisonous snake bites)****Cardiovascular:**

- Hypotension, shock, cardiac arrhythmias
- Spontaneous systemic bleeding from bite site, mucosa and old wounds, haematuria
- Dark urine from myoglobinuria and intravascular haemolysis

Neuromuscular:

- Cranial nerve paralysis - ptosis, ophthalmoplegia, slurred speech
- Bulbar respiratory paralysis - drooling, and inability to breath properly
- Impaired consciousness, seizures
- Meningism
- Tender and stiff muscles

Local effects:

- Rapid progression of swelling to more than half of bitten limb
- Blistering, necrosis and bruising
- Fascial compartmentalisation on bitten digits.

INVESTIGATIONS**Note**

Avoid venopuncture in state of generalised bleeding

- FBC
- BUE and Creatinine
- 20 minutes whole blood clotting test (leave 2-5 ml of blood in dried test tube. Failure to clot after 20 minutes implies incoagulable blood)
- Serum enzymes
- Liver function test

TREATMENT

Treatment objectives

- To relieve pain and anxiety
- To support the respiration or circulation if indicated
- To counteract the spread and effect of the snake venom
- To prevent secondary infection

Non-pharmacological treatment

First Aid

- Immobilization/splinting of the affected limb. Do not move the limb that has been bitten-the more it is moved, the faster the poison spreads. Carry the person on a stretcher and tie the limb to a straight piece of wood. If ice is available, wrap pieces in cloth and place it around the bite.
- Clean the wound and reassure the patient.

At the hospital

- Bed rest, reassure, keep warm
- Assess patient's airway, breathing and circulation (ABC of resuscitation)

For probable venomous bites:

- Clean site of bite with antiseptic lotion or soap and water
- Do not attempt to suck or make any incisions at the site of the bite
- Leave wound open; punctured wounds are especially likely to be infected.
- If the snake is identified as non-poisonous or there is absence of swelling or systemic signs after 6 hours reassure the patient
- Surgical debridement when required

Pharmacological treatment

(Evidence rating: B)

Indication for anti-venom treatment:

- Presence of symptoms and signs of local and systemic effects of envenomation

Procedure

- Use polyvalent anti-snake serum (ASS). Have resuscitation tray ready (adrenalin 1: 1000)
- Test dose-0.2 ml, subcutaneous, to test for anaphylaxis
- ASS 50-100 ml (5-10 ampoules) depending on severity by IV drip in 0.9% N/S or 5% Dextrose over 2-4 hours monitor signs and repeat as required.
- Never inject antivenom into toe/finger.
- Monitor patient and correct:
 - Hypovolaemic shock - crystalloids/colloids/blood

- Defects of haemostasis - clotting factors/fresh frozen Plasma/platelets
- Respiratory distress - O₂/intubate/ventilate.

Anti tetanus therapy

- Tetanol, IM, 0.5 ml stat

Mild sedation

- Diazepam, oral, 5-10 mg stat

Pain relief

- Paracetamol, oral,

Adults

500 mg-1 g 6 - 8 hourly

Children

6-12 years; 250-500 mg 6-8hourly

1-5 years; 120-250 mg 6-8hourly

3 months-1 year; 60-120 mg 6-8hourly

Or

Morphine, IV, IM, SC,

Adults

10 mg

Children

< 2 years 100-200 micrograms/kg

> 2 years 200 micrograms/kg

Prevention of secondary infection

- Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 5 days

Children

6 -12 years; 250 mg 8 hourly for 5 days

1-5 years; 125 mg 8 hourly for 5 days

1 year; 62.5 mg 8 hourly for 5 days



Note

Corticosteroids are of little or no value during poisoning except in treating anaphylactic crisis.

REFER

Refer all patients with respiratory failure, heart failure, renal failure, muscle paralysis, muscle necrosis, bleeding or intravascular haemolysis to a regional hospital for specialist care.

SNAKE SPIT IN THE EYES

The black-necked cobra or the spitting cobra sprays its venom into the eyes of its victim.

It causes irritation of the eyes and may cause conjunctivitis and even blindness if not washed away immediately.

TREATMENT

- Irrigate the eye with any liquid available (water, milk, saline etc).
- Instil diluted antivenom (one part to five parts of Sodium Chloride 0.9%).
- Treat as corneal abrasion with topical antibiotics (see section on Eye Injuries)

SCORPION STING

Scorpion stings leave a single mark, and the stings are extremely painful.

SYMPTOMS

- Pain
- Swelling

SIGNS

- Vomiting
- Abdominal pain
- Excessive salivation
- Sweating
- Rapid respiration
- Single-puncture wound

TREATMENT

Treatment objectives

- To relieve pain
- To maintain hydration
- To reassure patient

Non-pharmacological treatment

- Put ice compresses on the area. Detain for observation.
- Give the patient plenty of fluids to drink

Pharmacological treatment

(Evidence rating: C)

- Paracetamol, Aspirin, Ibuprofen or Diclofenac, oral
- 1% Lidocaine (Lignocaine)
2-5 ml for local infiltration to relieve pain

BEE AND WASP STINGS

Majority of bee and wasp stings only produce a painful local reaction. They may occasionally cause allergic reactions which may lead to anaphylaxis with local pain, generalized urticaria, hypotension, and difficulty in breathing as a result of bronchospasm and oedema of the glottis. Death may occur.

SYMPTOMS

- Painful local reactions

SIGNS

- Swelling at site
- Urticaria
- Hypotension
- Difficulty in breathing
- Bronchospasm

TREATMENT

Treatment objectives

- To relieve pain
- To manage anaphylaxis if necessary

Non-pharmacological treatment

- Put ice compresses on the area. Detain for observation
- Give the patient plenty of fluids to drink
- In the case of bee sting remove stinger from skin by scraping. Do not pull it out.

Pharmacological treatment

(Evidence rating: C)

- Adrenaline, SC, (1:1000)
0.5-1 ml stat
- Promethazine, IM,
Adults
50 mg stat
Children
12.5-25 mg stat
- Hydrocortisone, IV,
100-200 mg repeated 6 hours later if necessary
IV fluids for shock
- Paracetamol, oral, for pain
Adults
500 mg-1 g 6 - 8 hourly

Children

6-12 years;	250-500 mg 6-8hourly
1-5 years;	120-250 mg 6-8hourly
3 months-1 year;	60-120 mg 6-8hourly

REFER

Refer patients with anaphylaxis who are not responding to treatment

HUMAN BITES

Human bites (which usually occur during fights) lead to infections which, if neglected, almost invariably produce a highly destructive, necrotizing lesion contaminated by a mixture of aerobic and anaerobic organisms. A deliberately inflicted bite on the hand or elsewhere should be considered as contaminated.

SYMPTOMS

- Pain
- Swelling
- Bleeding
- Fever, if bites get infected

SIGNS

- Teeth impression on bitten site
- Wound

TREATMENT**Treatment objectives**

- To relieve pain
- To treat any secondary infection

Non-pharmacological treatment

- Clean wound thoroughly

**Note**

Do not suture the wound.

Pharmacological treatment**(Evidence rating: C)**

- Tetanus prophylaxis ([see section on Tetanus prophylaxis](#))
- Flucloxacillin, oral,

Adults

500 mg 6 hourly for 7 days

Children

5-12 years; 250 mg 6 hourly for 7 days

1-5 years;	125 mg 6 hourly for 7 days
>1 year;	62.5 mg 6 hourly for 7 days

Plus

Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 7 days

Children

6-12 years; 250 mg 8 hourly for 7 days

1-5 years; 125 mg 8 hourly for 7 days

<1 year; 62.5 mg 8 hourly for 7 days

- Paracetamol, oral,

Adults

500 mg-1g 6-8 hourly

Children

6-12 years; 250-500 mg 6-8 hourly

1-5 years; 120-250 mg 6-8 hourly

3 months-1 year; 60-120 mg 6-8 hourly

REFER

Refer if there is necrotising fasciitis.

DOG AND OTHER ANIMAL BITES

Mammals, including dogs, may carry the rabies virus. Saliva from an infected animal contains large numbers of the rabies virus which is inoculated through a bite, laceration, or a break in the skin. There is also risk of tetanus and other bacterial infection following the bites of any mammal.

