



Republic of Ghana

Ministry of Health
Ghana National Drugs Programme
(GNDP)

Standard Treatment Guidelines

Ministry of Health
Seventh Edition (7th), 2017

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PREFACE

Standard Treatment Guidelines (STGs) are systematically developed statements that assist healthcare providers 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 Ghana's 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 seventh 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. The official release of this edition would be the e-copy, available at <http://www.ghndp.org>. This edition is also available on compact disk.

The Ministry of Health is particularly grateful to its development partners, experts, and other stakeholders for their continuous support to the health sector.

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

Hon. Kwaku Agyeman-Manu
Minister for Health
June 2017

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Public Health Programmes

Expanded Programme on Immunisation (EPI), GHS
Eye Care Programme, GHS
National AIDS/STI Control Programme (NACP)
National Malaria Control Programme (NMCP), GHS
National Tuberculosis Programme (NTP), GHS
National Yaws Eradication Programme (NYEP)
Neglected Tropical Diseases Control Programme
Non-communicable Diseases Control Programme
Reproductive Health Unit, GHS

Contributors

Child Health, GHS
Christian Health Association of Ghana
Family Planning, GHS

Ghana Association of Quasi-Government Health Institutions

Ghana Medical Association

Head, Disease Control Unit, GHS

Nurses and Midwives Association of Ghana

National Blood Service of Ghana

Pharmaceutical Society of Ghana

Society of Private Medical and Dental Practitioners

Supporting Development Partners

European Union Commission

United Kingdom Department for International Development

World Health Organisation Country Office for Ghana

INTRODUCTION

The Government of Ghana, through the National Medicine 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 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 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.

To use treatment 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:

The Programme Manager
Ghana National Drugs Programme
Ministry of Health
PO Box MB 582
Accra, Ghana
West Africa
Website: www.ghndp.org

How to use this book

To use these guidelines effectively, it is important that you become familiar with the contents. Take time to read the book and understand the content and layout.

The contents of this book have been arranged in approximately alphabetical 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 structuring of the information and guidance has been standardised to include a brief description of the condition or disease and the more common signs and symptoms. 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 guidance 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

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and review of outcome. Prescribers are strongly recommended to 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. In most cases, the British Approved Name (BAN) and rINN are similar but in a few instances there are differences. Where these differences occur, the BAN has been put in parentheses to permit easy reference.

Prescribing for NHIS reimbursement

The National Health Insurance Scheme (NHIS) operates with a defined benefits package and reimburses healthcare providers for services rendered to its members according to the treatment protocols outlined in the STG. It is important for prescribers to be adept with the benefit package and also with the operational manuals of the scheme to ensure members benefit appropriately and facilities receive full payment for services rendered.

The Tariff Operational Manual and the NHIS Medicines List (NHIS ML) are important reference documents for service providers. They indicate the individual conditions that are covered, the medicines available on the scheme's formulary and the tariffs to be used for billing.

Prescribers must note that for every condition that is covered, there are medicines listed in the NHIS ML in line with the STG recommendations. In addition, the NHIS ML states the level of prescribing attached to each medicine as indicated in the Essential Medicines List of the MOH.

Medicines should be prescribed by the generic names on the ML and prescribers must indicate the quantity of medicines to be supplied on the prescription. This is a normal requirement for prescribing and will be very helpful in claims processing for reimbursement.

Notes on cost-effectiveness

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, diagnosis 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.

Table 0-1: Table of medical abbreviations for prescribing

Abbreviation	Connotation
IV	Intravenous
IM	Intramuscular
SC	Subcutaneous
p.o. or oral	per os (by mouth)*
kg	Kilogram
g	Gram
mg	Milligram
L	Litre
dl	Decilitre
ml	Millilitre
mmol	Millimole
mEq	Milliequivalent
hr(s)	Hour(s)
min(s)	Minute(s)

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Abbreviation	Connotation
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 p.o. or oral could be tablets, capsules, caplets, suspensions or 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 risk 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, 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, 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 of '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. 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

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there are clear, clinical indications for this route. Use the oral route whenever possible.

Dosing and medication based on Age and body weight in children

Table 0-2: Dosing and Medication based on body weight in children

Age	Body weight in kg
Children	
12 years	39
7 years	23
5 years	18
3 years	15
1 year	10
6 months	7.7
3 months*	5.6
1 month*	4.2
Newborn*	3.5

* These figures relate to full term and not preterm infants. A reduced dosage may be required in preterm infants.

Pharmacovigilance and Adverse Drug Event Reporting

The development of an undesirable medical condition such as a new symptom, sign, laboratory or other test alteration, deterioration of a pre-existing medical condition, disability or death during or following administration of a medicinal product (allopathic or herbal) or use of a medical device, or the lack of effect of the product, is considered an adverse event that needs to be reported, whether or not considered causally related to the product.

Spontaneous, voluntary reporting of adverse events relating to the use of prescription only medicines and vaccines, over-the-counter medicines and medical devices is now generally considered a norm in many countries for healthcare professionals and consumers alike. For health professionals, the need to report adverse reactions to these products is also a moral and professional obligation.

Although most medicines undergo rigorous safety monitoring during clinical trials before approval is given for their registration and use in any country, such trials have some limitations including the relatively small number of individuals involved. Post-marketing adverse drug event monitoring and reporting enables detection of less

commonly encountered, but potentially serious adverse events among a larger population. Older medicines and devices, with which healthcare practitioners may have experience with use, and newer ones with which they may not, can all give rise to adverse events in susceptible individuals.

This edition of the Standard Treatment Guidelines, like the previous edition, includes copies of the Ghana Food and Drugs Authority (FDA) adverse reaction reporting form. Extra copies of the adverse reaction reporting form may be obtained from the FDA or through its Institutional Contact Persons at various health facilities throughout the country. Patients may also report directly through Patient Safety Centres in designated community pharmacies nationwide. Online submission of reports by both health professionals and patients can also be done through the SafetyWatch System at <http://adr.fdaghana.gov.gh/> or <http://fdaghana.gov.gh/adr/> or www.fdaghana.gov.gh. An e-mail of a report may also be sent to the National Pharmacovigilance Centre at drug.safety@fdaghana.gov.gh. A phone call to 0244 310 297 or to short code 4015 could be made for any assistance regarding drug safety issues.

Assigning causality to each reported event is carried out by a committee of experts from several disciplines in medicine and pharmacy and others representing the pharmaceutical industry and consumer interests, selected by the FDA. The process is anonymous and handled with the strictest confidence and is linked to a World Health Organization pharmacovigilance system.

The early identification of warning signals for a particular product from adverse event reporting and pharmacovigilance activities enables timely interventions to forestall any potential harm to the public.

Important contacts

Table 0-3: Table of important contacts and referral centres

Unit/Department/Referral Centre	Contacts
Food And Drugs Authority (FDA) Adverse drug reactions: Please report any adverse drug reactions to the Pharmacovigilance Unit of the Food and Drugs Authority (FDA).	0302-235100, 0302-233200, 0544-341222 TOLL-FREE: 0800 151 000 (Vodafone/ Airtel) HOTLINE: 0299-802932, 0299-802933 Fax: 030-2229 794 Website: www.fdaghana.gov.gh Email: fda@fdaghana.gov.gh Twitter: gh_fda Whatsapp: 0206-973065 SMS short code: 4015 Facebook: Food and Drugs Authority-GH
National Aids Control Programme (NACP)	030-2678456/7/8/9 Website: www.tbghan.gov.gh

INTRODUCTION

Unit/Department/Referral Centre	Contacts
National Malaria Control Programme	030-2661484/2681418 Website: www.ghaneahalthservice.org/malaria
National Tuberculosis Control Programme	030-2660023 Website: www.tbghana.gov.gh
National Yaws Control Programme	030-2660023
National Buruli Ulcer Control Programme	030-2660023/2686337 Fax: 030-2686336 Website: www.burulighana.org
Expanded Programme for Immunisation	030-2660023
National Ambulance Service	030-2684201, 030-2684251, 030-2684259
National Drug Information Resource Centre	030-2678557, 030-2678559 Fax: 030-2678 557 Website: www.ghanadruginformation.org
National Poisons Control Centre	030-2238 636, 030-2243 552
National Blood Service	030-2663 702/030-2663 701 Website: www.nbsghana.org
Ghana Police Service	191, 999, 027-7522288 Website: www.ghanapolice.info
Teaching Hospitals	
Cape Coast Teaching Hospital	033-23401015, 020-1380902
Korle-Bu Teaching Hospital	030-2667759/2673034/2675401
Komfo Anokye Teaching Hospital	032-2022301
Tamale Teaching Hospital	037-2000180
Regional Hospitals	
Greater Accra Regional Hospital (Ridge Hospital)	030-228382
Central Regional Hospital (Winneba Trauma Specialist Hospital)	033-2094727
Volta Regional Hospital	020-6241929/8161310/7984537
Upper West Regional Hospital	039-2022007/2664/2529, 020-0041573
Northern Region	037-2000180 (Tamale Teaching Hospital)
Upper East Regional Hospital	038-2022461

Unit/Department/Referral Centre	Contacts
Brong-Ahafo Regional Hospital	035-2028456/456/461, 0266331214
Ashanti Regional Hospital (Kumasi South)	050-1266827, 020-7227655
Western Regional Hospital (Effia Nkwanta)	031-2023151-4, 031-2092180, 020-0041573
Eastern Regional Hospital	034-2023021/11
Laboratory	
National Reference Laboratory	030-2677696/020-8168903

Ghana National Drugs Programme

Comments and suggestions should be sent to:

The Programme Manager

Ghana National Drugs Programme

Ministry of Health

P.O. Box MB-582, Accra, Ghana

Telephone number: (0) 302-661 670/1

Fax number: (0) 302-664 309

E-mail: gndp@ghndp.org

Website: www.ghndp.org

DISORDERS OF THE GASTROINTESTINAL TRACT

8. Diarrhoea

Diarrhoea is defined as the passage of frequent, loose, watery stools 3 or more times a day. Diarrhoea may be accompanied by vomiting.

In children, the commonest cause is viral. There is therefore usually no need to prescribe antibiotics. Other diseases like malaria, pneumonia, ear infections and urinary tract infections, may be associated with diarrhoea. Fluid loss occurs quickly in this age group because of their size. If not corrected, it may result in dehydration, which can be fatal.

A complaint of diarrhoea should be taken seriously. Always ask about the frequency and the texture of the stools. Giving antibiotics in all cases of diarrhoea may worsen or prolong the condition except in special circumstances (See section on 'Causes' below). Enemas and laxatives should not be given to patients with diarrhoea.

CAUSES

Acute diarrhoea (< 2 weeks)

- Infections
 - Viral: e.g. rotavirus, norovirus
 - Bacterial: e.g. *Salmonella* spp., *Shigella*, *Campylobacter*, *E. coli*, *Vibrio cholerae*
 - Protozoal: e.g. *Entamoeba histolytica* (amoebiasis)
- Drug-induced: e.g. penicillins

Chronic diarrhoea (> 2 weeks)

- Chronic infections: e.g. amoebiasis, tuberculosis, opportunistic infections with HIV
- Functional: e.g. irritable bowel syndrome
- Inflammatory: e.g. ulcerative colitis, Crohn's disease
- Malabsorption syndromes: e.g. chronic pancreatitis
- Malignancy: e.g. colon cancer
- Endocrine: e.g. hyperthyroidism, diabetic autonomic neuropathy
- Drug-induced: e.g. laxatives, NSAIDs

SYMPTOMS

- Frequent watery stools
- Blood or mucus in the stool

- Presence of fever
- Reduced urine output
- Associated vomiting

SIGNS**Adults**

- Anaemia
- Weight loss
- Anorexia
- Oral lesions e.g. oral ulcers, candidiasis
- Skin lesions e.g. erythema nodosum
- Signs of dehydration (dry mucous membranes, reduction in skin turgor, capillary refill > 2 seconds, tachycardia, postural hypotension)
- Enlarged thyroid
- Abdominal masses
- Rectal mass

Box 1-1: Diagnostic clues for Diarrhoea

- Diarrhoea WITH vomiting, low grade fever with no mucus in stools: consider viral infection
- Diarrhoea WITH vomiting, fever, abdominal cramps, blood and mucus in stools: consider bacterial infection
- Diarrhoea WITH blood and mucus in stool WITHOUT fever: consider amoebiasis
- Profuse diarrhoea present (rice water stools) WITH vomiting: consider cholera
- Diarrhoea WITH excessive vomiting (especially if in more than one member of the household or group): consider food poisoning
- Diarrhoea presenting with oral and/or skin lesions, weight loss etc. over long period: consider HIV
- Diarrhoea alternating with constipation in adults: consider bowel malignancy

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

Table 1-1: Assessment of degree of dehydration in children with diarrhoea

Assessment of degree of dehydration in children with diarrhoea

% DEHYDRATION	<5% Nil	5-10% Mild-moderate	>10% Severe
LOOK AT			
Condition	Well, alert	Restless, irritable	Lethargic, unconscious, floppy
Eyes	Normal	Sunken	Very sunken and dry
Mouth and tongue	Moist	Dry	Very dry

Assessment of degree of dehydration in children with diarrhoea

% DEHYDRATION	<5% Nil	5-10% Mild-moderate	>10% Severe
Thirst	Drinks normally, not thirsty	Thirsty, drinks eagerly	Drinks poorly
FEEL			
Skin	Goes back quickly after pinching	Goes back slowly after pinching	Goes back very slowly after pinching
DECIDE			
	The patient has no signs of dehydration	If the patient has two or more signs, including at least one sign underlined, there is some dehydration	If the patient has two or more signs, including at least one sign underlined, there is severe dehydration
TREATMENT PLAN	Weigh patient and use Treatment Plan A	Weigh patient and use Treatment Plan B	Weigh patient and use Treatment Plan C

Adapted from Integrated Management of Childhood Illnesses, WHO

INVESTIGATIONS

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

TREATMENT**Treatment objectives**

- To prevent dehydration
- To replace lost fluid
- To maintain nutrition by ensuring adequate dietary intake during illness
- To maintain personal hygiene
- To eliminate infecting organisms where appropriate

Non-pharmacological treatment

- Keep surroundings clean
- Improve personal hygiene e.g. hand washing after toilet
- Adequate fluid intake - oral and intravenous as necessary (See section on 'Fluid management for children with diarrhoea')
- Maintain adequate nutrition as can be tolerated

Pharmacological treatment

A. Bacterial gastroenteritis (fever, abdominal cramps, blood and mucus in stools)

Note 1-1

No antibiotics are required for suspected viral gastroenteritis. Adequate rehydration is the main requirement.

1st Line Treatment

Evidence Rating: [A]

- Ciprofloxacin, oral,
Adults
500 mg 12 hourly for 5 days
Children (for all child age groups)
15 mg/kg 12 hourly for 5 days

2nd Line Treatment

Evidence Rating: [A]

- Cefuroxime, IV,
Adults
750 mg 8 hourly
Children
25 mg/kg body weight 12 hourly
Neonates
> 7 days; 25 mg/kg body weight 8 hourly
< 7 days; 25 mg/kg body weight 12 hourly
Then
• Cefuroxime, oral,
Adults
250 mg 12 hourly for 5-7days
Children
12-18 years; 250 mg 12 hourly for 5-7 days
2-12 years; 15 mg/kg body weight for 5-7 days (max.
250 mg 12 hourly)
3 months-2 years; 10 mg/kg body weight for 5-7 days (max.
125 mg 12 hourly)

Note 1-2

Suspension can only be given to children above 3 months, however the IV can be given to neonates.

B. Amoebic dysentery suspected (patient failing to respond to empirical treatment for bacterial gastroenteritis within 2 days or based on stool microscopy)

Evidence Rating: [A]

- Metronidazole, oral,
Adults
800 mg 8 hourly for 5 days
Children

CHAPTER 1: DISORDERS OF THE GASTROINTESTINAL TRACT

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

C. Cholera: profuse diarrhoea (rice water stool) + vomiting1st Line Treatment

Evidence Rating: [A]

- 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

6-12 years; 250-500 mg 8 hourly for 5 days

2-6 years; 250 mg 6 hourly for 5 days

1 month-2 years; 125 mg 6 hourly for 5 days

Neonates; 12.5 mg/kg 6 hourly for 5 days**D. Zinc supplementation for diarrhoea**

Evidence Rating: [A]

- Zinc supplement, oral,
Adults

Not required

Children

> 6 months; 20 mg/day for 10-14 days

< 6 months; 10 mg/day for 10-14 days

REFERRAL CRITERIA

Refer patients who fail to improve, or get worse, despite therapy for acute diarrhoea. Refer all patients with chronic diarrhoea to a specialist for further evaluation and management.

TREATMENT ALGORITHM**Fluid management for children with diarrhoea****Treatment Plan A—Nodehydration**

- 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
- 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

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 or 1000 mls depending on type of ORS.

- To get 600 ml, use 2 small (300 ml) soft drink bottles or 1 big beer bottle
- To get 1000 ml, use 1L mineral water bottle

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.

Table 1-2: 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

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 for Plan B
- 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 breastfeeding
- Observe stools passed and record quantity
- Check for signs of worsening dehydration
- If eyes become puffy, it means too much fluid has been given so stop ORS and re-evaluate
- 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 1-3: 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 urgent treatment with IV fluids in hospital
- If the child can drink, give ORS by mouth while the IV line is being set up
- 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 the above treatment and cannot pass a nasogastric tube, refer to a health facility that can do so.
- 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 for Plan B
- 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
- 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
- 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 (e.g. banana)
- If there is clinical and/or laboratory evidence of severe hypokalaemia, potassium should be given by the intravenous route using potassium chloride but only in a hospital. Potassium containing fluids such as

- half strength Darrow's solution or Ringer's lactate may be added
- If possible infants and children should continue to breastfeed or eat during the period of diarrhoea

Table 1-4: 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.

Note 1-3

Anti-diarrhoeal medicines like Mist Kaolin, diphenoxylate/atropine, codeine, loperamide should not be used in the treatment of diarrhoea in children and are likely to do more harm than good. Similarly, antibiotic preparations with kaolin or pectin are of no therapeutic value in the management of diarrhoea.

9. Rotavirus Disease and Diarrhoea

Rotavirus is the most common cause of severe diarrhoea in young children. It accounts for more than a third of all hospitalizations of children less than 5 years. It occurs year round with peaks between the dry months (December - March). Children are infected by age 2 to 3 years and re-infections are common.

CAUSES

- Rotavirus: 5 types of rotavirus are known to cause >90% of all cases worldwide

SYMPTOMS

- Fever
- Vomiting
- Profuse watery diarrhoea
- Thirst

SIGNS

- Sunken eyes
- Diminished skin turgor
- Altered consciousness, depending on the degree of dehydration

INVESTIGATIONS

- Detection of rotavirus antigen in stool by an enzyme immunoassay (EIA)

TREATMENT

Treatment objectives

- Correction of fluid and electrolyte deficits

- Replacement of on-going fluid losses
- Adequate nutrition to prevent malnutrition

Non-pharmacological treatment

- Home-based fluids e.g. breast milk, porridges, coconut drink
- Nutrition: feed as can be tolerated during the episode, give an extra meal per day for 2 weeks after the episode

Pharmacological treatment

A. ORS and Zinc supplementation

(See section on 'Diarrhoea')

REFERRAL CRITERIA

- Poor response to rehydration process (passing more stools than drinking)
- Poor drinking
- Blood in stool
- Poor feeding
- Altered consciousness/convulsions
- Diarrhoea and vomiting continuing for > 3 days

Note 1-4

Prevention:

Two (2) doses of Rotavirus vaccine, given at 6 - 10 weeks, is effective in preventing rotavirus diarrhoea. The 2nd dose should be given by 16 weeks, and not later than 24 weeks. Rotavirus vaccine is now currently given as part of routine immunization in Ghana. (See section on 'Immunisation').

10. Constipation

In general, constipation refers to bowel movements that are infrequent or stools that are difficult to pass. There is great individual variation in normal bowel habits; therefore emphasis should be laid on changes in the bowel habit.

Diarrhoea alternating with constipation may indicate a large bowel cancer especially in those aged 40 years and above. In children and the elderly, this may indicate chronic constipation with spurious diarrhoea.

The habitual use of laxatives is very common in the community. This practice must be discouraged to avoid hypokalaemia and its consequences.

CAUSES

Medical

- Diet deficient in roughage
- Ignoring the urge to defaecate e.g. due to immobility
- Hypothyroidism
- Irritable bowel syndrome
- Hypercalcaemia
- Drugs e.g. atropine, codeine, morphine, tricyclic antidepressants,

disopyramide

- Lazy bowel from chronic laxative use including 'herbal' preparations
- Lack of exercise
- Dehydration and starvation (particularly in children)

Surgical

- Gastrointestinal obstruction
- 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
- Aganglionic and acquired megacolon
- Pseudo-bowel obstruction (Ogilvie syndrome) following immobility from any cause

SYMPTOMS

- Inability to move bowels
- Passing hard stools
- Infrequent passing of stools
- Straining to pass stools
- Feeling of incomplete evacuation of bowel
- Inability to pass flatus, colicky abdominal pain with or without vomiting

SIGNS

- Frequent high pitched bowel sounds - suspect mechanical bowel obstruction
- Absent bowel sounds - suspect paralytic ileus
- Signs of peritonitis (generalised tenderness, guarding and rebound tenderness, refer appropriate section) -suspect gangrenous bowel

INVESTIGATIONS

- Digital rectal examination (must be carried out in all patients with suspected diagnosis of constipation)
- Stool for occult blood
- Plain abdominal X-ray (erect and supine)
- Proctoscopy/proctosigmoidoscopy/colonoscopy (must not be done if acute intestinal obstruction is suspected)

TREATMENT

Treatment objectives

- To identify possible cause of constipation
- To relieve constipation

Non-pharmacological treatment

- Adherence to regular exercise
- High fibre diet
- Adequate fluid intake (minimum of 3.2L of water per day if no contraindications exist)

Pharmacological treatment

A. Management of Constipation in Adults

1st Line Treatment

Evidence Rating: [C]

- Bisacodyl, oral, 10-20 mg at night
Or
- Senna, oral, 15-30 mg at bedtime (maximum 70-100 mg daily). Doses above 70 mg should be divided 12 hourly
Or
- Lactulose, oral, 15-30 ml daily until response, then 10-20 ml daily

2nd Line Treatment

Evidence Rating: [C]

- Bisacodyl, rectal, 10 mg in the morning
Or
- Glycerol suppositories, rectal, 4 g at night
Or
- Liquid paraffin, oral, 10-30 ml at night
Or
- Milk of Magnesia, oral, 5-10 ml in a glass of water, 12-24 hourly

B. Management of Constipation in Children

1st Line Treatment

Evidence Rating: [C]

- Lactulose, oral,

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

Or
- Glycerol suppositories, rectal,

2-5 years;	2 g at night
< 1 year;	1 g at night

Or
- Bisacodyl, rectal,

> 10 years;	5 mg in the morning
< 10 years;	on medical advice only

Or
- Senna, oral,

6-12 years;	5-40 ml at bedtime
2-6 years;	2.5-20 ml at bedtime

Note 1-5

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

REFERRAL CRITERIA

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

- Patients with absent bowel sounds, vomiting or not passing flatus
- Cases resistant to medical treatment
- Any suspected surgical cause

11. 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. Gastric ulcers should be taken seriously because they may be malignant.

Peptic ulcers may lead to life threatening complications of bleeding, perforation and gastric outlet obstruction.

CAUSES

- *Helicobacter pylori* (*H. pylori*) infection
- Excessive secretion of gastric acid
- Inadequate protection of the lining of the stomach and duodenum against digestion by acid and pepsin
- Medicines e.g. non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids

SYMPTOMS

- Episodic abdominal pain (often aggravated by dietary indiscretions and lifestyle)
 - May be a minor discomfort, gnawing, burning, dull ache or very severe pain
 - Typically pain is in the epigastrium or right hypochondrium
 - Occasionally high up behind the sternum or low down around the umbilicus
 - In duodenal ulcer, pain 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, and may be relieved by vomiting
 - Is relieved by alkalis and food in duodenal ulcer
- Vomiting may occur in both duodenal and gastric ulcers. It is usually a complication in duodenal ulcer (gastric outlet obstruction) but may be self-induced in gastric ulcer to relieve pain

In children

- Pain may be peri-umbilical

SIGNS

- There may be no abdominal signs
- Weight loss (sometimes in gastric ulcer)
- Weight gain (sometimes in duodenal ulcer)
- Tenderness - epigastrium, right hypochondrium or umbilical region

INVESTIGATIONS

- Haemoglobin
- *H. pylori* stool antigen
- Oesophago-gastro-duodenoscopy (endoscopy)
- Barium meal (in the absence of endoscopy)
- Stool examination (to exclude intestinal parasites)

TREATMENT**Treatment objectives**

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

Non-pharmacological treatment

- Avoid alcohol and tobacco intake
- Avoid foods that aggravate the pain
- Allay anxiety and stress
- Surgical treatment: for chronic cases with severe periodic attacks, failed medical treatment and complications e.g. perforation, gastric outlet obstruction and haemorrhage)

Pharmacological treatment**A. Dyspepsia**

1st Line treatment

Evidence Rating: [A]

- Magnesium trisilicate, oral, 15 ml 8 hourly (in-between meals and at bedtime to control dyspepsia)
Or
- Aluminium hydroxide, oral, 500 mg 6 hourly (in-between meals and at bedtime)

Note 1-6

Avoid taking antacids within 2 hours of proton pump inhibitors (PPIs) e.g. omeprazole, esomeprazole, pantoprazole

2nd Line treatment

Evidence Rating: [A]

- Omeprazole, oral,
Adults
20 mg daily for 4 weeks. Repeat course if ulcer is not fully healed.
- B. NSAID-associated duodenal or gastric ulcer and gastro-duodenal erosions**
Evidence Rating: [A]
- 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

- Pantoprazole, oral,

Adults

20-40 mg daily for 4 weeks. Repeat course if ulcer is not fully healed.

C. Bleeding peptic ulcer (may be an indication for surgery)

Evidence Rating: [A]

- Esomeprazole, IV,

Adults

40 mg daily

Or

- Omeprazole, IV,

Adults

40 mg 12 hourly for up to 5 days

D. *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 10-14 day course of treatment consisting of a PPI plus a combination of two of the antibiotics indicated in the table below.

Table 1-5: *Helicobacter pylori* Eradication Therapy

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 8 hourly -----	500 mg 12 hourly ----- 500 mg 12 hourly	----- 400 mg 8 hourly 400 mg 12 hourly
Or Pantoprazole, oral 40 mg 12 hourly	1 g 12 hourly -----	500 mg 12 hourly 500 mg 12 hourly	----- 400 mg 12 hourly

§ Avoid treatment regimens including Amoxicillin in patients with penicillin allergy

REFERRAL CRITERIA

Refer for specialist care when there is failure of *H. Pylori* eradication

or if surgery is indicated as stated above.

12. Gastro-oesophageal Reflux Disease

Gastro-oesophageal Reflux Disease (GORD) is caused by backflow of gastric and/or duodenal contents 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 gastro-oesophageal disease (non-erosive GORD) and erosive gastro-oesophageal disease (erosive GORD). Failure to treat may result in oesophagitis, ulceration, strictures and rarely adenocarcinoma.

CAUSES

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

SYMPOTMS

- Heartburn (worsens with vigorous exercise, bending forward, lying; relieved by antacids and sitting upright)
- Dyspepsia
- Early satiety
- Retrosternal and epigastric pain (mimics angina pectoris by radiating to neck, jaws and arms. The pain is worse on bending down e.g. sweeping)
- Pain on swallowing
- Difficulty swallowing
- Nocturnal regurgitation (wakes patients up with coughing, choking and filling of the mouth with 'saliva')
- Asthma-like (may be worse at night)

In children

- Failure to thrive/refusing food
- Vomiting
- Coughing
- Forceful regurgitation which may lead to aspiration pneumonia
- Iron deficiency anaemia
- Wheezing

SIGNS

- May be none

- Epigastric tenderness occasionally
- Chest signs (e.g. wheezing)

INVESTIGATIONS

- Oesophago-gastro-duodenoscopy (OGD), i.e. upper gastro-intestinal tract endoscopy
- Chest X-ray to exclude other causes
- Abdominal ultrasound (to exclude other diseases)
- Barium swallow with fluoroscopy (especially useful in children)
- Oesophageal pH monitoring (in cases that are difficult to diagnose)
- Lower oesophageal sphincter manometry (in cases that are difficult to diagnose)

TREATMENT

Treatment objectives

- To relieve symptoms
- To prevent complications

| Non-pharmacological treatment

Lifestyle changes:

- 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)
- Encourage moderate exercise
- Weight reduction in overweight and obese individuals
- Avoid corsets, instead wear loose clothing
- Surgical treatment: Fundoplication (for severe cases, treatment failures and complications)

| Pharmacological treatment

A. Non-erosive GORD

Evidence Rating: [B]

- Magnesium trisilicate, oral, 15 ml 8 hourly (in between meals and at bedtime to control dyspepsia)

Or

- Antacids containing Aluminum hydroxide, Magnesium hydroxide, Simethicone, Calcium alginates

Or

- Omeprazole, oral,

Adults

20 mg daily for 4-8 weeks

Children

> 20 kg;

20 mg daily for 4-8 weeks

10-20 kg;

10 mg daily for 4-8 weeks

5-10 kg;

5 mg daily for 4-8 weeks

Or

- Esomeprazole, oral,
Adults
40 mg daily for 4 to 8 weeks

Or

- Rabeprazole, oral,
Adults
20 mg daily for 4 to 8 weeks

B. Severe or Erosive GORD

- Omeprazole, oral,
Adults
20 - 40 mg daily for 8 weeks
Children
> 20 kg; 20 mg daily for 4-8 weeks
10-20 kg; 10 mg daily for 4-8 weeks
5-10 kg; 5 mg daily for 4-8 weeks

Or

- Esomeprazole, oral,
Adults
40 mg daily for 8 weeks
- Rabeprazole, oral,
Adults
20-40 mg daily for 8 weeks

C. Severe or Erosive GORD (with bloating)

- Use medications in Section B above for 'Severe GORD'
And
- Metoclopramide, oral,
Adults
10 - 20 mg 6-8 hourly
- Domperidone, oral,
Adults
10 mg 6-8 hourly

REFERRAL CRITERIA

Refer cases not responding to the measures above to a physician or surgical specialist, as well as severe cases, treatment failures and individuals with complications.

13. Pain Originating from the Oesophagus

Oesophageal pain is usually burning in quality and tends to be localised behind the sternum. Oesophageal pain may be associated with difficulty in swallowing (dysphagia). Dysphagia to water suggests achalasia,

while that to solids and not water suggests mechanical obstruction by tumour or stricture. 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 (Gastro-oesophageal Reflux Disease (GORD))
- Oesophageal candidiasis
- Hiatus hernia
- Achalasia
- Spasm of the oesophageal muscle in response to obstruction.
- Oesophageal tumours

SYMPTOMS

- Retrosternal chest pain worsened by swallowing (pain worse on lying flat may suggest GORD)
- Regurgitation of ingested material
- Difficulty in swallowing

SIGNS

- Usually none
- Patient may be obese or severely underweight in the case of GORD
- Severe weight loss may suggest tumour or candidiasis from immune suppression
- There may be oral candidiasis in the case of oesophageal candidiasis

INVESTIGATIONS

- Barium swallow
- Oesophago-gastroduodenoscopy (upper GI endoscopy)
- Oesophageal manometry when achalasia is suspected

TREATMENT

Treatment objectives

- To relieve pain
- To treat identified cause

Non-pharmacological treatment

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

Pharmacological treatment

A. For GORD

1st Line Treatment

Evidence Rating: [B]

- Omeprazole, oral,
Adults
20 mg 12 hourly for 14 days

Or

- Esomeprazole
Adults

20-40 mg daily for 14 days

B. For patients not responding to monotherapy with PPI

Evidence Rating: [B]

- Omeprazole, oral, 20 mg 12 hourly for 14 days

Or

- Esomeprazole, oral, 20-40 mg daily for 14 days

And

Magnesium trisilicate, oral, 10 ml 8 hourly for 10 days

C. For oesophageal candidiasis

Evidence Rating: [A]

- Nystatin, oral, (swish in mouth for several minutes and then swallow)

Adults

400,000-600,000 units 6 hourly for 7 days

Or

- Fluconazole, oral,

Adults

200 mg stat.

Then

100 mg daily for 14 days

REFERRAL CRITERIA

Refer to a specialist for confirmation of diagnosis and management.

14. Haemorrhoids

Haemorrhoids or “piles” are enlarged, displaced anal cushions derived from engorged veins, which primarily presents with anal bleeding.

First-degree haemorrhoids remain in the anal canal. Second-degree haemorrhoids prolapse, but reduce spontaneously, whereas third degree haemorrhoids prolapse and have to be replaced manually or remain prolapsed permanently until surgically treated.

The history is very important. The nature of the bleeding, associated pain and other symptoms help differentiate haemorrhoids from other more sinister conditions. Always do a digital rectal examination to exclude carcinoma and other conditions when a patient complains of pain or bleeding from the anus. Altered or dark blood, or blood mixed with stools, should raise suspicion of bleeding higher up in the rectum or colon.

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
- Excessive straining at stools from constipation or diarrhoea
- Familial predisposition

- Chronic liver disease with portal hypertension
- Anorectal tumours

SYMPOTMS

- Passage of bright red blood at defaecation
 - Not mixed with stools
 - May spray the toilet bowl or only found on the toilet paper after cleaning
- Mucoid discharge
- Swelling at anus
- Perianal irritation or itch (pruritus ani)
- Discomfort after opening bowels
- Anal pain (occurs during an acute attack of prolapse with thrombosis, congestion and oedema)
- Symptoms of anaemia

SIGNS

- May be none (inspection of the anus and digital rectal examination may be normal)
- Redundant folds of skin (skin tags) seen in the position of the haemorrhoids. Straining may show the haemorrhoids
- Swelling at the anus (in third degree haemorrhoids)
- Palpable thrombosed internal haemorrhoids on rectal examination
- Signs of complications (profuse bleeding with anaemia or haemorrhagic shock, prolapse, strangulation, thrombosis, infection or ulceration)
- Pallor

HAEMORRHOIDS

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
- Surgical treatment:

CHAPTER 1: DISORDERS OF THE GASTROINTESTINAL TRACT

- Rubber band ligation for second-degree haemorrhoids.
- Haemorrhoidectomy for third degree haemorrhoids.
- Haemorrhoids developing during pregnancy should be managed conservatively as most will resolve after delivery

Pharmacological treatment**A. When associated with constipation**

Evidence Rating: [C]

- Liquid paraffin, oral,
Adults
10-30 ml at night
Or
- Senna granules, oral,
Adults
1 sachet with water after supper

B. When associated with local itching or discomfort

- Soothing agent (with or without steroids), applied or inserted rectally,
Adults
One suppository 12 hourly for 7-10 days

C. For infected haemorrhoids1st Line treatment

Evidence Rating: [B]

- Gentamicin, IV,
Adults
40-80 mg 8 hourly for 5 to 7 days
And
- Metronidazole, oral,
Adults
400 mg 8 hourly for 5 to 7 days

2nd Line treatment

Evidence Rating: [B]

- Ciprofloxacin, oral,
Adults
500 mg 12 hourly
And
- Metronidazole, oral,
Adults
400 mg 8 hourly for 5 - 7 days

3rd Line treatment

Evidence Rating: [B]

- Amoxicillin, oral,
Adults
500 mg 8 hourly

And

- Metronidazole, oral,
Adults
400 mg 8 hourly for 5 to 7 days

D. When associated with anaemia

- Iron preparation (ferrous sulphate/fumarate) (See section on 'Anaemia')
Or
- Blood transfusion as indicated

REFERRAL CRITERIA

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

DISORDERS OF THE LIVER

8. Amoebic Liver Access

Amoebic liver abscess is a collection of typically brownish coloured fluid in the liver, occurring often as a single mass in the right lobe and a complication of intestinal infection with *Entamoeba histolytica*. Lung, heart and brain infections are uncommon sequelae. Occasionally, pyogenic abscesses may have a similar clinical presentation.

Treatment of amoebic abscesses should be initiated with a tissue agent active against the trophozoite form followed by a luminal agent to eliminate intra-luminal cysts.

CAUSES

- *Entamoeba histolytica*

SYMPTOMS

- Right upper abdominal pain referable to the epigastrium, right chest or right shoulder
- Fever
- Malaise
- Sweats
- Cough
- Hiccups
- Anorexia
- Weight loss
- Jaundice (uncommon)
- Concurrent diarrhoea (less than one-third of patients)

SIGNS

- Large tender liver
- Tenderness and/or bulging at right intercostal spaces
- Jaundice
- Dullness to percussion on the right lower chest zones with basal crepitations
- Amoebic empyema following extension into the chest cavity
- Peritonitis (uncommon)

INVESTIGATIONS

- Abdominal ultrasound
- Chest X-ray
- FBC
- ESR
- Stool examination
- Abdominal CT scan
- Serology (amoebic antibodies)

TREATMENT

Treatment objectives

- To eradicate *Entamoeba histolytica* infection
- To prevent further destruction of liver tissue
- To prevent further complications (e.g. rupture of abscess into pleural, pericardial or peritoneal space)

Non-pharmacological treatment

- Therapeutic aspiration may be required in patients with poor response to therapy

Pharmacological treatment

1st Line Treatment

Evidence Rating: [A]

- Metronidazole, oral,
Adults
800 mg 8 hourly for 10 days (tissue agent)
Children
15 mg/kg 8 hourly for 10 days (tissue agent)

Then

- Diloxanide furoate, oral,
Adults
500 mg 8 hourly for 10 days (luminal agent)
Children
6-8 mg/kg 8 hourly for 10 days (luminal agent)

2nd Line Treatment

Evidence Rating: [A]

- Tinidazole, oral,
Adults
2 g once daily for 5 days (tissue agent)
Children
> 3 years; 50 mg/kg (max. 2 g) once daily for 5 days (tissue agent)

Then

- Paromomycin, oral,
Adults
8-10 mg/kg 8 hourly for 7 days (luminal agent)
Children
8-10 mg/kg 8 hourly for 7 days (luminal agent)

REFERRAL CRITERIA

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

9. Jaundice

Jaundice refers to yellow pigmentation of skin, palms and the sclerae as a result of elevated levels of bilirubin in blood. It may be visible when serum levels exceed 35 micromol/L in adults and 100 micromol/L in children. The symptoms and signs that accompany jaundice often provide helpful clues to the underlying cause.

In adults and children, hyperbilirubinaemia may result in hepatic encephalopathy (See sections on 'Acute and Chronic Hepatitis' and 'Hepatic Encephalopathy'). Jaundice in neonates can result in kernicterus (bilirubin encephalopathy) because of the consequences of hyperbilirubinaemia on the brain of the newborn. (See section on 'Neonatal Jaundice')

CAUSES

Adults

- Hepatitis - viral, alcoholic, drug-induced including allopathic and herbal preparations
- Haemolysis - various causes including malaria, Glucose-6-Phosphate Dehydrogenase (G6PD) deficiency and sickle cell disease, allopathic drugs and herbal preparations
- Chronic liver diseases - decompensated cirrhosis, biliary cirrhosis, chronic hepatitis, hepatocellular carcinoma
- Liver malignancies - hepatocellular carcinoma, metastatic liver disease
- Hepatic congestion from heart failure
- Gall bladder diseases - stones, infections
- Carcinoma of head of pancreas
- Septicaemia

Children

- Haemolysis - sickle cell disease, G6PD deficiency, drugs
- Infections - malaria, hepatitis, urinary tract infections, typhoid fever and other septicaemic illnesses

Pregnancy

(See section on 'Jaundice in Pregnancy')

Neonates

(See section on 'Neonatal Jaundice')

SYMPTOMS

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

SIGNS

- Pallor (may indicate haemolysis, chronic disease or malignancy)
- Scratch marks (indicative of cholestasis)
- Stigmata of chronic liver disease (e.g. palmar erythema, clubbing, spider naevi)
- Hepatomegaly (may be tender)
- Splenomegaly in portal hypertension
- Palpable gall bladder
- Ascites
- Bleeding (cephalhaematoma, subgaleal haematoma, upper gastrointestinal bleeding)
- Hepatic flap (indicative of liver failure)

INVESTIGATIONS

Adults and children

- FBC
- INR
- Sickling status
- G6PD status
- Blood film for red cell anomalies, malaria parasites
- Liver function tests
- Urea and electrolytes
- Hepatitis screen (HBsAg, HCV Antibody, Hepatitis A IgM, Hepatitis E IgM)
- Blood culture
- Urinalysis
- Abdominal ultrasound
- Abdominal CT scan

JAUNDICE

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

Adults and children

(See section on 'Hepatic encephalopathy', Hepatitis')

- Avoid alcohol and other hepatotoxic agents
- Ensure adequate hydration

Pharmacological treatment

A. Cholestatic jaundice with severe pruritus while investigating for underlying aetiology

1st Line Treatment

Evidence Rating: [A]

- Cholestyramine, oral,
 - Adult
4 g 12 hourly (titrate dose to response and tolerance: max. 16 g/day)
 - Children and Adolescents
2-4 g 12 hourly (max. 8 g/day)

REFERRAL CRITERIA

Refer patients with unexplained jaundice to a specialist for further evaluation and management.

10. Acute Hepatitis

Hepatitis is defined as inflammation of the liver and has multiple causes. 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 chronic.

CAUSES

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

SYMPTOMS

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

SIGNS

- Jaundice
- Right hypochondrial tenderness
- Hepatomegaly
- Asterixis

INVESTIGATIONS

- FBC
- Liver function tests
- Hepatitis screen (HBsAg, HCV Antibody, Hepatitis A IgM, Hepatitis E IgM)
- Antinuclear Antibody, Anti-smooth muscle Antibody

- 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)
- Intravenous fluids if volume deplete
- Any food that the patient can tolerate
- Avoid alcohol

Pharmacological treatment

- Supportive care (analgesia, fluid replacement, etc. as required)

Note 2-1

Avoid hepatotoxic drugs such as paracetamol and high doses of anxiolytic-hypnotics.

REFERRAL CRITERIA

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

11. 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 in endemic areas including Ghana should be immunised against Hepatitis B infection after initial assessment of their immunological status regarding previous exposure to the virus.

Long-term monitoring for disease activity and hepatocellular carcinoma screening with six-monthly Hepatitis B viral DNA quantification, LFTs, abdominal ultrasound and alpha fetoprotein is mandatory for patients with chronic hepatitis B.

CAUSES

- Hepatitis B virus (HBV)
- Hepatitis C virus (HCV)
- Hepatitis E virus (genotype 3)

SYMPTOMS

- Usually asymptomatic
- Mild non-specific symptoms
- Recurrent fever
- Arthralgia
- Malaise
- Jaundice
- Lethargy

SIGNS

Stigmata of chronic liver disease

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

Signs of decompensated liver disease

- Jaundice
- Ascites
- Encephalopathy
- Peripheral oedema (hypoalbuminaemia)
- Purpura/skin bruising (coagulopathy)

INVESTIGATIONS

- FBC
- LFTs
- INR
- HIV
- Baseline Alpha-Feto-protein
- Abdominal ultrasound scan
- Liver biopsy

Chronic Hepatitis B

- Hepatitis B surface Antigen (HBsAg)
- HBc IgG
- Hepatitis-B-e-antigen (HBeAg) & Anti-HBe
- Hepatitis B Viral Load

Chronic Hepatitis C

- Hepatitis C Virus (HCV) antibody testing
- HCV RNA
- HCV genotyping

TREATMENT

Treatment objectives

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

- To improve synthetic liver function through viral suppression
- To prevent transmission

Non-pharmacological treatment

- Prevention of transmission to partners (e.g. protected sex, not sharing of toothbrushes and sharps, blades, needles, body piercings, tattoos, cultural scarification practices, circumcisions etc.)
- Lifestyle/dietary advice
- Spouse/household screening

Pharmacological treatment

A. Chronic Active Hepatitis B (HBeAg positive or HBeAg negative)

1st Line Treatment

Evidence Rating: [A]

- Pegylated Interferon alfa-2a, subcutaneous,
Or
- Tenofovir, oral,
Or
- Entecavir, oral,

| 2nd Line Treatment

Evidence Rating: [A]

- Lamivudine, oral,
- B. Decompensated liver cirrhosis/ Fulminant Liver failure from Chronic Hepatitis B**

1st Line Treatment

Evidence Rating: [A]

- Tenofovir, oral,
Or
- Entecavir, oral,

| 2nd Line Treatment

Evidence Rating: [A]

- Lamivudine, oral,

C. Patients with Chronic Hepatitis B undergoing chemotherapy or immunosuppressive treatment

1st Line Treatment

Evidence Rating: [A]

- Tenofovir, oral,
Or
- Entecavir, oral,

| 2nd Line Treatment

Evidence Rating: [A]

- Lamivudine, oral,

REFERRAL CRITERIA

Refer all cases of chronic hepatitis B infection to a specialist, especially those who have failed first-line anti-viral therapy or had adverse reactions to anti-viral therapy or have liver-related complications (e.g. liver cirrhosis, liver failure, liver mass, signs of portal hypertension, ascites, peripheral oedema, hypoalbuminaemia). Pregnant individuals and patients with hepatitis B co-infections (e.g. HIV/Hepatitis C) as well as those requiring chemotherapy or other immunosuppressive therapy should also be referred to a specialist.

Post-exposure management of healthcare workers after occupational exposure to Hepatitis B infection

*HCW Status	Post-Exposure Testing		Post-Exposure Prophylaxis		Post-Vaccination Anti-HBs
	Source Patient	*HCW Anti-HBs	§HBIG	HBV Vaccination	
Documented Responder (> 3 Doses Received)	No action required				
Documented Non-Responder (After > 6 Doses)	Positive	-	§HBIG Twice (One Month Apart)	-	No
	Negative	-	No Action Required		
Response Unknown (After > 3 Doses)	Positive/Unknown	<10 MIU/ml	§HBIG Once	Revaccinate	Yes
	Negative	<10 MIU/ml	None	Revaccinate	Yes
	Any Result	>10 MIU/ml	No action required		
Unvaccinated/Incomplete Vaccination	Positive/Unknown	-	HBIG once	Complete Vaccination	Yes
	Negative	-	None	Complete Vaccination	Yes

*HCW: Healthcare worker

§HBIG: Hepatitis B Immunoglobulin as soon as possible when indicated (0.06 ml/kg IM)

Note 2-2

Anti-HBs Titre should be performed 1-2 months after last dose of HBV vaccination series but ~ 4-6 months after HBIG to avoid detection of passively administered Anti-HBs.

Responder: person with Anti-HBs > 10 MIU/ml after 3 or more HBV vaccination doses

Non-responder: person with Anti-HBs < 10 MIU/ml after 6 or more HBV vaccination doses.

Note 2-3

All HCWS who have Anti-HBs < 10 MIU/ml, unvaccinated or incomplete vaccination and sustain exposure to a source patient who is HBsAg-positive/ unknown HBsAg status should undergo HBsAg screening as soon as possible after exposure and follow up testing ~ 6 months later (HBsAg + Anti-HBc).

A. Chronic Hepatitis C (Genotype 2 & 3)

1st Line Treatment

Evidence Rating: [A]

- Pegylated Interferon alfa-2a, subcutaneous,
Or
- Pegylated Interferon alfa-2b, subcutaneous,
And
- Ribavirin, oral,

B. Chronic Hepatitis C (Genotype 1 & 4)

1st Line Treatment

Evidence Rating: [A]

- Pegylated Interferon alfa-2a, subcutaneous,
Or
- Pegylated Interferon alfa-2b, subcutaneous,
And
- Ribavirin, oral,

REFERRAL CRITERIA

Refer all cases of chronic hepatitis C infection to a specialist, especially those who have failed first-line anti-viral therapy or had adverse reactions to anti-viral therapy or have liver-related complications (e.g. liver cirrhosis, liver failure, liver mass, signs of portal hypertension, ascites, peripheral oedema, hypoalbuminaemia). Pregnant individuals and patients with hepatitis C co-infections (e.g. HIV/Hepatitis B) as well as those requiring chemotherapy or other immunosuppressive therapy should also be referred to a specialist.

12. Hepatic Encephalopathy

This condition is a complication of either acute or chronic liver disease. It presents with disordered central nervous system function, due to inability of the liver to detoxify ammonia and other chemicals.

CAUSES

- Viral hepatitis
- Alcoholic hepatitis

- Cirrhosis of the liver
- Hepatocellular carcinoma
- Drugs e.g. halothane, isoniazid, paracetamol overdose, herbal preparations
- Fatty liver of pregnancy
- Precipitating factors in a patient with pre-existing liver disease:
 - Fever
 - 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

SYMPOTMS

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

SIGNS

- Cyanosis
- Fetor hepaticus
- Signs of chronic liver disease
- Neurological abnormalities:
 - Speech impairment
 - Asterixis (a flapping tremor) indicates pre-coma and strongly supports the diagnosis of encephalopathy
 - Inability to draw or construct objects e.g. a 5-pointed star
 - Incoordination
 - Lethargy
 - 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 B-surface-Antigen
- Hepatitis C screen

- Prothrombin time, INR
- Infection screen (blood culture, urine RE, chest X-Ray, diagnostic ascitic tap)

TREATMENT

Treatment objectives

- To identify and correct precipitating factors promptly
- To treat underlying cause of liver disease

Non-pharmacological treatment

- Place in the coma position if unconscious
- Maintain fluid and electrolyte balance (avoid dehydration and electrolyte abnormalities such as hypokalaemia)
- Monitor temperature, pulse and respiratory rate, blood pressure, pupils, urine output and blood glucose regularly
- Avoid alcohol, paracetamol and other hepatotoxic agents
- Avoid sedatives such as benzodiazepines and drugs that impair the coagulation system
- Patients should NOT have their protein intake restricted
 - Maintain an adequate protein intake of 1.2-1.5 g/kg per day
- Encourage intake of high carbohydrate diet by mouth or NG tube

Pharmacological treatment

A. Measures to correct hydration status and nutrition

Evidence Rating: [A]

Adults

- Dextrose saline (5-10% dextrose in 0.9% saline), IV, 500 ml 8 hourly (according to requirements)

And

- High potency Vitamin B, IV, (formulated as two separate vials) One pair of vials daily (added to glucose IV solution)

Children

- Dextrose saline (4.3% in 0.18% saline), IV,

And

- High potency Vitamin B, IV, (formulated as two separate vials)

B. Measures to lower blood ammonia concentration

1st Line Treatment

Evidence Rating: [A]

- Lactulose, oral,

Adults

Start with 30-45 ml (20-30 g), 6-12 hourly

(Review dose to maintain 2-3 semi-solid stools per day)

Children and Adolescents

Start with 5-20 ml 6-12 hourly

(Review dose to maintain 2-3 semi-solid stools per day)

Neonates

Start with 0.5-5 ml 6-12 hourly

(Review dose to maintain 2-3 semi-solid stools per day)

Or

- Lactulose, rectal,
300 ml diluted in 700 ml water (via rectal balloon catheter) 4-6 hourly, retain in the rectum for 30-60 minutes.
(Review dose to maintain 2-3 semi-solid stools per day)

And

- Metronidazole, oral,

Adults

400 mg 8 hourly

Children

15 mg/kg 12 hourly

Neonates

> 2 kg;	15 mg/kg 12 hourly
---------	--------------------

1-2 kg;	7.5 mg/kg 12 hourly
---------	---------------------

2nd Line Treatment

Evidence Rating: [A]

- Rifaximin, oral,

Adults

550 mg 12 hourly

Children

> 12 years;	200 mg 8 hourly
-------------	-----------------

< 12 years;	not recommended
-------------	-----------------

C. Hepatic encephalopathy associated with active bleeding (INR > 1.5 or platelet count < 50 x 10⁹/L)

Adults and Children (liaise with Haematology)

- Fresh frozen plasma, IV, (for INR > 1.5)

Or

- Platelet concentrate, IV, (platelet count < 50 x 10⁹/L)

D. Antibiotic prophylaxis in Hepatic encephalopathy (associated with cirrhosis and upper gastro-intestinal haemorrhage)

Patients in whom oral administration is not possible,

Evidence Rating: [A]

- Ciprofloxacin, IV,

Adults

400 mg 8-12 hourly (administered over 60 minutes)

Or

- Ceftriaxone, IV, 1 g daily for 7 days

Or

- Ciprofloxacin, oral, 500 mg 12 hourly

Or

- Norfloxacin, oral, 400 mg 12 hourly for 7 days

E. Hepatic encephalopathy precipitated by bacterial infection

Note 2-4

A diagnosis of SBP is established if the neutrophil count in the ascitic fluid is > 250 cells/mL, culture results positive and surgically treatable causes are excluded.

Patients with suspected SBP should be started on empiric antibiotics immediately after ascitic fluid is obtained pending results:

Evidence Rating: [A]

1st Line treatment

- Ciprofloxacin, IV, 400 mg 8-12 hourly for 2 days (to be administered over 60 minutes)
Then
- Ciprofloxacin, oral, 500 mg 12 hourly for 5 days

Note 2-5

Avoid in patients with prior fluoroquinolone therapy as SBP prophylaxis or history of resistance.

2nd Line treatment

- Cefotaxime, IV, 2 g 8 hourly for 7 days
Or
- Ceftriaxone, IV, 2 g daily for 7 days

REFERRAL CRITERIA

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

13. Ascites

Ascites is the accumulation of excess fluid within the peritoneal cavity.

CAUSES

- Portal hypertension secondary to liver cirrhosis
- Renal failure
- Nephrotic syndrome
- Cardiac failure
- Abdominal tuberculosis
- Intra-abdominal or pelvic malignancies

SYMPTOMS

- Abdominal enlargement
- Abdominal discomfort or pain
- Difficulty breathing

SIGNS

- Distended abdomen

- Shifting dullness
- Fluid thrill
- Abdominal tenderness
- Signs relating to the underlying causes (See appropriate section)

INVESTIGATIONS

- FBC
- BUE & Creatinine
- LFTs
- INR
- Urinalysis
- Abdomino-pelvic ultrasound
- Chest X-ray
- Diagnostic paracentesis
 - Appearance and colour
 - Gram stain
 - Cell count and differential
 - Biochemistry e.g. Albumin
 - Microscopy, culture (with bedside inoculation of aerobic & anaerobic blood culture bottles)
 - Acid fast bacilli
 - Cytology

TREATMENT

Treatment objectives

- To relieve symptoms
- To identify and manage underlying cause

| ASCITES |

Non-pharmacological treatment

- Bed rest
- Salt restriction <2 g/day
- Fluid restriction to ≤ 1.5 L/day
- Avoid NSAID-use
- Alcohol abstinence
- Therapeutic paracentesis (sterile abdominal tap) if ascites is tense and/or there is respiratory embarrassment

Note 2-6

Removal of up to 5 litres of ascitic fluid without concomitant colloid infusion is a safe short-term option and unlikely to have haemodynamic consequences.

Pharmacological treatment

A. Control of ascitic fluid accumulation

1st Line Treatment

Evidence Rating: [A]

- Spironolactone, oral,
Adults
50-200 mg daily

Children

0.3-3 mg/kg daily

And

- Furosemide, oral,

Adults

20-80 mg daily

Children

1-2 mg/kg daily

B. Massive ascites in liver cirrhosis with respiratory embarrassment requiring more than 5 litres of fluid drainage

1st Line Treatment

Evidence Rating: [A]

- Salt-poor human albumin solution, IV, 6-8 g per litre of ascitic fluid drained

REFERRAL CRITERIA

Patients with the following conditions must be referred to a specialist. Poor response to diuretic therapy or diuretic-refractory ascites, complicated cirrhotic ascites with suspected spontaneous bacterial peritonitis, hepato-renal syndrome, and hepatic encephalopathy.

Also refer when an underlying cause cannot be identified.

|

VOMITING

14. Vomiting

Vomiting can be induced by a variety of disease processes including

- I gastrointestinal, neurologic, renal, psychiatric, cardiovascular, endocrine, pain and the effects of drugs. The best course of action in identifying the underlying cause is to carry out a detailed clinical evaluation and management plan, looking out for the aetiology, consequences and potential complications of vomiting.

Severe uncontrolled vomiting can result in significant dehydration and electrolyte imbalance accompanied by renal complications.

Anti-emetics should be prescribed only when the cause of vomiting is known as they may delay diagnosis.

CAUSES

- Disorders of the gastro-intestinal tract (GIT) and liver: intestinal obstruction, peptic ulcer, pancreatitis, cholecystitis, gastroenteritis, hepatitis
- Neurological disorders: severe pain, migraine, raised intracranial pressure (i.e. tumours, haemorrhage; meningitis); seizures, stroke
- Endocrine and metabolic: diabetic ketoacidosis, uraemia, hypercalcaemia, intestinal pseudo-obstruction
- Psychiatric: anxiety, depression, severe emotional upset, psychogenic vomiting
- Drugs: cancer chemotherapy, aspirin, allopurinol, digoxin,

erythromycin, anticonvulsants, opioids

- Infections: malaria, urinary tract infections
- Cardiovascular: acute myocardial infarction
- Renal: uraemia from acute or chronic kidney disease
- Miscellaneous: pregnancy, cyclical vomiting syndrome, myocardial infarction, labyrinthitis, otitis media

SYMPOTMS

Vomiting may be associated with:

- Abdominal pain
- Diarrhoea: gastroenteritis
- Abdominal distension: suspected bowel obstruction
- Heartburn: suspected gastro-oesophageal reflux disease
- Chest pain
- Jaundice: hepato-biliary disease
- Vertigo and nystagmus: suspected vestibular neuronitis
- Anxiety
- Depression

Vomiting may have diagnostic clues e.g.:

- Vomiting of food eaten several hours earlier: gastroparesis or gastric-outlet obstruction
- Vomiting with blood: oesophageal, gastric or duodenal lesion
- Early morning vomiting: pregnancy
- Faeculent vomiting: intestinal obstruction, gastro-colic fistula
- Projectile: if pyloric stenosis

SIGNS

- Abdominal tenderness
- Dehydration (reduced skin turgor, dry tongue, hypotension, tachycardia)
- Abdominal distension
- Succussion splash
- Jaundice
- Signs of peritonitis (rebound tenderness, rigidity, guarding)
- Miscellaneous: e.g. vertigo, nystagmus, focal neurological signs, Kussmaul breathing (uraemia, diabetic ketoacidosis)

INVESTIGATIONS

- FBC
- BUE and Creatinine
- LFT
- Blood glucose
- Serum amylase
- Urine RE
- Urine Pregnancy test
- ECG (if myocardial infarction suspected)
- Abdominal X-ray: Intestinal obstruction

- Erect Chest X-ray: bowel perforation with air under diaphragm

Persistent Vomiting:

- Upper gastro-intestinal endoscopy
- Serum calcium level
- CT scan of brain

TREATMENT

Treatment objectives

- To identify and treat the underlying cause
- To prevent dehydration and electrolyte imbalance
- To maintain nutrition by ensuring adequate dietary intake during illness
- To maintain personal hygiene
- To eliminate infecting organisms where appropriate

Non-pharmacological treatment

- Maintain adequate oral fluid intake (if tolerated)
- Maintain adequate nutrition
- Place naso-gastric tube when needed
- Surgical intervention in suspected intestinal obstruction, peritonitis

Pharmacological treatment

A. **Suggested Anti-Emetics for use in Migraine**

Evidence Rating: [B]

- Metoclopramide, oral/IV/IM,
Adults
10 mg 8 hourly
Or
- Domperidone, oral,
Adults
10 mg, 8 hourly
Children
> 12 years (Body weight \geq 35 kg); 10 mg 8-12 hourly (max. 30 mg per day)
1 month-12 years (Body weight \leq 35 kg); 250 micrograms/kg 8-12 hourly (max. 750 microgram/kg per day)
Or

Note 2-7

Domperidone should be used at the lowest effective dose for the shortest possible duration. The maximum duration of treatment should not exceed 7 days).

Or

- Promethazine, IV/IM
Adults
12.5-25 mg 6-8 hourly as needed (max. 100 mg in 24 hours)
Or
- Promethazine, oral,
Children

2-12 years; 0.25-1 mg 6-8 hourly as needed (max. 25 mg per dose)

< 2 years; Not recommended

B. Suggested Anti-Emetics for use in Vestibular Nausea and Vomiting

- Promethazine, oral,

Adults

20-25 mg 12 hourly

Children

2-12 years; 0.25-1 mg 6-8 hourly as needed (max. 25 mg per dose)

< 2 years; Not recommended

Or

- Promethazine, IV/IM

Adults

12.5-25 mg 6-8 hourly as needed (max. 100 mg in 24 hours)

Or

- Cyclizine, oral,

Adults

50 mg 8 hourly as needed

Children

6-12 years; 25 mg 8 hourly as needed (max. 75 mg in 24 hours)

Or

- Cinnarizine, IV/IM,

Adults and children > 12 years

30 mg 8 hourly as needed

Children

5-12 years; 15 mg 8 hourly as needed

< 5 years; not recommended

C. Suggested Anti-Emetics for use in Gastroenteritis

- Metoclopramide, oral/IV/IM,

Adults

10 mg 8 hourly

Or

- Domperidone, oral,

Adults

10 mg, 8 hourly

Children

> 12 years (Body weight \geq 35 kg); 10 mg 8-12 hourly (max. 30 mg per day)

1 month-12 years (Body weight \leq 35 kg); 250 micrograms/kg 8-12 hourly (max. 750 microgram/kg per day)

D. Suggested Anti-Emetics for use in Post-Operative Vomiting

- Metoclopramide, oral/IV/IM,

Adults

10 mg 8 hourly

Or

- Cyclizine, oral/IV/IM,

Adults

50 mg 8 hourly as needed

Children

6-12 years; 25 mg 8 hourly as needed (max. 75 mg in 24 hours)

E. Suggested Anti-Emetics for use in Chemotherapy-Induced Vomiting

- Ondansetron, IV,

Adults

8 mg/ 0.15 mg/kg (pre-chemotherapy) infused over 15 minutes

Children

> 6 months; 0.15 mg/kg (pre-chemotherapy) infused over 15 minutes, then repeated 4 and 8 hours after first dose. (max is 16 mg/dose)

Or

- Ondansetron, oral,

Adults

8 mg 12 hourly

Children

4-12 years; 4 mg 30 minutes before chemotherapy, then 4 mg 8 hourly for 24-48 hours as needed

< 4 years; not recommended

Or

- Granisetron, IV,

Adults

1mg/10 microgram/kg (30 minutes before Chemotherapy)

Children

2-16 years; same as adults

<2 years; not recommended

Or

- Granisetron, oral,

Adults

1mg 1 hour before chemotherapy, then 1 mg 12 hours after 1st dose

Or

2 mg 1 hour before chemotherapy

Children

Not recommended

Or

- Dexamethasone, oral/IV,

Adults

8-12 mg before chemotherapy, then 8 mg 24 hourly from days 2-4

Children

Not recommended

Or

- Lorazepam, oral/IV,

Adults

0.5-2 mg 6 hourly as required

Children

Consult a specialist

F. Suggested Anti-Emetics for use in Pregnancy

- Promethazine teoclinate, oral,
10-20 mg 8 hourly as needed
Or
- Promethazine, IM,
12.5-25 mg 8 hourly as needed
Or
- Metoclopramide, oral,
10 mg 8 hourly
Or
- Metoclopramide, IV/IM,
10 mg 8 hourly as needed

REFERRAL CRITERIA

Refer all patients in whom vomiting persists or who show signs of progression in disease, patients with unexplained or persistent vomiting, and patients with suspected surgical cause of vomiting for specialist or surgical assessment and management.

15. Hepatocellular Carcinoma

Hepatocellular Carcinoma (HCC) is a primary malignancy of the liver cell and must be differentiated from malignancies elsewhere that metastasize to the liver. Hepatocellular carcinoma 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 metastatic or locally advanced disease. Complications include liver failure, variceal bleeding or tumour 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 can potentially reduce the prevalence of HCC in the long term.

CAUSES

- Cirrhosis of the liver
 - Alcoholic liver disease
 - Chronic hepatitis B virus infection
 - Chronic hepatitis C virus infection
 - Chronic exposure to hepatic carcinogens e.g. aflatoxin

SYMPTOMS

- Jaundice
- Itching
- Anorexia

- Early satiety
- Feeling of a mass in the upper abdomen
- Right upper abdominal pain
- Weight loss
- Haematemesis
- Abdominal distension
- Bone pain
- Dyspnoea

SIGNS

- Jaundice
- Cachexia
- Hepatomegaly (irregular surface, multiple nodules, may be tender)
- Ascites
- Hepatic bruit

INVESTIGATIONS

- FBC
- LFTS
- INR
- Serum Alpha-Fetoprotein
- Hepatitis B-Surface Antigen (HBsAg)
- Hepatitis C Antibody (HCVab)
- Chest X-Ray
- Abdominal ultrasound scan
- CT/MRI scan (if ultrasound inconclusive)

HEPATOCELLULAR CARCINOMA

TREATMENT

Treatment objectives

Curative

- To assess for potential resectability

Palliative

- To relieve pain
- To relieve discomfort from gross ascites
- To prevent or treat hepatic encephalopathy (See section on 'Hepatic Encephalopathy')

Non-pharmacological treatment

- Surgical resection of non-metastatic localised lesions
- Paracentesis for tense ascites (See section on 'Ascites')
- Supportive care (multi-vitamin supplements)

Pharmacological treatment

A. Pain control in patients with Hepatocellular Carcinoma

1st Line Treatment

Evidence Rating: [B]

- Tramadol, oral, 50 mg 12 hourly (titrate further as tolerated to desired effect: maximum 300 mg daily)

Or

- Morphine sulphate, oral, 5-10 mg 8-12 hourly

REFERRAL CRITERIA

Refer all patients with suspected HCC, especially those with small solitary lesion (< 5 cm) who may be considered for percutaneous alcohol injection or surgical resection, to a specialist.

16. Drugs and the Liver

Drug-Induced Liver Injury (DILI) can occur following the use of a variety of either prescription or over-the-counter medications. A high index of suspicion is often necessary in establishing the diagnosis. Early recognition of drug toxicity is important to permit withdrawal of the offending drug, assessment of severity and monitoring for acute liver failure. Drug-induced liver injury can be dose-dependent or idiosyncratic.

The hallmark for the treatment of DILI is early withdrawal of the offending drug.

CAUSES

- Allopathic drugs (prescription, over-the-counter, anaesthetic agents, e.g. paracetamol, statins, isoniazid, halothane, amiodarone, azathioprine, carbamazepine, phenytoin, nevirapine, ketoconazole, flucloxacillin etc.)
- Herbal preparations
- Dietary supplements

SYMPTOMS

- Asymptomatic
- Right upper quadrant pain
- Nausea
- Anorexia
- Malaise
- Lethargy
- Pruritus

SIGNS

- Occasionally none
- Jaundice
- Scratch marks
- Bruising
- Asterixis
- Altered mental state
- Signs of pre-existing chronic liver disease

INVESTIGATIONS

- FBC
- LFTS
- BUE and Creatinine

- INR
- Serum glucose
- Urinalysis
- Hepatitis screen (A, B, C, E) for exclusion
- Abdominal ultrasound scan

TREATMENT

Treatment objectives

- To identify and withdraw the offending agent
- To report as adverse drug event to Food and Drugs Authority (FDA) promptly
- To assess severity of liver disease
- To administer antidote where applicable or feasible

Non-pharmacological treatment

(See section on 'Hepatic Encephalopathy')

Pharmacological treatment

A. Drug-induced liver injury following paracetamol toxicity

1st Line Treatment

Evidence Rating: [A]

- N-Acetylcysteine

(See section on 'Management algorithm for Acute Paracetamol Poisoning')

REFERRAL CRITERIA

All patients failing to improve or showing progression in liver injury despite withdrawal of offending drug should be referred to a specialist.

I Management algorithm for Acute Paracetamol Poisoning

Box 2-1: Management algorithm for Acute Paracetamol Poisoning

Clinical presentation

Nausea and vomiting are common early symptoms

Patients that subsequently develop hepatic injury and death may be asymptomatic for hours after an acute ingestion

Investigations

In all patients with suspected paracetamol toxicity, obtain the following:
Serum paracetamol concentration, baseline liver function tests (AST, ALT, total bilirubin), PT and INR, urea and electrolytes

In all patients with a suspected intentional overdose, obtain serum salicylate concentration, serum glucose, ECG, and pregnancy test in women of childbearing age

Treatment regimen

Secure airway, breathing, and circulation as necessary

Give activated charcoal (AC) 50 g to all adult patients presenting within 4 hours of ingestion, unless contraindicated; AC may be useful for co-ingestants beyond 4 hours

Treat with N-Acetylcysteine (NAC) If:

- Serum paracetamol concentration drawn at 4 hours or more after a single acute ingestion is above the “treatment” line of the treatment nomogram for paracetamol poisoning
- Serum paracetamol concentration is unavailable or will not return within 8 hours of time of ingestion and paracetamol ingestion is suspected
- Time of ingestion is unknown and serum paracetamol level is greater than 10 microgram/ml (66 micromol/L)
- There is evidence of any hepatotoxicity with a history of paracetamol ingestion
- Patient reports or clinician suspects repeated excessive paracetamol ingestions, patient has risk factors for paracetamol-induced hepatotoxicity, and the serum paracetamol concentration is greater than 10 microgram/ml (66 micromol/L)

Oral Dosing Of NAC:

- Oral dosing is acceptable for non-pregnant patients with a functional GI tract and no evidence of hepatotoxicity
- Dose 140 mg/kg loading dose, followed by 17 doses of 70 mg/kg every 4 hours
- If vomiting occurs within 1 hour of NAC dosing, a full NAC dose should be repeated as rapidly as possible
- Therapy may be terminated by 24 to 36 hours after ingestion if the paracetamol level is below 10 micrograms/ml, and the patient does not develop evidence of hepatotoxicity and remains clinically well

Intravenous (IV) dosing of NAC:

- In patients with no biochemical evidence of liver failure (i.e., those with INR <2), use 21 hour IV protocol: 150 mg/kg loading dose over 60 minutes, followed by 50 mg/kg infused over 4 hours, with the final 100 mg/kg infused over the remaining 16 hours
- In patients with biochemical evidence of liver failure (i.e., those with INR >2), administer the 21 hour IV protocol (150 mg/kg loading dose over 60 minutes, followed by 50 mg/kg infused over 4 hours, followed by 100 mg/kg infused over the next 16 hours) followed by a continuous IV NAC infusion at 6.25 mg/kg per hour until INR is < 2
- IV dosing is acceptable in all cases of paracetamol toxicity, but should be used instead of oral dosing in patients unable to tolerate oral NAC (e.g., intractable vomiting), patients with a medical condition precluding administration of oral NAC (eg, corrosive ingestion, GI bleed), patients with significant hepatotoxicity (INR >2), and pregnant patients

Antiemetic therapy:

- May give IV metoclopramide 10 mg 8 hourly

NUTRITIONAL DISORDERS

17. Malnutrition

Malnutrition occurs when there is a deficiency in intake of essential nutrients (i.e. proteins, carbohydrates, fats, vitamins and minerals). It is most commonly seen in children less than five years, particularly after weaning. Malnutrition reduces the individual's ability to fight disease and infection thereby increasing the likelihood of the patient presenting with diarrhoea, vomiting, fever, worm infestation, pneumonia, tuberculosis, otitis media, urinary tract infection etc. In adults, malnutrition frequently occurs in association with chronic alcoholism.

Protein energy malnutrition (PEM), when severe, presents in different forms such as marasmus, kwashiorkor or marasmic-kwashiokor.

Birth-spacing, through family planning, as well as exclusive breastfeeding for up to 6 months, followed by Introduction of a weaning diet at 6 months and continuation with complimentary foods for up to 2 years, may be helpful measures in preventing malnutrition in young children. Encouraging a balanced diet for the family, including pregnant and lactating women, and nutrition education in schools and villages may help reduce the prevalence of malnutrition in the community.

CAUSES

- Poverty
- Inadequate quality and/or quantity of food intake
- Social neglect
- Repeated or chronic infections
- Repeated diarrhoeal illness
- Worm infestations
- HIV, pulmonary tuberculosis, measles, pertussis
- Chronic illness and cancers
- Alcoholism (adults)

SYMPTOMS

- Poor weight gain
- Weight loss (drop or flattening in weight on the child health record)
- Body swelling (kwashiorkor)

CHAPTER 3: NUTRITIONAL DISORDERS

- Child plays less because of lack of energy
- Disinterest in food and surroundings

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 disinterested appearance
- Disinterest in food
- Anthropometric measurements

Moderate Acute Malnutrition

- Mid Upper Arm Circumference: 11.5 - < 12.5 cm
- Weight for Age: < - 2 Z - Score but > - 3 Z Score
- Weight for Height: < - 2 Z - Score but > - 3 Z Score

Severe Acute Malnutrition

- Mid Upper Arm Circumference: < 11.5 cm (Age 6-59 months)
- Weight for Age: < - 3 Z - Score
- Weight for Height: < - 3 Z - Score

INVESTIGATIONS

- FBC
- Urea and electrolytes
- Serum albumin
- Urine culture and sensitivity
- Blood culture and sensitivity
- Chest X-ray
- HIV testing
- Gastric lavage for acid fast bacilli
- Screen for common infections such as tuberculosis, pneumonia, urinary tract infections, etc. (See relevant sections)

TREATMENT**Treatment objectives**

- To identify and treat associated infections and complications
- To correct fluid and electrolyte imbalance and other complications
- To correct the nutritional deficiency including Vitamin A
- To prevent recurrence by educating caregivers
- To adequately manage chronic illnesses

Non-pharmacological treatment

- Nutritional rehabilitation
 - Out-patient Care
 - Malnourished children who have appetite, and do not have any overt medical condition, which requires admission, should be managed as outpatients with Ready-to-Use Therapeutic Food (RUTF)
 - In-patient Care
 - Admit all severely malnourished children who have medical conditions requiring inpatient care
 - Stabilisation Phase
 - Frequent feeding with F75
 - Introduce Ready-To-Use Therapeutic Food - RUTF
 - Progressively return to acceptable balanced family meals
 - Participation of parents and caregivers in nutrition education

Pharmacological treatment

A. Vitamin A supplementation (children)

Evidence Rating: [A]

- Vitamin A, oral,
Children
> 1 year; 200,000 units daily for 2 days
6-11 months; 100,000 units daily for 2 days
< 6 months; 50,000 units daily for 2 days

Note 3-1

Vitamin A supplementation should be given to replace body stores, EXCEPT if the child is on RUTF made according to WHO specifications, which already contains adequate vitamin A.

B. Treatment of underlying infections (children)

Inpatients

Evidence Rating: [B]

- Cefuroxime, IV, 20 mg/kg 8 hourly for 48-72 hours

Then

- Cefuroxime, oral,
3 months-12 years; 15 mg/kg 12 hourly for 5-7 days

Outpatients

Evidence Rating: [B]

- Amoxicillin, oral,
5-18 years; 500 mg 8 hourly for 10 days
1-5 years; 250 mg 8 hourly for 10 days
1 month-1 year; 125 mg 8 hourly for 10 days

C. Immunisation (children)

(See section on 'Immunisation' and National Expanded Programme

on Immunisation (EPI) guidelines)

D. Treatment of worm infestations

(See section on 'Worm Infestations')

REFERRAL CRITERIA

Refer to appropriate specialist for management of the underlying cause. Also refer to Reproductive and Child Health (RCH) unit for family planning services and Social welfare department within the health facility, district or region.

Chapter

4

HAEMATOLOGICAL DISORDERS

17. 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 cause must be investigated before initiating treatment. In an emergency, blood samples must be taken for investigations before blood transfusion.

CAUSES

Nutritional micronutrient and vitamin deficiency

- Iron
- Folic acid
- Vitamin B12

Bleeding

- Heavy menstruation
- Haemorrhoids (piles)
- Peptic ulcer
- Infestations e.g. hookworm, bilharzia
- Solid organ malignant tumours e.g. colonic cancer
- Haematological malignancies: e.g. leukaemia

Haemolysis

- Severe malaria
- Sickle cell disease
- G6PD deficiency
- Hypersplenism
- Autoimmune
- Drugs

Bone Marrow Failure

- Disease infiltration e.g. leukaemia, lymphoma, tuberculosis
- Aplasia – primary or secondary e.g. due to cytotoxics

Chronic Diseases

- Kidney disease
- Tuberculosis

- Hypothyroidism

Autoimmune Disease

- SLE
- Pernicious anaemia

SYMPTOMS

- Easy fatigability
- Dizziness
- Shortness of breath on exertion
- Palpitations
- Fresh blood in stools
- Black tarry stools (malaena)
- Haematuria
- Cola-like urine

SIGNS

- Pale mucous membranes and palms
- Angular stomatitis
- "Spoon shaped" and ridged finger and toe nails
- Spleen, liver and lymph nodes may be palpable
- Signs of heart failure (in severe anaemia)
- Jaundice (in haemolysis)
- Petechiae and purpura (bone marrow failure)
- Hyperpigmentation of palms and soles of feet

INVESTIGATIONS

- FBC
- Reticulocyte count and blood film comment
- Sickling test and HB electrophoresis if indicated
- Blood film for malaria parasites
- Kidney function tests
- Serum iron, Vitamin B12 and folate levels
- Direct Coomb's test
- Stool for hookworm ova
- Stool for occult blood
- Urine for schistosoma ova
- Specialized tests depending on the suspected cause e.g. bone marrow examination, antinuclear antibody (ANA) test, upper and lower GI endoscopy

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 and folate deficiency and

maintain normal levels throughout life

Non-pharmacological treatment

- Advise on a balanced diet. Regular intake of leafy foods as well as fresh fruits and vegetables, beans, liver, meat, eggs, fish
- High fibre diets to reduce bleeding from haemorrhoids
- Surgical treatment
- Where applicable e.g. haemorrhoids, tumours, hypersplenism etc.

Pharmacological treatment

A. Iron Deficiency Anaemia

1st Line Treatment

Evidence Rating: [B]

- Ferrous sulphate (dried or anhydrous), oral,
Adults
200 mg (65 mg elemental iron) 8 hourly for 3-6 months
Children

> 10 years; 200 mg 12 hourly for 3-6 months

8-10 years; 200 mg daily for 3-6 months

5-7 years; 80-120 mg 8-12 hourly for 3-6 months

1-4 years; 45-90 mg 8-12 hourly for 3-6 months

< 1 year; 30-60 mg 8-12 hourly for 3-6 months

Or

- Ferrous fumarate, oral,
Adults
200 mg (65 mg elemental iron) 8 hourly
Children
3-6 mg elemental iron/kg per day for 3-6 months

2nd Line Treatment

Evidence Rating: [B]

Note 4-1

Parenteral iron has no advantage over oral iron preparations except in the rare case of malabsorption.

Or

- Iron sucrose, IV, (as a slow bolus injection over 2-5 minutes)
Adults
200 mg every 3 days for 5 doses
Children
0.5 mg/kg every 4 weeks for 12 weeks (max. 100 mg per dose), calculated based on body weight and iron deficit and the target Hb
Or
- Iron dextran, IV, (as a slow bolus or IM by deep intramuscular) injection
Adults
25-100 mg daily as needed
Children

Not recommended

B. Vitamin B₁₂ Deficiency

Evidence Rating: [B]

- Vitamin B₁₂ (Hydroxocobalamin), IM,
Adults

1 mg every other day for 6 doses

Then

1 mg every 3 months for life

Children

1 mg stat.

Then

1 mg every 3 months for life

C. Folate Deficiency

- Folic Acid, oral,

Adults

5 mg daily

Children

2.5-5 mg daily

D. Severe Symptomatic Anaemia

- Blood transfusion with packed cells

And

Treat for cardiac failure if signs of cardiac failure. (See section on 'Heart failure')

REFERRAL CRITERIA

Refer patients with haemoglobin levels that do not improve after two weeks on the above treatment or with severe anaemia from any cause, which recurs, to a specialist. Patients with suspected aplastic anaemia, anaemia due to uncontrolled bleeding, including heavy menstrual loss, would also require referral to a specialist.

18. Bleeding Disorders

Bleeding disorders may present at birth or develop later in life. The bleeding may be spontaneous or follow trauma or surgery and may be due to defective blood vessels, platelet disorders or clotting factor deficiency. Past episodes of excessive bleeding e.g. following circumcision, a family history of bleeding and drug therapy may be important clues to the diagnosis.

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, whereas 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 and brain.

CAUSES

- Haemophilia
- Von Willebrand disease
- Liver disease
- Vitamin K deficiency especially in newborns
- Bone marrow failure e.g. aplastic anaemia and leukaemia
- Low platelet count from any cause
- Disseminated Intravascular Coagulation (DIC) from any cause
- Drug induced - herbal preparations, aspirin, clopidogrel, warfarin, rivaroxaban, heparin

SYMPTOMS

- Spontaneous bleeding from mucous membranes or cuts
- Easy bruising, bleeding from orifices
- Excessive bleeding from cuts or incisions
- Deformed joints from recurrent joint bleeds
- Swelling at site of blood collection (pseudotumours)
- Pain limiting movement

SIGNS

- Pallor
- Excessive bleeding
- Localised swelling due to bleeding into body spaces e.g. Joints
- Tenderness
- Limitation of movement and joint deformities
- Purpura, petechiae, ecchymosis

INVESTIGATIONS

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

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

- Apply regulated pressure dressing and/or ice packs to minimise bleeding where possible
- Stop any event/drugs responsible for bleeding or which may aggravate bleeding
- Educate haemophiliacs on their disease, encouraging them to

CHAPTER 4: HAEMATOLOGICAL DISORDERS

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)
- Physiotherapy on affected joints
- Surgery

Pharmacological treatment

A. General Measures: fluid replacement following acute severe blood loss

Sodium Chloride 0.9%, IV,

Adults

(See Section on 'Shock')

Children and Neonates

20 ml/kg bolus stat.

Repeat if there is no clinical improvement

And

- Concentrated red cell transfusion, IV,
Adults, Children and Neonates
3 ml/kg for each expected 1 g/dL haemoglobin rise

B. Bleeding due to underlying liver disease

1st Line Treatment

Evidence Rating: [A]

- Vitamin K, IV,
Adults
5-10 mg stat.
Children
3-5 mg stat.
Neonates (irrespective of history of vitamin K injection)

Term; 1 mg stat.

Preterm; 500 micrograms stat.

And

- Fresh Frozen Plasma, IV,
Adults, Children, Neonates
15-20 ml/kg

C. Haemophilia A

- Recombinant Factor VIII, intravenous,
1 international unit raises % of Factor VIII on average by 2 per kg body weight
Required units = body weight (kg) x desired factor rise x 0.5
(Repeated as needed)

Or

- Desmopressin, Intranasal, 150 microgram spray into each nostril, 12 hourly. May be repeated for 3 days

D. Haemophilia B

- Recombinant Factor IX
Administration of 1 unit/kg factor IX (recombinant) generally increases factor IX levels by approximately 0.8% in adults and 0.7% in children <15 years of age

E. Von Willebrand Disease

- Desmopressin, Intranasal, 150 microgram spray into each nostril, 12 hourly. May be repeated for 3 days

F. DIC

Treat underlying cause.

- Fresh Frozen Plasma
Adults, Children, Neonates
15-20 ml/kg

Or

- Coagulation factor, red cell and platelet concentrates as needed

G. Thrombocytopaenia requiring platelet transfusion

- Platelet Concentrate
Adults, Children, Neonates
10 ml/kg (raises platelet count by $5 \times 10^9/L$)

Prevention of local fibrinolysis

- Tranexamic Acid, oral and IV,
100 mg/kg
Then
10 mg/kg
Adults
1300 mg oral 8 hourly

2nd Line Treatment

Evidence Rating: [A]

Haemophilia A

- Purified factor VIII
- Cryoprecipitate, IV,
Adults, Children, Neonates
1.5-2.0 packs/10 kg

Haemophilia B

- Purified factor IX
- Fresh frozen plasma

REFERRAL CRITERIA

Refer all haemophiliacs and all patients with unexplained recurring bleeding episodes and those requiring surgery to the physician specialist or hematologist for initial assessment, treatment plan and scheduled comprehensive review.

19. Sickle Cell Disease

This is an inherited disease characterized by the possession of two abnormal haemoglobins, at least 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) constitute a haemoglobinopathy trait and not sickle cell disease.

The use of the word ‘sickler’ to describe patients with sickle cell disease must be avoided. Sick cell disease patients may present either in the steady state, in crises or with complications. The crisis is commonly vaso-occlusive bone pain crisis. Other types of crises include acute chest syndrome, hyper-haemolytic crisis, aplastic crisis and sequestration crises. In vaso-occlusive crises there is occlusion of small vessels by sickled cells causing infarction and pain; in Acute Chest Syndrome (ACS), the patient presents with sudden onset of cough, difficulty in breathing and fever; in aplastic crises, infection with parvovirus causes sudden severe anaemia with a low reticulocyte count; in sequestration crises the spleen and liver enlarge rapidly due to trapping of red blood cells.

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

CAUSES

- Inheritance of two abnormal haemoglobin genes from both parents, at least one of which is an S.
- Crises are typically precipitated by:
 - cold weather
 - dehydration
 - infection
 - physical exertion
 - mental stress

SYMPTOMS

- Joint and bone pain, especially during cold wet seasons
- Easy fatigability
- Pallor
- Jaundice
- Difficulty in breathing with or without chest pain
- Chronic leg ulcer
- 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)
- Old or recent scarification marks by traditional healers, particularly over the abdominal wall and joints
- Venous ulcers
- Bossing
- Dactylitis (hand and foot syndrome)
- Gnathopathy
- Growth delay or tall, lanky stature ('marfanoid' habitus)

INVESTIGATIONS

- FBC
- Blood film comment
- Reticulocyte count
- Sickling test
- Haemoglobin electrophoresis
- Urine examination
- Chest X-ray in case of ACS
- Blood and urine C/S when infection suspected
- G6PD assay

I TREATMENT

Treatment objectives

- To prevent the development of sickle cell crises
- To relieve pain
- To identify and manage the precipitating cause of crises
- To maintain a good steady state haemoglobin
- To prevent long term complications and organ damage
- To manage sickle cell crises and complications once developed

Non-pharmacological treatment

- Good hydration at all times by drinking adequate water/fluids
- Avoidance of common precipitating causes of crises such as malaria (bed nets etc.), dehydration, stress, excessive exercise, and exposure to extremes of weather
- Maintenance of good nutrition
- Client education
- Parental/guardian education
- Genetic counselling with voluntary family size restriction
- General public knowledge

Pharmacological Treatment

A. Vaso-occlusive bone pain crises

1st Line Treatment

Evidence Rating: [B]

Mild to moderate pain

- 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

- Paracetamol, rectal,
Adults and Children

Doses as above

Or

- Ibuprofen, oral,
Adults

400 mg 6-8 hourly

Children

6-12 years;	200-400 mg 6-8 hourly
1-5 years;	100-200 mg 6-8 hourly
3 months-1 year;	not recommended

Or

- Diclofenac, oral,
Adults

50 mg 8 hourly or 100 mg 12 hourly

Children

> 12 years;	50 mg 12 hourly
< 12 years;	not recommended

Or

- Diclofenac, rectal,
Adults

100 mg daily up to a maximum of 200 mg daily in divided doses

Children

75-100 mg daily

Note 4-2

If the pain is not controlled by the measures above within 12 hours, consult a specialist. Pethidine is no longer the recommended drug of choice. Morphine may be used but specialist consultation is required.

- Morphine sulphate, oral/IV, consult specialist

Caution 4-1.