SYMPTOMS

- Pain
- Swelling
- Bleeding
- Fever, if bites get infected

SIGNS

- Teeth impression on bitten site
- Wound

TREATMENT**Treatment objectives**

- To treat laceration
- To prevent rabies infection
- To prevent other infections

Non-pharmacological treatment

Immediate local care

- Wash site with soap and water
- All injuries-abraded skin: minor bites and scratches, major bites and scratches are treated in the same way by thorough irrigation with copious amounts of saline solution or cleansing with cetrimide plus chlorhexidine solution

Pharmacological treatment

(Evidence rating: A)

- Flucloxacillin, oral,

Adults

500 mg 6 hourly for 7 days

Children

5-12 years;

250 mg 6 hourly for 7 days

1-5 years;

125 mg 6 hourly for 7 days

>1 year;

62.5 mg 6 hourly for 7 days

Plus

Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 7 days

Children

6-12 years;

250 mg 8 hourly for 7 days

1-5 years;

125 mg 8 hourly for 7 days

<1 year;

62.5 mg 8 hourly for 7 days

Update or provide (if not previously immunized) tetanus immunization ([See section on Tetanus immunization](#))

Indication for use of Rabies Immunoglobulin and Rabies vaccine

It should be remembered that not every animal carries rabies, although the possibility should be borne in mind for every animal bite. The treatment provided is dependent on both the certainty of the presence of the rabies virus in the animal and the immunization state of the patient.

Table 23-1 : Indication for use of Rabies Immunoglobulin and Rabies vaccine

Condition of Animal		Treatment	
At time of attack	During observation	Vaccination procedure	Immunoglobulin administration
Normal	No change after 10 days	Do not vaccinate	Give first dose
Normal	Confirmed signs of rabies after 10 days	Initiate vaccination in patient upon first sign of rabies in animal	Give according to guidelines below

Table 23-1 (Continued): Indication for use of Rabies Immunoglobulin and Rabies vaccine

Strong suspicion of rabies	Unconfirmed sign in animal	Initiate vaccination. Stop if animal is normal on day 5	Give according to guidelines.
	Rabies confirmed	Continue vaccination regime	Give according to guidelines
Rabies		Immediate vaccination	Give according to guidelines

Rabies Immunization post exposurePatients vaccinated within last three years**Day 0**

Infiltrate wound and around wound with rabies immunoglobulin (10 IU/kg body weight); **and**
 Rabies Immunoglobulin (10 IU/kg body weight) by IM injection;
 1 ml Rabies vaccine by IM injection*

Day 3 (or any day up to day 7)

1 ml Rabies vaccine by IM injection*

Patients with no vaccination or more than 3 years since vaccination**Day 0**

Infiltrate wound and around wound with rabies immunoglobulin (10IU/kg body weight); **and**
 Rabies Immunoglobulin (10 IU/kg body weight) by IM injection;
 1 ml Rabies vaccine by IM injection*

Days 3, 7, 14, 30

1 ml Rabies vaccine by IM injection*

**Note**

Evidence shows that when this vaccine is injected into the gluteal region there is a poor response. Always use the deltoid muscle, or in small children the anterolateral thigh, to give the IM injection of rabies vaccine.

Always complete the rabies vaccine monitoring form

Check availability of treatment for the next patient

First dose of antirabies vaccine may be given whilst observing for presence or absence of rabies in the dog

These guidelines are prepared with respect to the use of Rabies Immunoglobulin of human origin and human diploid cell rabies vaccine.

For the use of other products seek advice and guidance from the Pharmacist or SMO Public Health at either Regional or District level.

RABIES IMMUNISATION

Prophylactic immunisation should be offered to those at high risk (eg. laboratory staff working with rabies virus, animal handlers, veterinary

surgeons, and wildlife officers likely to be exposed to bites of possibly infected wild animals).

Rabies vaccine 1 ml by IM injection on each of days 0, 7 and 28. Booster doses should be given every 2-3 years.

REFER

Refer to a tertiary centre when symptoms of rabies set in.

179. BURNS

A burn is a destruction of the skin and sometimes deeper tissue. The burn may be superficial or deep.

CAUSES

- Fire
- Hot liquids e.g. water, steam, soup
- Hot metallic objects
- Caustic chemicals e.g. acid or alkali
- Electricity

SYMPTOMS

- Pain, which may be severe
- Patient may have difficulty in breathing if he has inhaled hot fumes or hot air
- Vomiting may occur
- The patient may be unconscious

SIGNS

- Shock-cold clammy skin, weak rapid pulse, low blood pressure
- Presence of a burn
- Pain on sterile pin prick of burn area indicates burn is superficial and will heal well if infection is prevented
- No pain on sterile pin prick indicates a deep burn

TREATMENT

Treatment objectives

- To relieve pain
- To replace fluid lost
- To prevent infection of burn wound
- To aid healing of the burn wound
- To avoid complications

Non-pharmacological treatment

- All burns due to hot liquids or steam should be put under the tap or into cool clean water immediately they happen and left in or under water for 10-15 minutes.
- Do not break blisters
- Do not smear oily substances on burns. If it is necessary to cover the wound then use Vaseline gauze (deep burns, circumferential burns, infected burns)

Pharmacological treatment**(Evidence rating: C)**

- If the blisters are already broken, wash gently with soap and cool clean water (boiled and cooled) till clean, then put gentian violet or silver sulfadiazine on the exposed area and leave open
- IV fluids and blood transfusion (where indicated otherwise encourage the patient to drink lots of fluids)
- 100% oxygen (where inhalation of smoke has occurred)
- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years;

250-500 mg 6-8 hourly

1-5 years;

120-250 mg 6-8 hourly

3 months-1 year;

60-120 mg 6-8 hourly

If burn is severe

- Morphine, IV, IM, SC,

Adults

10 mg

Children

< 2 years 100-200 microgram/kg SC or IM

> 2 years 200 microgram/kg SC or IM

Or

Pethidine, IM

Adults

100 mg 4 hourly as required

Children

Pethidine, IM

0.2-2mg/kg 4 hourly as required

Update tetanus prophylaxis (see section on **Tetanus Immunisation**)

- Benzylpenicillin, IV, (for extensive burns)

Adults

4 MU stat

Children

1.5 MU stat

Further antibiotic treatment is indicated if supra-infection occurs.

REFER

Refer all extensive burns and deep burn including burns of the head, neck, axillae, hand and perineum to a regional hospital or a Burns Unit.

180. HEAD INJURIES

Head injuries are injuries in which the brain, the skull or the blood vessels within the brain and skull may be affected separately or together. They may be open or closed injuries. The symptoms will depend on the severity of the head injury. Children, patients with no recall of the event leading to the injury and those vomiting should be admitted. Others who should be admitted include those with confusion, loss of consciousness, severe headache, and fracture of the skull or CNS signs.

CAUSES

- Road traffic accidents
- Falls from heights
- Blows to the head
- Gunshot wounds

SYMPTOMS

- Headaches
- Drowsiness
- Loss of consciousness
- Intolerance to light (photophobia)
- Memory loss

SIGNS

- Fluctuating levels of consciousness
- External injuries such as abrasions, contusions, lacerations or fractures
- Cerebrospinal fluid or blood leakage from the ears or nostrils
- Unequal pupil size
- Signs of raised intracranial pressure (ICP) such as deepening coma or a lucid interval followed by relapse, a rising blood pressure and slowing of the pulse and respiration
- Pallor of conjunctivae suggestive of bleeding

- Alcohol fotor
- Focal neurological deficits e.g. paralysis
- Post-traumatic seizures
- Coma (assess severity using the Glasgow coma scale/Blantyre coma scale)

INVESTIGATIONS

- FBC
- BUE, Creatinine
- Blood glucose
- X-ray (skull and cervical)
- Head CT scan



Note

Do not perform a lumbar puncture.

TREATMENT

Treatment objectives

- To assess level of consciousness
- To maintain a clear airway and assist ventilation if necessary
- To monitor posture, bladder function and feeding
- To treat skull fractures and its complications

Non-pharmacological treatment

- If patient is not severely injured, maintain in upright position
- In the unconscious patient:
 - Ensure a clear airway, suck out any secretions
 - Neck stabilization till cervical spine injury has been excluded
 - Ventilate if necessary
 - Nurse patient on the side or semi-prone position
 - Turn patient every 2 hours
 - Catheterize patient
 - Pass nasogastric tube for feeding if patient is unconscious. Do NOT pass nasogastric tube if there is suspected fracture of the skull base
 - Continuous observation of pulse, BP, level of consciousness, pupils

Pharmacological treatment

(Evidence rating: C)

- Mannitol 20%, IV, (may be given over 30 to 60 minutes to lower ICP)

Adults

1.5-2g/kg

Children

0.5-1/kg

**Note**

Steroids have demonstrated no benefits in the treatment of acute head injury.

- Aspirin, oral,
 - Adults
300-900 mg 4-6 hourly
 - Children
Not recommended
- **Or**
Paracetamol, oral,
 - Adults
500 mg-1g 6-8 hourly
 - Children

6-12 years;	250-500 mg 6-8 hourly
1-5 years;	120-250 mg 6-8 hourly
3 months-1 year;	60-120 mg 6-8 hourly
- For fracture base of skull
- Benzylpenicillin, IV,
 - Adults
1.2-2.4g 6 hourly
 - Children
50mg/kg 6 hourly
- For open skull fractures
- Co-amoxiclav, IV,
 - Adults
600 mg 8 hourly
 - Children
25 mg/kg 6 hourly

**Note**

Do not give sedatives.

REFER

Patients with disturbance of consciousness, fractured skull, CSF rhinorrhoea or otorrhoea, dilated pupil or pupils, lateralising signs should be referred immediately to a neurosurgeon.

181. ACUTE ABDOMEN

Acute abdomen is sudden onset of severe abdominal pain which may require surgical operation. Some medical conditions may present as acute abdominal pain.

CAUSES

- Inflammatory conditions e.g. appendicitis, salpingitis, cholecystitis
- Perforations e.g. typhoid perforation, traumatic perforation
- Intestinal obstruction e.g. strangulated hernia, adhesions, volvulus
- Haemorrhage e.g. ruptured ectopic pregnancy, ruptured spleen
- Acute pancreatitis
- Colics e.g. ureteric colic, biliary or intestinal colic
- Medical conditions e.g. diabetes mellitus, gastro-enteritis, gastritis, malaria, pneumonia, UTI, sickle cell crises, adrenocortical crises, porphyria, nephrotic syndrome

SYMPTOMS

- Pain
- Gradually increasing abdominal pain suggests inflammation
- It is sudden in perforations and colics
- Colicky abdominal pain and absolute constipation suggest intestinal obstruction
- Anorexia, nausea and vomiting may occur
- A history of dyspepsia may point to perforated peptic ulcer
- Fever, headaches, joint pains and sudden onset of abdominal pain may suggest typhoid perforation
- Dizziness or faintness or collapse may be due to bleeding from ruptured ectopic, ruptured spleen or liver
- Vaginal discharge may suggest pelvic infection
- Frequency and dysuria may suggest urinary tract infection
- A past history of alcohol ingestion may suggest gastritis or acute pancreatitis
- Watery mucoid blood-stained stools with abdominal colic points to dysentery

SIGNS

- Signs of dehydration e.g. dry tongue, sunken eyes, loss of skin turgor
- High temperature in acute inflammations
- Hypotension with low blood pressure and rapid pulse if shock is present or adrenocortical crises
- Abdominal distension with fluid or gas may suggest peritonitis, haemorrhage, acute pancreatitis or intestinal obstruction
- Abdominal surgical scars may suggest intestinal obstruction due to adhesions
- Examine the hernia orifices for a strangulated hernia, especially for femoral hernia

- Tenderness, rebound tenderness and guarding suggest peritonitis due to inflammatory conditions or perforations
- Absence of bowel sounds points to peritonitis and increased bowel sounds intestinal obstruction
- Rectal and vaginal examinations will reveal tenderness in the rectovesical or recto-uterine pouch
- Examine the chest for basal pneumonia or myocardial infarction.
- Pallor, gnathopathy, frontal bossing in sickle cell disease

INVESTIGATIONS

- FBC, blood film for malaria parasites, sickling test
- Chest X-ray to look for gas under the diaphragm in perforations and for signs of pneumonia
- Plain abdominal X-ray (erect & supine) for fluid level and distended bowel due to intestinal obstruction. Gallstones or kidney stones may be seen
- 4-quadrant abdominal tap may yield pus, bile stained fluids from perforations or blood from bleeding ectopic or ruptured spleen or liver
- Random blood glucose
- Urine examination
- BUE and Creatinine

TREATMENT

Treatment objectives

- To resuscitate patient
- To relieve pain
- To control infection if present
- To treat the underlying cause

Non-pharmacological treatment

- Pass nasogastric tube and aspirate the stomach
- Monitor pulse, blood pressure and urine output. Aim at urine output of 30-50 ml per hour
- Re-examine patient frequently if the diagnosis is uncertain

Pharmacological treatment

(Evidence rating: C)

- Resuscitation with IV fluids or blood transfusion
- Relieve pain as soon as diagnosis is made

- Pethidine, IM
Adults
 50-100 mg 4 hourly (maximum 400 mg/day)
Children
 0.5-2 mg/kg repeated 4 hourly

Antibiotics are indicated for infectious conditions, perforations and intestinal obstruction. The following regime may be used for gut related infections

- Gentamicin and Metronidazole
- Ciprofloxacin and Metronidazole
- Cephalosporin (with metronidazole if indicated)
- Gentamicin, IV or IM
Adults and Children
 2.5 mg/kg 8 hourly
 Do not give if urine output is less than 30 ml/hour.
- Metronidazole, IV,
Adults
 500 mg 8 hourly
Children
 7.5 mg/kg 8 hourly
- Ciprofloxacin, IV,
Adults
 200-400 mg 12 hourly infused over 30-60 minutes (may be added for typhoid perforation)
Children (Use only when benefit outweighs the risk)
 5-12 years; 10 mg/kg 12 hourly
 <5 years; 5mg/kg 12 hourly

Further treatment will depend on the diagnosis.

REFER

Patients should be referred if the diagnosis cannot be made or if surgical expertise is not available at the facility.

182. ACUTE ALLERGIC REACTION (ANAPHYLAXIS)

An acute allergic reaction or anaphylaxis is a life-threatening but rapidly reversible condition if treated promptly. Anaphylaxis can develop within minutes of injection or ingestion of medicines or contact with trigger factors.

CAUSES

- Bee or insect bites
- Drugs e.g. penicillins, sulphonamides
- Antisera e.g. snake serum, antitetanus serum
- Intravenous x-ray contrast media
- Vaccines
- Foods like seafoods, groundnuts etc.

SYMPTOMS

- Severe itching
- Urticarial rash
- Difficulty in breathing

SIGNS

- Collapse
- Angio-oedema-may have acute difficulty in breathing due to laryngeal oedema and obstruction
- Bronchospasm with wheeze
- Shock with severe hypotension
- Facial oedema
- Urticaria
- Oedema
- Tachycardia
- Erythema
- Cyanosis

TREATMENT

Treatment objectives

- To secure airways, breathing and circulation
- To remove the offending cause if possible
- To prevent death

Non-pharmacological treatment

- Resuscitation

Pharmacological treatment**(Evidence rating: B)**

- Adrenaline, IM,
Adults
0.5 ml (500 micrograms) of 1:1000 solution repeated if necessary every 10 minutes and while monitoring blood pressure and pulse
Children
0.3 ml (300 micrograms) of 1:1000 solution
Repeat as for adults.
- Hydrocortisone, IV,
200 mg 6-8 hourly, to control any late allergic reaction that may occur
- Promethazine hydrochloride, IM,
25 mg 8-12 hourly

If wheeze develops give
- Salbutamol, nebulised,
Adults
5 mg 6 hourly
Children
2.5 mg 6 hourly
Or
Aminophylline, IV,
Adults
250 mg over 20 minutes and repeat after 30 minutes if necessary (see section on **Asthma**)
Children
3-5 mg/kg over 20 minutes as a slow bolus injection or by infusion
- Sodium Chloride, IV, 500 ml-1 litre of 0.9% 4 hourly until fully recovered

REFER

Refer immediately if symptoms of anaphylaxis persist after initial treatment.