Caution: long term NSAIDS (for more than two weeks) e.g. Diclofenac and Ibuprofen may cause renal impairment, and gastritis

And

- Dextrose in Sodium Chloride, IV Infusion,
Adults
- 5% Dextrose in 0.9% Sodium Chloride 2-4 L daily
Children
- 5% Dextrose in 0.9% Sodium Chloride 150 ml/kg daily

Or**Adults**

Normal Saline alternating with 5% Dextrose 2-4L daily

Children

Normal Saline alternating with 5% Dextrose 150 ml/kg daily

Box 4-1: Fluid requirement in children according to age

< 1 year	50 ml/kg
1 year	140 ml/kg
2 years	130 ml/kg
4 years	110 ml/kg
6 years	100 ml/kg
8 years	90 ml/kg
10 years	85 ml/kg
12 years	70 ml/kg

Severe Pain**2nd Line Treatment**

Evidence Rating: [B]

- Diclofenac sodium, IM,
Adults
75-150 mg daily in divided doses

Then

- Codeine phosphate, oral,
Adults and Children over 12 years
30-60 mg 4-6 hourly

Or

- Tramadol, oral, 50-100 mg 8 hourly

And

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

B. Steady State

- Folic Acid, oral,

Adults

5 mg daily

Children

> 1 year; 5 mg daily

< 1 year; 2.5 mg daily

C. Severe Disease

Note 4-3

Patients with suspected acute chest syndrome should have an urgent chest X-ray, blood and urine C/S, blood for grouping and cross-matching

- Amoxicillin + Clavulanic Acid, IV, 1.2 g and urgently transferred to a tertiary centre
- Hydroxycarbamide, Aspirin, Opiates and /or Chronic transfusion therapy may be used under specialist care

D. Prevention of pneumococcal infections

- Pneumococcal conjugate vaccine 13 (PCV 13) vaccination in infancy, booster at 6 years

REFERRAL CRITERIA

Refer all sickle cell patients with bleeding into the eye, priapism, haematuria or renal disease and stroke to a specialist. The presence of osteomyelitis, aseptic necrosis of the hip, acute chest syndrome and persistent jaundice after initial management as recommended above should also warrant a referral to a specialist centre.

Patients with CNS events, unexplained high white cell and platelet counts (more than 15 and 500 x 10⁹/L respectively), intractable morbid pain, repetitive crises or recurrent severe anaemia interfering with their lives should be referred to a specialist.

20. Plasma Cell Myeloma

Plasma cell myeloma (previously referred to as multiple myeloma), is cancer affecting the plasma cells in the bone marrow. These abnormal plasma cells occur in increased numbers and produce abnormal non-functional immunoglobulins leading to impaired ability to fight infections in the patient affected, hyperviscosity and renal failure. In the bone marrow the increased plasma cells result in a reduction in normal blood cell production and erosion of bone with resultant peripheral blood cytopaenias, osteolytic lesions, pathological fractures and hypercalcaemia. The disease is commonest in the sixth decade and rare below the age of 40 years.

CAUSES

- Unknown
- Potential precipitants:
 - Chemicals e.g. dioxins, formaldehyde, and nitrobenzene found in solvents and cleaning agents
 - Ionizing radiation
 - Viruses e.g. Herpes Virus 8, Epstein-Barr, HIV, Hepatitis Virus

SYMPTOMS

- Bone pain
- Easy fatigability
- Excessive weakness
- Recurrent infections
- Bony swellings

SIGNS

- Pallor
- Fever
- Dehydration
- Bony lumps
- Paraplegia
- Paresis
- Renal Impairment
- Unprovoked fractures

INVESTIGATIONS

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

PLASMA CELL MYELOMA

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 treat infections
- To prevent and treat renal complications

Non-pharmacological treatment

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

Pharmacological treatment

- A. To reduce number of plasma cells and rate of increase
Available at specialized centres only
- B. To reduce bone pain
Pain relief (avoid NSAIDS)
- C. To treat anaemia
Packed red cells transfusion and platelet transfusion when indicated
- D. To prevent and treat renal complications
IV and oral fluids
- E. To mitigate tumour lysis
Allopurinol to mitigate tumour lysis
- F. To treat infections
(See appropriate section)

REFERRAL CRITERIA

All patients suspected to have plasma cell myeloma should be referred to a haematologist at a specialised tertiary centre for further evaluation and definitive management. Subsequent follow-up can be done by a physician specialist with guidance from the haematologist.

21. Leukaemia

Leukaemia is cancer of the blood cells. There are two main types of leukaemia, which are lymphoid leukaemia and myeloid leukaemia. Each type of leukaemia can be classified as acute (where the patient falls suddenly ill) and chronic (where the patient may have been harbouring the disease for months without knowing). Thus in all, there are 4 main types of leukaemia: 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.

The abnormal leukaemic cells especially in acute leukaemia, fill the marrow and prevent the marrow from producing the normal blood cells i.e. red cells, white cells and platelets leading to anaemia, neutropaenia and thrombocytopenia, respectively.

CAUSES

- Usually unknown
- Associated factors
 - Viruses e.g. human T lymphotropic virus type 1 (HTLV-1) and Epstein Barr virus (EBV)
 - Chemicals e.g. benzene, industrial solvents, pesticides (lin-

- Dane), dyes,
- Drugs e.g. alkylating agents such as melphalan
- Ionizing radiation

SYMPOTMS

Acute Leukaemia

- Fever
- Lymph node swelling
- Easy fatiguability
- Bruising tendencies
- Bone and joint pain (especially in children)

Chronic Leukaemia

- Asymptomatic
- Dragging sensation (left side of abdomen)
- Easy satiety
- Lymph node swelling
- Weight loss
- Generalized itch
- Excessive sweating
- Priapism
- Hearing loss

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
- Weight loss
- Pallor
- Generalized lymph node enlargement in CLL

LEUKAEMIA

INVESTIGATIONS

- FBC and blood film comment
- Bone marrow aspirate
- Uric acid levels
- LDH
- BUE and creatinine
- Liver function tests
- Septic screen (especially in acute leukaemia)
- LP for CSF cytology (especially in acute lymphoid leukaemia)

TREATMENT

Treatment objectives

- To aim for a cure in ALL in both children and adults
- To achieve remission and prolong good quality life in AML
- To aim for a complete haematological remission or cure in philadelphia positive CML
- To control white cell counts, symptoms and prolong good quality of life in philadelphia negative CML
- To provide supportive treatment (pain relief, transfusion support, treat infections, counselling)

Non-pharmacological treatment

- Ensure good hydration
- Ensure good nutrition and food hygiene
- Ensure good oral and personal hygiene

Pharmacological treatment

A. Treatment of the newly diagnosed patient

Supportive treatment

- Pain relief (avoid NSAIDS)
- Packed red cells transfusion and platelet transfusion when indicated
- IV and oral fluids
- Allopurinol to mitigate tumour lysis
- Treatment of infections

Specific treatment

- Available at specialized tertiary centres only

REFERRAL CRITERIA

Refer all patients to the haematologist at a specialized tertiary centre for confirmation of diagnosis and start of management. Follow-up can continue at a regional centre by a physician under the distant guidance of a haematologist.

22. Malignant Lymphoma

This refers to a 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, in that there is a high incidence in the third and seventh decades.

Burkitt's lymphoma, a subtype of NHL, is one of the fastest growing

tumours known in man. 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

- Often unknown
- Associated aetiological agents
 - Chronic antigenic stimulation by *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
- Jaw swelling (in Burkitts)
- Fever
- Night sweats
- Weight loss
- Easy fatigability
- Abdominal distension, intestinal obstruction (in abdominal lymphomas)

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)
- Fine needle aspiration (in Burkitts)
- FBC and blood film comment
- Chest X-ray, abdominal USG, CT scan when necessary
- Bone marrow aspirate and trephine biopsy

TREATMENT

Treatment objectives

- To provide a cure
- To provide supportive treatment (pain relief, transfusion support, treat infections, counselling)

Non-pharmacological treatment

- Ensure good hydration

- Counselling and education

Pharmacological treatment

A. Hodgkin's Lymphoma (HL) and Non-Hodgkin's Lymphoma (NHL)

1st Line Treatment

Evidence Rating: [A]

Supportive treatment

- Pain relief (avoid NSAIDS)
- Packed red cells transfusion and platelet transfusion when indicated
- IV and oral fluids
- Allopurinol to mitigate tumour lysis
- Treatment of infections

Specific treatment

- Available at specialized tertiary centres only

REFERRAL CRITERIA

All patients should be referred to a haematologist at a specialised tertiary centre.

Chapter

5

IMMUNISABLE DISEASES

23. Immunisation

Immunisation against vaccine preventable diseases through the national Expanded Programme for Immunisation (EPI) is one of the most effective measures of reducing morbidity, disability and mortality in the population, especially, in children.

Ghana currently has 12 (twelve) vaccines in the immunisation schedule, namely, BCG, oral poliomyelitis, diphtheria, pertussis, tetanus, hepatitis B, *haemophilus influenzae* type B, pneumococcus, rotavirus, measles, rubella and yellow fever. Newer vaccines may be introduced in the near future as they are discovered and found effective.

Immunisation is recommended for the following persons:

- High risk groups (e.g. during a disease outbreak or by virtue of being exposed)
- Young children
- Elderly
- The malnourished

The current schedule for routine Immunisation for children under 5 years is as follows:

Evidence Rating [A]

Table 5-1: Schedule for routine Immunisation of children under 5 years

Age	Vaccine (Dose)
BIRTH	BCG (0.05 ml Intradermally) Polio 'O' (2 Drops Orally)
6 weeks	"Five In One" (Or Penta-Vaccine) 1 (0.5 ml IM) Pneumococcal (PCV) 1 (0.5 ml IM) Polio '1' (2 Drops Orally) Rotavirus (Rotarix)

Age	Vaccine (Dose)
10 weeks	"Five In One"2 (Or Penta-Vaccine) 2 (0.5 ml IM) PCV 2 (0.5 ml IM) Polio '2' (2 drops orally) Rotavirus (Rotarix)
14 weeks	"Five In One"2 (Or Penta-Vaccine) 2 (0.5 ml IM) PCV 3 (0.5 ml IM) Polio '3' (2 drops orally)
9 months	Measles/Rubella (0.5 ml deep SC or IM) Yellow Fever (0.5 ml IM)
18 months	Measles (0.5 ml deep SC or IM)

*Five in One" Vaccine or Penta-Vaccine contains Diphtheria, Pertussis, Tetanus, *Haemophilus Influenzae* B and Hepatitis B Antigens in one vaccine.
Measles/Rubella is presented as a combined vaccine.

Box 5-1: Notes on Vaccine use

- Wrong method of administration reduces efficacy
- If Immunisation course is interrupted, resume with the same brand of vaccine, else restart with different brand
- There are no contraindications to the immunisation of the sick child if he/she is well enough to go home
- Children with diarrhoea who are due for oral vaccines: give but don't count, then repeat after 4 weeks and record this one as given
- Don't give OPV 0 after 15 days (disturbs regular immunisation schedule)
- Don't give Rotarix 1st dose after 12 weeks, 2nd dose after 24 weeks

Immunisation of preterm babies:

- Consider all premature babies for full immunisation course.
- Start immunisation in 2nd month after birth (after 4 weeks) irrespective of degree of prematurity. Give BCG on discharge.
- Delay OPV in neonatal unit since there is a small chance of transfer of OPV virus to other babies. Hence give OPV on discharge from nursery - not while still on admission.

Contraindications to Immunisation:

- Current serious febrile illness: delay vaccine
- History of severe reaction after previous dose (e.g. anaphylactic reaction) - avoid
- Evolving neurological disease (e.g. uncontrolled epilepsy) - avoid whole cell pertussis vaccine
- No DPT or DPT/HepB/Hib to child with convulsion/shock within 3 days of the most recent dose of DPT or DPT/HepB/Hib
- No DPT or DPT/HepB/Hib to child with recurrent convulsions or active CNS disease

- 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

Live vaccines should not be given to the following:

- Pregnant women - for risk of teratogenic effect
- Patients with malignant disease e.g. leukaemia, Hodgkins disease
- Malignant disease of the reticuloendothelial system,
- Patients with immune suppression, including Symptomatic HIV patients
- Patients on chemotherapy (defer for 6 months after stopping chemotherapy treatment)
However:
- Measles vaccine should be given to HIV positive patients even though it is a live vaccine because the benefit outweighs the risk

REFERRAL CRITERIA

Refer all problems related to Immunisation to a paediatrician or EPI specialist.

24. Measles

Measles is an acute infectious disease, which usually occurs in children between 6 months and 3 years who have not been immunised, or completed the full immunisation schedule. It is prevented by 2 doses of measles vaccination at 9 and 18 months. The condition is very infectious from up to 7 days before, to 5 days after, appearance of the rash.

Complications include otitis media, with or without deafness, bronchopneumonia, croup, diarrhoea, vitamin A deficiency leading to xerophthalmia and blindness, malnutrition and activation of latent tuberculosis. Seriously ill measles patients requiring admission should be isolated. There is no specific treatment for measles. Antibiotics are not required, except for some specific complications.

Measles diagnosis is mainly clinical. The disease is now uncommon because of immunisation. However, high immunisation coverage needs to be maintained to keep the disease under control. Report all cases to the District Disease Control Officer for appropriate action.

CAUSE

- Measles virus

SYMPTOMS

- Runny nose
- Cough
- Red eyes

- Sore mouth
- High fever, present before the rash appears
- Rash - starts on face and neck
- Diarrhoea
- Child is generally miserable

SIGNS

- Fever
- Conjunctivitis
- Koplik spots (white grain-like spots on the buccal mucosa 2 days before rash)
- Rash - itchy, generalised maculo-papular

INVESTIGATIONS

- Usually none
- Measles immunoglobulin M (IgM) antibody assay if required

Treatment objectives

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

Non-pharmacological treatment

- Tepid sponging for fever
- Encourage oral hygiene with frequent saline mouth wash
- Continue feeding with soft high calorie foods
- Wash eyes with clean water
- Discourage use of harsh items on skin

Pharmacological treatment**A. For pain and fever**

Evidence Rating: [C]

- Paracetamol, oral,

<u>Adults</u>	500 mg-1g 6-8 hourly
<u>Children</u>	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

B. To prevent eye complications due to Vitamin A deficiency

Evidence Rating: [A]

- Vitamin A, oral,

<u>Children</u>	> 1 year; 200,000 units daily for 2 days
	6-11 months; 100,000 units daily for 2 days
	< 6 months; 50,000 units daily for 2 days

C. For management of associated diarrhoea with dehydration
(See section on 'Diarrhoea')

D. For management of associated pneumonia and otitis media
(See relevant sections)

E. For relief of skin irritation

- Calamine lotion (apply liberally to the whole skin)

REFERRAL CRITERIA

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

25. Pertussis

This is a highly contagious bacterial respiratory tract infection common in children and adults. The incubation period is 7-21 days.

Complications include subconjunctival haemorrhage, otitis media, apnoea, pneumonia, bronchiectasis, activation of latent tuberculosis, dehydration, fever, convulsions, rectal prolapse, and malnutrition. Admit to hospital when complications are present.

Pertussis can be prevented by the “five-in-one” Immunisation recommended for all children (See section on ‘Immunisation’).

In the event of a child developing pertussis before immunisation, 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, appropriate antibiotics may help reduce the period of infectivity and transmission. All cases should be reported to the District Disease Control Officer.

CAUSE

- *Bordetella pertussis*

SYMPTOMS

Catarrhal Phase: Initial 1-2 weeks

- Low grade fever
- Nasal discharge
- Mild cough

Paroxysmal phase: within the following 6-10 weeks

- Episodes of violent repetitive cough ending with inspiratory whoop or vomiting (whoop may be absent in babies and adults)

Recovery (convalescent) phase: next 2-3 weeks

- Gradual reduction in bouts of coughing

SIGNS

- Apnoea (long pause in breathing) common in babies
- Cyanosis

INVESTIGATIONS

- FBC - high total lymphocyte count
- Chest X-ray (to exclude other causes of chronic cough)

TREATMENT**Treatment objectives**

- To reduce transmission
- To prevent complications

Non-pharmacological treatment

- Feed frequently between coughing spasms
- Encourage adequate oral fluid intake

Pharmacological treatment**A. Patients and close contacts within 14 days of onset of symptoms**

1st Line 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 suspension 6 hourly for 7 days

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

< 6 months; not recommended (risk of pyloric stenosis).

Consider Trimethoprim/Sulphamethoxazole instead. (See below).

Or

Evidence Rating: [B]

- Azithromycin, oral,
Adults

500 mg daily for 3 days

Children

10 mg/kg body weight daily for 3 days

(not recommended for children less than 6 months because of a risk of pyloric stenosis).

Consider Trimethoprim/Sulphamethoxazole instead. (See below).

Or

Evidence Rating: [C]

- Clarithromycin, oral,
Adults

500 mg 12 hourly for 7 days

Children

7.5 mg/kg 12 hourly for 7 days

2nd Line Treatment

Evidence Rating [C]

- Trimethoprim/Sulphamethoxazole, oral,

Adults

160/800 mg 12 hourly for 7 days

Children

4/20 mg/kg 12 hourly for 7 days

B. Oxygen therapy when oxygen saturation <92%

- Oxygen, intranasal or face mask, (if the patient has difficulty in breathing or is cyanosed)

REFERRAL CRITERIA

Refer infants who have an episode of apnoea or cyanosis after initial resuscitation to a specialist.

26. 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. Tetanus-prone wounds include burns, puncture injuries, or those contaminated by soil/manure, septic wounds, and those with much devitalised tissue and compound fractures.

- | The use of non-sterilised instruments or dressings on the umbilical cord predisposes to neonatal tetanus. The incubation period is 3-21 days.

TETANUS | Tetanus should be treated as a medical emergency. Tetanus immunisation is the key for prevention (See section on 'Immunisation').

CAUSE

- *Clostridium tetani*

SYMPTOMS

- Difficulty or inability to open mouth
- Constipation
- Stiff body
- Spasms- these are painful and are triggered by noise, bright light or touch; spontaneous in severe cases.

SIGNS

- Umbilicus may be infected
- Presence of wound (but may have healed)
- Irritability
- Cyanosis during spasms
- Sardonic (mocking) smile
- Lock jaw (cannot open the mouth)
- Opisthotonus (stiff arched back)
- Rigid abdomen and stiff neck and limbs

INVESTIGATIONS

- No confirmatory test (diagnosis is clinical)

TREATMENT

Treatment objectives

- To prevent further spasms
- To eliminate *Clostridium tetani* to stop further toxin production
- To neutralise circulating toxin
- To provide adequate hydration and nutrition
- To provide supportive care till spasms cease completely

Non-pharmacological treatment

- Always admit a suspected case of tetanus
- Maintain a clear airway
- Avoid noise, bright light and unnecessary physical 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 when necessary

Pharmacological treatment

A. Eradication of bacteria in a patient diagnosed to have tetanus

1st Line Treatment

Evidence Rating: [A]

- Metronidazole, IV,

Adults

500 mg 6 hourly for 7-10 days

Children

> 1 month 7.5 mg/kg 8 hourly for 7-10 day

Neonates

> 7 days; 7.5 mg/kg 12 hourly

< 7 days; 7.5 mg/kg 48 hourly

2nd Line Treatment

Evidence Rating: [B]

- 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

And

- Gentamicin, IV, (neonates only), 4 mg/kg 24 hourly

B. To neutralize free circulating toxin

Evidence Rating: [B]

- Human Tetanus Immunoglobulin, IM or IV,

Adults and Children

500 units stat.

Neonates

250 units stat.

And

- Tetanus Toxoid, IM, (inject at different site from Human Tetanus Immunoglobulin)

Adults and Children

> 2 years; 0.5 ml stat. Repeat at 4-8 weeks (2nd dose) and at 6-12 months (3rd dose)

< 2 years; 3 doses of Pentavalent vaccine at intervals of four weeks

C. To control spasms

Evidence Rating: [C]

Adults

- Chlorpromazine, IM, 50 mg 4-8 hourly

And

- Diazepam, IV or IM, (by slow IV at a rate of not more than 5 mg/minute), 5-10 mg 3-6 hourly when required

Or

- 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

And

- Diazepam, IV/IM/nasogastric tube/suppository, 0.3 mg/kg 3-6 hourly when required (by slow IV at a rate of not more than 5 mg/minute)

Or

- Phenobarbitone, IM or oral (via nasogastric Tube), 10 mg/kg stat., then 2.5 mg/kg 12 hourly

Neonates

- Chlorpromazine, IM or oral (via nasogastric tube), 7.5 mg 8 hourly

And

- Phenobarbital (Phenobarbitone), IM or oral (via nasogastric tube), 30 mg stat. then 7.5 mg 12 hourly

Neonates-if spasms are not controlled with the above treatment

Add

- Diazepam, rectal, 0.5 mg/kg 3-6 hourly when required

Box 5-2: Tetanus Immunisation

- Start Immunisation 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

Box 5-2: Tetanus Immunisation

- 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 "Five-in-One" (Penta-) vaccine
- Previously unimmunised children below the age of 2 years should receive 3 doses of 5 in 1 at intervals of four weeks.
- 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
- Tetanus Immunisation in pregnancy (See section on 'Antenatal Care')

REFERRAL CRITERIA

Refer patients to a specialist if spasms cannot be controlled.

27. Poliomyelitis

Poliomyelitis is a viral disease, which is spread by faecal-oral or oral-to-oral transmission. Insanitary disposal of excreta and use of unsafe drinking water contribute to the spread. The disease is characterised by varying degrees of acute flaccid paralysis, which commonly persists.

Paralysis commonly affects one lower limb but any group of skeletal muscles, including the muscles of respiration and bulbar cells in the brain may be affected.

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 Immunisation. Prevention is almost certain if 4 doses of oral polio vaccine are given as in the EPI schedule. Rarely Vaccine-Associated Paralytic Poliomyelitis (VAPP) may occur in recipients of oral polio vaccines and their unimmunised contacts. This is usually associated with polio virus type 2.

Note 5-1

All cases of poliomyelitis should be reported to the District Disease Control Officer for follow-up.

CAUSES

- Poliovirus serotypes 1, 2 or 3

SYMPTOMS

- Fever
- Headache
- Sore throat
- Muscle pain
- Flaccid paralysis

SIGNS

- Acute flaccid paralysis of affected muscles
- Diminished or absent muscle reflexes

INVESTIGATIONS

- Two fresh stool samples taken 24-48 hours apart (to be sent on ice to the Regional Public Health Reference Laboratory for confirmation)

TREATMENT

Treatment objectives

- To provide supportive care till patient recovers from acute illness
- To avoid or limit the extent of paralysis
- 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 antiviral treatment

REFERRAL CRITERIA

Refer all patients with difficulty in breathing and swallowing for hospital admission.

28. Diphtheria

The bacteria responsible for this disease produces a toxin that damages human body tissues and organs. It commonly affects the tonsils and sometimes the skin causing ulcers. It is spread mainly by respiratory droplets from person to person, and less commonly through skin contact.

Infected patients may recover after initial symptoms and signs or develop severe weakness and die within 6-10 days. Complications may develop in the early phase of the disease or weeks later such as abnormal heartbeat and heart failure, damage to valves of the heart, or respiratory obstruction leading to death.

The disease is now uncommon because of immunisation. However, high immunisation coverage needs to be maintained to keep the disease under control because it has a high mortality rate.

Note 5-2

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

CAUSES

- *Corynebacterium diphtheriae*

SYMPTOMS

- Sore throat
- Loss of appetite
- Slight fever
- Dysphagia
- Difficulty in breathing with or without stridor

SIGNS

- Greyish white membrane or patch in the throat and on tonsils within 2-3 days of the onset of symptoms. Membrane may bleed, become greyish green or black.

INVESTIGATIONS

- Throat/nasal swabs for culture for index case and close contacts
- Repeat swabs after antibiotic treatment course (treatment may need to be extended).

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
- To prevent spread

Non-pharmacological treatment

- Bed rest
- Feeding by nasogastric tube for patients who cannot swallow
- Strict isolation of suspected patients

Pharmacological treatment**A. All patients clinically diagnosed with diphtheria**

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

10,000 to 20,000 units

Children

> 10 years; 10,000-20,000 units

< 10 years; 5,000-10,000 units

Note 5-3

Reactions are common so resuscitation facilities should be available immediately

And

- Benzyl Penicillin, IV,

Adults

1.2 g 6 hourly for 48 hours

Children and Neonates

1 month-18 years; 50 mg/kg 6 hourly for 48 hours

Then

- Amoxicillin, oral,

Adults

1 g 12 hourly for 5 days

Children

5-18 years; 500 mg 12 hourly for 10 days

1-5 years; 250 mg 12 hourly for 10 days

1 month-1 year; 125 mg 12 hourly for 10 days

Or

- Azithromycin, oral,

Adults

500 mg daily for 5 days

Children

10 mg/kg body weight daily for 5 days.

Not recommended for children less than 6 months because of a risk of pyloric stenosis.

B. All close contacts

- Amoxicillin, oral, for 14 days (refer dosing above)

Or

For patients who may not tolerate penicillins:

- Azithromycin, oral, for 5 days (refer dosing above)

REFERRAL CRITERIA

Refer patients with laryngeal obstruction or respiratory paralysis to an ENT specialist.

29. Yellow Fever

Yellow fever is caused by a virus transmitted to man by a species of mosquitoes (*Aedes aegypti*) from infected monkeys. The disease is not spread from person to person. Classical yellow fever is usually fatal.

After the onset of symptoms, there is a brief remission of 2-24 hours, following which the symptoms may recur with the development of epigastric pain, jaundice, renal insufficiency, cardiovascular instability and

CHAPTER 5: IMMUNISABLE DISEASES

bleeding from various sites (e.g. gums and needle-puncture sites).

Yellow fever vaccination is protective against the disease and needs to be repeated every ten years. Yellow fever vaccination is a requirement for travel from Ghana to several countries.

Note 5-4

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

CAUSES

- Yellow fever virus

SYMPTOMS

- Fever
- Muscle pain, particularly backache
- Headache
- Shivering
- Loss of appetite
- Nausea or vomiting
- Diarrhoea

SIGNS

- Congestion of the conjunctivae
- Jaundice
- Bleeding from various sites (petechiae, ecchymosis, etc.)
- Right upper abdominal quadrant tenderness
- Signs of renal failure

INVESTIGATIONS

- Urinalysis - proteinuria and raised urobilinogen levels
- Liver function test
- Blood urea, electrolytes and creatinine
- Blood sample for yellow fever virus serology (at the Regional Public Health Reference Laboratory)

TREATMENT**Treatment objectives**

- To provide supportive care for hepatic, renal and circulatory failure
- To manage bleeding disorder

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

Pharmacological treatment**A. Antiviral therapy**

- There is no specific treatment

B. For bleeding patients

- Fresh frozen plasma

REFERRAL CRITERIA

Refer to a hospital, preferably one with an isolation unit.

30. *Haemophilus influenzae type b Disease*

The *Haemophilus influenzae* type b (Hib) bacterium is an important cause of infections such as acute bacterial meningitis, pneumonia, acute epiglottitis and otitis media in children less than 5 years old. Hib disease is not common beyond 5 years of age.

Hib infections are preventable by the five-in-one (penta-) vaccine (See EPI 'Schedule for routine Immunisation of children under 5 years').

CAUSES

- *Haemophilus influenzae* type b (Hib)

SYMPTOMS

- Fever
- Other symptoms associated with pneumonia, otitis media, meningitis, septicaemia

SIGNS

(See signs and symptoms of the specific diseases in other sections)

INVESTIGATIONS

- Culture and sensitivity of appropriate body fluids (e.g. pus from the ear in suppurative otitis media, cerebrospinal fluid in meningitis, pleural aspirate in empyema, blood).

Note 5-5

Blood culture is only relevant in invasive disease and would not be helpful in uncomplicated pneumonias.

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

REFERRAL CRITERIA

All patients who fail to show remarkable signs of improvement in 3

days following drug treatment, or present with complications should be referred for higher-level care.

31. Pneumococcal Disease

Pneumococcal disease presents more commonly as non-invasive disease in the form of non-bacteraemic pneumonia, middle-ear infections, sinusitis, or bronchitis. However, it may also manifest as Invasive Pneumococcal Diseases (IPD) in the form of pneumonia with empyema and/or bacteraemia or meningitis as a result of haematogenic spread. In developing countries, non-bacteraemic pneumonia causes the majority of pneumococcal deaths. Ninety distinct serotypes have been identified.

Pneumococcal disease is effectively prevented with Pneumococcal Conjugate Vaccine (PCV) at 6,10 and 14 weeks for infants. Pneumococcal Polysaccharide Vaccine (PPSV23) is recommended for persons older than 2 years with underlying medical conditions such as Sickle Cell Disease. Adults with immunocompromising conditions, functional or anatomic asplenia, cerebrospinal fluid leaks, or cochlear implants should receive PCV13 followed by PPSV23.

CAUSES

- *Streptococcus pneumoniae*

SYMPTOMS

- Fever
- Other symptoms associated with pneumonia, otitis media, meningitis, septicaemia

SIGNS

- Please refer to signs and symptoms of the specific diseases in other sections

INVESTIGATIONS

- Culture and sensitivity of appropriate body fluids (e.g. pus from the ear in suppurative otitis media, cerebrospinal fluid in meningitis, pleural aspirate in empyema, blood).

Note 5-6

Blood culture is only relevant in invasive pneumococcal disease and would not be helpful in uncomplicated pneumonias.

TREATMENT

Treatment objectives

- To eliminate the bacteria
- To provide supportive care

Non-pharmacological treatment

(See relevant sections on the presenting illness e.g. meningitis, pneumonia)

Pharmacological treatment

(See relevant sections on the presenting illness e.g. meningitis, pneumonia)

REFERRAL CRITERIA

All patients who fail to show remarkable signs of improvement in 3 days following drug treatment, or present with complications should be referred for higher-level care.

32. Hepatitis

(See section on 'Acute and Chronic Hepatitis under Disorders of the Liver')

33. Rotavirus Disease

(See section on 'Rotavirus Disease and Diarrhoea' under Disorders of the Gastrointestinal Tract)

PROBLEMS OF THE NEWBORN (NEONATE)

34. Sick newborn

The term newborn (neonate) refers to a baby in the first month of life. At birth all healthy 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. The newborn with one or more abnormal vital signs is unwell. These include colour, activity, temperature, respiration, heart rate, blood sugar, urine output, nature of bowel movements, signs of distress (pain).

CAUSES

- Birth asphyxia
- Prematurity
- Neonatal infections
- Congenital malformations e.g. heart, central nervous system, bowel etc.
- Birth injury
- Maternal sedation or 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
- Convulsions
- Blood in stools
- Reduced urine output

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 breaths/minute, chest indrawing)
- Respiratory rate < 20 breaths/minute
- Apnoea
- Abdominal distension
- Drowsiness or unconsciousness
- Seizures
- Tenderness of any part of the body

INVESTIGATIONS

- FBC
- Random blood glucose
- Blood urea and electrolytes
- Blood cultures
- Urine culture
- Swab of any lesions for culture and sensitivity
- Chest X-ray
- Plain abdominal X-ray, erect and supine if indicated
- Cerebrospinal fluid biochemistry and culture and sensitivity

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

- Establish airway, ensure breathing and adequate circulation (ABC)
- Keep baby warm either wrapped up in dry clothes or in an incubator

Pharmacological treatment

Evidence Rating: [A]

A. Oxygen Therapy

- Oxygen by face mask or nasal prongs, 1-2 L/minute if available, (monitor and maintain oxygen saturation between 92-95%)

B. Maintenance Fluid

- Dextrose 10%, IV, on day of delivery, 2 drops/minute/kg (60 ml/kg/day)
- Normal Saline 0.18% with Dextrose 10% (60-150 ml/kg/day after day 1)

C. Correction of Hypoglycemia

If hypoglycaemic, correct (See section on 'Neonatal Hypoglycaemia')

CHAPTER 6: PROBLEMS OF THE NEWBORN (NEONATE)**D. For neonates having seizures (convulsions)**

- Phenobarbitone, IV/IM, 10 mg/kg stat. then 5 mg/kg 12 hourly

E. To treat sepsis (other than cord sepsis)

- Ampicillin, IM/IV,

Neonates

> 7 days of age; 50 mg/kg 8 hourly for 5-7 days

< 7 days of age; 50 mg/kg 12 hourly for 5-7 days

And

- Gentamicin, IM/IV, 4 mg/kg daily for 7 days (irrespective of age after birth)

Or

- Ampicillin, IM/IV,

Neonates

> 7 days of age; 50 mg/kg 8 hourly for 5-7 days

< 7 days of age; 50 mg/kg 12 hourly for 5-7 days

And

- Cefotaxime, IV, 25-50 mg/kg 8 hourly for 7 days (irrespective of age after birth)

F. For cord sepsis

- Cloxacillin, IM/IV,

Neonates

> 7 days of age; 25-50 mg/kg 8 hourly

< 7 days of age; 25-50 mg/kg 12 hourly

And

- Gentamicin, IM/IV, 4 mg/kg 24 hourly for 7 days (irrespective of age after birth)

G. For bowel related sepsis

- Ampicillin, IM/IV,

Neonates

> 7 days of age; 50 mg/kg 8 hourly for 5-7 days

< 7 days of age; 50 mg/kg 12 hourly for 5-7 days

And

- Gentamicin, IM/IV, 4 mg/kg daily for 7 days (irrespective of age after birth)

And

- Metronidazole, IV (over 20–30 minutes)

Neonate

> 34 weeks corrected gestational age; 15 mg/kg as a single loading dose followed after 8 hours by 7.5 mg/kg every 8 hours

26-34 weeks corrected gestational age; 15 mg/kg as a single loading dose followed after 12 hours by 7.5 mg/kg every 12 hours

< 26 weeks corrected gestational age; 15 mg/kg as a single loading

dose followed after 24 hours by 7.5 mg/kg daily

REFERRAL CRITERIA

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

35. Neonatal Hypoglycaemia

Neonatal hypoglycaemia refers to a random blood glucose level below 2.6 mmol/L in the newborn.

As the clinical signs may be variable, or indeed absent, for small or sick babies or infants of diabetic mothers the random blood glucose level should be checked every three hours for the first 24 hours until it stays above 3.5 mmol/L for a further 24 hours.

Neonatal hypoglycaemia may result in death if not promptly treated and should therefore be managed as soon as suspected. Successful treatment results in prompt response. To prevent hypoglycaemia, breastfeeding should be encouraged soon after birth. If the neonate is unable to suck, a nasogastric tube may be passed and expressed breast milk given. If enteral feeds are contraindicated, intravenous fluids should be started immediately.

CAUSES

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

SYMPTOMS

- Irritability and restlessness
- Tremors
- Sweating
- Seizures
- Lethargy

SIGNS

- Sweating
- Tremor
- Tachycardia
- Seizures
- Unconsciousness

INVESTIGATIONS

- Random blood glucose (RBS)
 - Using bed-side glucose meter
 - Check within 2 hours after birth and at regular 3 hourly intervals in infants at risk

- Other investigations depend on the suspected underlying cause

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

- Blood glucose monitoring $\frac{1}{2}$ to 2 hourly in hypoglycaemic infants until normal levels attained

Pharmacological treatment

Evidence Rating: [A]

A. Initial management

- Dextrose 10%, IV, 4 ml/kg as a bolus

B. Maintenance treatment following immediately after initial management

- Saline 0.18% in Dextrose 10%, 60-150 ml/kg/day depending on the age of the newborn (See table below).

Table 6-1: Maintenance fluid requirement

Day	Premature	Term
1	60 ml/kg/day	50 ml/kg/day
2	90 ml/kg/day	70 ml/kg/day
3	110 ml/kg/day	90 ml/kg/day
4	130 ml/kg/day	120 ml/kg/day
≥ 5	150 ml/kg/day	120 ml/kg/day

C. Additional management

Depends on the underlying cause.

REFERRAL CRITERIA

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

36. Neonatal Jaundice

Jaundice in the neonate may be visible when the serum bilirubin level exceeds 100 micromol/L. Neonatal jaundice is important because of the consequences of hyperbilirubinaemia on the brain of the newborn. This condition is called kernicterus (bilirubin encephalopathy) and may cause death. Infants who survive may be handicapped with cerebral palsy, and associated deafness, mental retardation and motor incoordination.

Approximately 80% of newborns will be jaundiced in the first week of life and most of this is physiological. This occurs on day 3 and lasts up to 10 days. This jaundice is mild and the baby remains healthy.

Jaundice in the neonate is likely to be pathological if it is present within the first day of life; or conjugated (direct) bilirubin is more than 40 micromol/L; or total bilirubin is more than 170 micromol/L in preterm and more than 260 micromol/L in the term infant; or the neonate is significantly jaundiced beyond 14 days or has jaundice with fever.

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

CAUSES

- Physiological
- Haemolysis - Rhesus, ABO incompatibility, G6PD deficiency
- Blood extravasation - cephalhaematoma, subgaleal haematoma
- Sepsis
- Congenital infections
- Liver disease
- Metabolic disorders - galactosemia, hypothyroidism
- Enhanced extra hepatic circulation - GIT obstruction, inadequate feeding
- Congenital defects of bilirubin metabolism
- Breast milk related jaundice

SYMPTOMS

- Yellow eyes
- Yellow skin, hands and feet
- Pale stools (biliary atresia likely)

SIGNS

- Jaundice
- Yellow pigment in skin
- Yellow palms +/- yellow soles of feet
- Pale stools (biliary atresia likely)

INVESTIGATIONS

- Total and direct serum bilirubin concentration
- Other investigations as below, dependent on age at presentation and suspected cause:

Early onset (within first 24 hours of birth)

- Blood group and rhesus (Rh) group of both infant and mother
- Direct Coombs test, Indirect Coombs test, FBC, G6PD
- Blood film for red cell anomalies, malaria parasites
- Cultures of blood, urine, and spinal fluid may be indicated by the history, physical examination or initial laboratory findings

Prolonged jaundice (after 14 days)

- Liver Function tests

- Thyroid Function tests
- Urine for reducing substances
- Urine R/E and C/S
- TORCH (congenital infections) screen
- Hep B
- Abdominal ultrasound scan (exclude biliary atresia)

TREATMENT

Treatment objectives

- To prevent kernicterus (bilirubin encephalopathy)
- To detect and treat underlying cause

Non-pharmacological treatment

- Phototherapy (See note below on 'Phototherapy')
- Exchange blood transfusion (See note below on 'Exchange transfusion')

Box 6-1: Phototherapy

Phototherapy is started if:

- Jaundice is visible on day 1
- Jaundice involves palms and soles of feet
- Jaundice in prematurity
- After day 2, measured level of unconjugated bilirubin is more than 170 micromol/L in preterm or more than 260 micromol/L in term neonate.

A phototherapy unit with blue fluorescent tube lights is preferred. If unavailable, white fluorescent tubes may be used. The baby's eyes must be covered but should be examined daily for any infection. Continue breastfeeding during this time. Ensure adequate fluid intake. Prevent hypothermia or hyperthermia. Phototherapy should be continued till unconjugated bilirubin levels remain below phototherapy levels for at least 24 hours.

Box 6-2: Exchange transfusion

Use warm blood (37°C), cross-matched against maternal and infant serum (160 ml/kg over 2-3 hours). Monitor heart rate, respiratory rate, bilirubin and blood glucose levels 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.

Lower levels of bilirubin than stated above should be considered for intervention by phototherapy or exchange transfusion in the following cases: 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 more than 2 kg
- In newborns weighing less than 2 kg, serum bilirubin exceeding the following would require exchange transfusion
 - < 1 kg - 170 micromol/L
 - 1-2 kg - 250 micromol/L
 - Cord Hb < 12 g/dL or cord bilirubin > 80 micromol/L
 - Rapid progression of anaemia in presence of resolving jaundice
 - Hydrops foetalis (requires immediate exchange transfusion with packed cells)

Pharmacological treatment

A. Treatment of underlying sepsis (See section on 'the Sick Newborn')

REFERRAL CRITERIA

Refer immediately, all babies who develop jaundice within 24 hours of life or who have prolonged jaundice to a paediatrician.

Refer all patients requiring exchange transfusion to an appropriate facility.

37. Birth Injuries

Birth injuries include extensive caput succedaneum, cephalhaematoma, subgaleal haemorrhage, nerve palsies and fractures. The presentation varies depending on type and site of injury. Excessive traction may result in injury to the brachial plexus and may be associated with fracture or injury of the humerus or shoulder joint.

CAUSES

- Difficult delivery (including instrumental delivery)

SYMPTOMS

- Swelling of head
- Inability to move a limb properly
- Pallor

SIGNS

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

CHAPTER 6: PROBLEMS OF THE NEWBORN (NEONATE)

- Jaundice
- Nerve injuries
- Erbs Palsy - Whole upper limb does not move. There is movement only in the fingers
- Klumpke's Palsy - Fingers of the affected hand do not move (claw hand) but there is active movement in the arm and forearm
- Fractures
- Reduced movement of affected limb
- Swelling of the affected limb
- Abnormal position of limb
- Pain and tenderness on movement of limb

INVESTIGATIONS

- Haemoglobin level for subgaleal haemorrhage
- Serum bilirubin if jaundiced
- X-ray of relevant part if fracture is suspected

TREATMENT**Treatment objectives**

- To arrest further bleeding
- To treat complications of anaemia and jaundice
- To re-establish near normal movement in affected limb
- To promote normal healing of fracture

Non-pharmacological treatment**Extensive caput succedaneum**

- Reassure parents
- Leave swelling alone (spontaneous resolution over 3-4 days)

Cephalhaematoma

- Reassure parents
- Leave swelling alone (spontaneous resolution with time)
 - Do not perform incision and drainage
- Phototherapy if jaundiced

Subgaleal Haemorrhage

- Phototherapy if jaundice levels require this (See section on 'Neonatal Jaundice')

Nerve injuries

- Physiotherapy

Fractures

- May require splinting

Pharmacological treatment**A. Cephalhaematoma and Subgaleal haematoma**To reduce bleeding

Evidence Rating: [A]

- Phytomenadione (Vitamin K), IM, 1 mg stat. even if baby received a dose at birth
To correct Anaemia if Hb < 12 gm/dl
- Blood transfusion, 15-20 ml/kg

REFERRAL CRITERIA

Refer severe cases to an appropriate specialist facility.

38. Neonatal conjunctivitis

Neonatal conjunctivitis or ophthalmia neonatorum is an acute purulent conjunctivitis during the first month of life. It is usually contracted from infected genital secretions of the mother.

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. This must be implemented as a policy in all health facilities in which child deliveries are undertaken.

CAUSES

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- Staphylococci
- Streptococci
- 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 culture

TREATMENT

Treatment objectives

- To treat the infection
- To prevent blindness

Non-pharmacological treatment

- Clean the eyelids frequently (every 2 hours) with cotton wool dipped in sterile saline solution. In the absence of sterile saline solution, use boiled water that has been left to cool

Pharmacological treatment

A. Treatment of baby

Evidence Rating: [B]

- Ceftriazone, IM or IV, 50 mg/kg stat. (max. 125 mg)
Or
- Cefotaxime, IM, 100 mg/kg stat.

And

- Erythromycin, oral, 12.5 mg/kg 6 hourly for 14 days
And
- Chloramphenicol eye drops, 0.5% applied to each eye every 2 hours for 48 hours (after cleaning away discharge-saline irrigation)

Then

- Chloramphenicol eye drops, 0.5% applied to each eye 6 hourly
And
- Chloramphenicol eye ointment, 1% applied to each eye at night

B. Treatment of mother

Evidence Rating: [A]

- Ceftriazone, IM, 250 mg stat.
And
- Erythromycin, oral, 500 mg 6 hourly for 7 days
- **C. Treatment of mother's partner(s) for gonorrhoea and chlamydia**
• Ceftriazone, IM, 250 mg stat.
Or
- Cefixime, oral, 400 mg stat.
Or
- Ciprofloxacin, oral, 500 mg stat.

And

- 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
Or
- Azithromycin, oral, 1 g stat.

REFERRAL CRITERIA

Refer all neonates with corneal involvement and or severe neonatal conjunctivitis not responding to treatment to a paediatrician and or an ophthalmologist.

39. Retinoblastoma

Retinoblastoma is a congenital malignant tumour originating from the retina of the eye. This tumour may be hereditary, particularly the bilateral form which forms about 30% of cases. Most tumours however are sporadic (spontaneous mutation). This is the third commonest cancer seen amongst children in Ghana. Most children present before five years of age. It rarely occurs in older children. The prognosis with early presentation is excellent with a 95% chance of long term cure. There is a high rate of development of tumours of other organs later in life in the hereditary form.

CAUSES

- Genetic (up to 40% of cases)
- Sporadic (in about 60% of cases)

SYMPTOMS

- White, shiny spot (leukocoria) in the pupil, also known as the cat's eye reflex is usually the first symptom in most patients
- Squint (strabismus)
- Visual loss
- Protruding eyeball
- Redness of the eye

SIGNS

- Absent red reflex
- Tumour in the retina on fundoscopy
- Vitreous haemorrhage and retinal detachment on fundoscopy
- Increased intraocular pressure (glaucoma)
- Orbital cellulitis

INVESTIGATIONS

- Ultrasound scan of orbit
- Head CT or MRI scan
- Lumbar puncture for cerebrospinal fluid cytology
- Bone marrow aspirate

TREATMENT

Treatment objectives

- To arrest the progression of the tumour
- To prevent distant spread of tumour
- To achieve long term cure
- To provide adequate supportive and palliative care in advanced disease

Non-pharmacological treatment

- Enucleation of the affected eye is curative in the early stages
- Prosthetic eye insertion

- Laser therapy for focal control
- Radiotherapy for local spread of the tumour
- Counselling to help cope with psychological impact of the disease

Pharmacological treatment

A. Intraocular and extraocular retinoblastoma

Chemotherapy

Evidence Rating: [A]

- Vincristine, IV,
- Etoposide, IV,
- Carboplatin, IV,

Or

- Vincristine, IV,
- Etoposide, IV,
- Cyclophosphamide, IV,

B. Advanced disease with intracranial metastases

Palliative care with adequate pain and other symptom control
(See section on palliative care)

C. For treatment of vomiting

Evidence Rating: [A]

- Metoclopramide, IV or oral, 100-400 microgram/kg 8 hourly

Or

- Granisetron, IV, 40 microgram/kg (max. 3 mg) stat.
May repeat 12 hourly if necessary

Or

- Granisetron, oral,
20 microgram/kg (max. 1 mg) within 1 hour before start of treatment

Then

20 microgram/kg 12 hourly for up to 5 days

Or

- Ondansetron, IV,

Adult

5 mg/m² stat.

Repeat 8 hourly if necessary

Children

12-18 years; 8 mg stat. (immediately before chemotherapy)

Or

- Ondansetron, oral,

Adult

8 mg 8 hourly, administered 30 minutes before the start of chemotherapy

Children

12-18 years;

8 mg 8-12 hourly up to 5 days

1-12 years;

4 mg 8-12 hourly up to 5 days

D. For treatment of febrile neutropenia

- Ceftriaxone, IV, 100 mg/kg daily
And
- Gentamicin, IV, 5 mg/kg daily
And (if still febrile after 48 hours, add)
- Cloxacillin, IV, 25-50 mg/kg 6 hourly
And (if still febrile after 5 days, add)
- Fluconazole, oral, 10 mg/kg daily

E. For treatment of anaemia and thrombocytopenia

- Blood and blood product transfusions
(See section on 'Bleeding disorders')

REFERRAL CRITERIA

All patients should be referred to a tertiary centre that can effectively treat retinoblastoma.

40. Wilms Tumour

WILMS TUMOUR

Wilms tumour (nephroblastoma) is a malignant embryonal tumour of renal tissue. It is the fourth commonest cancer amongst children in Ghana. About 80% of children with Wilms tumour present before 5 years of age. It can present soon after delivery. It may be associated with congenital anomalies such as hemihypertrophy and the absence of the iris (aniridia). Wilms tumour has a very good prognosis with an over 80% chance of long-term cure.

CAUSES

- Sporadic gene mutation

SYMPTOMS

- Visible and or palpable abdominal mass
- Fever
- Blood in urine

SIGNS

- Abdominal mass (palpate with care to prevent rupture or dissemination)
- Haematuria (macroscopic or microscopic)
- Hypertension
- Associated congenital anomalies

INVESTIGATIONS

- Abdominal ultrasound scan
- Abdominal CT scan
- Chest X-ray
- Full Blood Count
- Blood Urea, electrolytes and creatinine

TREATMENT

Treatment objectives

- To obtain long term cure
- To provide adequate supportive and palliative care

Non-pharmacological treatment

- Nephrectomy
- Radiotherapy post-surgery for advanced cases

Pharmacological treatment

A. Pre-operative treatment

1st Line Treatment

Evidence Rating: [A]

- Vincristine, IV,
And
- Actinomycin D, IV,
And
- Doxorubicin, IV, (if presence of metastases)

B. Post-operative treatment

Evidence Rating: [A]

- Vincristine, IV,
And
- Actinomycin D, IV,
And
- Doxorubicin, IV, (depending on stage and risk category)
Or
- Carboplatin, IV,
- Etoposide, IV,
- Doxorubicin, IV, Cyclophosphamide IV in combination (For high risk tumours)

C. For treatment of vomiting

Evidence Rating: [A]

- Metoclopramide, IV or oral, 100-400 microgram/kg 8 hourly
Or
- Granisetron, IV, 40 microgram/kg (max. 3 mg) stat.
May repeat 12 hourly if necessary
Or
- Granisetron, oral, 20 microgram/kg (max. 1 mg) within 1 hour before start of treatment
Then
20 microgram/kg 12 hourly for up to 5 days
Or
- Ondansetron, IV,
Adults
5 mg/m² stat.
Repeat 8 hourly if necessary

Children

12-18 years; 8 mg stat. (immediatley before chemotherapy)

Or

- Ondansetron, oral,

Adults

8 mg 8 hourly, administared 30 minutes before the start of chemo-
therapy

Children

12-18 years; 8 mg 8-12 hourly up to 5 days

1-12 years; 4 mg 8-12 hourly up to 5 days

D. For treatment of febrile neutropenia

- Ceftriaxone, IV, 100 mg/kg daily
And
- Gentamicin, IV, 5 mg/kg daily
And (if still febrile after 48 hours, add)
- Cloxacillin, IV, 25-50 mg/kg 6 hourly
And (if still febrile after 5 days, add)
- Fluconazole, oral, 10 mg/kg daily

E. For treatment of anaemia and thrombocytopenia

- Blood and blood product transfusions
(See section on 'Bleeding disorders')

REFERRAL CRITERIA

All patients should be referred to specialist centres for appropriate treatment.

DISORDERS OF THE CARDIOVASCULAR SYSTEM

41. Chest Pain

Chest pain is a common patient complaint and must be treated as a medical emergency until proven otherwise as there are several life-threatening underlying causes. The top priority is to exclude or promptly treat serious cardiac and non-cardiac causes. A good history and examination is very helpful in this endeavour.

CAUSES

Common Cardiac

- Stable Angina
- Acute Coronary Syndrome
- Pericarditis

Non-cardiac

- Gastro-oesophageal reflux disease
- Pulmonary Embolus (PE)
- Pneumonia
- Peptic Ulcer
- Oesophageal spasm
- Pleural effusion

Others to consider

- Aortic dissection
- Mitral valve prolapse (other valvular problem)
- Coronary vasospasm
- Sickle cell disease - acute chest syndrome
- Hiatus hernia
- Oesophageal tear with mediastinitis
- Biliary tree disease
- Costochondritis
- Nerve root compression
- Cardiac neurosis/DaCosta's syndrome
- Herpes Zoster

SYMPTOMS

	Myocardial Ischaemia	Aortic Dissection	Pericarditis	Pleuritic Pain	Peptic pain	Musculo-skeletal pain
Quality of Pain	Crushing, tight, heavy or band-like	Tearing	Sharp	Sharp	Burning	Sharp or dull
Site of Pain	Central anterior chest	Central	Central anterior	Anywhere in chest	Central	Anywhere on chest wall
Radiation	To throat, jaw, arms or nowhere	Back	Usually no radiation	Usually none	To throat occasionally	To arms or around chest to back
Exacerbating Factors	Exertion, anxiety, cold	None	Lying supine,	Exacerbated by inspiration, coughing,	Spicy food, alcohol	Pressure on chest or moving neck
Relieving Factors	Rest, nitrates	None	Sitting forward	None	Bland food and antacids	Restriction of movement
Associated features	Nausea, vomiting, sweating, dyspnoea, shock	Shock, cyanosis, sweating, right & left arm BP difference, new aortic regurgitation murmur	Fever, recent viral illness	Cough, haemoptysis, dyspnoea and shock (in massive PE)	Bloating, wind	Patient looks well

| CHEST PAIN

SIGNS

- Shock, pallor, sweating - MI, Dissecting aneurysm, PE
- Dyspnoea - MI with LVF, PE, Pneumonia
- Blood pressure
 - Normal or high
 - Low - suggests cardiogenic shock
 - Difference > 30 mmHg between arms suggests aortic dissection
- Pulse - rate high, low or normal; regular or irregular
- Murmurs - consider valvular heart disease
- Pericardial rub - suggests pericarditis
- Unequal chest expansion - pneumonia and pneumothorax
- Reduced/absent breath sounds - pneumothorax
- Bronchial breathing - pneumonia
- Pleural rub - consider pneumonia, PE
- Abdominal (epigastric) tenderness - Peptic Ulcer Disease
- Guarding - perforated ulcer, peritonitis
- Reduced bowel sounds - paralytic ileus
- Chest wall tenderness - musculo-skeletal cause

INVESTIGATIONS

(See sections for specific disease conditions)

TREATMENT**Treatment objectives**

- Symptomatic relief of chest pain
- Reassurance to minimise anxiety
- Treatment of underlying cause (See sections for specific disease conditions)

Non-pharmacological treatment

(See sections for specific disease conditions)

Pharmacological treatment

(See sections for specific disease conditions)

REFERRAL CRITERIA

Persistent unexplained chest pain.

42. Ischaemic Heart Disease

Ischaemic heart disease is a condition whereby there is reduced blood supply to the heart muscle. It comprises of stable angina pectoris and the acute coronary syndromes.

STABLE ANGINA PECTORIS

Stable angina pectoris is pain or discomfort that occurs in the front of the chest, and may radiate to the neck, shoulders, jaw or arms. The chest pain is 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, family history of heart disease and persistently elevated markers of inflammation such as C-reactive protein.

Risk factors for this condition include obesity, diabetes mellitus, hypertension, smoking, hyperlipidaemia.

CAUSES

- Atherosclerosis with narrowing of the coronary blood vessels
- Spasms of the coronary arteries

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

INVESTIGATIONS

- 12-lead ECG

- Cardiac enzymes: creatinine kinase-MB (CK-MB) and troponins
- Blood glucose
- Blood lipid profile
- FBC
- Chest X-ray
- Stress ECG
- Echocardiography
- Coronary angiography

TREATMENT

Treatment objectives

- To minimise symptoms
- To prevent progression to acute coronary syndromes
- To identify and manage modifiable risk factors
- To improve quality of life

Non-pharmacological treatment

- Educate and reassure patient
- Healthy lifestyle modifications
 - Diet
 - Exercise
 - Weight management
 - Reduction in alcohol consumption
 - Avoid or quit smoking

Pharmacological treatment

A. Treating the acute chest pain

Evidence Rating: [A]

- Glyceryl trinitrate, sublingual, 500 microgram stat. then as required
 - And**
 - Aspirin, oral, 300 mg stat. then 75 mg daily
 - Or**
 - Clopidogrel, oral, 300 mg stat. then 75 mg daily

- And**
- Atenolol, oral, 50-100 mg daily
- Or**
- Bisoprolol, oral, 5-10 mg daily
- Or**
- Metoprolol, oral, 50-100 mg 8-12 hourly

Note 7-1

Avoid betablockers in bronchial asthma, bradycardia, and hypotension; avoid atenolol in heart failure.

Or

- Verapamil, oral, 80-120 mg 8 hourly

CHAPTER 7: DISORDERS OF THE CARDIOVASCULAR SYSTEM

Note 7-2

Avoid in bradycardia, hypotension and in patients already on beta-blockers

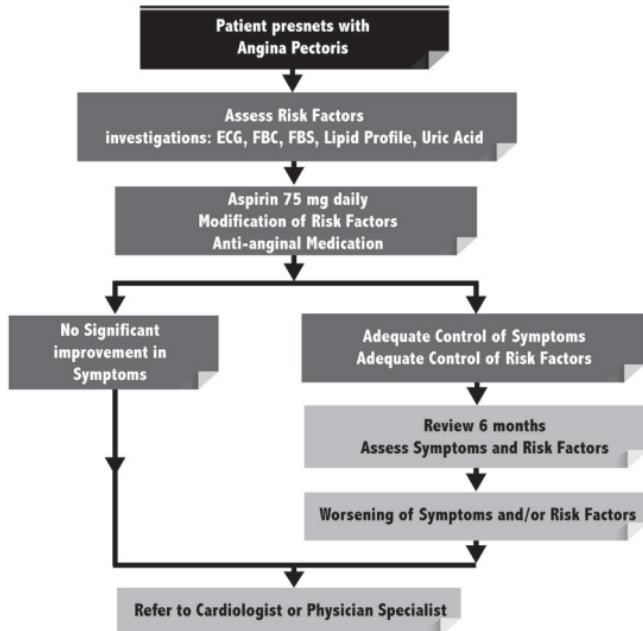
- Optimise or initiate treatment for hypertension
 - Optimise or initiate treatment for diabetes mellitus
 - Use statins to treat abnormal blood lipids to target levels
- B. If beta blockers or verapamil are contraindicated**
- Isosorbide dinitrate, oral, 10 mg 8-12 hourly

REFERRAL CRITERIA

Refer the following patients

- Those with no significant improvement in symptoms after the initial treatment above
- Those with worsening risk factors

FLOWCHART



Ghana National Drugs Programme, Ministry of Health
Email: gndp@ghnlp.org website: www.ghnlp.org

Fig 7-1: Flowchart: Angina Pectoris

ACUTE CORONARY SYNDROME

Acute Coronary Syndrome (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 is classified

as ST segment elevation on an electrocardiogram (ST-segment elevation myocardial infarction - STEMI) or 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.

Risk factors for this condition include obesity, diabetes mellitus, hypertension, smoking and hyperlipidaemia.

CAUSES

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

SYMPTOMS

- Chest pain
 - Sudden onset
 - 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
- Nausea
- Vomiting
- Shortness of breath or fatigue (this may be the only presentation in diabetics and the elderly)
- Loss of consciousness

SIGNS

- Restlessness and apprehension
- Excessive sweating
- Peripheral or central cyanosis
- Pulse may be thready, fast, irregular, slow or normal
- Blood pressure may be high, 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 (suggests heart failure)
- Confusion in the elderly

INVESTIGATIONS

- Standard 12 lead ECG
- Cardiac enzymes: CK-MB, troponins T and I
- Myoglobin
- Serum lipid profile
- Chest X-ray
- Random blood glucose
- FBC, ESR
- Serum uric acid
- Blood urea, electrolytes and creatinine
- C-reactive protein

CHAPTER 7: DISORDERS OF THE CARDIOVASCULAR SYSTEM

- Echocardiography
- Coronary angiography

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
- To identify and manage modifiable risk factors
- To improve quality of life

Non-pharmacological treatment

- Reassure patient and encourage bed rest in the first 48 hours
- Encourage cessation of smoking
- Ensure weight reduction (in overweight and obese individuals) in the long term

Pharmacological treatment**A. Initial treatment on admission**

Evidence Rating: [A]

- Oxygen, intranasal, by face mask or nasal cannula
And
- Aspirin, oral (chewable), 300 mg stat.
And
- Clopidogrel, oral, 300 mg stat.
And
- Glyceryl trinitrate, sublingual, 500 microgram stat.
And
- Morphine, IV, 5-10 mg stat.
And
- Metoclopramide, IV, 10 mg stat. (to prevent vomiting induced by morphine)

B. Maintenance treatment following immediately after initial treatment

- Aspirin, oral, 75-300 mg daily indefinitely
And
- Clopidogrel, oral, 75 mg daily (patients who receive revascularisation therapy will require treatment for up to 12 months)

C. Anticoagulation

- Enoxaparin, SC, 1 mg/kg (100 units/kg) 12 hourly

D. Prevention of cardiac arrhythmias and reduction of myocardial workload

- Atenolol, oral, 25-100 mg daily (avoid only if beta-blockers are con-

contraindicated)

Or

- Bisoprolol, oral, 5-20 mg daily
- Or**
- Metoprolol, oral, 50-100 mg 8-12 hourly

And

- Lisinopril, oral, 2.5-20 mg daily
- Or**
- Losartan, oral, 25-50 mg daily
- Or**
- Candesartan, oral, 4-16 mg daily

And

In patients with STEMI:

- Fibrinolytic agents may be given as reperfusion therapy in patients presenting with STEMI under specialist care.
- Manage acute complications such as pulmonary oedema, cardiogenic shock and cardiac arrhythmias
- Manage hyperglycaemia with insulin. Change diabetic patients previously on oral hypoglycaemic agents to insulin

E. Long-term treatment (secondary prevention)

- Aspirin, oral, 75-150 mg daily indefinitely

And

- Atenolol, oral, 25-100 mg daily (avoid only if beta-blockers are contraindicated)
- Or**
- Bisoprolol, oral, 5-20 mg daily
- Or**
- Metoprolol, oral, 50-100 mg 8-12 hourly

F. To prevent cardiac remodelling and improve survival

- Lisinopril, oral, 2.5-20 mg daily
- Or**
- Losartan, oral, 25-50 mg daily
- Or**
- Candesartan, oral, 4-16 mg daily

Note 7-3

Avoid ACE inhibitors and Angiotensin receptor blockers in patients with BP < 100 mmHg

G. To stabilise the clot and reduce blood cholesterol levels

- Atorvastatin, oral, 20-40 mg daily
- Or**
- Rosuvastatin, oral, 10-20 mg daily
- Or**

- Simvastatin, oral, 40-80 mg daily. Statins are indicated irrespective of lipid levels
- H. To improve coronary dilatation and reduce myocardial workload
- Isosorbide dinitrate, oral, 10 mg 8-12 hourly
- I. Control of hypertension and hyperglycaemia, if present
(See appropriate sections)

REFERRAL CRITERIA

All patients with suspected ACS require an urgent ECG. If ECG is not available or cannot be interpreted, refer immediately to a higher facility.

Patients with confirmed STEMI in any facility should be referred urgently to a Physician Specialist or Cardiologist for reperfusion therapy (after an initial oral dose of 300 mg of aspirin).

Other patients with N-STEMI and unstable angina should be referred to a physician specialist or cardiologist after the initial management above.

43. Dyspnoea

Dyspnoea is an uncomfortable awareness of one's own breathing. It is often the main symptom of cardiopulmonary disease although the differential diagnosis extends beyond these two systems. Dyspnoea of sudden onset should be treated as a medical emergency.

DYSPNOEA

CAUSES

- Cardiac
 - Heart Failure
 - Coronary Heart Disease
 - Valvular Heart Disease - mitral stenosis, aortic stenosis
 - Cardiac Arrhythmias
 - Pericardial effusion
- Respiratory
 - Pneumonia
 - Pulmonary Embolus (PE)
 - Obstructive lung disease - Chronic Obstructive Pulmonary Disease (COPD), Asthma
 - Restrictive lung disease - Intestinal lung disease eg cryptogenic fibrolysing alveolitis and the occupational lung diseases
 - Pneumothorax
 - Pleural Effusion
 - Chest wall function limitation - myopathy, neuropathy, kyphoscoliosis
- Other
 - Anaemia
 - Psychogenic hyperventilation
 - Acidosis - e.g. uraemia, Diabetic Ketoacidosis, drug overdose

- Foreign body aspiration
- Massive abdominal distension

SYMPTOMS

- Breathlessness
 - Quality
 - continuous or intermittent
 - exertional - suggests cardiopulmonary cause
 - positional - suggests paroxysmal nocturnal dyspnoea, orthopnoea and a cardiac cause
 - nocturnal - suggests cardiac or bronchial asthma
 - Time since onset - recent (acute) or longstanding (chronic)
 - Duration of episode(s)
 - minutes to hours - suggests asthma, pneumothorax, pulmonary oedema, pneumonia, pulmonary oedema, anaesthesia
 - weeks to months - suggests pleural effusion, pericardial effusion, pulmonary fibrosis, lung cancer, recurrent PE, cardiac failure, anaemia, neuromuscular disease, tuberculosis
 - years - COPD, lung fibrosis
- Associated features
 - cough (suggests acute heart failure, pneumonia)
 - sputum, haemoptysis
 - wheeze (asthma, heart failure)
 - ankle oedema (heart, kidney, liver)

DYSPNOEA

SIGNS

- Fever - pneumonia, less commonly PE
- Pallor - severe anaemia acute heart failure, PE, myocardial infarction or cardiogenic shock
- Sweating - acute heart failure, pneumonia, PE, myocardial infarction
- Clubbing - infections, cyanotic congenital heart disease, lung fibrosis
- Cyanosis - hypoxia e.g. in COPD, heart failure, PE, pneumonia etc.
- Peripheral oedema - heart, liver or renal failure
- Wheeze - heart failure or bronchial asthma
- Barrel shaped chest - COPD
- Ascites - cardiac, renal, gastrointestinal, hepatic or intra-abdominal lesion
- Pulse - fast (suggests tachyarrhythmia, PE) or slow (bradyarrhythmia)
- Blood pressure - may be high, normal or low
- Heart murmurs - valvular heart disease
- Other signs - features of pneumonia, pneumothorax, pleural effusion

INVESTIGATIONS

- Full Blood Count
- Urea, Electrolytes, Creatinine
- Chest X-ray

- ECG
- Pulse oximetry
- Peak flow rate measurement
- Cardiac enzymes, Troponin T, CK-MB if ischaemic heart disease is suspected
- Echocardiogram
- Lung Function Tests (spirometry)
- CT pulmonary angiogram useful for confirming PE

TREATMENT

Treatment objectives

- Treat underlying cause - see relevant chapters
- Maintain oxygen saturation above 95% - caution if there is underlying COPD, as these patients are dependent on hypoxic drive

Non-pharmacological treatment

- Based on underlying cause. (See relevant sections)

Pharmacological treatment

- Based on underlying cause. (See relevant sections)

REFERRAL CRITERIA

Refer to the next level of care if cause cannot be identified

44. Deep Vein Thrombosis (DVT)

Deep Vein Thrombosis (DVT) is a common disease although often asymptomatic. The deep veins of the lower limbs are affected most commonly, but thrombosis may affect other sites, including the upper limbs, intracranial and splanchnic veins. Complications include pulmonary thromboembolism, which can be life-threatening. It is therefore essential to have a reliable method for establishing the DVT risk of patients and to take active steps to provide prophylactic treatment as necessary. Common risk factors for DVT include obesity, smoking, prolonged immobility (e.g. bed rest, long haul flights), major surgery e.g. orthopaedic, abdominal and pelvic surgery, pregnancy and the puerperium, after caesarean section, malignancies, inherited blood disorders, oestrogen therapy and medical conditions, e.g. congestive cardiac failure, myocardial infarction, nephrotic syndrome, stroke, systemic lupus erythematosus.

In cases of confirmed DVT, treatment with anticoagulants must not be delayed unnecessarily unless there are significant contraindications to their use such as recent intracerebral bleed, severe liver disease, active peptic ulcer, bleeding disorders, and severe hypertension.

CAUSES

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

SYMPTOMS

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

SIGNS

- Swelling of affected limb
- Differential warmth
- Tenderness
- Redness
- Pitting oedema
- Prominent superficial veins

Box 7-2: Well's Scoring for DVT probability

The Well's scoring system for DVT probability objectifies clinical suspicion of DVT risk and provides criteria for initiating treatment.

The presence or absence of the clinical features below are computed to give a pre-testing probability score for that particular patient which is used to prioritise investigation and treatment.

- Paralysis, paresis or recent orthopedic casting of lower extremity (1 point)
- Recently bedridden (more than 3 days) or major surgery within past 4 weeks (1 point)
- Localized tenderness in deep vein system (1 point)
- Swelling of entire leg (1 point)
- Calf swelling 3 cm greater than other leg (measured 10 cm below the tibial tuberosity) (1 point)
- Pitting oedema greater in the symptomatic leg (1 point)
- Collateral non varicose superficial veins (1 point)
- Active cancer or cancer treated within 6 months (1 point)
- Alternative diagnosis more likely than DVT (Baker's cyst, cellulitis, muscle damage, superficial venous thrombosis, post phlebitic syndrome, inguinal lymphadenopathy, external venous compression) (-2 points)

Table 7-1: Well's Score Interpretation for DVT

3-8 Points:	High probability of DVT
1-2 Points:	Moderate probability
-2-0 Points:	Low Probability

Low probability: D-Dimer test is recommended. Low pre-test probability combined with a negative D-Dimer test essentially rules out a DVT.

Moderate or High Probability: D-Dimer test with additional Doppler/compression ultra sound scan is recommended.

INVESTIGATIONS

- D-Dimer test
- Doppler ultrasound
- Thrombophilia screen e.g. protein C, protein S levels (in patients with recurrent DVT)
- FBC

TREATMENT

Treatment objectives

- To prevent clot propagation and pulmonary embolism
- To prevent recurrence

Non-pharmacological treatment

- Avoidance of prolonged recumbency and dehydration
- Avoidance of excess amounts of coffee, tea and alcohol, especially on long journeys
- Increase water intake during long journeys or periods of immobility
- 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
- Avoid crossing legs for long periods on long journeys
- Use of elastic compression stockings

Pharmacological treatment

A. DVT Prophylaxis

1st Line treatment

Evidence Rating: [A]

- Heparin, SC,
Adults
5,000 units 8-12 hourly
Children
1 month-18 years; 250 units/kg 12 hourly

2nd Line Treatment

Evidence Rating: [A]

- Enoxaparin, SC,
Adults
40 mg daily
Children
2 months-18 years; 500 microgram /kg 12 hourly (max 40 mg)
1-2 months; 750 microgram /kg 12 hourly

B. DVT Treatment

1st Line Treatment

Evidence Rating: [A]

- Heparin, SC,
Children
1 month-18 years; 250 units /kg 12 hourly

Or

- Heparin, IV,
Adults
80 units/kg stat. continue with 18 units/kg / hour
Or
250 units/kg, SC, continue with 250 units /kg 12 hourly

Children

1-18 years; 75 units/kg stat. continue with 20 units/kg/hour

1 month-1 year; 75 units/kg stat. continue with 25 units/kg/ hour

Neonates (term baby); 75 units/kg stat. continue with 25 units/kg/ hour

Neonates (< 35 weeks); 50 Units /kg stat. continue with 25 units/kg/hour

2nd Line Treatment

Evidence Rating: [A]

- **Enoxaparin, SC,**

Adults

1.5 mg/kg (150 units/kg) daily

Children

2 months-18 years; 1 mg/kg 12 hourly

1-2 months; 1.5 mg/kg 12 hourly

Neonates; 1.5-2 mg/kg 12 hourly

Or

- **Dalteparin, SC,**

Adults

200 mg/kg (max. of 18,000 units) daily

Children

12-18 years; 200 units/kg once daily (max 18,000 units daily)

1 month-12 years; 100 units/kg 12 hourly

Neonates; 100 units/kg 12 hourly

And

- **Warfarin, oral,**

Adults**Loading Dose**

DAY	DOSE	INR
1	10 mg	-
2	10 mg	-
3	5 mg	Check INR

Note 7-4

Warfarin is not to be given in pregnancy.

Continue 5 mg daily INR until a target INR of 2 to 3 is achieved. After this the low molecular weight heparin is stopped and a maintenance warfarin dose of 2.5 mg to 5 mg (some patients may require 7.5 mg) is continued guided at all times by a target INR of 2 to 3.

Long-term treatment requires continuation of warfarin for three to six months if the risk factor is temporary or unknown. Recurrent DVT and permanent risk factors such as thrombophilia may require long-term anticoagulation.

REFERRAL CRITERIA

Refer to physician specialist for management and monitoring.

45. Pulmonary Embolism

Pulmonary Embolism (PE) results from thrombi, often from the deep veins of the lower limbs or pelvis, which are transported via the right heart into the pulmonary vasculature. Large emboli may cause obstruction to blood flow and result in life-threatening hypoxia and high mortality. PE should therefore be managed as a medical emergency.

The risk factors and management for PE are similar to those for DVT. (See section on 'DVT').

CAUSES

(See section on 'DVT')

SYMPTOMS

- Dyspnoea
- Pleuritic pain
- Cough
- Haemoptysis (due to pulmonary infarction)
- Presyncope, syncope or collapse (massive PE)
- Unilateral swelling of a limb

SIGNS

- Tachypnoea
- Tachycardia (may be regular or irregular)
- Blood pressure - low/unrecordable (suggests massive PE), normal or high
- Pleural effusion
- Low oxygen saturation on pulse oximetry <90%
- Pleural rub
- Cyanosis
- Unilaterally swollen calf or thigh of DVT

Box 7-3: Well's scoring for PE probability

- Symptoms of DVT (3 points)
- No alternative diagnosis better explains the illness (3 points)
- Tachycardia with pulse > 100 (1.5 points)
- Immobilization (>= 3 days) or surgery in the previous four weeks (1.5 points)
- Prior history of DVT or pulmonary embolism (1.5 points)
- Presence of hemoptysis (1 point)
- Presence of malignancy (1 point)

Table 7-2: Well's Score Interpretation for PE

Score > 6:	High probability
Score >= 2 and <= 6:	Moderate probability
Score < 2:	Low Probability

Low probability: D-Dimer test is recommended.

Moderate or High Probability: D-Dimer test with additional CT Pulmonary angiogram is recommended.

INVESTIGATIONS

- Chest X-ray
- ECG
- D-Dimer
- CT Pulmonary angiogram
- Echocardiography
- Doppler Ultrasound of the affected limb and pelvis
- FBC

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

- Elevate affected leg on a pillow if DVT present
- Apply compression stockings - after pain subsides if DVT present
- Surgical techniques e.g. embolectomy, inferior vena caval filters etc.

Pharmacological treatment

A. Clinical suspicion of pulmonary embolus

1st Line Treatment

Evidence Rating: [A]

- Oxygen, by face mask or nasal prongs or via non-rebreather mask (keep oxygen saturation > 95%)
And
- Morphine, IV, 5-10 mg stat.

And

- Enoxaparin, SC,
Adults
1.5 mg/kg (150 units/kg) daily
Or
- Dalteparin, SC,
Adult
200 mg/kg (max. 18,000 units) daily

- Warfarin, oral, simultaneously (NOT in pregnancy)
 - Adults**
 - Loading Dose**

DAY	DOSE	INR
1	10 mg	-
2	10 mg	-
3	5 mg	Check INR

Note 7-5

Continue 5 mg daily INR until a target INR of 2 to 3 is achieved. After this the low molecular weight heparin is stopped and a maintenance warfarin dose of 2.5 mg to 5 mg (some patients may require 7.5 mg) is continued guided at all times by a target INR of 2 to 3.

Long-term treatment requires continuation of warfarin for three to six months if the risk factor is temporary or unknown. Recurrent embolisms and permanent risk factors such as thrombophilia requires long term anticoagulation.

REFERRAL CRITERIA

Refer all patients with suspected pulmonary embolism, where facilities are unavailable for confirmation, to a physician specialist or cardiologist for expert management after stabilisation.

46. Stroke

A stroke can be defined as a sudden global or focal neurological deficit resulting from spontaneous haemorrhage or infarction of the central nervous system, with objective evidence of an infarction or haemorrhage, irrespective of the duration of clinical symptoms. A CT or MRI scan is required to make the diagnosis and exclude other intracranial lesions that could present similarly.

A Transient Ischaemic Attack (TIA), on the other hand, is a transient episode of neurologic dysfunction caused by focal brain, spinal cord, or retinal ischemia. There is no objective evidence of acute infarction in the affected region of brain or retina.

In adults, hypertension, diabetes, dyslipidaemia, atrial fibrillation and smoking, increase the risk for strokes. In children sickle cell disease and cyanotic heart disease are important risk factors for strokes.

Patients should ideally have multidisciplinary care.

CAUSES

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

SYMPOTOMS

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

SIGNS

- Paralysis of a limb
- Facial paralysis (lower half)
- Initial flaccidity of limbs, but later spasticity and exaggerated reflexes
- Hemianopia (loss of one-half of visual field)
- Hemi-anaesthesia (loss of sensation of one-half of body)
- Extensor plantar response
- Dysarthria/dysphasia (alteration of speech)
- Neck stiffness (in subarachnoid haemorrhage)

INVESTIGATIONS

- STROKE
- 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 area of brain damage
- To protect patients from the dangers of unconsciousness and immobility
- To prevent aspiration
- To treat the underlying cause if possible
- To identify and manage modifiable risk factors (hypertension, high cholesterol, diabetes mellitus etc.)
- To institute measures to improve functional recovery
- To support and rehabilitate patients who survive with residual disability
- To minimise adverse effects of drug therapy

Non-pharmacological treatment

- Admit and monitor patient's vital signs and neurological signs frequently (4 hourly)

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- Establish adequate airway in unconscious patients
- Swallowing test in an upright position (use 10-15ml of water)
- Insert nasogastric tube as early as possible for feeding and medications in unconscious patients or those with swallowing difficulties to prevent aspiration
- Nurse in the lateral position with suctioning where necessary
- Elevate head of bed to 30 degrees to reduce intracranial pressure
- Prevent pressure sores by regular turning (every 2 hours) in bed
- Maintain adequate hydration
- Keep patient clean and dry by frequent use of bedpan/urine pot, diapers, condom catheter as required. Urethral catheter should be used only if absolutely necessary
- Start physiotherapy as soon as practicable

Pharmacological treatment**A. Infarctive Strokes and TIAs**

1st Line Treatment

Evidence Rating: [B]

- Aspirin, oral,
Adults

300 mg stat.

Then

75 mg daily

Children

> 16 years; same as adult dose

< 16 years; not recommended

And

- Atorvastatin, oral,

Adults

40-80 mg daily

Children

Not recommended

Or

- Rosuvastatin, oral,

Adults

20-40 mg daily

Children

Not recommended

B. Haemorrhagic Stroke with evidence of cerebral oedema present

1st Line Treatment

Evidence Rating: [B]

- Mannitol, IV,
Adults

0.5-1 g/kg 6 hourly (up to 2 g/kg per dose)

Children

1 month-18 years; 0.5-1.5 g/kg **Or** 2.5-7.5 ml/kg of 20% solution
 (See treatment flowchart for acute medical management of stroke below)

C. Control of co-morbidities (e.g. hypertension, diabetes etc.)
 (See appropriate sections)

REFERRAL CRITERIA

Patients with worsening symptoms and signs should be urgently referred for specialist evaluation and care. All stable patients with neurological deficits should be referred to a speech therapist, occupational therapist or physiotherapist as appropriate.

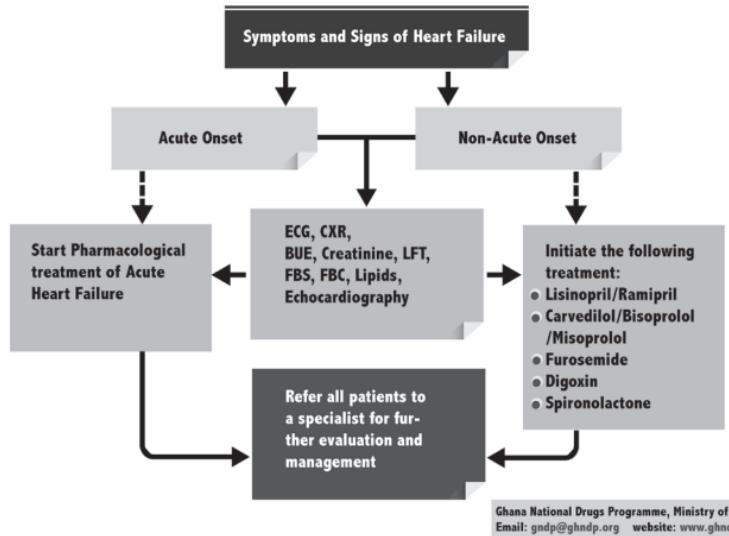
FLOWCHART

Fig 7-4: Flowchart: Stroke

Table 7-3: Treatment flowchart for acute medical management of stroke

History and examination	Identify risk factors, site and extent of the stroke Consider sources of embolism
Investigations	FBC, Urine R/E, BUE, +Cr, Fasting glucose, Fasting cholesterol, CT Scan, CXR, ECG
Hydration	Aiming for euvolaemia (2.5-3 L per day on average) Use normal saline or dextrose saline Avoid dextrose 5% or 10% unless hypoglycaemic.

Table 7-3: Treatment flowchart for acute medical management of stroke

Stress ulcer prophylaxis	Give proton pump inhibitor
Glucose control	Keep RBS (4-10) mmol/L May need insulin sliding scale to control or supplement oral medications (avoid oral metformin if diabetic)
Pyrexia	If > 37.5 oC manage with regular paracetamol to control pyrexia Consider source (chest, urine, malaria, other) and manage accordingly
Blood pressure management	Often rises as direct result of stroke and may partially settle with no action. If > 180/110 mmHg aim for gradual reduction of no more than 20% over 24 hours. Continue pre-stroke medication if indicated. DO NOT USE SUBLINGUAL NIFEDIPINE. Sudden reduction in BP can lead to extension of stroke.
Treatment of infarcts	Start aspirin 300 mg stat as soon as infarct identified via (oral/NG) if no contraindications. Reduce dose to 75 mg daily after 1 week, and consider further anti-platelet medication.
Atrial Fibrillation	Consider rhythm control for acute onset; anticoagulation
Mobilisation of patients	Early referral of all patients to the physiotherapist (even if unconscious)
Aspiration pneumonia	Look for signs of this regularly (rising respiratory rate, tachycardia, chest signs). Treat with IV Amoxicillin + Clavulanic Acid and IV metronidazole for first 48 hours then review
DVT and Pulmonary embolism	Prophylactic heparin if infarct detected on CT scan
Seizures	Terminate seizures as per protocols. Regular anticonvulsant if more than one seizure occurs
Change in conscious level	Urgently consider possibilities such as; cerebral oedema/hypoglycaemia/metabolic/drug causes that can be reversed
Rising ICP	Nurse at 30 degrees head up, IV mannitol +/- Dexamethasone as required
High cholesterol	Start high dose statins as per guidelines

47. Heart Failure

This is a condition in which the heart is unable to produce adequate cardiac output, and in so doing, is unable to meet the body's metabolic requirements. The cardiac dysfunction may predominantly involve the left or the right ventricle individually or both ventricles simultaneously. This latter case is termed Biventricular Failure (BVF) or 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 7-4: New York Heart Association (NYHA) 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

HEART FAILURE

CAUSES

- Systemic arterial hypertension
- Rheumatic heart disease
- Cardiomyopathies
- Severe anaemia
- Ischaemic heart disease
- Thyrotoxicosis
- Congenital heart disease
- Pulmonary arterial hypertension
- Cardiac arrhythmia

SYMPTOMS

Left Heart Failure

- Breathlessness
 - On exertion
 - On lying flat (orthopnoea)
 - At night (paroxysmal nocturnal dyspnoea)
- Easy fatigability
- Cough with frothy blood-stained sputum
- Wheezing

Right Heart Failure

- Swelling of the feet and lower extremities (may be absent in children below 6 months)
- Abdominal swelling

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- Right hypochondrial pain from an enlarging liver

SIGNS**Left Heart Failure**

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

Right Heart Failure

- Tachycardia
- Pitting pedal oedema (may be absent in children below 6 months)
- Ascites
- Tender, smooth, soft hepatomegaly
- Raised jugular venous pressure
- Gallop rhythm
- Cardiac murmur

In children

- Failure to thrive
- Difficulty in feeding

INVESTIGATIONS

- FBC
- ECG
- Chest X-ray
- Blood urea, electrolytes and creatinine and eGFR (estimated glomerular filtration rate)
- Liver function test
- Fasting blood sugar
- Fasting lipids
- Echocardiography
- Thyroid function tests
- Cardiac enzymes, if myocardial infarction is suspected
- Coronary angiography

TREATMENT**Treatment objectives**

- To relieve symptoms and improve quality of life
- To treat the precipitating cause
- To treat complications
- To prevent recurrence of symptoms
- To reduce need for hospital re-admissions
- To reduce mortality

Non-pharmacological treatment

- Reduce salt intake

- Reduce weight in overweight and obese individuals
- Avoid alcohol
- Avoid or quit smoking
- Encourage moderate exercise
- Bed rest (only in acute heart failure or exacerbations of chronic heart failure)
- Prop up in bed

Pharmacological treatment

A. Acute heart failure - initial treatment

1st Line Treatment

Evidence Rating: [A]

- Oxygen, by nasal cannula or face mask if there is hypoxaemia ($\text{SpO}_2 < 90\%$)
And
- Furosemide, IV,
Adults
40-80 mg, repeat after 30 minutes if necessary

Children

12-18 years; 20-40 mg repeated 8 hourly as necessary

1 month-12 years; 0.5-1 mg/kg repeated 8 hourly (max 4 mg/kg/dose)

B. Acute heart failure - maintenance treatment after stabilisation

- Furosemide, IV,

Adults

40-80 mg 12 hourly

Children

12-18 years; 20-40 mg repeated 8 hourly as necessary

1 month-12 years; 0.5-1 mg/kg repeated 8 hourly (max 4 mg/kg/dose)

C. Acute heart failure - patient not improving after initial treatment

- Furosemide (Frusemide), IV,

Adults

40-80 mg 12 hourly

Children

12-18 years; 20-40 mg repeated 8 hourly as necessary

1 month-12 years; 0.5-1 mg/kg repeated 8 hourly (max 4 mg/kg/dose)

And

- Morphine, IV,

Adults

5-10 mg slowly

Children

Not recommended for this condition as safety is not well established

And

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- Metoclopramide, IV,
Adults
10 mg to prevent vomiting
Children
Not required

D. Acute heart failure - patient improving after initial treatment

- Furosemide, oral,

Adults

40-80 mg 12 hourly

Children

0.5-2 mg/kg 8-12 hourly

E. Acute heart failure - patient with fast atrial fibrillation or in sinus rhythm with systolic dysfunction

Evidence Rating: [C]

- Digoxin, oral,

Elderly

125 micrograms 12 hourly for 24-48 hours

Adults

250 micrograms 12 hourly for 24-48 hours

Then

250 micrograms daily

Then

125 micrograms daily

Children > 10 years

0.5-1 mg in 3 divided doses over 24 hours

Then

62.5-250 microgram daily

Children 2-10 years

20-30 microgram/kg in 3 divided doses over 24 hours

Then

8-10 microgram/kg daily

Children < 2 years

30-40 microgram/kg in 3 divided doses over 24 hours

Then

10-12 microgram /kg daily

Neonates (full term)

20 microgram/kg in 3 divided doses in 24 hours

Then

8-10 microgram/kg daily

Neonates (< 1.5 kg)

25 microgram/kg in 3 divided doses in 24 hours

Premature

15 microgram/kg daily

Then

5 microgram/kg daily

- F. Acute heart failure - patients in cardiogenic shock (adult systolic blood pressure <85 mmHg) with hypotension and or hypoperfusion
- Dobutamine, IV infusion,
Adults
2.5-10 micrograms/kg per minute

Note 7-6

ECG should be monitored continuously because inotropic agents can cause arrhythmias and myocardial ischaemia

G. Prophylactic anticoagulation against venous thrombosis

- Enoxaparin, SC,
Adults
1.5 mg/kg (150 units/kg) daily
Children
2 months-18 years; 1 mg/kg 12 hourly
1-2 months; 1.5 mg/kg 12 hourly
Neonates; 1.5-2 mg/kg 12 hourly
- Identify and treat (if possible) precipitating causes such as hypertension, myocardial infarction, anaemia or thyrotoxicosis

H. Symptomatic Heart Failure

1st Line Treatment

- Furosemide, oral,
Evidence Rating: [C]
Adults
40-80 mg daily
Children
1-2 mg/kg daily

And

- Lisinopril, oral,
(only when systolic blood pressure > 100 mmHg)
Evidence Rating: [A]

Adults

2.5-20 mg daily

Or

- Ramipril, oral,
(only when systolic blood pressure > 100 mmHg)
Evidence Rating: [A]

Adults

2.5-10 mg daily

And

- Carvedilol, oral,
Evidence Rating: [A]

Adults

3.125-12.5 mg 12 hourly (maximum 25mg 12 hourly)

Or

- Bisoprolol, oral,
Evidence Rating: [A]

Adults

1.25-10 mg daily

Or

- Metoprolol, oral,
Evidence Rating: [A]

Adults

25-100 mg daily

I. Patients not tolerating ACE inhibitors (replace Lisinopril or Ramipril with the following in the 1st line treatment above)

- Losartan, oral,
Evidence Rating: [A]

Adults

25-50 mg daily

Or

- Candesartan, oral,
Evidence Rating: [A]

Adults

4-16 mg daily

J. Patients with fast atrial fibrillation or in sinus rhythm with systolic dysfunction;

Add

- Digoxin, oral,
Evidence Rating: [B]

Elderly

125 micrograms 12 hourly for 24-48 hours,

Then

125 micrograms 24 hourly

Adults

250 micrograms 12 hourly for 24-48 hours,

Then

250 micrograms once daily

Children

5 micrograms/kg 12 hourly

K. Symptomatic patients, inspite of the above medications

And

- Spironolactone, oral,
Evidence Rating: [A]

Adults

25-50 mg daily

REFERRAL

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.