**Note**

Ensure that the name of the drug or substance that caused the reaction is written prominently on the patient's folder and educate the patient and relatives on future avoidance.

183. SHOCK

Shock is a state of circulatory collapse leading to reduction in delivery of oxygen and other nutrients to vital organs which if prolonged leads to irreversible multiple organ failure.

CAUSES

- Hypovolemia e.g. hemorrhage
- Cardiogenic e.g. myocardial infarction
- Extracardiac
- Obstructive
- Pericardial tamponade
- Pneumothorax
- Massive pulmonary embolus
- Severe sepsis

SYMPTOMS

- Feeling faint
- Palpitations
- Sweating
- Restlessness
- Clouding of consciousness

SIGNS

- Pallor
- Cold extremities
- Tachycardia
- Hypotension Systolic BP < 90 mmHg

TREATMENT**Treatment objectives**

- To reverse shock
- To secure airway, breathing and circulation
- To prevent complications
- To prevent death

Non-pharmacological treatment

- Raise foot end of bed

Pharmacological treatment**(Evidence rating: C)**

- Hypovolaemic shock
- Insert the largest bore cannula in the largest vein visible. Two cannulae may be inserted at separate sites for rapid IV infusion
- Raise drip stand or squeeze bag to increase infusion rate
- Give colloids (e.g. Haemaccel)

- In haemorrhagic states cross-matched blood is preferred but is time-consuming so resuscitate with crystalloids
- Crystalloids e.g. Sodium Chloride 0.9%.

Adults

70 ml/kg body weight;

Children

30 ml/kg (see section on **Management of severe dehydration**)

- Sodium chloride should be given quickly and slowed only when BP rises and urine flow is adequate.

Adults and older children

1 ml/kg per hour

Smaller children

2 ml/kg per hour

- Catheterise the bladder
- Oxygen, nasally or by facial masks
6 L/minute
- Continue to monitor BP, pulse and urine output

MULTIPLE ORGAN DYSFUNCTION SYNDROME

This is a life-threatening complication of shock. Different organs may be affected moderately or severely in the process as follows:

- CNS -Encephalopathy
- Heart -Tachyarrhythmias
- Pulmonary-Acute Respiratory Failure
-ARDS
- Kidney -Acute Tubular Necrosis
- Gastrointestinal - Ileus
- Pancreatitis
- Liver -Ischemic hepatitis
- Blood - Disseminated Intravascular Coagulation
- Metabolic - Hyperglycemia
- Hypoglycemia
- Immune system - Cellular, Humoral
-Immune depression

REFER

Refer all patients to the appropriate physician specialist

184. ANTIBIOTIC PROPHYLAXIS IN SURGERY

Antibiotic prophylaxis refers to the administration of antibiotics in patients to reduce the risk of post-operative wound infections. The main cause of morbidity and mortality in surgery is infectious complications. Antibiotic prophylaxis in surgery is the administration of antibiotics in the perioperative period in order to reduce septic complications.

Pathogens involved

- *Staphylococcus aureus*
- Streptococcal species
- Enterobacteriaceae (GI)
- Anaerobes (GI)
- Coagulase negative staphylococci (especially cardiac surgery, and implantation surgery)

OBJECTIVES

Antibiotic prophylaxis is indicated in cases where a high level of septic complications is to be expected or where a possible infection could have disastrous local or generalized effects. The aim therefore is to prevent:

- Frequent infections e.g. in appendicectomy, resection of colon
- Major local consequences of infections e.g. in brain surgery, in surgery where implants are used as in joint and vascular prostheses.
- Major generalized consequences of infections e.g. surgery in diabetics, in patients with obstructive jaundice, the aged, multiple trauma.
- Lethal infections e.g. in heart valve replacement surgery.

Indications for antibiotic prophylaxis in surgery:

Proven indications

- Acute appendicitis and intestinal obstruction
- Surgery on the colon and rectum
- Surgery on the biliary tract
- Gastro-oesophageal and oro-pharyngeal surgery for carcinoma
- Hysterectomy
- Surgery in the presence of pus
- Patients with rheumatic heart disease
- Patients with congenital heart disease

Accepted indications

- Implantation surgery where prosthesis and other implants are used
- Cardiovascular surgery
- Caesarian section

Possible indications

- Thoracic surgery
- Neurosurgery
- Surgery on the genito-urinary tract
- Trauma surgery

Choice of antibiotic for prophylaxis

It should:

- Have antibacterial activity against the anticipated pathogens
- Not easily induce antimicrobial resistance
- Be easy to administer and absorb with high concentration at the site of infection
- Be easy to metabolize and excrete
- Have few toxic or adverse reactions
- Be cheap

Regimens

Short-course (three-dose) antibiotic prophylaxis and single-dose regimens have been described. Single-dose prophylaxis is preferred, as antimicrobial resistance has not been noted.

Table 25-1 : Choice of Antibiotic for Prophylaxis

SURGICAL PROCEDURE	REGIMEN
Appendicectomy/ Uncomplicated appendicitis	Metronidazole, IV, <u>Adults</u> 500 mg single dose at induction of Anaesthesia. <u>Children</u> 7.5 mg/kg single dose at induction of anaesthesia Or Metronidazole, rectally, <u>Adults</u> 1 g one hour before surgery <u>Children</u> 125-250 mg one hour before surgery
Resection of the colon or rectum or obstructed bowel	Gentamicin [§] , IV, 5 mg/kg plus Metronidazole [§] , IV, <u>Adults</u> 500mg <u>Children</u> 7.5 mg/kg Or Metronidazole [§] , IV, (doses same as above) plus Cefuroxime [§] , IV,

Table 25-1 (Continued): Choice of Antibiotic for Prophylaxis

SURGICAL PROCEDURE	REGIMEN
Resection of the colon or rectum or obstructed bowel	<p><u>Adults</u> 1.5 g <u>Children</u> 60 mg/kg as a single dose.</p> <p>Or Ciprofloxacin, IV, <u>Adults</u> 200 mg 12 hourly plus Metronidazole 500 mg stat <u>Children</u> 5 mg/kg plus Metronidazole 7.5 mg/kg stat</p>
Biliary tract surgery	Single dose of Gentamicin [§] or Cefuroxime [§] (same as above)
Hysterectomy	Single dose of Metronidazole [§] , IV, 500mg
Dental procedures for patients with heart valve prostheses, rheumatic heart disease, septal defect and patent ductus.	<p>Under Local Anaesthesia: Amoxicillin(Amoxycline), oral, <u>Adults</u> 3 g one hour before procedure. <u>Children</u> 6-12 years; 1.5 g 5 years; 750 mg</p> <p>Patients With Penicillin Allergy Or Who Have Received More Than One Dose Penicillin in The Previous Month; Clindamycin, oral, <u>Adults</u> 600 mg <u>Children</u> 5-10 years; 300 mg < 5 years; 150 mg</p> <p>Patients Who Have Had Previous Endocarditis <u>Adults</u> Ampicillin, IV, 1 g plus Gentamicin, IV, 120 mg at induction then, Amoxicillin, oral, 500 mg 6 hours later. <u>Children</u> Ampicillin,IV 6-12 years; 500mg < 5 years; 250mg, plus Gentamicin, IV, 2mg/kg, then Amoxicillin, oral, 6 hours later 6-12 years; 250 mg < 5 years; 125 mg</p>

Table 25-1 (Continued): Choice of Antibiotic for Prophylaxis

SURGICAL PROCEDURE	REGIMEN
	<p>Under General Anaesthesia: Amoxicillin, IV, <u>Adults</u> 1 g at induction then Amoxicillin, oral, 500 mg 6 hours later. <u>Children</u> 5-10 years; ½ of adult dose < 5 years; ¼ of adult dose</p> <p>If patient has a prosthetic valve or previously had endocarditis, Ampicillin, IV and Gentamicin, IV.</p> <p>Patients who are allergic to penicillin or who have had more than a single dose of Penicillin In Previous Month Clindamycin, IV, <u>Adults</u> 300 mg over at least 10 minutes at induction or 15 minutes before procedure, then Clindamycin, oral or IV, 150 mg 6 hours later <u>Children</u> 6 mg/kg stat, 3 mg/kg 6 hours later</p>
§ = Doses to be administered at induction of anaesthesia.	