FLOWCHART

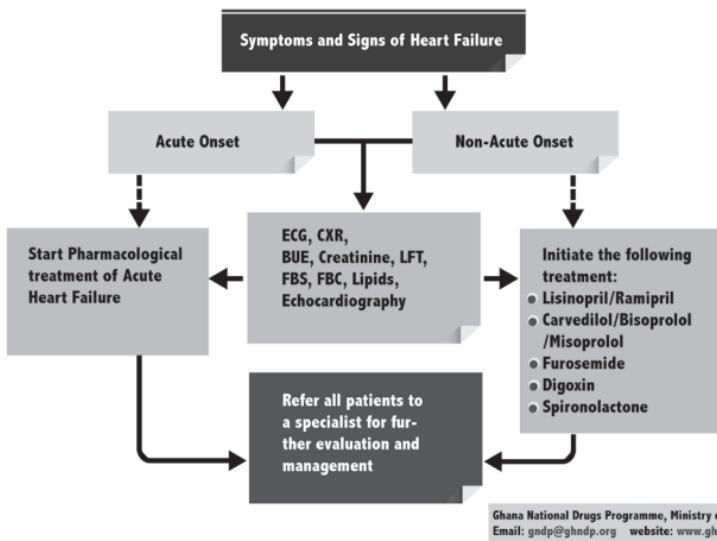


Fig 7-5: Flowchart: Heart Failure

48. Congenital Heart Disease

Congenital malformation of the heart, commonly 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
- Genetic (higher risk with increasing maternal age)

CHAPTER 7: DISORDERS OF THE CARDIOVASCULAR SYSTEM

- Maternal infections due to viruses in early pregnancy, notably rubella
- Maternal diabetes
- Alcohol, smoking, and use of drugs during early pregnancy
- Exposure to X-rays and other radiation during early pregnancy
- Prematurity
- Multiple pregnancy

SYMPTOMS**Acyanotic**

- Easy fatigability
- Breathlessness
- Poor feeding/Interruption of sucking in babies during feeding
- Poor growth
- Cold sweat on forehead
- Puffy eyelids, swollen feet (however, these are uncommon in infants)
- Distended abdomen
- Exertion may lead to chest pains, syncope or sudden death

Cyanotic

- All symptoms of acyanotic heart disease, plus the following:
- Blue tongue and fingernails (cyanosis) at birth or becoming worse with exertion in older children
- Squatting several times during play in toddlers

SIGNS**Acyanotic**

- Signs of heart failure for moderate to severe lesions:
 - Cold sweaty skin
 - Puffy eyelids
 - Distended neck veins and ankle oedema (in older children)
 - Tachycardia
 - Tachypnoea
 - Weak thready pulse
 - Cardiomegaly
 - Gallop rhythm
 - Crepitations, rhonchi
 - Hepatomegaly
- Heart murmur (not always present)

Cyanotic

- Signs of heart failure as above, plus
- Finger clubbing
- Cyanosis (low peripheral oxygen saturation measured by pulse oximetry)
- Heart murmur
- Hypercyanotic attack i.e. respiratory distress with deepening cyanosis, loss of consciousness and convulsions

INVESTIGATIONS

- FBC
- Chest X-ray
- ECG
- Echocardiography

TREATMENT**Treatment objectives**

- Early recognition of the problem
- Prompt treatment of heart failure
- Early surgical correction if indicated
- Prevention of endocarditis

Non-pharmacological treatment

- Ensure good nutrition, good oral and dental hygiene
- Avoid excessive physical exertion (notify parents and teachers)

Pharmacological treatment**A. Symptomatic congenital heart disease**

Evidence Rating: [C]

- Oxygen, by face mask or nasal prongs, 2 L/minute if available, (monitor oxygen saturation)

Note 7-7

For patients in heart failure or with hypoxic attack

B. Treatment of heart failure in symptomatic congenital heart disease
(See section on 'Heart Failure')**C. To improve blood flow into the lungs for patients with Tetralogy of Fallot**

- Propranolol, oral,
Children 1 month-12 years
0.25-1 mg/kg 6-8 hourly (max. 5 mg/kg daily)
Neonates
0.25-1 mg/kg 8-12 hourly (max. 2mg/kg 8 hourly)
- Propranolol, slow IV with ECG monitoring,
Children 1 month - 12 years
15-20 microgram/kg 6-8 hourly (max. 200 microgram/kg) repeated every 6-8 hours if necessary
Neonates
15-20 microgram/kg (max. 100 microgram/kg) repeated every 12 hours if necessary

D. Congenital heart disease with hypoxic attack
(See section on 'Hypoxic Attack')

REFERRAL CRITERIA

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

49. Hypercyanotic attack

This is a life threatening paediatric cardiac emergency.

It usually occurs in infants with a peak incidence between 4 and 6 months. A severe episode may lead to limpness, seizures, cerebrovascular accident or even death. Spells may be brief (1-2 minutes) and self-correct or may progress to a severe, life-threatening episode. Prompt recognition by parents and medical staff is important. The attack is often early in the morning with no apparent reason. It may be precipitated following a bath, by prolonged crying, defaecation, dehydration, febrile illness or induction of anaesthesia.

CAUSES

- Congenital heart disease e.g. Tetralogy of Fallot, pulmonary stenosis, double outlet right ventricle, tricuspid atresia, Eisenmenger syndrome

SYMPTOMS

- Irritability and prolonged crying
- Deep rapid breathing
- Increased severity of 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 complications and death from severe hypoxia

Non-pharmacological treatment

- Hold in knee chest position (teach parents)

- The above actions increase peripheral vascular resistance and help to reduce cyanosis.

Pharmacological treatment

A. All children with hypercyanotic attack

Evidence Rating: [C]

- Oxygen (100%), by face mask or nasal prongs, 2 L/minute (monitoring oxygen saturation if possible)-to all patients to reduce hypoxia

And

- 0.9% Normal Saline or Ringers' Lactate, IV, 10 ml/kg, over 30 minutes then assess response

And

- Morphine sulphate, slow IV (preferred), or IM, if IV line not accessible, 100-200 micrograms/kg stat.

B. For patients with poor response to above measures, Add

- Propranolol, oral,

Children 1 month-12 years

500 microgram/kg 8 hourly (max. 5 mg/kg daily)

Neonates

500 microgram/kg 8 hourly (max. 2 mg/kg 8 hourly)

C. To correct acidosis in cyanotic patients with no improvement after 10 minutes of above treatment, Add

- Sodium Bicarbonate, IV,

For all age groups

1-2 mmol/kg

Note 7-8

Emergency surgical shunt may be required

D. Maintenance treatment to prevent recurrent attacks pending surgery

- Propranolol, oral,

Children 1 month-12 years

0.25-1 mg/kg 6-8 hourly (max. 5 mg/kg daily)

Neonates

0.25-1 mg/kg 8-12 hourly (max. 2 mg/kg 8 hourly)

- Propranolol, slow IV with ECG monitoring,

Children 1 month-12 years

15-20 microgram/kg 6-8 hourly (max. 200 microgram/kg) repeated every 6-8 hours if necessary

Neonates

15-20 microgram/kg (max. 100 microgram/kg) repeated every 12 hours if necessary

REFERRAL CRITERIA

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

50. Pericarditis

Pericarditis is inflammation of the pericardium. It may be dry, fibrinous, effusive or constrictive. It may be acute or chronic (>3 months).

CAUSES

- Viral
- Bacterial
- Tuberculous
- Fungal
- Rheumatic fever
- Post-cardiotomy
- Postmyocardial infarction
- Uraemia
- Autoimmune diseases

SYMPTOMS

- Retrosternal or left precordial chest pain (worsens with lying down and improves with sitting and leaning forward)
- Palpitation
- Fatigue

SIGNS

- Fever
- Malaise
- Myalgia
- Pericardial friction rub
- Fast and regular heart rate
- Distant heart sounds (if there is a large effusion)

INVESTIGATIONS

- FBC and ESR
- ASO titre
- 12-lead ECG
- Chest X-ray
- Echocardiogram
- Chest CT scan

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

Bed rest

Pericardiocentesis (indicated when there is cardiac tamponade, large or symptomatic pericardial effusion). Evidence Rating: [B]

Pharmacological treatment

A. Acute pericarditis

1st Line Treatment

Evidence Rating: [B]

- Ibuprofen, oral,

Adults

300-800 mg 6-8 hourly

Children

7-18 years;	200 mg 6-8 hourly
2-7 years;	100 mg 6-8 hourly
1-2 years;	50 mg 6-8 hourly
6-12 months;	50 mg 8 hourly
1-6 months;	5 mg/kg 6-8 hourly

And

- Colchicine, oral,

Adults

0.5 mg 12 hourly

Children

Not recommended

Or

- Prednisolone, oral, (restricted to connective tissue diseases and uraemic pericarditis)

Adults

40 mg daily for 14 days and taper off

Children

2 mg/kg daily for 14 days and taper off

B. For treatment of underlying cause

(See appropriate section)

REFERRAL CRITERIA

Refer all patients to a Cardiologist for further evaluation after the initial treatment. Patients with large effusions or cardiac tamponade require urgent pericardiocentesis under echocardiographic guidance and they should be referred immediately.

51. Hypertension

Hypertension or 'high blood pressure' carries an increased risk of early death from stroke, heart attack, heart failure and kidney failure if it is not detected early and properly controlled. Owing to this, the focus must

be on when to initiate treatment, rather than how hypertension should be defined.

Since there are often no specific symptoms associated with hypertension, there is the need for regular blood pressure (BP) screening in the adult population for early detection.

In the general adult population, treatment must be initiated at a BP of 140/90 mmHg or higher for individuals below 60 years of age, and 150/90 mmHg or higher in those above 60 years. For individuals with diabetes mellitus or non-diabetics with Chronic Kidney Disease (CKD), treatment for hypertension must be initiated at a BP of 140/90 mmHg, irrespective of age.

In the majority of patients with hypertension, no specific underlying cause is identified (primary hypertension). In these individuals, increasing age, family history, excess body weight, lack of physical activity and excessive alcohol intake may be possible predisposing factors. In about 10% of cases of hypertension, there may be an underlying kidney disease, endocrine disorder, renal artery stenosis or coarctation of the aorta (secondary hypertension).

Once a diagnosis of hypertension is made, the individual should be evaluated to exclude secondary causes and to identify other existing cardiovascular risk factors e.g. diabetes, dyslipidaemia, hyperuricaemia, etc.

Box 7-6: Cardiovascular Risk Factors

- Age (men \geq 55 years; women \geq 65)
- Family history of premature cardiovascular disease (men aged $<$ 55 years; women aged $<$ 65)
- Dyslipidaemia
- Obesity ($BMI \geq 30 \text{ kg/m}^2$)
- Diabetes mellitus
- Smoking
- Pulse pressure (in the elderly) $\geq 60\text{mmHg}$
- Microalbuminuria or proteinuria
- Left ventricular hypertrophy
- Left bundle branch block and other electrocardiographic features suggestive of ischaemic heart disease
- Previous stroke or transient ischaemic attack
- Periperal arterial disease
- Heart failure
- Coronary artery disease
- Chronic kidney disease
- Advanced retinopathy: haemorrhages or exudates, papilloedema

CAUSES

- Primary hypertension
- Secondary hypertension
 - Kidney related- CKD, polycystic kidney disease
 - Endocrine - phaeochromocytoma, Cushing's syndrome, Conn's syndrome, hypothyroidism, hyperthyroidism, acromegaly

- Vascular - renal artery stenosis, coarctation of the aorta

SYMPOTMS

- Usually none
- Occasionally,
 - Headaches
 - Palpitations
 - Dizziness
 - Easy fatiguability

SIGNS

- Blood pressure $\geq 140/90$ mmHg
- Displaced apex beat
- Signs pointing to a specific cause for secondary hypertension

INVESTIGATIONS

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

HYPERTENSION

TREATMENT

Treatment objectives

- To reduce blood pressure levels to recommended targets:
 - $< 140/90$ mmHg for age below 60 years, diabetes, CKD
 - $< 150/90$ mmHg for age above 60 years
- To manage co-morbid conditions e.g. obesity, diabetes, lipids etc.
- To prevent cardiovascular, cerebrovascular and renal complications
- To promote therapeutic lifestyle changes e.g. smoking cessation, regular physical activity, reduction in alcohol intake
- 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
- Avoid or quit smoking

Pharmacological treatment

A. Treatment of hypertension

1st Line Treatment

Evidence Rating: [A]

Box 7-7: Notes on anti-hypertensive medicines

Any of the five classes of major antihypertensive drugs can be used as first-line treatment. These are:

- Thiazide Diuretics
- Calcium Channel Blockers
- Angiotensin Converting Enzyme Inhibitors
- Angiotensin Receptor Blockers
- Beta-blockers

In the general black population thiazide diuretics or calcium channel blockers, either as monotherapy or in some combination therapy, is preferable. Angiotensin converting enzyme Inhibitors are not recommended as first-line drugs for uncomplicated hypertension in black patients.

Dual therapy should be started earlier when the blood pressure exceeds 180/110 mmHg.

Additional anti-hypertensive drugs should be used if target blood pressure levels are not achieved. Add-on drugs should be chosen from first-line choices bearing in mind compelling indications and contraindications.

Compelling indications for the choice of antihypertensives

- Left ventricular hypertrophy: ACE-I or ARB, CCB preferably Amlodipine
- Microalbuminuria: ACE-I or ARB
- Renal dysfunction: ACE-I or ARB; Caution- if eGFR <15min/ml without renal replacement therapy
- Previous stroke: Any of the first-line drugs, especially ACE-I
- Coronary artery disease (Angina/Myocardial infarction): ACE-I or ARB, Beta-blocker, CCB.
- Heart failure: ACE-I or ARB, Cardio-selective B-Blockers- bisoprolol, metoprolol, carvedilol; Loop diuretics, Spironolactone in advanced heart failure
- Peripheral artery disease: CCB, ACE-I or ARB
- Diabetes mellitus: ACE-I or ARB
- Atrial fibrillation: ARB or ACE-I or B-blockers

Compelling Contraindications

- Gout: Thiazide diuretics
- Beta-blockers: Asthma, 2 and 3 AV block
- CCB: Heart failure
- ACE-I or ARB: Bilateral renal artery stenosis and hyperkalaemia

Thiazide Diuretics:

- Bendroflumethiazide, oral, 2.5 mg daily
Or
- Hydrochlorothiazide, oral, 12.5 mg-25 mg daily

And/Or

Calcium Channel Blockers:

- Amlodipine, oral, 5-10 mg daily
Or
- Nifedipine retard, oral, 10-40 mg 12 hourly

And/Or

Angiotensin-converting enzyme (ACE) inhibitors

- Lisinopril, oral, 5-40 mg daily
Or
- Ramipril, oral, 2.5-10 mg daily

Or

Angiotensin receptor blockers

- Losartan, oral, 25-100 mg daily
Or
- Candesartan, oral, 4-32 mg daily
Or
- Valsartan, oral, 80-160 mg daily

And/Or

Beta-blockers:

- Atenolol, oral, 50 -100 mg daily
Or
- Bisoprolol, oral, 5-20 mg daily
Or
- Metoprolol, oral, 50-200 mg 12 hourly
Or
- Carvedilol, oral, 12.5-50 mg daily
Or
- Labetalol, oral, 100-400 mg 12 hourly

2nd Line Treatment

Evidence Rating: [C]

Centrally acting agents

- Metyldopa, oral, 250 mg-1g 8-12 hourly

And/Or

Vasodilators

- Hydralazine, oral, 25-50 mg 12 hourly

And/Or

Alpha-blockers

- Prazosin, oral, 0.5 mg 8-12 hourly and increasing gradually to a max. dose of 20 mg

And/Or

Aldosterone antagonists

- Spironolactone, oral, 25-50 mg daily

REFERRAL CRITERIA

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

FLOWCHART

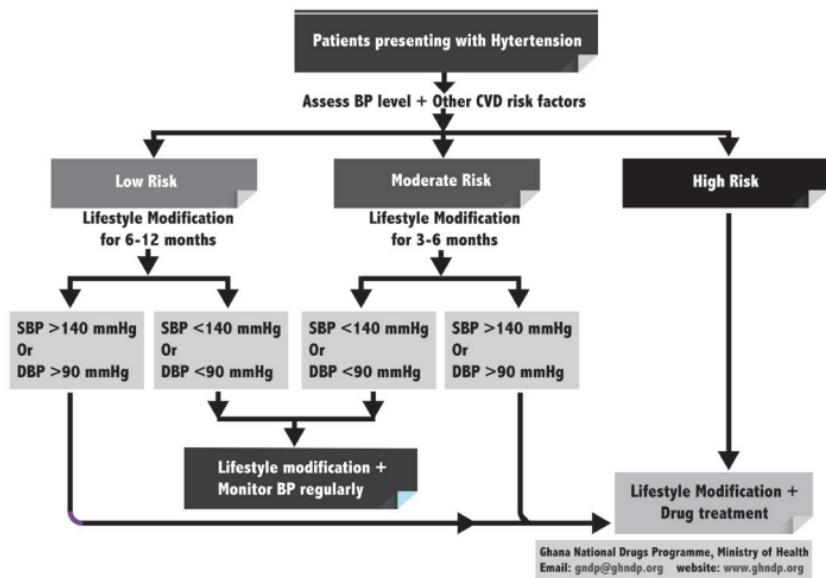


Fig 7-8: Flowchart: Hypertension

52. Hypertension in children and adolescents

Hypertension in children is defined as an average systolic and/or diastolic blood pressure that is \geq 95th 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). An appropriate cuff size that covers two thirds (%) of the length of the arm (between shoulder and elbow) and encircling the whole arm, should be used.

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 abnormal and would require a referral to, and evaluation by a paediatrician.

Most adolescent and childhood hypertension, especially in infants and younger children, is due to secondary causes (See section on 'Hypertension in Adults'). Adolescents, however, may have early onset primary hypertension.

CAUSES

- Renal e.g. chronic pyelonephritis, hydronephrosis
- Vascular e.g. coarctation of aorta, renal artery stenosis
- Endocrine e.g. phaeochromocytoma, Cushing's syndrome, adrenal disorders
- Obesity
- Primary hypertension

SYMPTOMS

- Chest pain
- Headaches
- Dyspnoea on exertion
- Excessive sweating
- Leg swelling
- Palpitations
- Haematuria
- Unconsciousness (hypertensive encephalopathy)

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
- Signs pointing to a specific cause for secondary hypertension

INVESTIGATIONS

(See section on 'Hypertension in Adults')

TREATMENT

Treatment objectives

- To reduce blood pressure (BP) to a target of < 95 th percentile for age, gender and height in the absence of end organ-damage (to < 90 th

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percentile if end organ damage present)

- To prevent complications
- To manage underlying secondary cause
- To encourage weight reduction in obese and overweight children

Non-pharmacological treatment

- Therapeutic lifestyle changes
 - weight control
 - regular exercise
 - low fat intake
 - low sodium diet
 - regular fruit and vegetable intake

Pharmacological treatment

Evidence Rating: [A]

Angiotensin-converting enzyme (ACE) inhibitors

- Enalapril, oral,
 - Children
12-18 years; initially 2.5 mg daily (increased to max. 10-20 mg daily in 1-2 divided doses)
20 mg daily in 1-2 years; initially 100 micrograms per kg daily (increased to max. 1 mg/kg daily in 1-2 divided doses)
 - Neonate
10 microgram/kg daily (increased to max. 500 microgram/kg daily in 1-3 divided doses)

Diuretics

- Bendroflumethiazide, oral,
 - 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

Beta blockers

- Propranolol, oral,
 - 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

Or

- Atenolol, oral,
 - Children
0.5-1 mg/kg daily (max. 2 mg/kg daily)

Calcium channel blockers

- Nifedipine, oral,
 - Children
12-18 years; 5-20 mg 8 hourly
1 month-12 years; 200-300 microgram/kg 8 hourly (max. 100 mg daily)

Or

- Amlodipine, oral,
Children
12-18 years; 5-10 mg daily
1 month-12 years; 100-400 microgram/kg daily (max. 10 mg daily)

Vasodilators

- Hydralazine, oral,
Children
12-18 years; 25 mg 12 hourly increased to usual max. 50-100 mg 12 hourly
1 month-12 years; 250-500 microgram/kg 8-12 hourly increased as necessary to max. 7.5 mg/kg daily (not exceeding 200 mg)
Neonate
250-500 microgram/kg 8-12 hourly increased as necessary to max. 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-receptor blockers

- Losartan, oral,
Children
Initial dose; 0.7 mg /kg daily (max. 50 mg)
Maintenance dose; 1.4 mg /kg daily (max. 100 mg)

REFERRAL CRITERIA

Refer all cases of hypertension in children to a specialist for investigation and further treatment.

53. Hypertension in Pregnancy

(See section on 'Hypertension in Pregnancy' under 'Obstetric care and Obstetric Disorders')

54. Hypertensive Emergencies

A hypertensive crisis is a severe and potentially life threatening increase in blood pressures (BP) which may result in an acute stroke, subarachnoid haemorrhage, seizures (hypertensive encephalopathy), heart attack, acute dissection of aorta, heart failure, renal damage or eclampsia (during pregnancy). The underlying cause may be primary hypertension; however, secondary causes of hypertension must be excluded.

In adult patients this often occurs with a BP > 180/120 mmHg, while in children this may occur at lower BP levels.

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These patients need careful examination to exclude target organ damage. Rapid correction of blood pressure with careful monitoring to avoid a precipitous drop is indicated to prevent organ damage.

SYMPOTMS

- Headache
- Chest pain
- Shortness of breath
- Nausea
- Vomiting
- Confusion
- Seizures
- Unconsciousness

SIGNS

- Severely elevated blood pressure (for age)
- Unconsciousness
- Seizures
- Neck rigidity
- Lung crepitations

INVESTIGATIONS

- Chest X-ray
- 12-lead ECG
- FBC
- Urinalysis
- Blood urea, electrolytes and creatinine
- Brain CT scan (for stroke)
- Chest CT scan with angiography (for suspected aortic dissection)
- Cardiac enzymes: creatinine kinase-MB (CK-MB), serum aspartate transaminase (AST), serum lactic dehydrogenase (LDH) and troponins (for acute coronary syndrome)
- Echocardiography

TREATMENT**Treatment objectives**

- To limit further organ-related complications by controlled reduction of BP
- To control and subsequently prevent seizures if present
- To manage identified target organ damage

Non-pharmacological treatment

- Strict bed rest

Pharmacological treatment

Evidence Rating: [A]

- Labetalol, IV,
Adults
20-50 mg stat. (over a 2 minute period)

Repeat at 10 minute intervals, if necessary, to a max. of 200 mg
Children

12-18 years; 10-30 mg stat. (over a 2 minute period). Repeat at 15 minute intervals, if necessary (max. 200 mg)

1 month-12 years (by IV infusion); initially 500-1000 microgram /kg body weight / hour adjusted at intervals of at least 15 minutes according to response. Max. 3 mg /kg/hour.

Note 7-9

Monitor BP every 5 minutes following each injection for all age groups.

Cease Labetalol injections if BP < 140/90 mmHg and/or pulse <60 BPM in adults, (for children consult a paediatrician) or wheezing and bronchospasm occurs.

Or

- **Hydralazine, IV,**

Adults

5-10 mg slowly (over a 2 minute period), diluted with 10 ml Normal Saline (0.9%).

Repeat at 20-30 minute intervals, if necessary

Children

12-18 years; 5-10 mg stat.

Repeat every 4-6 hours, if necessary

1 month-12 years; 100-500 microgram/kg

Repeat every 4-6 hours, if necessary; max. 3 mg/kg daily (not exceeding 60 mg per day)

< 1 month; 100-500 microgram/kg

Repeat every 4-6 hours, if necessary; max. 3 mg/kg daily

Note 7-10

Monitor BP every 5 minutes following each injection for all age groups.

Do not use short-acting nifedipine (e.g. sublingual) in the management of hypertensive crises as it lowers the BP too rapidly and may cause ischaemia of vital organs.

REFERRAL CRITERIA

Refer all patients to a physician specialist for further evaluation.

55. Arrhythmias

Arrhythmias are disorders of cardiac rate, rhythm and conduction. They can be classified as bradyarrhythmias (heart rate < 60 per minute) and tachyarrhythmias (heart rate > 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.

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Prior to drug treatment of a suspected cardiac arrhythmia, a 12-lead 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
- Other valvular heart diseases
- Hypertensive heart disease
- Ischaemic heart disease
- Thyrotoxicosis
- Hypothyroidism
- Cardiomyopathies
- Complete heart block
- Electrolyte abnormalities particularly hypokalaemia
- Pericardial disease
- Drugs
- Smoking, alcohol, coffee, tea, etc.
- Pulmonary embolism
- Post cardiac surgery
- Idiopathic

SYMPTOMS

- Palpitations
- Dizziness
- Chest discomfort/pain
- Fatigue
- Difficulty in breathing
- Sudden collapse
- Sudden death

SIGNS

- Pulse
 - Rate may be fast, slow or normal
 - Rhythm

Regular	Regularly irregular	Irregularly irregular
Sinus tachycardia		Atrial fibrillation
Sinus bradycardia		Atrial flutter (with variable atrio-ventricular block)
Complete heart block		Multiple supraventricular or ventricular ectopic beats
Supraventricular tachycardia	Supraventricular or ventricular ectopic beats	
Ventricular tachycardia		

- Pulse deficit (apical rate faster than radial pulse rate; seen in fast atrial fibrillation or flutter)
- Hypotension or blood pressure may be unrecordable
- Signs of heart failure (may be present)

INVESTIGATIONS

- 12-lead ECG
- Serum electrolytes (including magnesium, calcium)
- Thyroid function tests
- Chest X-ray
- Ambulatory ECG (Holter)
- Echocardiography

TREATMENT

Treatment objectives

- To control ventricular rate
- To restore sinus rhythm
- To relieve symptoms
- To improve functional capacity and quality of life
- To prevent or treat associated complications
- To treat the underlying condition e.g. thyrotoxicosis
- To prevent stroke or systemic thromboembolism
- To reduce morbidity and mortality

Non-pharmacological treatment

- | ● Reassure the patient
- | ● Avoid excessive intake of alcohol, coffee or tea and stop smoking (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
- | ● Electrical cardioversion

Pharmacological treatment

A. Fast atrial fibrillation or atrial flutter-for rate control

1st Line Treatment

Evidence Rating: [A]

- Atenolol, oral,

Adults

50-100 mg daily

Children

12-18 years; 25-50 mg daily

1 month-12 years; 12.5-50 mg daily

Neonates

Refer to a paediatrician

Or

- Bisoprolol, oral,

Adults

2.5-10 mg daily

Children

Safety not established in children

Or

- Metoprolol tartrate, oral,

CHAPTER 7: DISORDERS OF THE CARDIOVASCULAR SYSTEM**Adults**

50-100 mg 8 or 12 hourly daily (max. 300 mg daily)

Children

12-18 years; 50 mg 8 or 12 hourly daily (max. 300 mg daily)

< 12 years; refer to a paediatrician

Note 7-11

Avoid if beta-blockers are contraindicated e.g. bronchial asthma, hypotension

Or

- Verapamil, oral,

Adults

40-120 mg 6-8 hourly (max. 480 mg daily)

Children

Refer to a paediatrician

Note 7-12

Avoid use in patients already on beta-blocker

2nd Line Treatment

Evidence Rating: [A]

- Digoxin, oral,

Adults

125-250 micrograms daily

Children

Refer to a paediatrician

B. Fast atrial fibrillation or atrial flutter-for rhythm control

This is required to restore sinus rhythm.

Refer to a cardiologist, physician specialist or paediatrician as appropriate.

C. Paroxysmal supraventricular tachycardia

1st Line Treatment

Evidence Rating: [A]

- Atenolol, oral,

Adults

50-100 mg daily

Children

12-18 years; 25-50 mg daily

1 month-12 years; 12.5-50 mg daily

Neonates

Refer to a paediatrician

Or

- Bisoprolol, oral,

Adults

2.5-10 mg daily

Children

Safety not established in children

Or

- Metoprolol tartrate, oral,
Adults
50-100 mg 8 or 12 hourly daily (max. 300 mg daily)
Children
12-18 years; 50 mg 8 or 12 hourly daily (max. 300 mg daily)
<12 years; refer to a paediatrician

Note 7-13

Avoid if beta-blockers are contraindicated e.g. bronchial asthma, hypotension

Or

- Verapamil, oral,
Adults
40-120 mg 6-8 hourly (max. 480 mg daily)
Children
Refer to a paediatrician

Note 7-14

Avoid use in patients already on beta-blocker

2nd Line Treatment

Evidence Rating: [A]

- Digoxin, oral,
Adults
125-250 micrograms daily
Children
Refer to a paediatrician

D. Prevention of stroke or systemic thromboembolism in atrial fibrillation or flutter

Patients should be given long-term anticoagulation.

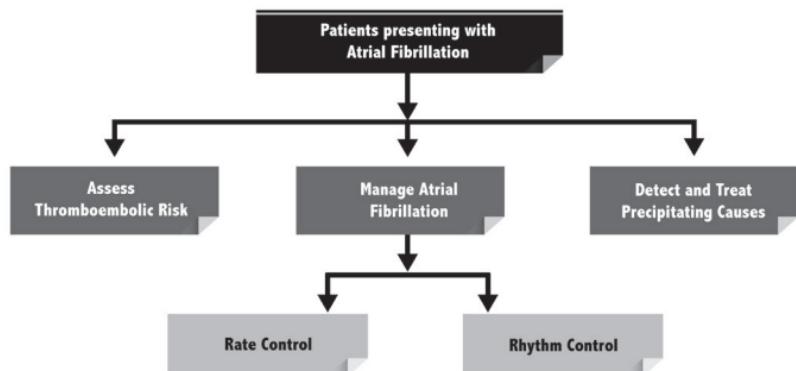
(See options for long-term anticoagulation in section on 'DVT' or 'Pulmonary Embolism').

REFERRAL CRITERIA

Refer all patients to a cardiologist, physician specialist or paediatrician for further evaluation and management after the initial treatment.

All symptomatic patients, as well as those who cannot have an ECG done or interpreted, or who present with heart failure, should be referred immediately.

FLOWCHART



Ghana National Drugs Programme, Ministry of Health
Email: gndp@ghndp.org website: www.ghndp.org

Fig 7-9: Flowchart: Arrhythmias

56. Acute Rheumatic Fever

Acute rheumatic fever is an illness caused by an immunological reaction to group A streptococcal infection of the throat. The onset of symptoms occurs 1-3 weeks after an untreated or inadequately treated throat infection. The disease occurs mainly in children and adolescents with a peak age of 5-15 years. Acute rheumatic fever often results in lasting damage to heart valves leading to the chronic form, which is known as rheumatic heart disease.

Individuals who have had acute rheumatic fever previously are more likely to have subsequent episodes. These recurrences may cause further heart valve damage. Following treatment of an acute episode, secondary prophylaxis should be continued for a minimum of 10 years after the recent episode of acute rheumatic fever or until age 21 years (whichever is longer). For those with severe rheumatic heart disease secondary prophylaxis should be continued indefinitely.

Rheumatic heart disease is an important cause of heart failure and premature death. In Ghana, acute rheumatic fever may mimic malaria, typhoid fever and other febrile conditions, while the joint symptoms may mimic sickle cell disease.

Jones criteria is used for diagnosis of rheumatic fever.

Box 7-10: Jones criteria for diagnosis of Acute Rheumatic Fever

For diagnosis of initial acute rheumatic fever:

Evidence of preceding group A streptococcal infection,

And

2 major criteria

Or

1 major criterion and 2 minor criteria

For diagnosis of recurrent acute rheumatic fever:

Evidence of preceding group A streptococcal infection,

And

2 major criteria

Or

1 major criterion and 2 or 3 minor criteria

(See symptoms and Signs below for major and minor criteria)

CAUSES

- Group A streptococcal infection

ACUTE RHEUMATIC FEVER | SYMPTOMS

- Fever
- Malaise
- Joint pain which moves from one joint to another (knees, ankles, wrists, elbows)
- Palpitations
- Easy fatigability
- Chest pain
- Skin rash
- Abnormal body movements (chorea)

SIGNS

- Fever $> 38^{\circ}\text{C}$ (minor criteria)
- Single joint tenderness and/or swelling (minor criteria)
- Rapid heart rate ($> 100/\text{minute}$), murmur, heart failure, pericardial rub (suggests carditis) (major criteria)
- Skin rash
- Subcutaneous nodules over bony prominences

INVESTIGATIONS

- FBC
- ESR > 30 or C-reactive protein $> 3 \text{ mg/dL}$ (minor criteria)
- Sickling status
- Chest X-ray
- Throat swab for culture
- Anti-streptolysin O titre
- 12-lead ECG (prolonged PR interval for age - minor criteria)
- Echocardiogram evidence of carditis (major criteria)

TREATMENT**Treatment objectives**

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

Non-pharmacological treatment

- Bed rest

Pharmacological treatment**A. Treatment of Acute Rheumatic Fever**1st Line Treatment

Evidence Rating: [C]

- Benzathine benzylpenicillin, IM,
≥ 30 kg body weight; 1,200,000 U as a single dose
< 30 kg body weight; 600,000 U as a single dose

Or

- Phenoxymethyl penicillin (Penicillin V), oral,
Adults

500 mg 12 hourly for 10 days

Children

6-12 years;

250 mg 12 hourly for 10 days

1-5 years;

125 mg 12 hourly for 10 days

Or

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

500 mg 12 hourly for 10 days

Children

8-12 years;

500 mg 12 hourly for 10 days

3-8 years;

250 mg 12 hourly for 10 days

1-2 years;

125 mg 12 hourly for 10 days

And

Evidence Rating: [B]

- Aspirin, oral,

Adults

300-900 mg 4-6 hourly until joint symptoms relieved, and gradually withdraw over 1-2 weeks.

Children

1 month-18 years; 25 mg/kg 6 hourly until joint symptoms relieved, and gradually withdraw over 1-2 weeks.

Or

Evidence Rating: [B]

- Ibuprofen, oral,

Adults

200-800 mg 6-8 hourly (max. 2400 mg daily)

Children

10-15 mg/kg 6-8 hourly (max. 40 mg per kg daily)

B. Treatment of Acute Rheumatic Fever with Carditis

As in 'treatment option A' above

And

- Prednisolone, oral,

Adults and Children

2 mg/kg daily for 2 weeks and then gradually taper off by 20-25% per week for 1-3 weeks.

C. Treatment of Acute Rheumatic Fever with Heart Failure

As in 'treatment option A' above

And

Treatment for heart failure (See section on 'Heart failure')

D. Secondary prevention (prophylaxis) of acute rheumatic fever and rheumatic heart disease

1st Line Treatment

- Benzathine benzylpenicillin, IM,
≥ 30 kg body weight; 1,200,000 U
< 30 kg body weight; 450 mg (600,000 U) 4-weekly

2nd Line Treatment

- Phenoxyethyl penicillin (Penicillin V), oral,
Adults

500 mg 12 hourly daily

Children

6-12 years; 250 mg 12 hourly

1-5 years; 125 mg 12 hourly

Or

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

500 mg 12 hourly

Children

8-12 years; 500 mg 12 hourly

3-8 years; 250 mg 12 hourly

1-2 years; 125 mg 12 hourly

REFERRAL CRITERIA

Refer all patients to a paediatrician, physician specialist or cardiologist as necessary for further management.

57. Dizziness and Blackouts

Dizziness is a nonspecific term that refers to abnormal sensation of body orientation or position in space. These include feeling of unsteadiness, light-headedness and vertigo. Patients often find these

CHAPTER 7: DISORDERS OF THE CARDIOVASCULAR SYSTEM

sensations difficult to describe. Dizziness is almost always associated with other symptoms, therefore a careful history and focused physical examination should be performed in all cases to identify the cause.

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

Cardiovascular

- Vasovagal - (fainting)
- Postural hypotension
- Acute haemorrhage
- Cardiac arrhythmias
- Severe aortic stenosis
- Complete heart block with Stokes-Adams attacks
- Vertebro-basilar insufficiency

Cerebral

- Transient Ischaemic Attacks (TIA)
- Stroke
- Epilepsy

Others

- Drug-induced
- Severe anaemia
- Hypoglycaemia
- Middle ear disease
- Meniere's disease
- Conversion disorder (Hysterical fainting/Hyperventilation)

SYMPTOMS

- Light-headedness
- Loss of consciousness
- Sense of motion or spinning of body
- Unsteadiness
- Nausea
- Vomiting
- Tinnitus

SIGNS

- Sweating (suggests vasovagal episode/hypoglycaemia)
- Tachycardia or bradycardia (suggest cardiac arrhythmia)
- Hypotension
- Postural hypotension
- Pallor

- Nystagmus, dysdiadochokinesis, ataxia, hypotonia, dysarthria (suggests cerebellar cause)
- Focal neurological signs suggests stroke, TIA

INVESTIGATIONS

- These vary depending on the cause
- FBC
- Random blood sugar
- X-ray of cervical spine
- ECG

TREATMENT

Treatment objectives

- To identify and appropriately manage the possible underlying cause(s)

Non-pharmacological treatment

- Postural hypotension - review medications
- Hyperventilation syndrome - breathing control exercise
- Counseling
- Cervical collar
- Moulded cervical pillows

Pharmacological treatment

- Treat the underlying cause. (See appropriate section)

REFERRAL CRITERIA

Refer patients to a physician specialist for evaluation if the cause is difficult to determine. If the cause is identified, refer to the appropriate specialist for further evaluation and management.

DISORDERS OF THE RESPIRATORY SYSTEM

58. Common Cold

This is a self-limiting infection of the upper respiratory tract, particularly the nasopharyngeal mucosa and sinuses. It is contagious and spread by airborne droplets, as well as from hands and contact with contaminated surfaces. The symptoms resolve without antibiotic treatment, usually within a week.

If the 'cold' lasts longer than a week and there is persistent fever and cough, a diagnosis of influenza may be considered. With influenza, fever, systemic symptoms and prostration are more pronounced. Secondary bacterial infection may be associated with purulent phlegm or offensive nasal discharge and fever.

Occasionally, the common cold is complicated by otitis media and pharyngotonsillitis, particularly in children, in which case one should refer to the appropriate sections for treatment.

CAUSES

- Rhinoviruses
- Corona viruses
- Respiratory Syncytial Virus (RSV)

SYMPTOMS

- Runny nose (rhinorrhea)
- Sneezing
- Nasal congestion
- Mild fever
- Headaches
- Sore throat
- Muscle aches
- Cough
- Fatigue
- Malaise

SIGNS

- Low grade fever
- Nasal discharge

- Nasal mucosa reddening
- Watering of eyes

INVESTIGATIONS

- No investigations required

TREATMENT

Treatment objectives

- To relieve symptoms
- Resolution of infection in the shortest possible time

Non-pharmacological treatment

- Rest
- Encourage adequate fluid intake
- Gargle lukewarm salt solution
- Steam inhalation

Pharmacological treatment

A. Uncomplicated common cold

1st Line Treatment

Evidence Rating: [C]

- Paracetamol, oral,

<u>Adults</u>	500-1g 6-8 hourly
<u>Children</u>	10-15 mg/kg/dose 6-8 hourly
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

And

- Sodium Chloride 0.9%, nasal drops,
Adult and Children
 2 drops, into each nostril, 4 hourly to relieve congestion as necessary

Or

- Xylometazoline, nasal,
Adults (0.1% preparation)
 1-2 drops 12 hourly into each nostril
Children (0.05% preparation)
 > 3 months; 1-2 drops 12 hourly into each nostril

And

- Cetirizine, oral,
Adults
 10 mg daily
Children
 > 12 years; 10 mg daily
 6-2 years; 5 mg daily
 2-6 years; 2.5 mg daily

Or

- Chlorpheniramine maleate, oral,
Adult
 4 mg 12 hourly
Children
 6-12 years; 2 mg 6-12 hourly daily (max. 12 mg daily)
 2-6 years; 1 mg 6-8 hourly (max. 6 mg daily)
 1-2 years; not recommended

Note 8-1

Antibiotics are not indicated for common cold.

REFERRAL CRITERIA

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

59. Pneumonia

Pneumonia is an infection of the lung tissue caused by various bacteria, viruses or fungi. Identification of the causative organism and drug sensitivity testing is the key to correct treatment. However, because of the serious nature of the infection, antibiotic treatment should be started immediately based on knowledge of the most probable causative organism and the antibiotics used for its treatment. Local knowledge of drug resistance patterns are also taken into account. Treatment may be maintained or changed based on culture results and assessment of the patient's response to initial treatment. In the event that the cultures of blood or sputum prove negative, empiric treatment is continued with clinical response as a guide.

The severity of the illness is a key factor in the decision for admission, and the choice of first or second-line treatment.

Box 8-1: Severity score for community acquired pneumonia (CURB-65)

Severity score may be based on the following, assigning one point to each of the following factors (maximum 5 points);

- Confusion, restlessness, or excessive drowsiness
- Blood Urea Nitrogen ($> 7 \text{ mmol/L}$)
- Respiratory rate (≥ 30 per minute in adults, and ≥ 50 in children)
- Low BP (Systolic BP < 90 and/or diastolic BP $< 60 \text{ mmHg}$)
- Patients at the extremes of age, ($< 5\text{yr}$ or $\geq 65\text{yr}$)

0-1; consider home treatment

2-3; consider short inpatient hospitalisation

> 3 ; admit and consider intensive care

Box 8-1: Severity score for community acquired pneumonia (CURB-65)

In the presence any of the following additional factors, all cases of pneumonia would warrant hospitalisation.