185. MANAGEMENT OF ACUTE PAIN

Pain is an unpleasant sensory or emotional experience associated with actual or potential tissue damage. It is a common presenting symptom in clinical practice. Many factors influence the feeling and emotion of pain and these vary from one person to the other and in the same person from time to time.

Pain can be acute or chronic. Acute pain lasts less than three months and is often felt in response to an easily identifiable cause such as surgery, trauma, or an acute illness. Chronic pain may begin as acute pain, but lasts or recurs over a period longer than would normally be expected for the underlying condition.

Management of pain must be individualized to each patient and must take into consideration both the relief of the pain as well as treatment of the underlying cause of the pain. Treating only the underlying cause may take a long time for pain relief to be achieved.

Special attention must be given and precautions taken in providing pain relief in children, pregnant women and the elderly as well as those with concurrent hepatic or renal disease, cognitive or behavioural disorders and those who are opiate-tolerant or have a history of substance abuse.

Pain relief is usually required following the under listed situations.

- Post-operatively
- Post-traumatic musculo-skeletal injury
- Post-intervention (diagnostic and therapeutic procedures)
- Burns
- Child birth
- Spinal cord injury
- Acute headache
- Sickle cell crisis
- Myocardial infarction and other major cardiac and respiratory events
- Pancreatitis
- Colic (intestinal or ureteric)
- Joint inflammation
- Trigeminal neuralgia (tic doloieux)
- HIV/AIDS-related conditions

TREATMENT

Treatment objectives

- Stabilisation of the patient
- Relief of pain
- Treatment of the underlying disorder

Non-pharmacological treatment

- Placing affected part in the most comfortable posture
- Elevation of the affected part
- Splinting
- Reassurance by and positive attitude of the health care worker

Pharmacological treatment**(Evidence Rating: A)**Mild Pain

- Paracetamol or NSAID

Moderate Pain

- Paracetamol, NSAID or opioid

Severe Pain

- Opioid, paracetamol, NSAID

**Note**

Use of combinations of different groups of pain relievers is recommended even in severe pain as this reduces the dose needed and side effects of individual medications, especially opioids.

In moderate pain, you first should use NSAIDs in musculoskeletal pain and opioids in visceral pain.

Non-Opioid, Non-NSAID

- Paracetamol, oral,

Adults

1g 4-6 hourly

Children

6-12 years;

250-500 mg 4-6 hourly

1-5 years;

120-250 mg 4-6 hourly

3 months - 1 year;

60-120 mg 4-6 hourly

NSAID

- Diclofenac, oral,

Adults

25-50 mg 8 hourly

Children

1 mg/kg 8 hourly

Or

Diclofenac rectal,

Adults

100-150 mg daily in divided doses

Children

1-2 mg/kg daily (maximum 150 mg)

Or

Ibuprofen, oral,

Adults

400 mg, 6-8 hourly

Children

5 mg/kg 6-8 hourly

Opioid

- Tramadol, oral

Adults

50-100 mg 4-6 hourly, maximum 400 mg/day

- Pethidine, IM

Adults

25-100 mg (approx. 1 mg/kg) 4 hourly for first 36 hours then p.r.n.

Children

0.5-1 mg/kg 4 hourly regularly for first 36 hours then p.r.n.

Or

Pethidine, IV

Adults

25 mg repeated as necessary with caution

- Morphine, IM

Adults

5-10 mg 4 hourly for first 36 hours then p.r.n.

Children

0.1 mg/kg 4 hourly for first 36 hours then p.r.n.

Or

Morphine, IV

Adults

2.5 mg slowly, repeated if necessary

186. BREAST CANCER

Breast cancer is the commonest cancer affecting women. Early detection of this cancer is possible through monthly breast self examination, which is especially recommended for women of child-bearing age, and periodic screening through clinical breast examination (3 yearly for women below 40 years and yearly for women above 40 years) as well as mammography every 2 years for women 40 years and above.

Various modalities are available for the treatment of breast cancer which depend on the biological characteristics of the tumour, stage of disease and other patient factors.

CAUSES

- Unknown
- Associated risk factors
- Female sex
- Age
- Family history of breast cancer
- Previous personal history of breast cancer
- Oestrogen therapy

SYMPTOMS

- Lump in the breast
- Other changes in breast change in size or shape
- Skin changes in breast
 - Peau d'orange
 - Skin nodules
 - Ulceration
- Changes in the nipple and areola
 - Nipple discharge
 - Nipple retraction
 - Eczema/ulceration of nipple or areola
- Swelling in axilla
- Swelling of upper limb
- Metastatic disease
 - Bone pain
 - Pathological fractures
 - Back pain
 - Paraplegia
 - Breathlessness from pleural effusion and lung metastasis

- Brain metastasis (Headache, vomiting altered consciousness, localizing signs)

SIGNS

- Breast lump
 - Hard
 - Edges may be indefinite
 - Surface may be rough
 - May be tethered to skin or attached to skin and underlying tissues
- Skin
 - Peau d'orange, tethering, nodules or ulceration
 - Nipple retraction
 - Bloody nipple discharge
 - Palpable axillary nodes
 - Look for evidence of metastatic disease

INVESTIGATIONS

- Mammography
- Ultrasonography of the breast
- Biopsy and Fine Needle Aspiration for cytology and histology

TREATMENT

Treatment objectives

- To achieve a cure
- To prevent local and distant metastasis
- To prolong survival in metastatic disease
- To relieve pain in incurable cases

Non-pharmacological treatment

- None

Pharmacological treatment

(Evidence Rating: A)

- Surgery
 - Wide Local Excision OR Mastectomy
 - Axillary dissection
- Chemotherapy
- Hormonal therapy
- Radiotherapy
- Immunotherapy

REFER

If breast cancer is suspected, investigate (including needle biopsies) if possible and refer. All cases of breast cancer must be referred for specialist attention. Avoid excising suspicious lumps. All excisions must be sent for histology.

187. CARCINOMA OF THE CERVIX

Carcinoma of the cervix is the commonest form of female genital cancer seen in Ghana and indeed most developing countries. Even though it is common, it is thought to be preventable. Its treatment poses a major challenge, demanding the services of a gynaecological oncologist and the surgical procedure, Wertheim's hysterectomy, for operable cases.

In developed countries, the incidence of this disease has fallen considerably owing to regular screening procedures using the Pap smear.

In Ghana, the absence of an effective screening system results in most cases presenting late and thus requiring treatment with radiation.

Surgery involves the removal of the central tumour as well as the lymphatics draining the area including the obturator, internal iliac, the external iliac, common iliac and the para-aortic nodes. Since it is an extensive surgery, it is recommended that this is carried out only by specialists who have been trained for it.

CAUSES

- Human papilloma virus
- Associated risk factors
 - Sexual promiscuity
 - Multiple child births
 - Infections with Herpes Simplex Hominis type II, HIV
 - Smoking
 - Low socio-economic status
 - Family history

SYMPTOMS

- Asymptomatic (diagnosed on routine screening or assessment during antenatal care, family planning etc.)
- Symptomatic

Abnormal vaginal bleeding**In between regular menstrual periods**

- After sexual intercourse
- Post menopausal bleeding
- Increased vaginal discharge

- Lower abdominal pain
- Pain during sexual intercourse
- Weight loss
- Urinary symptoms e.g. dysuria, frequency, incontinence
- Rectal pain

SIGNS

- Early cases-erosion of cervix or changes of chronic cervicitis
- Ulcerative or fungating cervical lesion on speculum examination

INVESTIGATIONS

- Cervical biopsy
- FBC and sickling status
- Renal function tests
 - Blood urea and electrolytes
 - Serum Creatinine
- Serum uric acid
- Chest radiograph
- Intravenous urography
- CT Scan and or Magnetic Resonance Imaging (to detect aortic nodes and metastases to the lungs and liver)
- Examination under Anaesthesia. This is used to find whether the parametria or utero-sacrals are involved. At the same examination cystoscopy and proctoscopy with or without biopsy may be done to allow visualisation of vesical or rectal mucosa.

TREATMENT

Treatment objectives

- To treat central tumour
- To treat areas of tumour spread with the aim of eradicating the disease

Non-pharmacological treatment

The treatment modalities for carcinoma of the cervix are:

- Surgery
 - Radiotherapy
 - A combination of surgery and radiotherapy
- Early disease
- Primary surgery
 - Conisation of the cervix or simple hysterectomy
- Overt disease
- Radical surgery

- Total abdominal hysterectomy
- Bilateral salpingo-oophorectomy
- Excision of $\frac{1}{3}$ to $\frac{1}{2}$ of the vagina
- Pelvic lymphadenectomy and para-aortic node dissection

Advanced disease

- Radiotherapy (with or without chemotherapy)

Pharmacological treatment

(Evidence Rating: A)

- Adjuvant chemotherapy (Section on **referral** below)

REFER

All patients must be referred to a specialist for evaluation to decide on mode of treatment. The treatment of carcinoma of the cervix is best done in hospital under specialist care.

188. BLADDER CANCER

Bladder cancer is the second commonest urological cancer after prostate cancer. It is the commonest of all the cancers which affect the urinary tract lining (urothelium). Males are more affected than females in a ratio of about 3:1. It is more common in the white race compared to the black race in a ratio of 4:1. More than 80% of clients with bladder cancer are above 50 years. The commonest pathological types are transitional cell carcinoma TCC (90%), Squamous cell carcinoma (8%) and adenocarcinoma and carcinoma in-situ (2%).

CAUSES

- Smoking of cigarettes
- Occupational Risks; Environmental exposure to cancercausing chemicals used in industries like dye, textile, rubber, cable, printing, plastic, spraying and hair-dressing.
- Chronic Infections of the bladder like *Schistosoma haematobium* (*Bilharzia*) and chronic bacterial infections.

SYMPTOMS

- May be asymptomatic in early disease (25%)
- Haematuria (usually painless)
- Frequency
- Urgency
- Dysuria

- Flank pain (hydronephrosis)
- Pelvic pain from cancer invasion

SIGNS

- Pallor
- Wasting
- Palpable bladder mass
- Palpable kidney from ureteric obstruction and hydronephroses
- Lymphoedema of lower limb/limbs
- Secondary UTI in 30% of cases

INVESTIGATIONS:

- Laboratory
 - FBC and ESR
 - Urine analysis and culture
 - Urine cytology
 - Urea, creatinine, electrolytes
- Imaging
 - Ultrasound scan: Abdominopelvic
 - CT Scan /MRI for staging (By specialist)
- Special Investigations: Abdominopelvic
 - IVU
 - Urethrocystoscopy and biopsies (By specialist)
 - Examination under anaesthesia (Bimanual palpation of bladder through DRE and Pelvic examinations).

TREATMENT

Treatment objectives

- Surgical cure for early disease
- Prevention of recurrence, progression and metastases
- Management of complications
- Additional treatment with cancer drugs and radiotherapy where necessary. (neoadjuvant and adjuvant therapy)

Non-pharmacological treatment

- Cystectomy: Partial or radical with or without bladder replacement.
- Radiotherapy

Pharmacological treatment

(Evidence rating: C)

Early Stage

- BCG or Thiotepa bladder instillation for superficial tumours after resection (TURP)

Advanced Disease

- Chemotherapeutic agents recommended for advanced stage are:
- Methotrexate, Vinblastine, Adriamycin, Cis-platinum. (M-VAC).
New agents are being tried on experimental basis.

REFER

- Refer all cases of bladder cancer for specialist evaluation and treatment.
- All cases of chronic cystitis should be referred to specialist to exclude bladder cancer.

189. CARCINOMA OF PROSTATE

Ninety-five per cent of these tumours are adenocarcinomas. The majority of men affected are aged between 65 and 85 years. The incidence increases with age. It is recommended that every male, 40 years and above, should have annual screening by Prostate Specific Antigen (PSA) tests and Digital Rectal Examination (DRE) since early detection is associated with better prognosis. It is worth noting that not every hard prostate on DRE is malignant. Likewise a normal-feeling prostate does not exclude a malignancy. A prostatic biopsy is therefore necessary to establish a diagnosis.

CAUSES

- Ageing
- Functional testes
- Family history
- Race (more common in blacks)
- High dietary fat intake

SYMPTOMS

- Lower Urinary Tract Symptoms (LUTS)
- Retention of urine
- Haematuria
- General debility anorexia, weight loss, listlessness
- Bone pain (commonly in the waist or limbs)
- Paralysis in the lower limbs or inability to walk

SIGNS

- On DRE clinical signs include;
- Hard prostate gland with an irregular surface and edges

- Obliterated median sulcus
- Adherent rectal mucosa
- Advanced or metastatic disease:
- Anaemia
- Uraemia
- Wasting
- Bone tenderness
- Paraplegia
- Pathological fracture

INVESTIGATIONS

- FBC
- Blood urea, electrolytes and creatinine
- Prostate specific antigen (PSA)
- Liver function tests
- Abdominal and pelvic ultrasound
- Transrectal ultrasound (TRUS) of the prostate, if available
- Transrectal needle biopsy of the prostate
- TRUS-guided or finger-guided

TREATMENT

Treatment objectives

- To relieve symptoms
- To control complications
- To achieve cure for early disease
- To prevent local progression and metastases

Non-pharmacological treatment

- Urethral catheterisation to relieve urinary retention where needed
- Radical prostatectomy or radiotherapy, under specialist care, for early disease
- Surgical castration (bilateral orchidectomy) for advanced disease

Pharmacological treatment

(Evidence rating: A)

Pharmacological treatment of carcinoma of the prostate, which involves hormonal manipulation which inhibits growth of the tumour by depriving it of androgens, is best carried out under specialist care.

The common drugs used in advanced prostate cancer therapy are:

Hormone Ablation Therapy**Antiandrogens**

- Bicalutamide, oral, 50 mg/150mg daily

Or

Flutamide, oral, 250 mg 8 hourly

Oestrogen

- Stilboestrol, oral, 2-5 mg daily (Avoid in clients with cardiovascular diseases)

LHRH Analogues

- Goserelin, SC, preferably in the abdominal wall
3.6 mg once every month **or** 10.8 mg once every three months

Or

Leuprolide acetate, IM,

7.5 mg once every month **or** 22.5 mg once every three months**REFER**

Refer all cases to a specialist centre for evaluation and management.

190. HEPATOCELLULAR CARCINOMA (LIVER CANCER)

Hepatocellular carcinoma (HCC) is a primary malignancy of the liver cell and must be differentiated from malignancies elsewhere that metastasize to the liver. HCC occurs more commonly in men than in women and is often diagnosed several years after establishment of the initial causative condition. The disease has a poor prognosis resulting from early metastases to the lung, portal vein, peri-portal lymph nodes, bone or brain and complications such as hepatic failure, variceal bleeding or tumor rupture with bleeding into the peritoneum. The tumour is often resistant to chemotherapy. Current strategies to prevent or treat hepatitis B and C infections and liver cirrhosis have a potential for reducing the prevalence of HCC in the long term.

CAUSES

- Alcoholic liver cirrhosis
- Chronic hepatitis B virus infection
- Chronic hepatitis C virus infection
- Chronic exposure to hepatic carcinogens e.g. Aflatoxin

SYMPTOMS

- Jaundice
- Itching
- Weight loss

- Haematemesis
- Abdominal distension
- Right upper abdominal pain

SIGNS

- Jaundice
- Cachexia
- Hepatomegaly (irregular surface, multiple nodules, may be tender)
- Ascites
- Bruit over the liver

INVESTIGATIONS

- LFTs
- Blood level of alpha-fetoprotein
- Abdominal ultrasound scan
- Chest X-ray

TREATMENT

Treatment objectives

- To relieve pain
- To relieve discomfort from gross ascites
- To prevent or treat hepatic encephalopathy

Non-pharmacological treatment

See section on Hepatic Encephalopathy

- Paracentesis for gross ascites
- Surgical resection or chemoembolisation of small, solitary nodules (rarely the case)

Pharmacological treatment

See section on Hepatic Encephalopathy

REFER

Refer patients with complications to a physician specialist. Patients with small, solitary lesions may be referred to a surgical specialist.