Additional factors

- Coexisting diseases such as chronic lung disease, heart failure or renal disease
- Extensive disease, multiple lobes involved
- Low oxygen saturation $\text{SpO}_2 < 92\%$ on room air
- Severe tachycardia

CAUSES**Community acquired pneumonia**

- *Streptococcus pneumonia*
- *Streptococcus pyogenes*
- *Haemophilus influenza*
- *Klebsiella pneumoniae*
- Mycoplasma pneumonia and *Legionella pneumophila* (tend to occur in epidemics)
- *Staphylococcus aureus* (in children after viral illness like measles, in diabetics or in the elderly during 'flu' epidemics)

Aspiration pneumonia

- Anaerobic and/or gram negative organisms (associated with aspiration e.g. stroke, seizures, unconsciousness)

Hospital acquired pneumonia

- Gram-negative bacteria e.g. *Pseudomonas aeruginosa*
- MRSA (Methicillin resistant)
- VRSA (Vancomycin resistant)
- *Staphylococcus aureus*

Others

- *Pneumocystis jiroveci* pneumonia and other fungi (in immunocompromised states e.g. haematological malignancies, HIV/AIDS)
- Viruses

SYMPTOMS

- Fever - short history
- Productive cough
- Sputum - rusty or blood stained, yellowish, greenish
- Pleuritic chest pain - worse on deep breathing or coughing
- Breathlessness
- Sweating
- Muscle aches
- Elderly and immunocompromised patients may have minimum or no symptoms

SIGNS

- Rapid breathing

- Grunting (in children)
- Use of accessory muscles of respiration and flaring of the nasal margins
- Lower chest wall indrawing (in children)
- Restricted movement of the affected side of the chest (due to pain)
- Fever
- Rapid pulse rate
- Blood pressure may be normal or low
- Signs of consolidation or pleural effusion on chest examination
- Restlessness or confusion, drowsiness
- Low blood oxygen saturation by pulse oximetry < 92%

COMPLICATIONS

- Pleural effusion
- Lung abscess
- Empyema
- Pericardial effusion/pericarditis
- Pneumothorax particularly *Staph. aureus* infection, *Pneumocystis jiroveci* pneumonia
- Meningitis
- Septicaemia with multi organ failure
- Adult respiratory distress syndrome (ARDS)

INVESTIGATIONS

- FBC
- C-reactive protein (CRP)
- Chest X-ray
- Sputum gram stain and culture and sensitivity
- Ziehl-Neelsen stain for acid-fast bacilli (to exclude TB)
- Blood culture and sensitivity
- Blood urea and electrolytes

TREATMENT

Treatment objectives

- To identify patients at greater risk who require in-hospital management
- To alleviate symptoms
- To treat and eradicate the infection
- To prevent and/or manage complications

Non-pharmacological treatment

- Nurse in comfortable position, usually 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)
- Chest physiotherapy

Pharmacological treatment

A. Ambulatory patient: low severity score < 2 (see above)

1st Line Treatment

Evidence Rating: [A]

- Amoxicillin (Amoxycillin), oral,

Adults

1 g 8 hourly for 7 days (high dose)

Children

5-12 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

And

- Azithromycin, oral,

Adult

500 mg daily for 6 days

Children

10 mg/kg daily for 6 days

Or

- Erythromycin, oral, (if patient is allergic to penicillin)

Adult

500 mg 6 hourly for 7 days

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

2nd Line Treatment

Evidence Rating: [A]

- Cefuroxime, oral,

Adults

500 mg 12 hourly for 7 days

Children

3 months-12 years; 30 mg/kg/day in two divided doses for 7 days

> 12 years; 250-500 mg 12 hourly for 7 days

Or

- Doxycycline, oral,

Adults

100 mg 12 hourly for 7-14 days depending on severity

Note 8-2

Not recommended in pregnancy, lactating mothers and in children < 8 years of age.

B. Hospitalised patient: Severity score, ≥ 2 or with additional factors as mentioned above

- Oxygen, by face mask or nasal prongs,
Adults and Children
Maintain oxygen saturation > 92%
- And**
- IV fluids as normal saline and dextrose saline to replace estimated insensible loss
- And**
- 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
- Or**
- Paracetamol suppository
Adults and children
doses as above
- And**
- Amoxicillin + Clavulanic Acid, IV, (change to oral route when patient improves)
Adults
1.2 g 8 hourly for 7-10 days
Children
3 months-18 years; 30 mg/kg 8 hourly, max. 1.2 g 8 hourly for 7-10 days
< 3 months; 30 mg/kg 12 hourly for 7-10 days
- And**
- Azithromycin, oral,
Adult
500 mg daily for 3-7 days
Children
10 mg/kg once daily for 3-7 days
- Or**
- Azithromycin, IV,
Adult
500 mg daily for 3 days
Revert to oral azithromycin, when clinically stable to complete 7 days of treatment. (See section on treatment for ambulatory patients above).
Children
IV route not recommended in children for pneumonia treatment

Note 8-3

Azithromycin infusion should not be given in shorter than 1 hour. It should not be given as an IV bolus or as an intramuscular injection.

2nd line treatment

Evidence Rating: [A]

- Ceftriaxone, IV,

Adult

2 g daily for 7-10 days

Children

All ages 25 mg/kg 12 hourly (max. 75 mg/kg daily)

And

- Azithromycin, IV (as above)

C. Treatment for aspiration pneumonia

1st Line treatment

Evidence Rating: [B]

- Ceftriaxone, IV,

Adult

2 g daily for 7-10 days

Children

All ages 50-75 mg/kg/day in divided 12 hourly doses

Or

- Amoxicillin + Clavulanic Acid, IV, (change to oral route when patient improves)

Adults

1.2 g 8 hourly for 7-10 days

Children

3 months-18 years; 30 mg/kg 8 hourly, max 1.2 g 8 hourly for 7-10 days

< 3 months; 30 mg/kg 12 hourly for 7-10 days

Or

- Ciprofloxacin, IV, (to be administered over 60 minutes)

Adults

400 mg 8-12 hourly for 7 days

Children

10 mg/kg (max. 400 mg) 12 hourly for 7 days

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 7 days

Children

7.5 mg/kg 8 hourly for 7 days

Or

- Clindamycin, IV,

Adults

300-600 mg 6 hourly for 7 days

Children

3-6 mg/kg 6 hourly for 7 days

REFERRAL CRITERIA

Refer to the paediatrician or physician specialist if no improvement occurs (i.e. fever remains high, patient is still breathless, or repeat X-rays show complications or no resolution).

60. Bronchial Asthma

Asthma is a chronic inflammatory disease of the bronchial airways, which manifests as recurrent episodes of wheeze, cough, chest tightness and shortness of breath, which is usually reversible with treatment. It is characterised by increased sensitivity to many environmental agents. Asthma is variable 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, and may be associated with a personal or family history of allergic rhinitis (hay fever), eczema or allergic conjunctivitis.

Complications of asthma include pneumomediastinum, pneumothorax, subcutaneous emphysema and pneumonia.

CAUSES

- Allergens e.g. house dust mite, cockroach droppings, grass, pollen and animal hair
- Environmental factors e.g. air pollution, climatic changes, strong scents and smoke (including cigarette smoke and car fumes)
- Viral infections
- Exercise
- Emotions and hyperventilation
- Drugs e.g. aspirin, NSAIDS and beta-blockers such as propranolol
- 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 above symptoms waking up the patient at night

SIGNS

- Tachypnoea (fast breathing)
- Use of accessory muscles of respiration; neck and/or abdominal muscles
- Rhonchi/wheeze

- Signs of severe attack
 - Inability to complete full sentences in one breath
 - Rapid pulse > 110/minute in adults and adolescents or >130/minute in children 2-5 years
 - Rapid respiration > 30/minute in adults and adolescents or > 50/minute in children 2-5 years
 - Peak Expiratory Flow Rate (PEFR) is reduced < 50% of expected (for age, sex and height)
- Signs of a life-threatening attack are:
 - Cyanosis
 - Pulsus paradoxus
 - Silent chest on auscultation
 - Drowsiness or confusion
 - Exhaustion
 - Peak Expiratory Flow Rate (PEFR) less than 33 % of expected value
 - SpO₂ less than 92% on room air

INVESTIGATIONS

- No investigation required in most cases
- FBC, mildly high eosinophil count
- Chest X-ray (only for the exclusion of other diagnoses or complications)
- Spirometry - reduction in FEV1 and FEV1/FVC ratio with reversibility demonstrated after bronchodilator use (a normal spirometry between attacks does not exclude asthma).
- Tests for atopy - skin prick test or specific IgE for common allergens
- Stool examination, exclude helminthiasis

TREATMENT

Treatment objectives

- To relieve bronchospasm
- To prevent complications and recurrence
- To treat underlying inflammation or infection

Non-pharmacological treatment

- Avoid known triggers/allergens, such as dust (dust mite) where possible
- Avoid smoking
- Education on asthma self management, device use and technique

Pharmacological treatment

A. Acute Exacerbation of Asthma: Initial Management in the Community

Evidence Rating: [C]

- Salbutamol inhaler, using pressurized metered dose inhaler (pMDI) with a spacer
Adults and Children
Give 1-2 puffs via a spacer and mask if needed (e.g. Volumatic Or

Aerochamber, or large plastic mineral water bottle) with the patient taking 3-4 breaths after each puff.

Repeat after every 15-30 minutes maximum 10 doses.

If there is no improvement seek care at a health facility with a nebuliser.

B. Acute Moderate/Severe Exacerbation of Asthma: Initial Management in Hospital

1st Line Treatment

Evidence Rating: [A]

- Oxygen

By nasal prongs 2-6 L/min

Or

Face mask 4-8 L/min

Or

Non-rebreather mask 10-15 L/min

And

- Salbutamol, nebulised,

Adults

2.5-5 mg repeated initially after 15-30 minutes, then every 2-4 hours until improved

Children

2.5-5 mg every 2-4 hours until improved

And

- Ipratropium bromide, nebulised,

Adults

500 microgram 4-6 hourly

Children

6-12 years; 250 microgram 4-6 hourly

1-5 years; 125 microgram 4-6 hourly

(max. dose for children is 1 mg/24 hours)

And

- Hydrocortisone, IV,

Adults

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

Children

12-18 years; 100 mg 6-8 hourly

1 month-12 years; 2-4 mg/kg 8 hourly

Then

C. Acute Moderate/Severe Exacerbation of Asthma: Maintenance Treatment in Hospital

- Salbutamol, nebulised,

Adults

2.5-5 mg repeated every 6 hours until improved

Children

2.5-5 mg every 6 hours until improved

And

- Ipratropium bromide, nebulised,

Adults

500 microgram 4-6 hourly

Children

6-12 years; 250 microgram 4-6 hourly

1-5 years; 125 microgram 4-6 hourly

(max. dose for children 1 mg/24 hours)

Note 8-4

For children < 12 years with severe symptoms consider;

Ipratropium bromide, 250 microgram repeated every 20-30 minutes, for the first 2 hours, then 4-6 hourly as necessary

And

- Prednisolone, oral, initial dose given on admission and subsequently given as a morning dose. (Once on prednisolone, stop IV hydrocortisone after 24 hours)

Adults

30-40 mg daily for 7 days until stable. Taper off dose over a period of 2 weeks if patient has been on long term steroids.

Children

1-2 mg/kg for 3-5 days

D. Acute Moderate/Severe Exacerbation of Asthma: Maintenance Treatment in Hospital (where patient is still distressed after 3-4 initial doses of nebulised salbutamol)

- Aminophylline, IV,

Adults

250 mg slow injection over 20 minutes

Repeat after 30 minutes with a continuous infusion by perfusor, if necessary, at a rate not exceeding 0.5 mg/kg/hour over 24 hours

Or

- Aminophylline, IV infusion, 250 mg in 500 ml of 5% Dextrose or 0.9% Sodium Chloride, 6 hourly for 24 hours

Children

5 mg/kg over 20 minutes as a slow infusion or by perfusor at 1mg/kg/hour (max. 500 mg)

E. Chronic Asthma - Initial management

Evidence Rating: [A]

- Salbutamol, inhaled,

Adults and children

100 microgram, 2 puffs as often as needed

And

(If inhaled Salbutamol is needed more than once daily)

- Budesonide, inhaled,

Adults

200 microgram (one puff 12 hourly)

Children

> 10 years;

200 microgram (one puff 12 hourly)

< 10 years;

100 microgram (one puff 12 hourly)

Or

- Fluticasone, Inhaled - MDI,

Adults

125-250 microgram (2 puffs 12 hourly)

Children

50 microgram (2 puffs 12 hourly)

Or

- Beclometasone (Beclomethasone), inhaled,

Adults and Children

100 microgram (2 puffs 12 hourly)

F. Chronic Asthma - Maintenance treatment

- Salbutamol, inhaled,

Adults and children

100 microgram, 2 puffs as often as needed

And

- Fluticasone/Salmeterol, inhaled,

Adults and children over 5 years

100/50-250/50 microgram; 1 puff 12 hourly

Or

- Budesonide/Formoterol , inhaled,

Adults

160/4.5 microgram (1-2 puffs 12 hourly)

Children over 5 years

80/4.5 microgram (1-2 puffs 12 hourly)

And

- Montelukast, oral,

Adult

10 mg daily

Children

4 or 5 mg granules daily

And

- Prednisolone, oral,

Adults

30-40 mg daily and tail down slowly over 2-3 week period to a low maintenance daily dose of 5 mg daily.

Children

1 mg/kg tailed off by 5 mg every third day, reducing to 5-10 mg daily or alternate daily, lowest dose possible without provoking attacks

Note 8-5

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 month). All patients with chronic Asthma should receive continuous education and counselling by the medical team.

REFERRAL CRITERIA

In acute exacerbation, refer patients if not improving or rapidly deteriorating after initial management to a specialist.

All discharged clients should be followed up within one week and referred to a specialist clinic for continued care.

For chronic asthma refer patients with persistent symptoms to a specialist clinic in a regional or tertiary hospital, and patients who have recurrent acute exacerbations within a few days/ weeks of each other for specialist care and review of their treatment.

Also refer when a patient requires more than one course of oral prednisolone in 3 months.

61. Acute Bronchitis

ACUTE BRONCHITIS This refers to an acute inflammation of the bronchial mucosa. It is often found in association with upper respiratory tract infection. Most cases do not require antibiotics, however, they may be prescribed if the patient's SPO₂ is less than 92% or if there is an underlying co-morbidity like malnutrition, measles, rickets, anaemia, diabetes mellitus, chronic bronchitis or HIV/AIDS.

CAUSES

- Viruses e.g. Influenza virus, Corona virus (common cold)
- Bacteria e.g. *Streptococcus pneumoniae*, *H. influenza*, *Moraxella catarrhalis*, *Staph. aureus* (tends to cause post-influenza chest infections, including bronchitis)

SYMPTOMS

- Dry cough
- Sputum production
- Sore throat
- Pleuritic chest pain
- Low grade fever

SIGNS

- Fever
- Rhinorrhoea
- Rhonchi (wheeze)
- Crepitations (rare)

INVESTIGATIONS

- FBC

CHAPTER 8: DISORDERS OF THE RESPIRATORY SYSTEM

- Sputum culture and gram stain
- Sputum AFBs (2 samples) for tuberculosis if symptoms have lasted more than 2 weeks
- Sinus X-ray for rhinosinusitis (with post nasal drip) as a possible cause for prolonged cough

TREATMENT**Treatment objectives**

- To relieve symptoms
- To treat suspected bacterial infection if any

Non-pharmacological treatment

- Bed rest
- Oral fluids to keep well hydrated
- Humidified air or steam inhalation if necessary

Pharmacological treatment**A. Uncomplicated acute infections**

1st Line 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

Or

- Paracetamol, rectal,
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

B. Uncomplicated acute infections-for irritating or chesty coughs

- Guaifenesin containing expectorant, oral,
Adult
200-400 mg 4 hourly (max. 2.4 g per day)
Children
>12 years; 100-400 mg 4 hourly (max. 2.4 g per day)
6-11 years; 100-200 mg 4 hourly (max. 1.2 g per day)
2-5 years; 50-100 mg 4 hourly (max. 600 mg per day)
6 months-2 years; 25-50 mg 4 hourly (max. 300 mg per day)
- Simple linctus, oral,
Adults (adult formulation)
5 ml 6-8 hourly

Children (paediatric formulation)

1 month-12 years; 2.5-5 ml 6-8 hourly

Or

- Carbocysteine, oral,

Adult

500-750 mg 6-8 hourly

Children

2-5 years; 62.5-125 mg 6 hourly

<2 years; not recommended

C. Uncomplicated acute infections-for non-productive or dry cough

- Dextromethorphan containing cough preparations

Adult

10-20 mg 6-8 hourly

Children

7-12 years; 15 mg 6-8 hourly (max. 60 mg per day)

4-6 years; 7.5 mg 6-8 hourly (max. 30 mg per day)

< 4 years; not recommended

Or

- Codeine containing cough preparations

Adult

7.5 -20 mg 4-6 hourly as needed (max. 120 mg per day)

Children

7-12 years; 1-1.5 mg/kg per day in 4-6 divided doses
(max. 60 mg per day)

2-6 years; 1-1.5 mg/kg per day in 4-6 divided doses (max. 30 mg per day)

< 2 years; not recommended

D. For complicated acute infections with co-morbidities or secondary bacterial infection

1st Line Treatment

Evidence Rating: [C]

- Amoxicillin (Amoxycillin), oral,

Adults

500 mg 8 hourly for 5-7 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

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly for 5-7 days

Children

> 12 years; One 500/125 tablet 12 hourly for 7 days

4-12 years; 5 ml of 400/57 suspension 12 hourly for 7 days

1-4 years; 5 ml of 200/28 suspension 12 hourly for 7 days

CHAPTER 8: DISORDERS OF THE RESPIRATORY SYSTEM

3 months-1 year; 20 mg/kg (of amoxicillin) 12 hourly for 7 days

< 3 months; 15 mg/kg (of amoxicillin) 12 hourly for 7 days

For children double the dose of the above antibiotic in severe infections (bronchopneumonia)

Or

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

Adults

250-500 mg 6 hourly for 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

And

- Oxygen

By nasal prongs, 2-6 L/min

Or

Face mask, 4-8 L/min

Or

Non-rebreather mask, 10-15 L/min

REFERRAL CRITERIA

Refer all complicated cases of acute bronchitis to a specialist.

62. Chronic Bronchitis

This is chronic inflammation of the bronchial mucosa due to irritants such as tobacco smoke. It occurs after the age of 40 years and is part of the syndrome of chronic obstructive pulmonary disease (COPD). There is progressive worsening with age, eventually resulting in chronic respiratory failure. It is aggravated by recurrent viral and bacterial infections.

Oxygen therapy in these patients must be given with caution to prevent carbon dioxide retention due to depression of respiration. High flow rates remove the central hypoxic drive that maintains respiratory effort and can be harmful.

CAUSES

- Cigarette smoking
- Industrial dust
- Chemical irritants
- Inhaled smoke from use of biomass fuels (eg. charcoal, wood)

SYMPOTOMS

- Shortness of breath, particularly on exertion
- Wheeze
- Fever
- Cough with production of sputum for most of the year
- Infective exacerbation associated with increased quantity of thick purulent sputum

SIGNS

- May be none
- Barrel chest
- Pursed lip breathing
- Clubbing
- Cyanosis
- Increased respiratory rate
- Use of accessory muscles i.e. neck and/or abdominal muscles, for breathing
- Hyperresonance on percussion and loss of cardiac dullness
- Wheeze or rhonchi
- Reduced Peak Expiratory Flow Rate (PEFR)

CHRONIC BRONCHITIS

INVESTIGATIONS

- FBC
- Spirometry, shows reduced lung volumes, particularly FEV1 which is not reversed post-bronchodilator administration
- Chest X-ray
- Sputum culture and gram stain

TREATMENT

Treatment objectives

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

Non-pharmacological treatment

- Smoking cessation
- Physical exercise
- Good nutrition
- Use of face mask in high risk occupations

Pharmacological treatment

A. Stable chronic bronchitis

Evidence Rating: [B]

- Salbutamol, inhaled, (via pMDI)
Adults
100 microgram (2 puffs) 4-6 hourly as required

CHAPTER 8: DISORDERS OF THE RESPIRATORY SYSTEM**Children (by nebulisation)**

2.5-5 mg 4-6 hourly as required

And

- Tiotropium, inhaled (dry powder inhaler),

Adults

18 microgram (2 puffs) daily

Children

> 12 years; 18 microgram (2 puffs) daily

< 12 years; not recommended

And

- Fluticasone/salmeterol, inhaled (via accuhaler or pMDI),

Adults

100/50 microgram or 250/50 microgram or 500/50 microgram, 1 puff 12 hourly

Children

4-12 years; 100/50 microgram, 1 puff 12 hourly

< 4 years; safety not established

Or

- Budesonide/formoterol, inhaled (via accuhaler or pMDI),

Adults

160/4.5 microgram 1-2 puffs 12 hourly

Children

>12 years; 160/4.5 microgram 1-2 puffs 12 hourly

<12 years; efficacy not established

B. Chronic bronchitis with infective exacerbation

Evidence Rating: [C]

- Oxygen

By nasal prongs, 2-6 L/min

Or

Face mask, 4-8 L/min

Or

Non-rebreather mask, 10-15 L/min

And

- Salbutamol, nebulised,

Adults

2.5-5 mg repeated initially after 15-30 minutes, then every 2-4 hours until improved

Children

2.5-5 mg 4-6 hourly

And

- Ipratropium bromide, nebulised,

Adults

500 microgram 4-6 hourly, until improved

Children

6-12 years; 250 microgram 4-6 hourly

1-5 years; 125 microgram 4-6 hourly
 (max. dose for children 1 mg/24 hours)

And

- Amoxicillin (Amoxycillin), oral,
 - Adults**
 500 mg 8 hourly for 7-14 days
 - Children**
 6-12 years; 250 mg 8 hourly for 7-14 days
 1-5 years; 125 mg 8 hourly for 7-14 days
 <1 year; 62.5 mg 8 hourly for 7-14 days
- **Or**
- Erythromycin, oral,
 - Adults**
 500 mg 6 hourly for 7-14 days
 - Children**
 8-18 years; 250-500 mg 6 hourly 7-14 days
 2-8 years; 250 mg 6 hourly 7-14 days
 6 months-2 years; 125 mg 6 hourly 7-14 days
- | • **Or**
- | • Azithromycin, oral,
 - Adult**
 500 mg daily for 6 days
 - Children**
 10 mg/kg daily for 6 days
- | • **Or**
- | • Amoxicillin + Clavulanic Acid, oral,
 - Adults**
 1 g 12 hourly for 7-10 days
 - Children**
 > 12 years; One 500/125 tablet 12 hourly for 7-10 days
 4-12 years; 5 ml of 400/57 suspension 12 hourly for 7-10 days
 1-4 years; 5 ml of 200/28 suspension 12 hourly for 7-10 days
 3 months-1 year; 20 mg/kg (of amoxicillin) 12 hourly for 7-10 days
 < 3 months; 15 mg/kg (of amoxicillin) 12 hourly for 7-10 days

And

- Prednisolone, oral,
 - Adults**
 30-40 mg for 7 days

Then

20 mg daily for 5 days, 10 mg daily for 5 days, 5 mg daily for 5 days.
 Tail down over 2-3 weeks and stop.

Children

1-2 mg/kg for 3-5 days. Tail down over 2-3 weeks and stop.

And

- Acetylcysteine, oral,

Adults

10 ml 8 hourly for 5-7 days

Children (paediatric formulation)

5-10 ml 8 hourly for 5-7 days

Or

- Carbocysteine, oral,

Adult

500-750 mg 6-8 hourly

Children

2-5 years; 62.5-125 mg 6 hourly

< 2 years; not recommended

REFERRAL CRITERIA

Refer all patients not improving on initial management, with acute exacerbation, recurrent infective exacerbations or rapidly deteriorating to a specialist.

63. Bronchiectasis

In bronchiectasis, the medium and smaller sized bronchi and bronchioles are damaged. Their ciliated epithelium is destroyed by inflammation and scarring, which in a vicious cycle of infection and further scarring leads to permanent dilatation and bronchial wall thickening. The mucus lining of these airways become colonized by bacteria and generate copious amounts of purulent and often offensive sputum. The disease, if not treated is characterized by frequent infective exacerbations with progressively worsening lung function.

I
BRONCHIECTASIS

CAUSES

- Childhood pneumonia e.g. whooping cough, post measles
- Post-pulmonary tuberculosis
- Chronic rhinosinusitis with post-nasal drip
- Asthma and COPD
- Fibrosing lung disease of any cause e.g. rheumatoid lung disease
- Immune deficiency states e.g. HIV infection, agammaglobulinaemia
- Inherited disorders e.g. cystic fibrosis, primary ciliary dyskinesia should be considered in young children presenting with bronchiectasis

SYMPTOMS

- Persistent cough over many months
- Copious purulent sputum which is sometimes offensive
- Haemoptysis in over one third of cases during exacerbations
- Intermittent systemic symptoms - fever, night sweats and weight loss
- Chest pain
- Difficulty in breathing

SIGNS

- Weight loss

- Fever
- Clubbing
- Dull percussion note
- Bronchial breath sounds
- Coarse crepitations

INVESTIGATIONS

- FBC, ESR
- Sputum culture and sensitivity, gram stain
- Sputum AFBs
- Chest X-ray
- CT scan of the chest
- Pulse oximetry

TREATMENT

Treatment objectives

- To treat infection
- To aid sputum clearance
- To minimize cough and sputum production
- To prevent exacerbations
- To diagnose and treat underlying disorders

Non-pharmacological treatment

- Chest physiotherapy - Postural drainage, Sputum clearance techniques
- Breathing exercises
- Improve nutrition
- Encourage adequate fluid intake
- Encourage physical exercise

Pharmacological treatment

A. Acute infective exacerbation

1st Line Treatment

Evidence Rating: [C]

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly for 14 – 21 days

Children

>12 years; One 500/125 tablet 12 hourly

6-12 years; 5ml of 400/57 suspension 12 hourly

1-6 years; 2.5ml of 400/57 suspension 12 hourly

1 month-1 year; 0.25ml/kg body weight of 125/31

suspension 8 hourly

< 1 month; 0.25ml/kg body weight of 125/31

suspension 8 hourly

And

- Azithromycin, oral, (for patients allergic to penicillin, given as mono-therapy)

Adults

500 mg once daily for 6-14 days

Children

10 mg/kg once daily for 6-14 days

REFERRAL CRITERIA

Refer all suspected cases to a specialist for confirmation and further management.

64. Lung Abscess

A lung abscess is defined as necrosis of the pulmonary parenchyma and formation of cavities containing necrotic tissue or purulent fluid, usually caused by microbial infection. Antibiotic management should be considered as soon as it is diagnosed, while awaiting confirmation of the causative organism and must be continued for 4-6 weeks.

CAUSES

- Aspiration of infected secretions or tissue from the mouth and upper respiratory tract in the unconscious or semi-conscious patient e.g. in alcoholics, epileptics, anaesthetised or dental patients
- Foreign body aspiration e.g. inhaled peanut, dentures, fish bone
- Inadequately treated bacterial pneumonia especially, gram negative bacteria like *Klebsiella pneumoniae*, and beta-haemolytic streptococci
- *Staphylococcus aureus* causing multiple lung abscesses
- Penetrative lung injury
- Partial obstruction of an airway by tumour or lymph node
- Septic emboli from other infected areas of the body e.g. right sided bacterial endocarditis
- Bronchiectasis
- Infected bullae in chronic lung disease

SYMPTOMS

- Fever with swinging temperatures
- Cough, productive of copious amounts of purulent foul smelling sputum
- Haemoptysis
- Chest pain
- Breathlessness
- Easy fatigability

SIGNS

- Fever
- Tachycardia
- Tachypnoea
- Chest wall tenderness
- Dull percussion note

- Diminished breath sounds
- Increased vocal resonance

INVESTIGATIONS

- FBC
- Sputum culture and sensitivity, gram stain
- Sputum AFBs
- Chest X-ray

TREATMENT

Treatment objectives

- To drain abscess collection
- To treat underlying infection
- To treat predisposing conditions

Non-pharmacological treatment

- Chest physiotherapy
- Improve nutritional status
- Ensure adequate fluid intake
- Surgical drainage of abscess

Pharmacological treatment

A. Initial treatment

1st Line Treatment

Evidence Rating: [B]

- Cloxacillin, IV,
Adults
500 mg 6 hourly for 4 weeks

Children

5-12 years;	250 mg 6 hourly for 2-4 weeks
1-5 years;	125 mg 6 hourly for 2-4 weeks
< 1 year;	62.5 mg 6 hourly for 2-4 weeks

And

- Amoxicillin + Clavulanic Acid, IV,
Adults
1.2 g 8 hourly for 4 weeks

Children

3 months -18 years;	30 mg/kg 8 hourly, max. 1.2g 8 hourly
< 3 months;	30 mg/kg 12 hourly for 2-4 weeks

And

- Ceftriaxone, IV,
Adult
2 g daily for 4 weeks

Children

All ages 50-75mg /kg per day in divided 12 hourly doses for 4 weeks

Or

- 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

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 4 weeks

Children

7.5 mg/kg 8 hourly for 4 weeks

Or

- Clindamycin, IV,

Adults

300-600 mg 6 hourly for 4 weeks or until clinical improvement

Children

3-6 mg/kg 6 hourly for 2-4 weeks

B. Continuation treatment

- Flucloxacillin, oral,

Adults

500 mg 6 hourly for 2 weeks

Children

5-12 years; 250 mg 6 hourly for 2 weeks

1-5 years; 125 mg 6 hourly for 2 weeks

< 1 year; 62.5 mg 6 hourly for 2 weeks

And

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly for 14-21 days.

Children

> 12 years; One 500/125 tablet 12 hourly

6-12 years; 5 ml of 400/57 suspension 12 hourly

1-6 years; 2.5 ml of 400/57 suspension 12 hourly

1 month-1 year; 0.25ml/kg body weight of 125/31 suspen-
sion 8 hourly

< 1 month; 0.25 ml/kg body weight of 125/31 suspen-
sion 8 hourly

And

- Clindamycin, oral,

Adult

300 mg 6 hourly for 14 days

Children

> 3 months; 15-40 mg/kg/day, in 3 divided doses,
(Minimum dose - not less than 300 mg/day)

REFERRAL CRITERIA

Refer to a specialist or higher-level facility if there is no clinical

improvement within the first 2 weeks of initiating antibiotic therapy.

DISORDERS OF THE CENTRAL NERVOUS SYSTEM

65. 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

- 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

Subacute

- Lesions of the middle ear (otitis media, mastoiditis)
- Intracranial mass (tumour, subdural haematoma, abscess)
- Idiopathic intracranial hypertension
- Trigeminal neuralgia
- Post-herpetic neuralgia
- Severe hypertension
- Atypical facial pain
- Medication
- 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, tactile
- Accompanying features e.g. nausea, vomiting, fever, collapse
- 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

- Usually none
- Local tenderness
- Fever
- Neck stiffness
- Positive Kernigs
- Markedly elevated blood pressure
- Drowsiness
- Excessive lacrimation
- Conjunctival redness
- Papilloedema
- Focal neurologic deficit e.g. cranial nerve deficit, hemiparesis

HEADACHE

INVESTIGATIONS

- FBC
- ESR
- Skull X-ray
- Cervical X-ray
- X-ray of the paranasal sinuses
- Lumbar puncture (meningitis, subarachnoid bleed)
- Eye tests (tonometry, refraction, fundoscopy)
- Cranial CT scan or MRI 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
- Avoidance of stress
- Psychotherapy
- Identification and elimination of trigger factors

Pharmacological treatment

- A. Acute symptomatic treatment of headaches
- 1st Line Treatment
Evidence Rating: [B]
- Paracetamol, oral,

<u>Adults</u>	500 mg-1 g 6 - 8 hourly
<u>Children</u>	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
 - Diclofenac, oral,

<u>Adults</u>	50 mg 8 hourly or 100 mg 12 hourly
<u>Children</u>	>12 years; 50 mg 12 hourly
	<12 years; not recommended

Or
 - Ibuprofen, oral,

<u>Adults</u>	400 mg 6-8 hourly
<u>Children</u>	6-12 years; 200-400 mg 6-8 hourly
	1-5 years; 100-200 mg 6-8 hourly
	3 months-1 year; not recommended

Or
 - Tramadol, oral,

<u>Adults</u>	50-100 mg 4-6 hourly (max. 400 mg daily)
<u>Children</u>	> 12 years; 50-100 mg 4-6 hourly
	< 12 years; not recommended
- B. Prophylaxis for Migraine headaches
- 1st Line Treatment
Evidence Rating: [B]
- Propranolol, oral,

<u>Adults</u>	Initial; 40 mg 12 hourly, maintenance; 80-120 mg 12 hourly
<u>Children</u>	Initial; 20-40 mg 12 hourly, maintenance; 40-80 mg 12 hourly

REFERRAL CRITERIA

Refer recurrent, unresolving or unexplained headaches to a specialist for evaluation and appropriate management.

66. Seizures

A seizure is a clinical event caused by a transient disturbance of brain function due to an abnormal paroxysmal neuronal discharge in the brain. If these episodes are recurrent 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. (See section on 'Epilepsy and Status epilepticus').

The clinical presentation depends on the part of the brain affected. Patients may sometimes describe the warning signals (termed a prodrome or aura), which they experienced before the event. A detailed description by a witness is key.

General anaesthesia and ventilation may be required in severe cases and where high doses of anticonvulsants are required.

CAUSES

- Congenital, prenatal or perinatal injury
- Fevers, especially in children aged 6 months to 6 years (febrile convulsion)
- 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 (See section on 'Epilepsy')
- Eclampsia
- Vascular diseases: hypertensive encephalopathy, stroke, myocardial infarction
- Space occupying lesions: tumour or malformations of the brain
- Head trauma
- Drugs and toxins: alcohol, antidepressants, metronidazole, drug and alcohol withdrawal
- Degenerative diseases e.g. dementia
- 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)
- Muscle twitching and movements which may be focal or generalized
- After a seizure, the patient may be confused (post-ictal confusion) or may sleep for some time (post-ictal sleep)

SIGNS

- A prodrome or 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
- Electroencephalogram (EEG)
- CT scan (head)

TREATMENT**Treatment objectives**

- To stop the seizure
- To treat underlying cause
- To prevent injury

Non-pharmacological treatment

- Move sharp objects, fire etc. away from patient during seizures
- Ensure clothing around the neck is loose
- Ensure the airway is clear, wipe or suction any secretions or vomitus from the mouth or nose.
- Do not 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

- A. Acute Seizures (immediate emergency measures)
- 1st Line Treatment
 - Evidence Rating: [A]
 - Oxygen
By nasal prongs, 2-6 L/min
 - Or
Face mask, 4-8 L/min
 - Or
Non-rebreather mask, 10-15 L/min

And

- Lorazepam, slow IV,
Adults
4 mg as a single dose, repeated once after 10 minutes if necessary.
Given into a large vein slowly over 3-5 minutes.
Children
12-18 years; 4 mg as a single dose, repeated once after 10 minutes if necessary. Given into a large vein slowly over 3-5 minutes.
1 month-12 years; 100 microgram/kg (max. 4 mg) as a single dose, repeated once after 10 minutes if necessary.
Neonates; 100 microgram/kg (max. 4 mg) as a single dose, repeated once after 10 minutes if necessary.

Or

- Midazolam, IV,
Adults
150-300 microgram/kg, may repeat every 10-15 minutes as required
Children
1 month-18 years; initially 150-200 microgram, followed by followed by continuous infusion of 60 microgram/kg per hour. May increase by 60 microgram /kg per hour every 15 minutes until seizures are controlled. (max. 300 microgram/kg per hour)
Neonates; 150-200 microgram/kg followed by continuous infusion of 60 microgram/kg per hour. May increase by 60 microgram /kg per hour every 15 minutes until seizures are controlled. (max. 300 microgram/kg per hour)
- Or
- Midazolam, buccal,
Adults
10 mg
Repeat after 10 minutes if necessary.
A third dose must not be given sooner than 12 hours after the second dose.
Children
6 months-18 years; 200-500 microgram/kg (max. single dose 10 mg)
Repeat after 10 minutes if necessary.
A third dose must not be given sooner than 6 hours after the second dose in children < 40 kg.

2nd Line Treatment

- Diazepam, IV,
Adults
10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds)
Children
200-300 microgram/kg slowly over 2-3 minutes.
This may be repeated 10 minutes later if the fit continues.

Or

- Diazepam, rectal,

Children

>12 years;	0.2 mg/kg
6-12 years;	0.3 mg/kg
2-6 years;	0.5 mg/kg
1 month-2 years;	2.5 mg
<u>Neonates;</u>	1.25-2.5 mg

This may be repeated 10 minutes later if the fit continues. (max. 10 mg)

Note 9-1

If a rectal formulation is not immediately available, draw up the injectable form directly into a syringe and administer it into the rectum (after removing the needle).

- B. If seizures continue (Status Epilepticus)

- Phenytoin, IV, (with ECG monitoring)

Adults

15 mg/kg slowly at rate no greater than 50 mg/minute. (max. 2 g loading dose),

Then

Maintenance, 100 mg 6-8 hourly

Children

1-12 years; initially, 18 mg/kg slowly at a rate no greater than 50 mg/minute.

Then

Maintenance, 5-10 mg/kg daily (max. 300 mg daily)

1-6 months; initially, 18 mg/kg slowly at a rate no greater than 1 mg/kg/minute.

Then

Maintenance, 2.5-5 mg/kg 12 hourly

Neonates; initially, 18 mg/kg slowly at a rate no greater than 1 mg/kg/minute.

Then

Maintenance, 2.5-5 mg/kg 12 hourly

Note 9-2

May cause cardiac arrhythmias if given faster than 25 mg/minute.

Caution 9-1.

Never mix phenytoin with 5% Dextrose, to minimise the risk of crystallisation.

Instead, phenytoin must be put in Normal Saline.

Or

- Phenobarbitone, IV,

Adults

10-20 mg/kg, repeat dose at 20 minute intervals if necessary (max. total dose 30 mg/kg)

Then (starting 12 hours after initial dose)

0.5-1.5 mg/kg 12-24 hourly

Children

1 month-12 years; 10 mg/kg at a rate not more than 1 mg/kg/minute. Repeat after 15 minutes if necessary.

Neonates

Initially, 15-20 mg/kg stat.

May repeat dose of 5-10 mg /kg at 20 minute intervals (max. total dose 40 mg/kg)

Then (starting 12 hours after initial dose)

3-4 mg/kg 24 hourly

REFERRAL CRITERIA

If seizures remain uncontrolled within 30 minutes after they began, refer immediately for specialist attention. Note that oxygenation should be continued during transfer.

67. Epilepsy

EPILEPSY

Epilepsy is a disorder of the central nervous system (CNS), which is characterized by spontaneous recurrent seizures or the tendency to have seizures. Epilepsy is now classified as Generalized (tonic, clonic, absence,

| atonic or myoclonic) with aura and loss of consciousness or Focal.

Traditionally, a single seizure has been regarded as an indication for investigation and assessment, but not for drug treatment unless the circumstances of the seizure necessitate it.

| Drug treatment should certainly be considered after two seizures, or if the second seizure follows closely from the first. The type of drug used depends on the type of seizure.

Drug treatment of epilepsy should be guided by the following general principles. Begin with a single drug at the lowest dosage range and increase dose gradually to the upper limit of dosage range or until side-effects appear, if seizures are not controlled.

Subsequently, if seizures still remain uncontrolled, change to a different drug by gradually reducing the dose of the initial agent while simultaneously introducing the new one. This usually takes 3-4 weeks.

Try three separate drugs in this fashion if no clinical response is observed, before resorting to drug combinations.

Anticonvulsant drug treatment can be totally withdrawn (gradually) in a patient with epilepsy only after a 2-year seizure-free period and after a full evaluation and discussion with the patient.

Patients with epilepsy should be advised not to drive a vehicle if not certified to be seizure-free, swim alone, work at heights, operate machines, cook by open fire alone, nor ingest alcohol excessively.

CAUSES

- Idiopathic

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**A. Management of Epilepsy - Acute Generalized seizures**

- **Phenytoin, IV,**
Adult
10-15 mg/kg stat. over 20-30 minutes

Then

100 mg 6-8 hourly PRN

Children

3-5 mg/kg

Or

- **Phenobarbital (daily), IM,**
Adult
60-180 mg at night
Children
2.5-5 mg/kg daily by slow IV or oral

Or

- **Carbamazepine**
Adult
100-200 mg once or 12 hourly

Then

Increase gradually to 0.8-1.2 g 8-12 hourly

Children

1 month-12 years; 2.5-5 mg/kg at night or 12 hourly

Increase when necessary

Then (maintenance)

5 mg/kg 8-12 hourly

Or

- **Sodium valproate (12 hourly)**
Adult
600 mg (max. 2 g)

Children

> 12 years; 600 mg (max. 2g)

1 month-12 years; 10-15 mg/kg, daily or two divided doses

Then (maintenance)

25-30 mg/kg daily in two divided doses

Or

- Lamotrigine

Adult

25-50 mg 12 hourly

Children

25-50 mg daily

Or

- Levetiracetam

Adult

25-50 mg 12 hourly

Children

25-50 mg daily

B. Management of Epilepsy - Generalized absence seizure

- Sodium valproate (8-12 hourly)

Adult

600 mg (max. 2 g)

Children

> 12 years; 600 mg (max. 2 g)

1 month-12 years; 10-15 mg/kg, daily or two divided doses

Then (maintenance)

25-30 mg/kg daily in two divided doses

Or

- Ethosuximide (daily)

Adult

250 mg 12 hourly, increase by 250 mg every 5-7 days to 1-1.5 g daily in two divided doses

Children

> 6 years; 250 mg 12 hourly, increase by 250 mg every 5-7 days to 1-1.5 g daily in two divided doses

1 month-6 years; 5 mg/kg (max. 125 mg 12 hourly)

C. Management of Epilepsy - Focal seizure

- Carbamazepine, oral,

Adult

100-200 mg once or 12 hourly,

Then

Increase gradually to 0.8-1.2 g 8-12 hourly

Children

1 month-12 years; 2.5-5 mg/kg at night or 12 hourly.

Increase when necessary

Then (maintenance)

5 mg/kg 8-12 hourly

Or

- Sodium valproate (8-12 hourly)

Adult

600 mg (max. 2 g)

Children

> 12 years; 600 mg (max. 2 g)
1 month-12 years; 10-15 mg/kg, daily or two divided doses
Then (maintenance)
12.5-15 mg/kg 12 hourly

Note 9-3

Where available slow release preparations are preferred

All patients with epilepsy should receive continuous education and counselling by the Pharmacist.

REFERRAL CRITERIA

Refer all patients with intractable seizures to the specialist

68. 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. Obtaining a thorough history from accompanying relatives, friends and the police is essential.

CAUSES

- Infections e.g. meningitis, cerebral malaria
- Hypoglycaemia (diabetes-related or alcohol induced)
- Diabetic ketoacidosis
- Severe hypertension with encephalopathy
- Cerebrovascular Accident (CVA) or stroke
- Drug ingestion or overdose e.g. alcohol, salicylates, barbiturates, cocaine
- Electrolyte imbalance
- Epilepsy - status epilepticus
- Head injury
- Major organ failure e.g. hepatic failure, renal failure and myocardial infarction
- Hypoxia from severe anaemia
- Poisoning e.g. kerosene, pesticides, herbicides

SYMPOTOMS

- Depends on the underlying cause (See appropriate sections)

SIGNS

- Depends on the underlying cause (See appropriate sections)

INVESTIGATIONS

Tests depend on suspected cause

- FBC
- BF for MPs
- Blood glucose
- Urea and electrolytes

- Liver function tests
- Blood culture and sensitivity
- Urine culture and sensitivity
- ECG
- Toxicology: drug screen, alcohol levels
- Lumbar puncture
- Head CT scan

TREATMENT

Treatment objectives

- To support life until consciousness is regained
- To prevent complications e.g. aspiration, hypoxia
- To determine the underlying cause and manage it appropriately

Non-pharmacological treatment

- Ensure the airway is patent and clear of secretions
- Examine and stabilize the cervical spine if any history or sign of injury
- 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

Pharmacological treatment

Table 9-1: Guide to pharmacological treatment of the unconscious patient

Complaints	Diagnosis	Action
History of diabetes, use of oral anti-diabetic or ingestion of alcohol	Hypoglycaemia *	(See section on 'Hypoglycaemia')
History of ingestion of medication (tablets or liquid). There may be smell of alcohol or other substance on breath	Drug overdose e.g. Alcohol	Support respiration IV Dextrose 10% 50-100 ml to prevent hypoglycaemia. In chronic alcoholics. Precede IV Dextrose by IV/IM Thiamine 100 mg IV, then 50-100 mg IM until regains consciousness
	Paracetamol	Start N-acetylcysteine (as indicated below) and refer IV continuous infusion: Body weight > 20 kg: 100 ml of Dextrose 5% given over 15 min, Followed by

CHAPTER 9: DISORDERS OF THE CENTRAL NERVOUS SYSTEM

Complaints	Diagnosis	Action
		50 mg/kg in 250 ml of Dextrose 5% over 4 hours. Then 100 mg/kg in 500 ml of Dextrose 5% over 16 hours.
		Children < 20 kg: 150 mg/kg in 3 ml/kg of Dextrose 5% given over 15 min. Followed by 50 mg/kg in 7 ml/kg of Dextrose 5% given over 4 hours. Then 100 mg/kg in 14 ml of Dextrose 5% over 16 hours.
Presence or absence of 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 *	(See section on DKA)
High-grade fever, seizures, headache, neck stiffness, altered consciousness etc.	Meningitis * Cerebral Malaria	Treat with appropriate antibiotics and anti-malarial until either diagnosis confirmed. (See appropriate section).
History of previous seizures, sudden onset of convulsions; with or without incontinence.	Epilepsy *	Give Diazepam, IV (slowly over 2-3 minutes), to abort seizures and continue or start with anti-epileptic drug treatment. (See appropriate section)
Patient with sudden onset of paralysis of one side of body.	Stroke *	Check blood pressure and blood glucose. (See appropriate section)
Patient with hypertension, headaches, seizures	Hypertensive encephalopathy *	Check blood pressure If > 180/110 mmHg, give oral or parenteral anti-hypertensive to reduce BP gradually
Sudden onset associated with cardiac arrhythmia or emotional crisis.	Syncope	Unconsciousness is usually brief. Prompt awakening occurs. Monitor vital signs, ECG Reassure

Complaints	Diagnosis	Action
History of injury, or alcoholism, signs of trauma	Head Injury	Treat lacerations, Stabilise Cervical spine X-ray skull for fractures, Head CT scan
History of heavy alcohol ingestion over many years. History of jaundice and gradual onset of changes in sensorium	Hepatic Failure *	Manage as hepatic encephalopathy
Diaphoresis, cold clammy skin, weak pulses	Shock Hypovolaemic Haemorrhagic Cardiogenic Septic	(See appropriate sections)

* (See appropriate section)

| REFERRAL CRITERIA

Refer to a specialist for further definitive management if not responding to standard measures of resuscitation.

69. Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Hyperactivity Disorder is the most common neurobehavioural disorder affecting children. It may present in infancy and can continue into adulthood. It affects 5-8% of children and nearly three times as many boys as girls. Nearly half the children presenting with ADHD may also have an associated learning problem.

The term is commonly applied wrongly to the normal child who is always on the go and never sits still. Recognized causes of hyperactivity in children include normal variation, boredom or understimulation or excessive restraint, learning difficulties, autism, partial seizures and drugs like clonazepam, phenobarbitone and phenytoin.

ADHD is also wrongly attributed to poor parenting, too much TV, poor schools, poor home environment, excess sugar or food allergies.

No specific tests confirm a diagnosis of ADHD. A full physical and neurological examination must be done in all cases. The behavioural deficits and excesses that constitute a diagnosis of ADHD must be present in multiple settings such as home and school.

CAUSES

- Unknown
- Related factors:
 - Hereditary
 - Imbalance of neurotransmitters

SYMPTOMS

- Inattention
 - child often fails to finish things he or she starts
 - often does not seem to listen
 - has difficulty concentrating on school work
- Impulsivity
 - child often acts before thinking
 - hits others when upset
 - inability to wait for his or her turn in a game
 - engages in dangerous activities without consideration of the consequences

- has difficulty organizing work (this not due to cognitive impairment)
- Hyperactivity
 - child tries to do several things at once
 - talks incessantly,
 - struggles to sit still at a desk and fidgets
- Distractibility is evidenced by
 - not listening when spoken to
 - an inclination to daydream
 - not being able to work independently
 - disorganized

SIGNS

- Similar to symptoms above

INVESTIGATIONS

- Usually none

TREATMENT

Treatment objectives

- To reduce hyperactivity
- To improve attention
- To improve compliance to instruction

Non-pharmacological treatment

Behaviour management techniques - Evidence Rating: [A]

- A class helper in class to sit with child and focus attention to school work
- Parenting class to help parents cope
- Desist from punitive physical interventions e.g. caning

Pharmacological treatment

1st Line Treatment

Evidence Rating: [A]

- Methylphenidate, oral,
Adults

10 mg 8-12 hourly (max. 60 mg)

Then

Increase weekly by 5-10 mg, if necessary, to max. of 30 mg 12 hourly
Children

6-18 years; 2.5-5 mg 12 hourly

Increase weekly by 5-10 mg, if necessary, to max. of 30 mg 12 hourly
4-6 years; 2.5 mg 12 hourly

Increase weekly by 2.5 mg daily to max. of 1.4 mg/kg if necessary in 2 to 3 divided doses.

< 4 years; not recommended

Or

- Atomoxetine, oral,
Adults

40 mg once daily for 7 days

Then

Increase according to response to a max. of 100 mg

Children

> 6 years (weight > 70 kg); 40 mg once daily for 7 days

Then

Increase according to response to a max. of 80 mg

> 6 years (weight < 70 kg); 500 micrograms/kg daily for 7 days

Then

Increase according to response to a max. of 1.2 mg/kg daily

< 6 years; not recommended

2nd Line Treatment

Evidence Rating: [B]

- Imipramine, oral,

Adults

75 mg daily

Then

Increase to 150 mg daily if necessary (max. 200 mg per day)

Children

6-18 years; 10-30 mg 12 hourly

REFERRAL CRITERIA

Refer to a clinical psychologist for behaviour management. An occupational therapist, remedial teacher, speech therapist following a needs assessment.

Refer to a specialist if there is no clinical improvement after a month of the above recommended therapy.

70. The Acutely Disturbed Patient

The acutely disturbed patient presents in an excited, agitated or aggressive state. There may be delusions and perceptual changes like hallucinations that overwhelm the patient. Disorientation and alteration in consciousness are often prominent when the cause is organic. The patients are usually brought in restrained by more than one person or by the police. The condition must be regarded as an emergency since a few cases are potentially fatal.

CAUSES

Acute (Functional) Psychiatric Disorders

- Mania or hypomania
- Schizophrenia and like states
- Other psychotic disorders
- Agitated depression
- Acute psychosis

Acute (Organic) Psychiatric Disorders

- Toxic psychosis secondary to drug intoxication (amphetamines, cocaine, marijuana, heroin etc.)
- Abnormal reaction to alcoholic Intoxication
- Acute Alcoholic Withdrawal Syndrome (delirium tremens)
- Infective causes e.g. typhoid, malaria, meningitis, HIV, encephalitis, hepatitis

Acute Metabolic Disorders

- Hypoglycaemia
- Thyroid disease
- Porphyria

Others

- Head trauma
- Subdural hematoma

SYMPTOMS

(See relevant sections for symptoms of specific disorders)

- Sleeplessness
- Restlessness - agitated or even combative patient
- Talking excessively and loudly, or low toned, reduced speech, even mute in some cases
- Disinhibited behaviour or speech
- Hearing or seeing "imaginary" people or objects.
- Expression of fear, undue suspicion, inappropriate guilt or bizarre beliefs
- Destructiveness

SIGNS

(See relevant sections for signs of specific disorders)

- Elated, irritable, angry or depressed mood
- Physical aggression, agitation or restlessness
- Lack of insight
- Pressured or retarded speech
- Hyperactivity or reduced motor activity
- Disinhibition - social and sexual
- Delusions of grandeur, guilt or paranoia
- Auditory hallucinations
- Visual hallucinations (especially in toxic, infectious and withdrawal states)
- Fever (infective conditions)
- Drowsiness, altered consciousness (mainly in alcohol withdrawal)
- Disorientation and confusion (mainly in alcohol withdrawal)
- Sweating
- Tremors (mainly in alcohol withdrawal)

INVESTIGATIONS

- Usually none
- Urine screen (for substances like amphetamines, cocaine, heroin, cannabis)

CHAPTER 10: PSYCHIATRIC DISORDERS

- FBC, Rapid Diagnostic Test for malaria parasites (when there is fever and suspected infections)
- Random Blood Sugar
- Blood culture

TREATMENT**Treatment objectives**

- Rapid tranquillisation - to calm down the patient as quickly as possible using the safest drugs available without necessarily inducing sleep
- 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
- Remove and store away any offensive weapons on or around patient.

Pharmacological treatment

Evidence Rating: [C]

- Lorazepam, IV/IM,
Adults

2-4 mg stat.

Repeated once after 10 minutes if necessary.

Children

> 12 years;	500 microgram-2 mg (max. 4 mg)
< 12 years;	500 microgram-1 mg (max. 2 mg)

Or

- Haloperidol, IM,
Adults

2-5 mg stat. may repeat in 4-8 hours (max. 20 mg per day)

Children

13-18 years;	2-5 mg 4-8 hourly as required
6-12 years; mg/kg per day)	1-3 mg 4-8 hourly as required (max. 0.15
< 5 years;	not recommended

Note 10-1

Patient should be switched to oral as soon as possible

Then

- Haloperidol, oral,
Adults

3-5 mg 8-12 hourly (max. 30 mg per day)

Children

> 12 years;	3-5 mg 8-12 hourly as required (max. 30 mg per day)
3-12 years (15-40 kg); < 3 years;	0.25-0.5 mg per day (max. 0.5 mg per day) not recommended

Or

- Chlorpromazine, IM, (for very agitated patients)

Adults

50-150 mg stat. repeated after 30-40 minutes if necessary

Children

12-18 years;	25-50 mg 6-8 hourly
6-12 years; per day)	500 microgram/kg 6-8 hourly (max. 75 mg)
1-6 years; per day)	500 microgram/kg 6-8 hourly (max. 40 mg)

Note 10-2

Never give chlorpromazine intravenously! It may lead to severe hypotension.

Or

- Olanzapine, IM,

Adults

10-20 mg stat. subsequent doses of 10 mg may be given 2 hours after initial dose, if necessary and 4 hours after 2nd dose (max. 30 mg per day)

Children

Not recommended

Or

- Chloral hydrate, oral or rectal,

Adults

500 mg-1g

Children

12-18 years;	500 mg-1 g
1 month-12 years;	30-50 mg/kg (max. 1g)
<u>Neonate;</u>	30-50 mg/kg

Or

- Diazepam, IV,

Adults

10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds)

Children

200-300 microgram/kg slowly over 2-3 minutes.

This may be repeated after 10 minutes if necessary (max 10 mg)

Or

- Diazepam, rectal,

Children

> 12 years;	0.2 mg /kg
6-12 years;	0.3 mg/kg
2-6 years;	0.5 mg/kg
1 month-2 years;	2.5 mg
<u>Neonates;</u>	1.25-2.5 mg

This may be repeated after 10 minutes (max 10 mg)

Note 10-3

If a rectal formulation is not immediately available, draw up the injectable form directly into a syringe and administer it into the rectum (after removing the needle).

Diazepam IV must be administered with care if the cause of the acute disturbance is thought to be organic.

REFERRAL CRITERIA

Refer all acutely disturbed patients to a specialist.

71. 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 or psychological abuse. The symptoms may be precipitated by stress and the signs are often variable and may include resistance to eye opening upon examination. The diagnosis requires a high level of suspicion since it is often difficult to separate from epileptic seizures and may, in fact co-exist with epilepsy.

SYMPTOMS

- Recurrent tonic clonic-like seizures
- Attacks usually occur only when attention of other people can be attracted
- Patients hardly ever get injured, even when they fall (unlike in true seizures)
- Thrusting pelvic movements are common during “seizure” attacks
- Tongue biting, if it occurs is usually at the tip of the tongue instead of the sides as in true seizures
- May have urinary incontinence as in normal seizures

INVESTIGATIONS

- Serum prolactin
- EEG

TREATMENT

Treatment objectives

- To stop seizures
- To restore normalcy

Non-pharmacological treatment

- Reassure parents, guardians etc.
- Counselling
- Psychotherapy

Pharmacological treatment

- Anti-epileptic medicines do not appear to have any beneficial effect on frequency of attacks

REFERRAL CRITERIA

Refer all cases for evaluation by psychologist or psychiatrist.

72. Insomnia

Insomnia is defined as a subjective report of difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate opportunity for sleep, and that results in some form of daytime impairment. Insomnia symptoms occur quite commonly in the general population. Risk factors for insomnia include increasing age, female sex, co-morbid disorders such as medical, psychiatric, substance use, and shift work. Patients with psychiatric and chronic pain disorders have relatively high rates of insomnia.

CAUSES

- Behavioural - spending more time in bed in an effort to “catch up” on sleep
- Stress
- Learned habits which do not enhance sleep
- Cognitive distortions (e.g. if one does not sleep throughout the night, one has not slept at all)
- Medicines (e.g. for treatment of common cold, hypertension, asthma)
- Caffeine-containing beverages (e.g. coffee, tea)
- Withdrawal from alcohol and other drugs of abuse (e.g. cocaine, marijuana, amphetamines)
- Medical condition (e.g. sleep apnea, airway obstruction, liver disease, renal disease, thyroid disorders)
- Psychological and environmental factors
- Other psychiatric disorders such as anxiety and mood disorders
- Travel (especially across time zones leading to jet lag)
- Shift work

SYMPTOMS

- Prolonged average time for falling asleep - longer than 30 minutes
- Total sleep time less than 6.5 hours
- Difficulty falling asleep
- Frequent awakenings
- Difficulty returning to sleep
- Awakening too early in the morning
- Sleep that does not feel restful, refreshing or restorative
- Anticipating poor sleep hours before bedtime, and becoming more alert and anxious as bedtime approaches
- Daytime effects of poor sleep:
 - Fatigue and sleepiness
 - Mood disturbances and cognitive difficulties
 - Poor quality of life (worsened by interpersonal difficulties, or

- avoidance of day activities)
- Exacerbation of co-morbid conditions such as depression, high blood pressure, etc.
- Day-to-day variability

Box 10-1: History taking and assessment of patients with Insomnia

- Characterization of the sleeping environment (couch/bed, light/dark, quiet/noisy, room temperature, alone/bed partner, TV on/off), patient's state of mind (sleepy vs. wide awake, relaxed vs. anxious)
- Identify perpetuating negative behaviours and cognitive processes
- Assess Sleep-Wake Schedule with sleep dairy: time to fall asleep (sleep latency), number of awakenings, Wake time After Sleep Onset (WASO), sleep duration
- Assess
- Breathing-related sleep disorders (snoring, gasping, coughing)
- Sleep related movement disorders (kicking, restlessness)
- Parasomnias (behaviors or vocalization)
- Co-morbid medical/neurological disorders (reflux, palpitations, seizures, headaches)
- Other physical sensations and emotions associated with wakefulness (such as pain, restlessness, anxiety, frustration, sadness)

Assess Daytime Activities and Daytime Function:

- Napping (frequency/day, times, voluntary/involuntary)
- Work (work times, work type such as driving or with dangerous consequences, disabled, caretaker responsibilities)
- Lifestyle (sedentary/active, homebound, light exposure, exercise)
- Travel (especially across time zones)
- Quality of life and exacerbation of co-morbid disorders

INVESTIGATIONS

- FBC
- BUE and creatinine
- LFTs
- Blood glucose
- Thyroid function tests

TREATMENT

Treatment objectives

- Reduction of waking symptoms
- Improvement of daytime function
- Reduction of distress
- Treatment of co-morbid conditions

Non-pharmacological treatment

- Stimulus control therapy (avoid stimulating sleep environments such as leaving lights, TV and radio on)
- Relaxation training
- Cognitive Behavior Therapy
- Avoidance of day-time sleep
- Avoidance of excessive stimulant consumption pre-bed time (e.g.

coffee, tea, alcohol etc.)

Pharmacological treatment

1st Line Treatment

Evidence Rating: [C]

- Lorazepam, oral,
Adults
1-4 mg at bedtime
Children
Not recommended
- Or
- Triazolam, oral,
Adults
Elderly; 125-250 microgram at bedtime
< 60 years; 125-500 microgram at bedtime
Children
Not recommended

2nd Line Treatment

Evidence Rating: [B]

- Melatonin, oral, (particularly for children)
Adults
3-5 mg daily, 1-2 hours before bedtime (max. 10 mg)
Children
1 month-18 years; 2-3 mg at bedtime
Increase if necessary after 1-2 weeks to 4-6 mg daily (max. 10 mg)
- Or
- Evidence Rating: [B]
- Amitriptyline, oral,
Adult
25-50 mg at night for two weeks
Children
Not recommended

REFERRAL CRITERIA

Refer to clinical psychologist for those patients who do not respond to the common non-pharmacological and pharmacological interventions for cognitive behaviour therapy. Refer patients with underlying physical causes to the appropriate specialists.

73. Depression

Depression is a mood disorder, which may occur in all age groups, although the symptoms may differ in children. It is a relatively common condition and has a tendency to recur. Some affected persons may turn out to have bipolar disorder, in which case, episodes of mania occur.

Clinically significant depression, also called major depression, is

twice as common in women as in men. Many affected individuals seek help from spiritual and traditional healers. For a good proportion of those who go to hospitals, their condition is not recognised.

Depression is a significant cause of morbidity all over the world and most people who attempt or successfully complete suicide have depression. One should not dismiss or take for granted statements made by patients such as "I want to die", "life is not worth living", or "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 injuries or poisoning.

Recurrent depression or unipolar depression is treated differently (with antidepressants) from bipolar depression, which responds more to mood stabilizers.

The diagnostic criteria for major depression relies on the presence of at least five (5) of the symptoms listed in the section on symptoms below, experienced every day for at least two weeks.

In the treatment of depression, maximum tolerable doses of antidepressant medications must be given for at least 6 weeks before deciding a particular medication is not effective.

After an episode of depression, treatment must be continued for at least 6 months, as there is a high risk of relapse within this period.

Antidepressants must be stopped immediately if a manic swing occurs. Patients with suicidal tendencies must be admitted and kept under close observation.

CAUSES

- Genetic
- Familial
- Environmental
- Psychosocial factors
- Endocrine disorders e.g. hypothyroidism, Cushing's syndrome

SYMPOTMS

- Depressed mood, often reported as feeling 'out of sorts'
- Loss of interest or lack of pleasure in things previously of interest
- Significant weight loss or weight gain
- Insomnia or sleeping too much
- Psychomotor agitation or retardation
- Fatigue or loss of energy
- Feelings of worthlessness or excessive guilt
- Impaired thinking
 - Poor concentration;
 - indecisiveness;
 - worrying excessively
- Multiple bodily complaints
- Suicidal ideas or thoughts of death

- Hallucinations or 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 listed above

SIGNS

- Depressed mood
- Evidence of weight loss or weight gain
- Agitation or retardation
- Hallucinations

INVESTIGATIONS

- FBC
- BUE and Creatinine
- FBS
- Thyroid function and cortisol levels if indicated
- Administer a standardized scale of depression such as the PHQ (patient health questionnaire 9 item scale)

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

1st Line Treatment

Evidence Rating: [A]

- Fluoxetine, oral,

Adults

20 mg once daily for 2-4 weeks,

Then

Increase if necessary to max. of 80 mg

Children

8-18 years;

10 mg once daily for 1-2 weeks

Then

Increase if necessary to max. 20 mg once daily.

< 8 years; not recommended

Note 10-4

Use with caution in children with epilepsy. Stop if seizure occurs.

Or

- Sertraline, oral,

Adults

50 mg once daily,

Then

Increase if necessary by increments of 50 mg at intervals of at least 1 week, to max. of 200 mg daily.

Children

13-18 years; 50 mg once daily

Then

Increase if necessary by increments of 50 mg at intervals of at least 1 week, to max. of 200 mg daily.

6-12 years; 25 mg daily,

Then

Increase if necessary to 50 mg daily after 1 week.

Further increase if necessary in steps of 50 mg at intervals of at least one week to a max. of 200 mg daily

< 6 years; not recommended

Or

- Citalopram, oral,

Adults

20 mg once daily, increase if necessary in steps of 20 mg daily, at intervals of 3-4 week, max. 40 mg.

Children

> 12 years; 10 mg once daily,

Then

Increase if necessary to 20 mg once daily in the evening, over 2-4 weeks (max. of 40 mg once daily)

< 12 years; not recommended

Or

- Imipramine, oral,

Adults

25-50 mg once daily (early evening),

Then

Increase by 25 mg every 3-5 days up to max. of 150 mg.

Children

Not recommended

Or

- Amitriptyline, oral,

Adults

25-50 mg once daily (early evening),

Then

Increase by 25 mg every 3-5 days up to a max. of 150 mg.

Children

> 16 years;	5-15 mg 12 hourly
< 16 years;	not recommended

A. Management of patients with depression requiring night sedation

- Lorazepam, oral,

Adults

2-3 mg 8-12 hourly, max. 10 mg daily

Children

2-18 years; 0.05 mg/kg 8 hourly, max. 2 mg daily

Or

- Diazepam, oral,

Adults

5-10 mg 6-12 hourly

Children

12-18 years; 10 mg 12 hourly

5-12 years; 5 mg 12 hourly

REFERRAL CRITERIA

Refer patients with atypical or unusual symptoms, hysterical or phobic features, and those who do not respond to adequate anti-depressant treatment within 2 months, to a psychiatrist, as should children suspected to suffer from depression.

Patients requiring Cognitive Behaviour Therapy should be referred to a psychologist.

74. Schizophrenia

Schizophrenia is probably the most severe and potentially disabling form of mental illness in every community worldwide. It 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.

For this illness, a few people may recover completely after an episode or two. Treatment must be started once symptoms are present. A definitive diagnosis and establishment of a treatment plan is best carried out by a psychiatrist. Treatment for acute episodes can be started by a psychiatrist and follow up treatment continued by most health care givers. Treatment must be for at least 18 months after remission of symptoms for a first episode. However, life long treatment is probably the best strategy to avoid recurrence.

Side effects such as extra-pyramidal reactions (slowness, drooling, stiffness, tremors, rigidity, muscle spasms including tongue sticking

out, neck bending, etc.) to antipsychotics may occur especially when administered at high doses. These adverse reactions can be prevented or managed with anticholinergic agents, which must be used sparingly as they may contribute to the development of another adverse event, called tardive dyskinesia, in the long term. (See section on 'Adjunct Treatment' below)

CAUSES

- Largely unknown
- Possible associations:
 - Bio-Genetic (to do with dopamine and serotonin receptors)
 - Bio-Psycho social determinants; genetic predisposition coupled with stress (economic, disruptive family environments, etc.) Birth defects in brain associated with season of birth, possible viral infections, etc.
 - Environmental triggers
 - Illicit drugs (marijuana, amphetamines etc.)

SYMPOTMS/SIGNS

'Positive' symptoms

- Hallucinations (e.g. hearing voices)
- Delusions (stated beliefs which cannot be substantiated)
- Incoherent speech or illogicality
- Odd or disorganised behaviour
- Patient believes his or her thoughts are controlled by outside forces

'Negative' symptoms

- Poverty of speech or content of speech (few words or with little substance)
- Apathy
- Reduced social contact or withdrawal
- Flattened affect (showing little facial expressive responses)
- Delusions
 - May be persecutory, such as undue suspicion, or totally bizarre, like being controlled or being made to feel emotions or sensations
 - Grandiose delusions may also occur but without the elevated mood seen in manic patients
- Hallucinations
 - commonly auditory (but may involve any of the other senses)
 - Auditory hallucinations of multiple voices commenting on patients' actions, arguing about the patient are almost diagnostic
- Motor disorders like posturing, excitement or stupor may occur but are not essential for diagnosis

INVESTIGATIONS

- Usually none required for diagnosis
- Tests to rule out organic causes of psychosis
- Baseline full blood count, blood sugar, lipids, liver and kidney function

tests, for purposes of guiding treatment

- For Olanzapine and Risperidone, ensure that fasting blood sugar, lipid profiles, liver and kidney function test are carried out at least twice a year.

TREATMENT

Treatment objectives

- To abolish symptoms
- To restore functioning to the maximum level possible
- To reduce the chances of recurrence
- To monitor blood glucose, lipid profiles, liver and kidney function at least twice a year for patients on olanzapine and risperidone

Non-pharmacological treatment

- Supportive psychotherapy
- Rehabilitation
- Family therapy
- Psychoeducation about cause, course, treatment, side effects and relapse prevention
- Behaviour Therapy e.g. social skills training, progressive muscle relaxation, coping skills, etc.

Pharmacological treatment

1st Line Treatment

Evidence Rating: [A]

A. Management of acute attacks

- Olanzapine, IM or oral,

Adults

5-10 mg stat.

Then

5-10 mg daily, max. 20 mg daily

Children

> 12 years; 5-10 mg stat.

Then

5-10 mg daily, max. 20 mg daily

< 12 years; not recommended

Or

- Chlorpromazine, IM,

Adults

25-50 mg 6-8 hourly, adjusting to max. of 400 mg daily

Children

12-18 year; 25-50 mg 6-8 hourly, adjusting to max. of 400 mg daily

6-12 years; 500 microgram/kg 6-8 hourly to max. of 75 mg daily

1-6 year; 500 microgram/kg 6-8 hourly to max. of 40 mg daily

Or

- Chlorpromazine, oral,

Adults

25 mg 8 hourly or 75 mg at night

Then

Adjust according to response to 75-300 mg daily

Children

> 12 years; 25 mg 8 hourly or 75 mg at night

Then

Adjust according to response to max. of 75-300 mg daily

6-12 years; 10 mg 8 hourly

Then

Adjust according to response to max. of 75 mg daily

1-6 years; 500 microgram/kg 4-6 hourly

Then

Adjust according to response to max. of 40 mg daily

Or

- Haloperidol, IM,

Adults

2-5 mg stat.

Then

Repeat 4-8 hourly according to response, to maximum of 20 mg daily

Children

6-12 years; 1-3 mg 4-8 hourly as required

< 6 years; not recommended

Or

- Haloperidol, oral,

Adults

0.5-5 mg 8-12 hourly daily

Then

5-10 mg 8-12 hourly (max. of 30 mg)

Children

> 12 years; 0.5-5 mg 8-12 hourly daily

Then

5-10 mg 8-12 hourly (max. of 30 mg)

3-12 years or body weight 15-40 kg; 0.25-0.5 mg daily

Then

Increase by 0.5 mg daily every 5-7 days

< 3 years; not recommended

B. Maintenance

- Risperidone, oral,

Adults

1-4 mg 12-24 hourly (start at low dose and adjust daily according to patient response)

Or

- Olanzapine, oral,

Adults

5-10 mg, max. 20 mg daily

Children

> 12 years; 5-10 mg, max. 20 mg daily
< 12 years; not recommended

Or

- Chlorpromazine, oral,
Adults
25 mg 8 hourly or 75 mg at night, adjust to max. of 200 mg 8 hourly
Children
12-18 years; 25 mg 8 hourly or 75 mg at night, adjust to max. of 200 mg 8 hourly
< 12 years; not recommended

Or

- Haloperidol, oral,
Adults
1-3 mg 8 hourly, adjusted to max. daily dose of 20 mg
Children
12-18 years; 1-3 mg 8 hourly, adjusted to max. daily dose of 20 mg
3-12 years; 500 micrograms 12 hourly, adjust up to a max. of 5 mg 12 hourly

| SCHIZOPHRENIA

C. Maintenance treatment for patients with recurrent or chronic illness (depot preparations)

- Fluphenazine decanoate, IM,
Adults
25 mg monthly
Children
Not recommended
- Or**
• Flupenthixol decanoate, IM,
Adults
Give test dose of 5-20 mg, and after at least 7 days, give 40 mg monthly
Children
Not recommended

D. Adjunct treatment for management or prevention of antipsychotic drug side effects

- Trihexyphenidyl (Benzhexol), oral,
Adults
2.5-5 mg 6-8 hourly max. 20 mg daily
Children
6-18 years; 0.5-1 mg 12-24 hourly,
Then
Increase every 3-7 days by 1 mg daily according to response
Or
• Benzatropine (Benztropine), oral,
Adults

1-2 mg 8-12 hourly

Children

> 3 years; 20-50 microgram/kg 12-24 hourly

Or

- Biperidine, oral,

Adults

1 mg 12 hourly,

Then

adjust to 2 mg 8 hourly up to 4 mg 8 hourly.

Children

not recommended

Or

- Biperidine, slow IV/IM,

Adults

2.5-5 mg adjust to a max. of 20 mg in 24 hours

Or

- Benztropine, IV/IM,

Adults

1-2 mg slowly over 2-4 minutes, repeat if symptoms persist after 8-12 hours

Or

- Diazepam, oral,

Adults

5-10 mg 6-12 hourly

Children

12 -18 years; 10 mg 12 hourly

5 - 12 years; 5 mg 12 hourly

Or

- Diazepam, IV,

Adults

5-10 mg slowly over 2-3 minutes (approximately 2.5 mg every 30 seconds)

Children

200-300 microgram/kg slowly over 2-3 minutes.

This may be repeated 10 minutes.

Or

- Promethazine hydrochloride, oral or IM,

Adults

12.5-25 mg initially, may repeat dose if symptoms persist after 6 hours

Children

> 6 years; 6.25-12.5 mg

Then

Repeat dose after 6 hours

< 6 years; not recommended

REFERRAL CRITERIA

Refer all patients to a psychiatrist after an acute episode if treatment

was initiated without a psychiatrist's supervision.

Likewise refer all patients with recurrent episodes and those whose symptoms cannot be controlled to a psychiatrist for further drug treatment or Electroconvulsive Therapy.

75. Bipolar Disorder

Bipolar disorder is a form of mood disorder. The term refers to a condition in which patients experience mood swings between the two extremes of 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 is not diagnosed as a bipolar disorder. Repeated depressive episodes are diagnosed as recurrent depression.

CAUSES

- | • Largely unknown
- | • Possible associations:
 - Tendency to run in families
 - Genetic factors

SYMPTOMS

- | • Persistently elevated mood:- euphoria, expansiveness, feeling 'high' or irritable
- | • Overactivity
- | • Talking fast and excessively
- | • Grandiose claims
- | • Reduced sleep
- | • Reckless spending and being overly generous
- | • Sexual and social disinhibition
- | • Auditory hallucinations, in severe cases (patients may hear voices, often reinforcing their grandiose beliefs)
- | • Undue suspicion (paranoia) may exist
- | • Impaired judgement

SIGNS

- | • None typical of bipolar disorder
- | • Same as symptoms above

INVESTIGATIONS

- | • Usually no specific investigations
- | • Rarely, thyrotoxicosis may mimic mania and must be excluded

TREATMENT**Treatment objectives**

- To treat symptoms of mania or depression, whichever is present with current episode
- To reduce the level of activity in mania to a manageable state
- To elevate mood to a normal state in depression
- To abolish psychotic symptoms (delusions and hallucinations), if present

Non-pharmacological treatment

- Psychotherapy
- Psychoeducation

Pharmacological treatment**A. Management of the manic patient**

- Risperidone, oral,

Adults

1-4 mg 12-24 hourly, to a max. of 8 mg daily

Children

>12 years; 500 micrograms stat.

Then

Adjust daily in steps of 500 micrograms - 1 mg daily to a max. of 6 mg daily

< 12 years; not recommended

Or

- Olanzapine, oral,

Adults

5-15 mg 12-24 hourly to max. 20 mg daily

Children

12-18 years; 2.5 mg daily, up to max. of 20mg daily

<12 years; not recommended

Or

- Haloperidol, oral,

Adults

5-10 mg 12 hourly up to a max. of 20 mg daily

Or

- Chlorpromazine, oral,

Adults

25 mg 8 hourly or 75 mg at night,

Then

Increase by 25 mg daily to 50-100 mg 8 hourly

Or

- Sodium valproate, oral,

Adults

250-750 mg 12 hourly (controlled release preferable)

Children

< 18 years; not recommended

Or

- Carbamazepine, oral,
Adults
200-800 mg 12 hourly (controlled release preferable)
Children
< 18 years; not recommended

B. Management of significantly aggressive patient
(See section on 'The Acutely Disturbed Patient').

C. Management of the depressive phase

- Lamotrigine, oral,
Adults
25 mg daily for 2 weeks

Then

Increase by 25 mg every 2 weeks to a max. of 200 mg daily as required

- Children
< 18 years; not recommended

And

- Lorazepam, oral,
Adults
2-3 mg 8-12 hourly, max. 10 mg daily
Children
2-18 years; 0.05 mg/kg 8 hourly, max. 2 mg daily
- Or
Diazepam, oral,
Adults
5-10 mg 6-12 hourly
Children
12-18 years; 10 mg 12 hourly
5-12 years; 5 mg 12 hourly

Note 10-5

The benzodiazepines are withdrawn as soon as the patient is calm, but this should be done by slowly tapering the dose.

D. Maintenance management after control of the acute phase

- Lithium, oral,
Adults
200-600 mg 6-8 hourly (max. 2400 mg daily)
Children
12-18 years; 200-600 mg 8 hourly (max. 2400 mg daily)
6-12 years; 5-20 mg /kg 8 hourly
< 6 years; not recommended

Note 10-6

Lithium levels should be monitored 12 hours after dose, twice weekly until condition stabilises, then once every month.

Or

- Sodium valproate, oral,
Adults
 250-750 mg 12 hourly (controlled release preferable)
Children
 < 18 years; not recommended

Or

- Carbamazepine, oral,
Adults
 200-800 mg 12 hourly (controlled release preferable)
Children
 < 18 years; not recommended

REFERRAL CRITERIA

Refer all patients suffering a first episode, not responding to treatment after one month and all children to a psychiatrist.

76. Alcohol Withdrawal Syndromes

These occur following sudden withdrawal from alcohol. They are often seen 12 to 18 hours after the last drink, but may be earlier and are worst between 24 to 48 hours after onset. This commonly occurs in patients admitted to hospital for other problems e.g. arising from accidents or physical illnesses, which keeps them from drinking. The presentation varies from minimal tremors to states of full-blown agitation and confusion, which are potentially fatal.

CAUSES

- Abrupt cessation or significant reduction in alcohol intake in an individual with heavy drinking over many months or years

	Minor Withdrawal	Alcoholic Hallucinosis	Alcoholic Seizures
Onset	12 to 18 hours after last drink, but may be earlier. Peaks between 24-48 hours	12-24 hrs after cessation of drinking and generally stops within 48 hours	7-36 hours after the last drink but may be earlier.
Symptoms	Shaky hands Headaches Insomnia Mild anxiety Nausea, Vomiting Sweating	Sensation of objects crawling on body “Seeing” objects not really present “Hearing” noises or voices nobody else can hear.	sudden generalised seizures in a chronic alcoholic

	Minor Withdrawal	Alcoholic Hallucinosis	Alcoholic Seizures
Signs	Increased pulse rate Raised blood pressure	The vivid hallucinations occur in clear consciousness. Pulse, Blood Pressure and respiration are within normal limits	generalised seizures

TREATMENT

Treatment objectives

- To stabilise pulse and blood pressure
- To prevent dehydration
- To treat presenting conditions like malaria etc.
- To relieve pain, tremors and seizures
- To stop hallucinations

Non-pharmacological treatment

- Sit or lie in a quiet place
- Physical restraints may be required temporarily for very agitated patients
- Encourage intake of fluids as can be tolerated to prevent dehydration

Pharmacological treatment

1st Line Treatment

Evidence Rating [A]

- Haloperidol, oral/IM,
Adults
5 mg 8 hourly as required until hallucinations cease.

Children

Refer to specialist

Or

- Olanzapine, oral,
Adults
5-10 mg 24 hourly (max. of 10 mg 12 hourly)

Children

> 12 years; 2.5-5 mg stat.

Then

May be increased up to 10 mg (max. 5 mg 12 hourly)

REFERRAL CRITERIA

Refer all patients with alcohol withdrawal syndromes to a psychologist or psychiatrist. Also refer all children to a paediatrician.

77. Alcoholic Delirium Tremens

This is the most dramatic withdrawal syndrome. It usually starts 2-3 days after drinking stops. On average, the syndrome lasts 3 days but may continue for much longer. Without good supportive care and adequate treatment, Delirium Tremens (DT) is associated with significant mortality.

Risk factors include long history of heavy alcohol use, previous history of DT, concurrent illness, significant alcohol level during withdrawal, long duration since last drink (over 48 hours) and age over 30 years.

CAUSES

- Sudden withdrawal of alcohol from a long-term chronic user of alcohol

SYMPTOMS

- Restlessness
- Shaking of hands, whole limbs or body
- Sweating
- Confusion
- Inappropriate behaviour
- Unintelligible speech
- Misidentification
- Seeing or talking to imaginary objects

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.)
- Fever $> 38^{\circ}\text{C}$.
- Pulse > 100 beats/minute, Blood Pressure $> 160/100\text{mmHg}$

INVESTIGATIONS

- Full Blood Count
- Liver Function Tests
- Screen for malaria and common infections

TREATMENT

Treatment objectives

- To relieve agitation and calm patient
- To correct fluid and electrolyte imbalance
- To prevent complications like seizures, development of amnesia and encephalopathy
- To prevent or manage heart complications if present

Non-pharmacological treatment

- Seclusion of the patient
- Application of restraints as necessary
- Psychotherapy and psychoeducation

Pharmacological treatment

Evidence Rating: [A]

A. For control of seizures

- Lorazepam, IV, IM or oral,
Adults

Days 1 to 3: 2-4 mg once daily

Days 4 and 5: 1-2 mg once daily

Or

- Diazepam, IV, (administer slowly-over 2-3 minutes, approximately 2.5 mg every 30 seconds)

Adults

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

Note 10-7

It is best to give benzodiazepines as needed rather than on a fixed dose schedule.

Withhold if patient is asleep or has slurred speech, ataxia, nystagmus or over sedated.

Or

- Chlordiazepoxide, oral,
Adults

50-100 mg 4 hourly as required (max. 300 mg)

And

- Thiamine, oral, IM or IV,
Adults (oral, IM, IV)

100 mg daily for 3 days (before any IV Glucose load)

And

- Folic Acid, oral,
Adults

1 mg daily as needed

And

- Dextrose saline (5% glucose in 0.9% saline), IV,
Adults

As necessary

B. For patients with seizures not controlled by benzodiazepines alone

- Lorazepam, IV, IM or oral,

Adults

Days 1 to 3:	2-4 mg once daily
Days 4 and 5:	1-2 mg once daily

Or

- Diazepam, IV, (administer slowly-over 2-3 minutes, approximately 2.5 mg every 30 seconds)

Adults

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

And

- Phenobarbitone, slow IV or IM,

Adults

0.5-1.5 mg/kg 12 hourly

REFERRAL CRITERIA

Refer patients whose symptoms are difficult to control within 3 days or who remain agitated despite being given over 20 mg diazepam within 4 hours to a specialist.

Refer patients to a psychiatrist or clinical psychologist for consideration of other treatment options to assist long-term abstinence and rehabilitation after acute phase is over.

78. Anxiety Disorders

Anxiety is a common symptom that occurs in all psychiatric disorders including depressive illness and most psychoses. Physical diseases like hyperthyroidism, cardiac disease or hypertension may also present with anxiety and therefore must be excluded.

There are various forms of anxiety disorders (e.g. generalized anxiety disorders, panic disorders, phobias, obsessive compulsive disorder, acute stress disorder, post traumatic stress disorder, etc.), but the common ones seen in general practice are generalized anxiety disorders and panic disorders.

In all cases of suspected anxiety disorders, it is important to assess the scope of the anxiety, including the antecedents, behaviour and consequences of anxiety for the patient through an indepth interview. It is also important to ask about the presence of obsessive thoughts and/or compulsions as these are increasingly common and tend not to be reported out of embarrassment but which lead to much personal distress. In this case refer to a psychiatrist.

In generalized anxiety disorders, 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.

A panic disorder refers to a pattern of recurrent unexpected attacks of intense fear or discomfort over a discrete period more than 3 times a week. 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.

GENERALIZED ANXIETY DISORDERS

CAUSES

- Multiple negative life experiences
- Environmental factors
- Personality trait
- Genetic predisposition

SYMPTOMS

- Excessive anxiety and worry occurring on most days, for at least 6 months
- Anxiety or worry 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 wakening)
 - Palpitations

SIGNS

- Restlessness
- Sweating
- Anxious mood
- Tachycardia
- Tremors

INVESTIGATIONS

- None to confirm the diagnosis.
- Tests to exclude probable differential diagnoses such as hyperthyroidism, phaeochromocytoma, cardiac arrhythmias etc.

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 physical exercise if possible
- Encourage healthy social activities
- Cognitive Behaviour Therapy

Pharmacological treatment

A. For anxiety with somatic complaints

1st Line Treatment

Evidence Rating: [B]

- Sertraline, oral,

Adults

50 mg as a single oral evening dose;

Then

Increase by 25 mg at 1 week intervals, if necessary, to a max. of 200 mg

Children

12-18 years; 50 mg daily

6-12 years; 25 mg daily

< 6 years; not recommended

Or

- Fluoxetine, oral,

Adults

10 mg daily,

Then

Increase up to 60 mg daily if necessary

Children

7-18 years; 10 mg daily

Then

Increase to 20 mg after 1-2 weeks if necessary

Or

- Amitriptyline, oral,

Adults

25-50 mg daily (as a single evening dose)

Children

> 12 years; 10 mg daily (as a single evening dose) max.

20 mg

Or

- Imipramine, oral,

Adults

25-50 mg daily (as a single evening dose)

Children

Not recommended for this indication

B. For anxiety with prominent somatic complaints

- Propranolol, oral,
Adults
10-80 mg 12 hourly

C. Additional treatment for anxiety with significant distress

- Diazepam, oral,
Adults
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)
Children
1-12 years; 1.25-5 mg 6 hourly as needed

REFERRAL CRITERIA

Refer to a clinical psychologist for Cognitive Behaviour Therapy and other non-pharmacological treatment modalities. Refer to a psychiatrist in severe cases not responsive to drug treatment.

PANIC DISORDERS

CAUSES

- Largely unknown
- Misinterpretation of normal internal body stimuli (e.g. a quickened heart beat interpreted as a heart attack or serious illness, etc).
- Misinterpretation of external stimuli (crowds, enclosed spaces such as moving vehicles, lifts, etc.) as signalling danger
- Contributing factors:
 - Stress
 - Genetic predisposition

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
- Sweating

INVESTIGATIONS

- None diagnostic

TREATMENT**Treatment objectives**

- To stop the attacks of panic or at least reduce the frequency and intensity of symptoms to a minimum
- To help return to normal activities of daily living
- To prevent recurrence of symptoms

Non-pharmacological treatment

- Rebreathing in and out of a paper bag closed around lips and nose (avoid polythene bags, try large paper envelopes)
- Eliminate caffeine-containing foods e.g. coffee, tea, cola and chocolates, from their diet, as they tend to worsen anxiety
- Relaxation training
- Cognitive Behaviour Therapy

Pharmacological treatment**A. Initial management for patients unresponsive to non-pharmacological treatment**

1st Line Treatment

Evidence Rating: [B]

- Fluoxetine, oral,
Adults

10 mg daily (as a single morning dose)

Then

Increase up to 60 mg daily if necessary

Children

6-18 years; 10 mg daily

Then

Increase up to 20 mg after 1-2 weeks if necessary

Or

Sertraline, oral,

Adults

25 mg daily (as a single evening dose)

Then

Increase to 50 mg after 1 week if necessary

Then

50 mg weekly to a max. of 200 mg daily if necessary

Children

Not recommended

Or

- Imipramine, oral,
Adults

25-50 mg daily (as a single evening dose) max. 150 mg daily

Children

Not recommended for this indication

B. For very frequent panic attacks

- Lorazepam, oral,
Adults
1-4 mg daily for 2 weeks
Children
2-18 years; 0.05 mg/kg daily for 2 weeks

C. For anticipated anxiety attacks

- Lorazepam, oral,
Adults
1-4 mg stat.
Children
0.25-0.5 mg stat.

D. For Acute Symptomatic Control

- Lorazepam, oral,
Adults
1-4 mg 8-12 hourly as required (max. 10 mg daily)
Children
Not recommended for this indication
Or
- Alprazolam, oral,
Adults
0.25-0.5 mg 6-8 hourly
Increase if necessary every 3-4 days, max. 4 mg daily
Children
< 18 years; not recommended
Or
- Diazepam, oral,
Adults
2-5 mg 12 hourly for 2 weeks and gradually taper off over the next 2 weeks.
(Do not give for more than one month continuously)
Children
1-12 years; 1.25-5 mg 6 hourly as needed

Note 10-8

Duration of treatment for recurrent cases should be at least 6 weeks and should be continued for up to 6 months or more after attacks have remitted to prevent early relapse. Wean off slowly over a month or more.

REFERRAL CRITERIA

Refer children with symptoms suggestive of a panic disorder to a paediatrician. Also refer patients to a psychologist for Cognitive Behaviour Therapy and to a psychiatrist for additional drug therapy where indicated.

79. Substance Use Disorders

Abuse of substances such as marijuana, benzodiazepines, heroine, cocaine etc. is prevalent in many communities around the country. Typically, individuals with such disorders request help only after they are forced to do so by family members. They may also begin to have withdrawal symptoms when on admission for serious physical illness. This is because they have no access to the substance being abused. This may complicate treatment of the primary disease for which they were admitted.