191. MANAGEMENT OF POISONING

Poisoning represents the harmful effects on the human body of accidental or intentional exposure to toxic amounts of any substance. The exposure can be by ingestion, inhalation, injection, through the skin, or other less common routes. The effect of poisoning may be local, systemic or both and may occur immediately or several hours or even days after the exposure.

Poisoning may present with only mild symptoms and signs, sometimes resembling other well known diseases and injuries, or may be so severe as to result in death.

For positive identification of the toxic substance involved in a case of poisoning, it is often more helpful to have a sample of the substance or the container in which it was stored than to rely solely on laboratory analysis of tissue samples, which could be time-consuming and sometimes inconclusive. Only a few poisons can be identified instantly, thereby permitting specific treatment to be given. A prudent approach in managing poisons in the initial stages is to begin with general treatment measures, followed by more specific treatments and antidotes when the poison is identified. Induction of vomiting does not necessarily reduce the absorption of injected poisons and may indeed be harmful as it may increase the risk of aspiration. Gastric lavage and induction of vomiting after ingestion of a corrosive substance or petroleum distillate should be avoided.

A Poison Control Centre exists in Ghana to support health professionals in dealing rationally, and in a timely manner, with poisoning by providing treatment recommendations. **The Poison Control Centre Hotlines (emergency telephone numbers) are 030-223 86 36 or 030-224 35 52.**

CAUSES

- Chemicals
 - Household e.g. bleach, kerosene
 - Industrial e.g. methanol, ethylene glycol, cyanide, arsenic
 - Pesticides e.g. organophosphates, organochlorines (e.g. DDT), rat poison
- Therapeutic drug overdose e.g. paracetamol, aspirin, iron tablets, nifedipine, phenobarbitone
- Toxic plants e.g. poisonous mushrooms, toxic herbal preparations, cyanogenic cassava
- Bites and stings of venomous animals e.g. snakes, scorpions, bees, spiders, aquatic animals

SYMPTOMS

- Vomiting
- Diarrhoea
- Upper abdominal pain
- Jaundice
- Difficulty breathing
- Palpitations
- Skin rashes

- Scanty urine

SIGNS

- Fever
- Vomiting
- Diarrhoea
- Dehydration
- Jaundice
- Tongue discolouration
- Unusual fetor (smell on breath)
- Changes in breathing rate or regularity
- Changes in pulse rate or regularity
- Skin lesions
- Abdominal tenderness
- Changes in pupil size (small or enlarged)
- Seizures

Danger signs

- No breathing
- Wheezy or noisy breathing
- Pulse below 50, or above 110 beats per minute, irregular, or very weak
- Non-reacting pupils
- Loss of consciousness
- Continuous seizures
- Temperature > 39°C (mouth or rectum) or 38°C (armpit)
- Severe abdominal tenderness
- Anuria
- Signs of acute liver failure (e.g. Asterixis)

INVESTIGATIONS

- FBC
- BUE and creatinine
- Liver function tests
- Fasting blood glucose
- Toxicological analysis of identified substance or tissue samples (e.g. gastric aspirate)

TREATMENT

Treatment objectives

- To maintain normal vital signs
- To decontaminate the site of exposure

- To prevent and reduce absorption
- To enhance elimination
- To relieve symptoms
- To prevent further organ damage or impairment without delay

Non-pharmacological treatment

- Ensure airways are patent
- Remove contaminated clothing, if necessary
- Wash chemical away from the skin with soap and a lot of water, if necessary
- Perform nasogastric aspiration if airway is protected
- Carry out gastric lavage or aspiration within the first 1 hour after the event or later if it involves slow release or highly toxic substances
- Detain the patient in the clinic or hospital for close and continuous observation, re-evaluation, and supportive and symptomatic treatment
- Maintain and continuously monitor vital signs

Pharmacological treatment

Initial Management

For hypoglycaemia

- Glucose, IV,
25-50 ml of 50% over 1-3 minutes

For opioid overdose

- Naloxone, IV,
Adult
0.4-2 mg, repeat every 2-3 minutes (maximum of 10 mg)

Children

10 micrograms/kg stat, subsequent dose of 100 microgram/kg if no response to initial dose

Or

Naloxone, SC or IM, only if IV route is not feasible

Adult and child doses same as for IV route above

For benzodiazepine overdose

- Flumazenil, IV,
Adults
200 micrograms given over 15 seconds, then 100 micrograms at 60 second intervals if required. Maximum total dose 1 mg.

For Wernicke-Korsakoff syndrome

- Thiamine, IV,
100 mg stat
- Activated Charcoal, oral, (within the first 1 hour after the event if indicated)

Adults and Children >12 years

50 g

Children < 12 years

25 g

Further Management

- Supportive treatment of the following, if present (See appropriate sections)
 - Restlessness and agitation
 - Cardiac arrhythmias
 - Seizures
- Administer a specific antidote (check reference literature, instructions on substance container or obtain information from Poisons Control Centre)



Note

Specific antidotes are only available for a few substances. The benefits of the use of a specific antidote must outweigh the possible risks.

REFER

Referral to a hospital must be considered for patients who do not improve following institution of general treatment measures, or those who require specific antidotes. As much as possible a sample of the substance, if available, must accompany the patient. Consult the Poisons Control Centre (**emergency telephone numbers 021-23 86 36 or 021-24 35 52**) for advice.

POISONING BY SPECIFIC SUBSTANCES

CARBAMATES AND ORGANOPHOSPHATES

Onset of toxicity is delayed for 6-12 hours.

SYMPTOMS

- Nausea
- Vomiting
- Salivation
- Sweating
- Faecal and urinary incontinence
- Blurred vision

SIGNS

- Watery eyes
- Bronchial secretions with pulmonary oedema
- Bradycardia with hypotension or tachycardia with hypertension
- Restlessness
- Tremors
- Muscle twitching and convulsion

INVESTIGATIONS

- Plasma acetylcholinesterase level (if available)

TREATMENT**Pharmacological treatment**

- Atropine, IM or IV, (according to the severity of poisoning)

Adults

1-3 mg every 3-5 minutes, until pulmonary secretions are dry

Children

20 microgram/kg every 5-10 minutes until the skin becomes dry, the pupils dilate and tachycardia develops (pulse ≥ 100 beats per minute)

- Diazepam, IV,

Adults

5-10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds); to control seizures if required

Children

200-300 microgram/kg slowly over 2-3 minutes or if not possible then give the same injectable form (directly from the syringe) into the rectum after **removing** the needle. This may be repeated 10 minutes later if the fit continues.

ORGANOCHLORINE/CHLORINATED HYDROCARBON INSECTICIDES

Oily food and preparations enhance absorption of these substances and must be avoided.

SYMPTOMS

- Nausea
- Vomiting
- Diarrhoea
- Headache
- Dizziness
- Dyspnoea

- Paraesthesia
- Skin irritation

SIGNS

- Confusion
- Tremors
- Muscle twitching
- Seizures
- Coma
- Hypotension
- Arrhythmia
- Respiratory depression
- Renal failure
- Signs due to chronic exposure
 - Anaemia
 - Enlarged liver
 - Leukaemia
 - Depressed sperm count

INVESTIGATIONS

- Full blood count
- Liver function test

TREATMENT

Pharmacological treatment

- Activated charcoal, oral, 25 to 100 g in water (30 g per 240 ml water)
- IV fluids and monitor electrolyte/acid-base
- Oxygen ventilation
- Diazepam, IV,

Adults

5-10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds); to control seizures if required

Children

200-300 microgram/kg slowly over 2-3 minutes or if not possible then give the same injectable form (directly from the syringe) into the rectum after removing the needle. This may be repeated 10 minutes later if the fit continues.

RAT POISON (ANTICOAGULANTS)

The prolonged prothrombin time occurs within 24 hours and the maximum effect is from 36 to 72 hours. Coagulopathy may persist for 6 weeks to many months.

SYMPTOMS

- Nose bleeding
- Blood in sputum
- Gum bleeding
- Blood in urine
- Excessive vaginal bleeding
- Abdominal and back pain
- Headache

SIGNS

- Epistaxis
- Gum bleeding
- Haemoptysis
- Haematemesis
- Malaena stools
- Haematuria
- Haemothorax
- Multiple ecchymotic skin lesions
- Hypotension
- Intra-cranial bleeding
- Seizures and coma

INVESTIGATIONS

- Haemoglobin and haematocrit
- Prothrombin Time (PPT) or INR 6 hourly for 48 - 72 hours

TREATMENT**Pharmacological treatment**

- Activated charcoal, oral, (in a semi-liquid state)

Adults

25 to 100 g

Children

25 to 50 g

- Phytomenadione (Vitamin K1), oral, (if PTT or INR is prolonged)
0.4 mg/kg

Or

Phytomenadione (Vitamin K1), slow IV,

0.2 mg/kg in saline /glucose in severe cases

Maintenance dose of 4 times the oral dose for 1.5 to 8 months

- Fresh whole blood or packed cells and exchange transfusion as necessary

- In patients with active bleeding
- Phytomenadione (Vitamin K1) plus packed red blood cells and fresh frozen plasma

SOAPS, BLEACHES AND DETERGENTS

SYMPTOMS

- Vomiting
- Haematemesis (may occur following large ingestion)

SIGNS

- Vomiting

INVESTIGATIONS

- Blood electrolytes (when large amount ingested)
- Upper gastrointestinal endoscopy (when there is drooling, dysphagia, pain or a large amount ingested, generally > 5 mg/kg)

TREATMENT

Non-pharmacological treatment

- Encourage drinking of copious amount of water or milk, to a maximum of 120 ml for a child and 240 ml for adults to dilute substance

Pharmacological treatment

- None

PETROLEUM DISTILLATES

Systemic toxicity is unlikely from a pure petroleum distillate.

SYMPTOMS

- Nausea
- Vomiting
- Non-productive cough

SIGNS

- Tachycardia
- Atrial fibrillation
- Tachypnoea
- Intercostal recession
- Rhonchi
- Coarse crepitations
- Lethargy

- Irritability
- Central nervous system depression

INVESTIGATIONS

- Full blood count
- Urine routine examination
- Electrocardiogram (ECG)
- Chest x-ray after 6 hours

TREATMENT

Non-pharmacological treatment

- Assess the asymptomatic cases and detain for observation for 8-12 hours
- With the airway protected a gastric aspiration is done only for highly toxic ones or those with very toxic additives

Pharmacological treatment

- Oxygen, nasally, as necessary
- Antibiotics when febrile
- Activated charcoal is for highly toxic ones or those with very toxic additives charcoal 25 to 50 g for children and 25 to 100 g for adults
- Enema

PYRETHROIDS

These are present in 2 forms. Type I pyrethroid or permethrin contains no cyano group whereas the Type II pyrethroid e.g. Cypermethrin, deltamethrin and fenvalerate contain a cyano group. Type II pyrethroids are generally more toxic than type I pyrethroids.

SYMPTOMS

- Nausea and vomiting
- Diarrhoea
- Burning sensation in the mouth
- Laryngitis Paresthesias
- Headaches
- Dizziness

SIGNS

Type I pyrethroid poisoning

- Severe fine tremor
- Marked reflex hyperexcitability
- Sympathetic activation

- Paraesthesia (dermal exposure)
- Hyperthermia

Type II Poisoning

- Profuse watery salivation
- Coarse tremor
- Sympathetic activation
- Increased extensor tone
- Moderate reflex hyperexcitability
- Seizures
- Paraesthesia (dermal exposure)
- Pulmonary edema
- Coma

TREATMENT

Non-pharmacological treatment

- Monitor fluid status and serum electrolytes
- Monitor arterial blood gases

Pharmacological treatment

- Activated charcoal

Adults

25 to 100 g

Children

25 to 50 g

- Diazepam, IV,

Adults

5-10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds); to control seizures if required

Children

200-300 microgram/kg slowly over 2-3 minutes or if not possible then give the same injectable form (directly from the syringe) into the rectum after removing the needle. This may be repeated 10 minutes later if the fit continues.

- Normal saline 0.9%, IV, (for hypotension)
- Antihistamines with or without beta agonists (for allergy)

ADVERSE DRUG REACTION FORMS

FOOD AND DRUGS BOARD

In strict confidence

(A) PATIENT:

Age/Date of Birth: / /

Name/Folder Number Gender: M() F() Wt:kg

Hospital/Treatment Centre.....

(B) DETAILS OF ADVERSE REACTION AND ANY TREATMENT GIVEN

(Attach a separate sheet when necessary)

Date of onset of reaction / / Date reaction stopped: / /

(C) OUTCOME OF ADVERSE REACTION:

Recovered () Not yet recovered () Unknown ()

Did the adverse reaction result in any untoward medical condition?

Yes () No () If yes, specify.....

SEVERITY: Death () Life threatening () Disability () Hospitalization ()
others (specify).....

(D) SUSPECTED PRODUCT(S) (Attach sample or product label if available)

Brand name	Generic name	Batch no.	Expiry date	Manufacturer
Reasons for use (Indication)	Daily dose:	Route of Administration:		
Date started:		Date stopped:		
Was the product prescribed? Yes () No ()		Source of Drug:		

Was product re-used/re-applied after detection of adverse reaction?
Yes () No ()

Did adverse reaction re-appear upon re-use/re-application?
Yes () No ()

(E) DRUGS TAKEN WITHIN LAST THREE MONTHS PRIOR TO ADVERSE REACTION

Including herbal medicines (Attach a separate sheet when necessary)

Name of Drug	Daily dose	Date started	Date stopped	Reasons for use

Attach all relevant laboratory tests/data

(F) DETAILS OF REPORTER

Name of Reporter:

Address:.....

Profession:

Signature:

Tel: E-mail:.....

Date: / /

For all questions relating to Suspected Adverse Reactions, please call the Food and Drugs Board on Landline: (030) 233 200/2235 100, Mobile: (024) 4310 297. Fax (030) 2229 794. E-mail: drugsafety@fdbghana.gov.gh

Please return the completed form to the Technical Advisory Committee on Safety Monitoring, Food and Drugs Board, P. O. Box CT2783, Cantonments-Accra, Ghana.

This form can also be downloaded on the Food and Drugs Board's website: www.fdbghana.gov.gh

Please, note that this report does not constitute an admission that the reporting medical professional or the suspected product caused or contributed to the event.

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ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:
such as:

- *Medications (drugs and biologicals)
- *Traditional and herbal remedies

Report Product Quality Problems

- *Suspected Contamination
- *Questionable components
- *Poor packaging or labeling
- *Therapeutic failures

Report even if:

- *You're not certain the product caused the event
- *You don't have all the details

Confidentiality: Identities of the reporter and patient will remain strictly confidential.

Your support of the Safety Monitoring programme is much appreciated. Information supplied by you will contribute to the improvement of drug safety and therapy in Ghana.

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OTHER PUBLICATIONS

- Ghana Assessment of Medicines Procurement and Supply Management Systems in the Public Health Sector, A Country Report (2009)
- Partners Mapping for Medicines Procurement and Supply Management in Ghana (2009)
- Standard Treatment Guidelines (2004)
- Ghana Essential Medicines List (2004)
- National Drugs Policy (2004)
- Code of Ethics and Standards of Practice for Traditional Medicines Practitioners in Ghana (2003)
- Standards of Pharmaceutical Care for Health Institutions in Ghana (2003)
- Increasing Access to Medicines: An Assessment and Policy Options for Ghana (2003)
- An Assessment of the Pharmaceutical Sector in Ghana (2002)
- Logistics Management of Public Sector Health Commodities in Ghana: Standard Operating Procedures - Regional Medical Stores to Service Delivery Points (2002)
- Drugs and Therapeutics Committee (DTC) Training Manual (2002)
- Standard Treatment Guidelines (2000)
- Ghana Essential Drugs List (2000)
- Baseline Survey on the Pharmaceutical Sector in Ghana (1999)
- Procurement Procedure Manual (1999)
- Procurement Training Manual
- Rational Drug Use Training Manual