CAUSES

- Social factors
 - Peer pressure (e.g. family members, friends)
 - Lack of coping skills (e.g. with life's difficulties, aids to coping in times of trouble)
- Addiction
- Tolerance (increased requirement of substance to maintain the same feeling)
- Withdrawal effects (unpleasant effects lead to a return to drug use)

SYMPTOMS

Cannabis withdrawal

- Insomnia
- Shakiness
- Irritability
- Restlessness
- Anxiety
- Anger
- Onset: Within 24 hours of drug use
- Duration: 1-2 weeks

Benzodiazepine withdrawal

- Anxiety
- Headache
- Insomnia
- Muscle aching and twitching
- Perceptual changes
- Feelings of unreality
- Depersonalization
- Seizures
- Onset: 1-10 days (depending on half-life of drug)
- Duration: 3-6 weeks (may be longer)

Opioid withdrawal

- Anxiety

- Craving
- Muscle tension
- Muscle and bone ache
- Muscle cramps and sustained contractions
- Sleep disturbance
- Sweating
- Hot and cold flushes
- Piloerection
- Yawning
- Lacrimation and rhinorrhoea
- Abdominal cramps
- Nausea, vomiting and diarrhoea
- Palpitations
- Elevated pulse and blood pressure
- Dilated pupils
- Onset: 6-24 hours (may be later with longer-acting opioids)
- Duration: peaks 2-4 days, ceases 5-10 days (more prolonged for longer-acting opioids)

Psychostimulant withdrawal

- Crash (fatigue, flat affect, increased sleep, reduced cravings)
- Withdrawal (fluctuating mood and energy levels, cravings, disturbed sleep, poor concentration)
- Extinction (persistence of withdrawal features, gradually subsiding)
- Onset: 6-12 hours (cocaine); 12-24 hours (amphetamines)
- Duration: Several weeks for withdrawal phase, then months for extinction

SIGNS

Cannabis withdrawal

- Same as symptoms

Benzodiazepine withdrawal

- Same as symptoms

Opioid withdrawal

- Same as symptoms

Psychostimulant withdrawal

- Same as symptoms

INVESTIGATIONS

- Toxicology screen for suspected substances

Box 10-2: Screening of patients suspected of substance abuse**Physical appearance**

- Sweating, tremor, agitation, problem with coordination, gait. Rate these appearances and reassess them at regular intervals to monitor the progress of symptoms. If symptoms are increasing in severity, notify a senior staff member, or if available, a doctor

Suicide risk assessment

- To determine the level of risk at a given time and to provide appropriate clinical care and management. Possible suicidal behaviour includes thinking about suicide, harming oneself or attempting suicide.
- Screening questions of suicide risk:
- Have things been so bad lately that you have thought you would rather not be here?
- Have you had any thoughts of harming yourself?
- Are you thinking of suicide?
- Do you have any plans to commit suicide?
- Have you ever tried to harm yourself?
- Have you made any current plans?
- Do you have access to any thing with which to hurt yourself?

Mental state examination

- To determine:
- The need for other psychological therapies
- Concomitant psychiatric conditions which place the patient or others at risk
- The patient's capacity for informed consent and active participation in treatment planning

Assessment of psychosocial factors affecting withdrawal

- Ask patient about:
- Reasons for presenting for withdrawal management at this time
- Past experiences, current knowledge and fears of withdrawal
- Perceived ability to cope with withdrawal and its treatment.
- Family supports and social networks available for withdrawal treatment:
- Potential barriers to successful withdrawal
- Care of children (assess possible neglect or physical or sexual abuse of children or exposure to such harm from others and intervene to protect as soon as possible or refer to appropriate agency)
- Drug use of cohabitants
- Current legal issues
- Financial problems
- Work commitments

TREATMENT**Treatment objectives**

- To provide supportive care (information, stress reduction, reassurance)
- To teach coping skills (relaxation techniques, dietary guidelines, methods to reduce craving for the substance, sleep disturbance management)
- To manage difficult behavior (anxiety, agitation, panic and aggression)

- To manage confusion, disorientation and hallucinations
- To plan an organised discharge, follow up and after-care to prevent relapse

Non-pharmacological treatment

- Cognitive Behaviour Therapy
- Stress management to reduce craving

Pharmacological treatment

A. Management of withdrawal symptoms - cannabis

- Requires no medical intervention

B. Management of withdrawal symptoms - stimulants

- Requires observation but does not require a specific intervention

C. Management of withdrawal symptoms - benzodiazapines

- Substitute with equivalent dose of benzodiazepine for a few days, then taper off dose over 2-3 weeks

D. Management of withdrawal symptoms - opiates

- Oral rehydration fluids or IV fluids may be required
- Long acting benzodiazepines e.g. diazepam, to control insomnia and muscle cramps (See drug doses under appropriate sections)
- Anti-emetics e.g. promethazine etc., for nausea and vomiting (See drug doses under appropriate sections)
- Methadone, buprenorphine and clonidine may be used, where available and with caution, to reduce the severity of symptoms (See drug doses under appropriate sections)
- NSAIDs e.g. ibuprofen, diclofenac etc., for pain relief (See drug doses under appropriate sections)

REFERRAL CRITERIA

Refer for specialist psychiatrist/clinical psychologist care and management if withdrawal symptoms are particularly distressful and do not respond to treatment or when there are repeated relapses.

Refer for Cognitive Behaviour Therapy to a clinical psychologist.

80. Autistic Spectrum Disorder

Autism is a neurodevelopmental disorder characterized by qualitative impairments occurring in a child before the age of 36 months, in three key areas; social interaction (often the earliest features of Autistic Spectrum Disorder-ASD), communication, interests and activities.

The clinical presentation is varied and may encompass children with severe manifestations of the above features or with more subtle behavioural deficits, hence the use of the term Autistic Spectrum Disorder. Learning disability in this condition is very common and the risk of epilepsy is significant.

ASD is increasingly being recognized in Ghana.

CAUSES

- No clear aetiology
- Genetic

SYMPTOMS

- Absence of joint attention (i.e. failure to show interest, follow gaze, lack of social smiling and limited use of gestures e.g. shaking head, waving or clapping)
- Communication deficit
 - Receptive: fails to acquire language or delays in understanding language
 - Expressive: delays in use of language
- Limited range of interests (limited play with toys and other objects)
- Repetitive activities (e.g. spinning objects)
- Global developmental delays (e.g. walking, speech etc.)
- Learning difficulties
- Attention deficit
- Sleeping difficulties
- Feeding difficulties

SIGNS

- Lack of pointing to objects by 24 months
- No single words by 18 months
- No two word spontaneous phrase by 24 months
- Loss of language
- Avoidance of eye contact

INVESTIGATIONS

- Usually none required
- Electroencephalogram (EEG) if seizures suspected
- Brain CT or MRI only in special circumstances e.g. abnormal physical features present

TREATMENT

Treatment objectives

- To correct social communication difficulties using a multidisciplinary behavioural and educational approach

Non-pharmacological treatment

- Applied Behaviour Analysis (ABA) - teaching based on teacher request, prompt assistance to child, child response and feedback

Pharmacological treatment

A. For aggression, irritability or self-mutilation

Evidence Rating: [B]

- Risperidone, oral,
Children

5-18 years (body weight > 50 kg); 0.5 mg daily. May increase by 0.5 mg on alternate days (max. 1 mg daily)
5-18 years (body weight < 50 kg); 0.25-0.5 mg daily. May increase by 0.25 mg on alternate days (max. 0.75 mg daily)
< 5 years; not recommended

B. For sleep problems

Evidence Rating: [B]

- Melatonin, oral,
Children

1 month-18 years; 2-3 mg daily (before bedtime)

Then

Increase if necessary after 1-2 weeks to 4-6 mg (daily before bedtime) max. 10 mg

C. For significant hyperactivity-in children \geq 4 years

Evidence Rating: [B]

- Methylphenidate, oral,
Children

6-18 years; 5 mg 12-24 hourly

Then

Increase if necessary at weekly intervals by 5-10 mg (max. of 20 mg 8 hourly)

4-6 years; 2.5 mg 12 hourly

Then

Increase if necessary by 2.5 mg at weekly intervals (max. 0.4-0.5 mg/kg 8 hourly)

Note 10-9

Discontinue if there is no response after a month

REFERRAL CRITERIA

All suspected cases of autism should be referred to a Tertiary centre.

Chapter

11

DISORDERS OF THE SKIN

Bacterial Skin Infections

81. Boils

A boil or furuncle is a deep bacterial infection of the hair follicles. A more superficial infection is termed folliculitis. Several boils grouped in an area and discharging pus from several points is termed a carbuncle. Patients with recurrent boils or carbuncles should be screened for diabetes mellitus and skin disorders such as scabies, pediculosis or eczema while patients with repeated folliculitis in the shaving areas, e.g. face and armpits should be educated on shaving techniques.

CAUSES

- *Staphylococcus aureus*

SYMPTOMS

- Single or multiple painful swellings on the skin which may discharge pus
- Fever

SIGNS

- Swellings - purulent, warm, fluctuant and/or tender (in single or multiple areas of skin)

INVESTIGATIONS

- FBC
- Fasting blood glucose (if diabetes suspected)
- Swabs for culture and sensitivity in persistent or recurrent infection

TREATMENT

Treatment objectives

- To treat infection
- To relieve pain
- To identify and treat any predisposing condition
- To prevent scars and keloids

Non-pharmacological treatment

- Incision and drainage - if boil becomes fluctuant and large
- Wound dressing

Pharmacological treatment1st Line Treatment

Evidence Rating: [B]

A. For boils or furunculosis in patients without penicillin allergy

- 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

B. For boils or furunculosis in patients with penicillin allergy

- 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

And

- Paracetamol, oral,

Adults

500 mg -1 g 6 to 8 hourly for 3-5 days

Children

6-12 years; 250-500 mg 6 to 8 hourly for 3-5 days

1-5 years; 120-250 mg 6 to 8 hourly for 3-5 days

3 months-1 year; 60-120 mg 6 to 8 hourly for 3-5 days

C. For Folliculitis

- Mupirocin ointment, topical,

Adults and children

12 hourly for 7 days

REFERRAL CRITERIA

Refer to a specialist if the underlying condition requires further management.

82. Impetigo

Impetigo is a highly contagious superficial bacterial skin infection. It is common in neonates and children and may be associated with conditions such as scabies, eczema, lice infestation and herpes simplex infection as

secondary infection. The condition does not cause any symptoms until four to 10 days after initial exposure. It usually improves within a week of treatment.

There are two types of impetigo. The non-bullous type typically affects the skin around the nose and mouth, causing lesions to develop, that quickly burst to leave a yellow-brown crust. The other type, bullous impetigo, typically affects the trunk causing fluid-filled blisters (bullae) to develop that burst after a few days to leave a yellow crust.

Both types of impetigo may leave behind marks when the crusts have cleared up, but these usually improve over the following days or weeks.

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

- *Staphylococcus aureus*
- *Streptococcus pyogenes*

SYMPTOMS

- Pus-filled blisters and sores on the body or scalp

SIGNS

- Superficial, fragile fluid-filled blisters
- Irregular spreading ulcers with yellow crusts

INVESTIGATIONS

- Often no test required
- Microscopy and culture of the exudate from the blisters (except in recurrent or severe cases)

TREATMENT

Treatment objectives

- To eradicate infection
- To prevent transmission
- To reduce the risk of developing complications (e.g. cellulitis, septicaemia)
- To identify and treat any predisposing condition

Non-pharmacological treatment

- Antiseptic baths for all cases

Pharmacological treatment

A. Mild cases (few pustules without fever or systemic manifestations)

Evidence Rating: [B]

- Mupirocin ointment, topical,
Adults and children
Apply 12 hourly for 7 days

B. Moderate to severe or extensive cases in patients without penicillin allergy1st Line Treatment

- Cloxacillin, IV,

Adults

500 mg 6 hourly for 3 - 5 days

Children

10-18 years;

250-500 mg 6 hourly for 3-5 days

2-10 years;

125-250 mg 6 hourly for 3-5 days

< 2 years;

62.5-125 mg 6 hourly for 3-5 days

Then

- Flucloxacillin, oral,

Adults

500 mg 6 hourly for 5-7 days

Children

10-18 years;

250-500 mg 6 hourly for 5-7 days

2-10 years;

125-250 mg 6 hourly for 5-7 days

< 2 years;

62.5-125 mg 6 hourly for 5-7 days

Or

- Amoxicillin + Clavulanic Acid, oral,

Adults

625 mg 12 hourly for 5-7 days

Children

11-18 years;

625 mg 12 hourly for 5-7 days

6-10 years;

457 mg 12 hourly for 5-7 days

1-5 years;

228 mg 12 hourly for 5-7 days

< 1 year;

114 mg 12 hourly for 5-7 days

2nd line treatment

Evidence Rating: [B]

- Cefuroxime IV,

Adults

750 mg 8 hourly for 3-5 days

Children

1 month-18 years;

20 mg/kg 8 hourly for 3-5 days

Then

- Cefuroxime, oral,

Adults

250 mg 12 hourly

Children

12-18 years;

250 mg 12 hourly

2-12 years;

15 mg/kg 12 hourly, max. 250 mg 12 hourly

3 months-2 years;

10 mg/kg max. 125 mg 12 hourly

C. Moderate to severe or extensive cases in patients with penicillin allergy:

- Azithromycin, oral,

Adult

500 mg daily for 3-5 days

Children

10 mg/kg body weight daily for 3 days

< 6 months; not recommended because of a risk of pyloric stenosis

REFERRAL CRITERIA

Refer for hospital care and treatment if spreading rapidly or cellulitis, osteomyelitis or septicaemia develops.

83. Cellulitis and Erysipelas

(See section on 'Cellulitis' in Disorders of the Musculoskeletal system)

84. Buruli Ulcer

This is a chronic painless necrotising ulcer with undermined edges, which can lead to debilitating skin and soft tissue infection and permanent disfigurement. 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.

When detected early, the majority can be cured with a combination of antibiotics. Thus, early identification and appropriate management reduce morbidity and disability from this condition.

CAUSES

- *Mycobacterium ulcerans*

SYMPTOMS

- Painless subcutaneous nodule
- Painless swelling of the legs, arms or face
- Extensive skin ulceration

SIGNS

- Nodule: Painless firm lesion 1-2 cm in diameter situated in the subcutaneous tissue and attached to the skin
- Diffuse painless swelling of the legs, arms or face
- Large painless area of induration
- Extensive skin ulceration

INVESTIGATIONS

- Wound swab for AFBs, 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

1st Line Treatment

Evidence Rating: [A]

- Rifampicin, oral, 10 mg/kg daily for 8 weeks

And

- Streptomycin, IM, 15 mg/kg daily for 8 weeks

2nd Line Treatment

Evidence Rating: [C]

- Rifampicin, oral, 10 mg/kg daily for 8 weeks

And

- Clarithromycin, oral, 7.5 mg/kg 12 hourly for 8 weeks

REFERRAL CRITERIA

Refer to centres with expertise for managing buruli ulcer.

| Yaws

85. 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 pertenue*

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]

A. Single Dose Treatment for Yaws

- Azithromycin, oral,
Adults
30 mg/kg body weight (max. 2 g) as a single dose
Children
> 15 years; 2 g
10-15 years; 1.5 g
6-9 years; 1 g
6 months-6 years; 500 mg (syrup preferable)
< 6 months; not recommended

B. For Non-response or Non-availability of Azithromycin

- Benzathine Penicillin, IM,
Adults
1.2 million units stat.
Children
> 10 years; 1.2 MU stat.
< 10 years; 600 000 units stat.

|
YAWS

REFERRAL CRITERIA

Refer intractable cases to the dermatologist.

Fungal Skin Infections

86. Superficial Fungal Skin Infections

These are fungal infections that affect the outer layers of the skin, the nails and hair. When florid, it may be associated with immunosuppression such as in diabetes and retroviral infection and corticosteroid abuse.

CAUSES

- Dermatophytes (tinea) i.e. microsporum, epidermophyton, trichophyton
- Yeasts i.e. candida, malassezia

SYMPTOMS

- Itchy scaly ring shaped rash on the skin
- Scaly bald patches of the scalp
- Distorted, discoloured finger or toe nails
- Itchy and sore skin folds
- Scaly patches of skin with altered pigmentation

SIGNS

- 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 (hypopigmented or brownish appearance)
- Pustular rash in the flexures

INVESTIGATIONS

- Skin scrapings for microscopy and culture (mycology)
- Nail and/or hair clippings for microscopy and culture
- FBS and HIV status (if infection is florid and/or oral candidiasis present)

TREATMENT

Treatment/management objectives

- To eradicate infection
- To prevent transmission
- To identify and treat any predisposing conditions

Non-pharmacological treatment

- Good personal hygiene
- Use of loose clothing
- Open footwear

Pharmacological treatment

A. Dermatophyte infection of scalp (tinea capitis)

Evidence Rating: [C]

1st Line Treatment

- Griseofulvin, oral,

Adults

500 mg daily (double in severe infection) for 4 weeks

Children

1 month-12 years; 10 mg/kg (max. 500 mg) once daily or in two divided doses for 4 weeks

12-18 years; 500 mg once daily or in two divided doses (may be doubled in severe infections) for 4 weeks

2nd Line Treatment

- Terbinafine, oral,

Adults

Not recommended

Children

Children over 1 year;

Body weight > 40 kg; 250 mg once daily for 4 weeks

Body weight 20-40 kg; 125 mg once daily for 4 weeks

Body weight 10-20 kg; 62.5 mg once daily for 4 weeks

B. Dermatophyte infection of body (tinea corporis), perineum (tinea cruris), hands (tinea manuum) and feet (tinea pedis)

Evidence Rating: [C]

1st Line Treatment

- Benzoic Acid compound ointment (Whitfield's ointment), topical,

Adults and children

Apply twice daily to patches up to one or two weeks after the last visible rash has cleared

Or

- Clotrimazole 1%, topical,

Adults and children

Apply twice daily to patches up to one or two weeks after last visible rash has cleared

Or

- Miconazole 2%, topical,

Adults and children

Apply twice daily to patches up to one or two weeks after last visible rash has cleared

Or

- Ciclopirox olamine 1%, topical,

Adults and children

Apply twice daily to patches up to one or two weeks after last visible rash has cleared

2nd Line Treatment

- Griseofulvin, oral,

Adults

500 mg daily (double in severe infection) for 4 weeks

Children

12-18 years;

500 mg once daily or in two divided doses

(may be doubled in severe infections) for 4 weeks

1 month-12 years; 10 mg/kg (max. 500 mg) once daily or in two divided doses for 4 weeks

Or

- Itraconazole, oral,

Adults

200 mg once daily or 12 hourly for 7 days

Children

12 years-18 years; 200 mg daily for 7 days

1 month-12 years; 3-5 mg/kg (max. 100 mg) once daily for 15 days or 30 days (for tinea pedis and manuum)

Or

- Terbinafine, oral,

Adults

250 mg daily for 2-6 weeks

Children

Children over 1 year;

| Bodyweight > 40 kg; 250 mg once daily for 4 weeks,

6 weeks-3 months in nail infections

Body weight 20-40 kg; 125 mg once daily for 4 weeks

Body weight 10-20 kg; 62.5 mg once daily for 4 weeks

C. Dermatophyte infection of nails (onychomycosis)

Evidence Rating: [C]

1st Line Treatment

- Itraconazole, oral,

Adults

200 mg 12-24 hourly for 7 days, repeated courses after 21 days interval (max.of 2 courses for finger nails and 3 courses for toe nails)

Children

| 12 years-18 years; 200 mg 12 hourly for 7 days, repeated courses after 21 days interval (finger nails 2 courses, toe nails 3 courses)

1 year-12 years; 5 mg/kg (max 200 mg) daily for 7 days, repeated courses after 21 days interval (finger nails 2 courses and toe nails 3 courses)

Or

- Terbinafine, oral,

Adults

200 mg daily for 6 weeks-3 months

Children

Children over 1 year;

Bodyweight over 40 kg; 250 mg once daily for 6 weeks – 3 months

Body weight 20-40 kg; 125 mg once daily for 6 weeks – 3 months

Body weight 10-20 kg; 62.5 mg once daily for 6 weeks – 3 months

2nd Line Treatment

- Griseofulvin, oral,

Adults

500 mg daily (double in severe infection) for 4 weeks

Children

12-18 years; 500 mg once daily or in two divided doses
(may be doubled in severe infections) for 4 weeks

1 month-12 years; 10 mg/kg (max. 500 mg) once daily or in two divided doses for 4 weeks

D. For Candida intertrigo

Evidence Rating: [C]

- Benzoic Acid compound ointment (Whitfield's ointment), topical,
Apply twice daily to patches up to one or two weeks after the last visible rash has cleared.
- **Or**
- Clotrimazole 1%, topical,
Apply twice daily to patches up to one or two weeks after last visible rash has cleared
- **Or**
- Miconazole 2%, topical,
Apply twice daily to patches up to one or two weeks after last visible rash has cleared
- **Or**
- Ciclopirox olamine 1%, topical,
Apply twice daily to patches up to one or two weeks after last visible rash has cleared.

E. For Oral candidiasis and Pityriasis versicolor

Please refer to section on oral candidiasis and pityriasis versicolor

REFERRAL CRITERIA

Refer to a dermatologist if patient fails to respond to treatment.

87. Pityriasis Versicolor

Pityriasis versicolor is a common yeast infection of the skin, in which flaky discoloured patches appear on the chest and back. It is sometimes called tinea versicolor. It is more common in hot climates, and often affects people that perspire heavily. It is a disorder of the healthy but florid cases are seen in the immunosuppressed such as those with diabetes mellitus, HIV/AIDS and topical steroid abuse.

CAUSES

- *Pityrosporum orbiculare*
- *Pityrosporum ovale (malassezia furfur)*

SYMPTOMS

- Asymptomatic
- Mildly Itchy

- Pale or dark skin patches

SIGNS

- Hypopigmented macules and/or patches
- White scaly patches

INVESTIGATIONS

- Skin scraping for microscopy
- Fasting blood glucose (for florid cases)
- Retroscreen (for florid cases)

TREATMENT

Treatment Objectives

- To eradicate infection
- To prevent transmission
- To address predisposing factors

Non-Pharmacological Treatment

- Good personal hygiene
- Avoid sharing bath towels, sponges and clothing

Pharmacological Treatment

A. For Mild Tinea Versicolor

Evidence Rating: [C]

- Miconazole, 2%, topical,
Adults
12 hourly for 4 weeks
Children
> 2 years; 12 hourly for 4 weeks
< 2 years; 12 hourly for 4 weeks

Or

- Clotrimazole, 1%,
Adults
12 hourly for 4 weeks
Children
> 2 years; 12 hourly for 4 weeks

Or

- Whitfield's ointment, topical,
Adults
12 hourly for 4 weeks

Children

Not recommended

Or

- Selenium sulphide, shampoo 2.5%, topical,
Adults
Once daily for 5-7 days (washed off after 30 minutes to prevent irritation)
Children
Once daily for 5-7 days

< 5 years; not recommended

B. For Severe Tinea Versicolor

Evidence Rating: [B]

- Itraconazole, oral,
Adults

200 mg daily for 7 days

Children

> 12 years; 200 mg daily for 7 days

1 month-12 years; 3-5 mg /kg daily for 7 days

Caution 11-1.

Use of itraconazole is associated with potentially life-threatening liver-toxicity.
Monitor liver function while on long term therapy.

REFERRAL CRITERIA

Refer intractable cases to a dermatologist.

Viral Skin Infections

88. Herpes Simplex Infections

These are acute self-limiting viral infections of the skin and mucous membranes resulting in blistering eruptions usually seen on the face (called “cold sores”) or the genitalia. Recurrence is common on previously affected skin areas and is due to proliferation of virus within the epidermis of the affected dermatome. Extensive lesions may be associated with an immunocompromised state or atopy.

CAUSES

- Herpes simplex virus type 1
- Herpes simplex virus type 2

SYMPTOMS

- Fever
- Tingling, discomfort, or painful sensation over affected skin area
- Grouped small blisters
- General malaise

SIGNS

- Fever
- Tender grouped vesicles
- Regional lymphadenopathy
- Genital ulcers
- Oral ulcers

INVESTIGATIONS

- Usually none

- Diagnosis is mainly clinical
- HSV serology (if necessary)

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

Pharmacological treatment

A. Perioral or genital lesions

Evidence Rating: [B]

- Aciclovir cream 5%, topical,
 - Adults
4 hourly (five times daily) for 4-5 days
 - Children
4 hourly (five times daily) for 4-5 days

Note 11-1

Start immediately the premonitory symptoms are felt or within 48 hours of onset.

B. For severe primary infections, disseminated herpes simplex, frequent recurrences and immunosuppressed patients

- Aciclovir, oral,
 - Adults
400 mg 4 hourly (five times daily) for 5-7 days
 - Children
> 2 years; 200 mg 4 hourly (five times daily) for 5-7 days
1 month-2 years; 100 mg 4 hourly (five times daily) for 5-7 days
 - And**
 - Paracetamol, oral,
Adults
500 mg-1 g 6-8 hourly for 3-5 days
 - Children
6-12 years; 250-500 mg 6-8 hourly for 3-5 days
1-5 years; 120-250 mg 6-8 hourly for 3-5 days
3 months-1 year; 60-120 mg 6-8 hourly for 3-5 days

REFERRAL CRITERIA

Refer complicated cases to a dermatologist.

89. Herpes Zoster Infections

This is an acute painful blistering viral infection of the skin. It can occur in childhood but is much more common in adults, especially the elderly, sick or immunosuppressed. The primary infection presents as chickenpox (varicella), usually during childhood. Like herpes simplex, the virus persists usually in the anterior horn cells before it is reactivated. Post-herpetic neuralgia is a common complication and defined as persistence or recurrence of pain more than a month after the onset of shingles.

CAUSES

- Varicella-zoster virus

SYMPTOMS

- Fever
- Severe pain over areas involved
- Headache
- Blisters

SIGNS

- Fever
- Tender vesicles spread within one or more dermatomes unilaterally
- Regional lymphadenopathy

INVESTIGATIONS

- Usually none
- HIV screen (for recurrence and/or multi-dermatomal cases)

TREATMENT

Treatment objectives

- To provide adequate pain relief
- To prevent secondary bacterial infection
- To limit extent of disease spread in immuno-compromised patients
- To prevent complications

Non-pharmacological treatment

- Bed rest

Pharmacological treatment

Evidence Rating: [B]

A. Mild Herpes Zoster Infection

- Aciclovir cream 5%, topical,
 - Adults
4 hourly (five times daily) for 4-5 days
 - Children
4 hourly (five times daily) for 4-5 days

Note 11-2

Start immediately the premonitory symptoms are felt or within 48 hours of onset.

And

- Diclofenac, oral,
Adult
50 mg 8 hourly for 7 days

Or

- Ibuprofen, oral,
Children
5-10 mg/kg 6 hourly for 7 days

And

- Povidone iodine 10%, topical,
Adults
Apply to blisters daily till lesions resolve
Children
Apply to blisters daily till lesions resolve

B. Severe Herpes Zoster Infection

Evidence Rating: [B]

- Aciclovir, oral,
Adults
800 mg 4 hourly (five times daily) for 5-7 days
Children
> 12 years; 800 mg 4 hourly (five times daily) for 5-7 days
6-12 years; 800 mg 6 hourly for 5-7 days
2-6 years; 400 mg 6 hourly for 5-7 days
< 2 years; 200 mg 6 hourly for 5-7 days

And

- Diclofenac, oral,
Adults
50 mg 8 hourly for 7 days
Or
- Ibuprofen, oral,
Children
5-10 mg/kg 6-8 hourly for 7 days

And

- Povidone iodine 10%, topical,
Adults
Apply to blisters daily till lesions resolve
Children
Apply to blisters daily till lesions resolve

C. Post Herpetic Neuralgia

- Amitriptyline, oral,
Adults
25-50 mg daily till resolution
Children
Not indicated for this condition

Or

- Carbamazepine, oral,
Adults
50-150 mg 12 hourly till resolution (maximum 600 mg 12 hourly)

Children

12-18 years; 50-100 mg 12 hourly

Then

Increase to 600 mg 12 hourly if necessary

1 month-12 years; 2.5 mg/kg 12 hourly

Then

Increase slowly to 5 mg/kg 12 hourly

Or

- Pregabalin, oral,
Adults
75 mg 12 hourly till resolution
Children
Not recommended

REFERRAL CRITERIA

Refer complicated cases to a specialist.

90. Chicken pox

Chicken pox and shingles are caused by the same virus (Varicella or Herpes Zoster). Humans are the only source of infection for chicken pox and shingles. Person-to-person transmission occurs by direct contact with vesicular fluid from patients with either condition. Chicken pox may additionally be transmitted by airborne spread from respiratory tract secretions. There is a risk of infection up to 21 days after contact.

Chicken pox is a highly contagious viral illness usually occurring in epidemics. It is generally a benign, self-limiting disease in immunocompetent children but tends to be more severe in adolescents and adults and also in immunosuppressed patients e.g. patients on steroids. 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.

Exposure to the virus during the second 20 weeks of pregnancy can result in congenital varicella syndrome characterised by skin scarring, abnormalities of limbs, brain, eyes and low birth weight. Varicella infection can be fatal for an infant if the mother develops varicella from 5 days before to 2 days after delivery.

Shingles presents with skin lesions in a dermatomal distribution and in immunocompromised individuals, can be very extensive. It may be complicated by pain persisting for weeks to years after the infection

(postherpetic neuralgia).

CAUSES

- Varicella-Zoster (or Herpes Zoster) virus

SYMPTOMS

Chicken pox

- Fever
- Malaise
- Anorexia
- Headache
- Itchy skin rash

Shingles

- Painful rash
- Fever

SIGNS

Chickenpox

- Vesicular rash eventually becoming crusted
 - Rash in different stages (papules, vesicles, crusted lesions)
 - Appear first on face, scalp or trunk and spreads to rest of body, more concentrated on trunk
 - Persists for 5-7 days
 - Presence of pus in lesions suggests secondary bacterial infection

Shingles

- Vesicular rash
 - Along a dermatome
 - Rash eventually crusts

INVESTIGATIONS

- Usually none (diagnosis is mainly clinical)
- Polymerase Chain Reaction (PCR) or cell culture from vesicular fluid, crusts, saliva, cerebrospinal fluid or other specimens (if diagnosis in doubt)

TREATMENT

Treatment objectives

- To relieve the intense itching or pain
- To prevent or treat secondary infection
- To prevent dehydration in children

Non-pharmacological treatment

- Avoid scratching
- Regular bathing with soap and water
- Avoid intentionally breaking up vesicles

Pharmacological treatment

A. To relieve pain and fever

1st Line Treatment

Evidence Rating: [C]

- Paracetamol, oral,
Adults
500 mg-1 g 6-8 hourly for 3-5 days
Children
6-12 years; 250-500 mg 6-8 hourly for 3-5 days
1-5 years; 120-250 mg 6-8 hourly for 3-5 days
3 months-1 year; 60-120 mg 6-8 hourly for 3-5 days

B. To soothe the skin and relieve pruritus

- Calamine lotion/cream, topical, apply liberally to the skin

And

- Cetirizine oral,
Adults
10 mg daily
Children
12-18 years; 10 mg daily
6-12 years; 5 mg 12 hourly
1-6 years; 2.5 mg 12 hourly
Or
- Promethazine hydrochloride, oral, (sedating)
Adults
25 mg daily or 8 hourly daily
Or
- Chlorpheniramine maleate, oral,
Adult
4 mg daily or 12 hourly daily
Children
6-12 years; 2 mg 6-12 hourly daily (max. 12 mg daily)
2-6 years; 1 mg 6-8 hourly (max 6 mg daily)
1-2 years; 1 mg 12 hourly

C. Antiviral therapy in immunocompetent individuals for Post exposure prophylaxis

- Aciclovir, oral,
Adults
800 mg 4-6 hourly for 5 days
Children
20 mg/kg 6 hourly (max 800 mg 6 hourly)

D. Antiviral therapy in Immuno-compromised patients (e.g. HIV)

- And
- Aciclovir, oral,
Adults
800 mg 4 hourly (5 times daily) for 7 days or until 2 days after crusting of lesions
Children
12-18 years; 800 mg 4 hourly (5 times daily) daily for 7

days (continue for 2 more days after crusting of lesions
6-12 years; 800 mg 4 hourly (5 times daily) for 7 days
(continue for 2 more days after crusting of lesions
2-6 years; 400 mg 4 hourly (5 times daily) for 5 days
(continue for 2 more days after crusting of lesions)
1 month-2 years; 200 mg 4 hourly (5 times daily) for 5 days
(continue for 2 more days after crusting of lesions)

E. Superimposed bacterial skin infection in individuals not allergic to penicillins

Evidence Rating: [C]

- Flucloxacillin, oral,

Adults

250-500 mg 6 hourly for 5-7 days

Children

10-18 years; 250-500 mg 6 hourly 5-7 days

2-10 years; 125-250 mg 6 hourly 5-7 days

< 2 years; 62.5-125 mg 6 hourly 5-7 days

Or

- Amoxicillin + Clavulanic Acid, oral,

Adults

625 mg 12 hourly for 5-7 days

Children

10-18 years; 625 mg 12 hourly for 5 days

6-10 years; 457 mg 12 hourly for 5 days

1-5 years; 228 mg 12 hourly for 5 days

F. Superimposed bacterial skin infection in individuals allergic to penicillin

- Azithromycin, oral,

Adult

500 mg daily for 3 days

Children

10 mg/kg body weight daily for 3 days

Not recommended for children less than 6 months because of a risk of pyloric stenosis

REFERRAL CRITERIA

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.

Non-Specific Skin Infections

91. Large Chronic Ulcers

An ulcer or sore is a breach in the continuity of the skin and the underlying tissue. Large ulcers can cause a lot of morbidity and lead to serious complications. Predisposing and underlying disease needs to be investigated. Complications include deformity, ankylosis of joints, osteomyelitis, cellulitis and malignant transformation of ulcers. Surgical treatment may be needed.

CAUSES

- Infections and infestations e.g. Buruli ulcers, yaws ulcers, tuberculous ulcers, guinea worm ulcers
- Non-specific ulcers e.g. pressure (decubitus), traumatic, venous, diabetic, sickle cell ulcers, ischaemic
- Malignant ulcers e.g. squamous cell carcinoma, melanoma, Kaposi's sarcoma

SYMPTOMS

- Pain
- Loss of sensation at site of ulcer
- Discharge, which may be offensive
- Severe disfigurement
- Disability

SIGNS

- Sloping edges (non-specific ulcers)
- Undermined edges (buruli and tuberculous ulcers)
- Punched out edges (yaws ulcers)
- Raised everted edges (malignant ulcers)
- Loss of sensation in affected part (diabetes, leprosy, yaws or syphilis ulcers)
- Deformity of affected part
- Wound discharge (purulent or offensive)
- Gangrene of affected part (diabetes, peripheral vascular disease)
- Darkening of affected area (peripheral vascular disease, venous insufficiency)
- Pink granulation tissue without slough (healthy wound)

INVESTIGATIONS

- FBC, ESR
- 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 identify and manage any underlying cause
- To prevent complications

Non-pharmacological treatment

- Change dressing daily
- Use absorbent dressing for wounds that have profuse discharge
- Deslough wounds that have adherent slough
- Elevate lower limb on sitting
- Adequate nutrition

Pharmacological treatment

Evidence Rating: [C]

- A. For non-antiseptic wound cleansing
 - Normal saline solution (Do not use Eusol)
- B. For antiseptic wound cleansing
 - Evidence Rating: [C]
 - Chlorhexidine solution 4%, topical,
Or
 - Cetrimide 15%, topical,
Or
 - Povidone iodine solution 10%, topical,
- C. Systemic antibiotic treatment for secondary bacterial infections
 - Specific antimicrobial treatment is guided by culture and sensitivity results.

Empiric antibiotic treatment may be initiated while awaiting culture and sensitivity results based on suspected or likely organisms.

Note 11-3

Avoid topical antibiotics as there is insufficient evidence for their effectiveness

REFERRAL CRITERIA

Refer patients with ulcers failing to show signs of healing with above treatment, and patients who would require surgery either for skin grafting, wound excision or limb amputation to a surgical specialist. All ulcers suspected to be malignant should also be referred to a surgical specialist.

92. Pruritus

Pruritus or itching is an unpleasant sensation on the skin that provokes the desire to rub or scratch the area. Itching can cause discomfort and frustration. In severe cases it can lead to disturbed sleep, anxiety and depression. Constant scratching to obtain relief can damage the skin and reduce its effectiveness as a major protective barrier. Treatment of pruritus must address the underlying condition. Diagnosis therefore needs to be made for effective treatment.

CAUSES

Localised pruritus (confined to a certain part of the body)

- Seborrhoiec dermatitis
- Pruritus vulvae
- Anogenital pruritus
- Tinea infections
- Gravitational eczema
- Lichen simplex chronicus

Pruritic skin disorders (due to a primary skin disease)

- Atopic eczema
- Dry skin
- Allergic contact dermatitis
- Urticaria
- Scabies
- Prurigo
- Miliaria (heat rash)
- Pediculosis
- Insect bites
- Dermatitis herpetiformis
- Lichen planus
- Bullous pemphigoid

Generalised pruritus (usually due to a systemic disease)

- Haematological e.g. iron deficiency anaemia, polycythaemia rubra vera, lymphomas, leukaemias
- Liver disease e.g. intrahepatic or extrahepatic cholestasis, primary biliary cirrhosis, hepatitis
- Chronic kidney disease
- Thyroid disease
- Pregnancy
- Diabetes mellitus
- Carcinomas
- Drug reaction
- Onchocerciasis
- Psychogenic

SYMPTOMS

- Itching

- Scratching

SIGNS

- Excoriation
- Lichenification
- Scars
- Features of underlying conditions

INVESTIGATIONS

- FBC, film comment
- BUE, Creatinine
- LFTS
- FBS
- Thyroid function test
- Skin snip and skin scrapings
- Stool RE

TREATMENT

Treatment objectives

- To relieve symptoms
- To identify and treat underlying disorder

Non-pharmacological treatment

- PRURITUS**
- Avoid or minimize exposure to any identifiable causative agents e.g. soaps, detergents, drugs, clothes or fabric, foods etc.
 - Good personal hygiene
 - Counselling (for psychogenic pruritus)

Pharmacological treatment

A. Symptomatic treatment

Evidence Rating: [C]

- Hydrocortisone 1%, topical, apply 12 hourly for 14 days

And

- Cetirizine, oral,

Adults

10 mg daily for 7 days

Children

7-18 years;

10 mg daily for 7 days

2-6 years;

5 mg daily for 7 days

< 2 years;

safety not established

Or

- Chlorpheniramine, oral,

Children

< 2 years;

1 mg 12 hourly for 5 days

B. For treatment of Scabies

Evidence Rating: [A]

- Permethrin lotion 1%, topical,

Adult

Apply to whole body and wash off after 8-12 hours

Repeat after 7 days

Children

Apply to whole body and wash off after 8-12 hours

Repeat after 7 days

< 2 months; not recommended

Note 11-4

Avoid contact with the mouth.

Refer patient to the clinical pharmacist for counselling on the use of permethrin lotion in children and for breastfeeding mothers.

Evidence Rating: [C]

- Benzyl benzoate 25% lotion, topical,

Adults

Apply over the whole body after a bath at night (except the face and head) for 3 nights [and wash off the next morning]

Children (> 2 years) (25% - half strength dilution)

Apply over the whole body after a bath at night (except the face and head) for 3 nights [and wash off the next morning]

Note 11-5

Treat all contact cases in same manner simultaneously.

Consult the clinical pharmacist for appropriate dilution and counselling on the use of benzylbenzoate in children.

Or

- Malathion 0.5%, topical,

Adults

Apply to whole body. Leave on for 24 hours and wash off. Repeat application after 7 days

Children

Apply to whole body. Leave on for 24 hours and wash off. Repeat application after 7 days

< 6 months; not recommended

Note 11-6

Clothing and bed linen must be changed and washed daily with a strong disinfectant and should be well dried and ironed or dry-cleaned.

Sexual and household contacts should also be treated.

C. For treatment of Candidiasis

- Clotrimazole 1%, topical,

Adults

Apply to affected area 12 hourly for 14 days

Children

Apply to affected area 12 hourly for 14 days

Or

- Miconazole 2%, topical

Adults

Apply to affected area 12 hourly for 14 days

Children

Apply to affected area 12 hourly for 14 days

D. For treatment of Miliaria (Prickly Heat, Heat Rash)

- Calamine lotion, topical,

Adults

Apply 12 hourly for 7 days

Children

Apply 12 hourly for 7 days

Or

- Zinc oxide cream, topical,

Adults

Apply 12 hourly for 7 days

Children

Apply 12 hourly for 7 days

E. For treatment of Atopic Eczema

- Aqueous cream, topical,

Adults and children

Apply as often as possible

Or

- Aqueous soap, topical,

Adults and children

Use as soap for bathing 12 hourly before applying cream

Or

- Salicylic Acid ointment, topical,

Adults and children

Apply as needed

F. For treatment of Atopic Eczema with acute flare-ups (see section on dermatitis)

- Topical steroids may be used in addition to the above for Atopic Eczema

And

- Hydrocortisone cream, 1% topical,

Adults and children

Apply 2-4 times daily

G. For treatment of Urticaria

- Cetirizine, oral,

Adults

10 mg daily for 7 days

Children

7-18 years;

10 mg daily for 7 days

2-6 years;

5 mg daily for 7 days

< 2 years; not recommended

Or

- Chlorpheniramine, oral,
Children
< 2 years; 1 mg 12 hourly for 5 days
(See section on 'Urticaria')

H. For treatment of Contact Dermatitis

- Hydrocortisone 1%, topical,
Adults and children
Apply 12 hourly for 14 days

I. For Insect Bites (e.g. Fleas, Bed Bugs)

Note 11-7

Sources of infestation such as combs, hat, clothing or bedding should be decontaminated by thorough washing, ironing or fumigation.

- Cetirizine, oral,
Adults
10 mg daily for 7 days
Children
7-18 years; 10 mg daily for 7 days
2-6 years; 5 mg daily for 7 days
< 2 years; 2.5 mg daily for 7 days
Or
- Chlorpheniramine, oral,
Children
< 2 years; 1 mg 12 hourly for 5 days

J. For treatment of Pediculosis (lice)

- Malathion 0.5%, topical,
Adults
Apply to whole body. Leave on for 24 hours and wash off. Repeat application after 7 days
Children
Apply to whole body. Leave on for 24 hours and wash off. Repeat application after 7 days
< 6 months; not recommended

REFERRAL CRITERIA

Refer to a dermatologist as soon as possible if diagnosis is unclear.

93. Urticaria

Urticaria or wheal is a transient, itchy swelling of the skin secondary to the release of histamine. Each episode of wheal may last a few minutes or several hours and may change shape. Wheals may be round, or form

rings, a map-like pattern or giant patches. The surface wheals may be accompanied by deeper swelling of mucous membrane such as the eyelids, lips, hands and other parts of the body. The deeper swelling is called angioedema.

Urticaria is classified as acute urticaria if the condition lasts less than six (6) weeks and chronic urticaria if it lasts more than six (6) weeks. Causes of acute urticarias can easily be identified as against those for chronic urticaria.

CAUSES

- Medicines e.g. penicillins, cephalosporins, aspirin, NSAIDS, toxoids, animal sera, morphine, radiocontrast media, ACE inhibitors
- Foods e.g. fish, nuts, eggs, chocolate, shellfish, pork, spices, milk, cheese, food dyes, additives
- Infections e.g. sepsis, hepatitis (viral)
- Latex e.g. gloves, medical equipment
- Medical conditions e.g. lupus erythematosus, lymphoma, polycythaemia
- Plants
- Idiopathic
- Environmental and physical factors
 - Pressure urticaria: wheals appear on the area of skin experiencing any form of pressure e.g. soles of feet after prolonged standing
 - Solar, cold and heat urticaria: wheals appear when exposed to these environments
 - Aquagenic urticaria: exposure to water leads to itchy wheals
 - Cholinergic urticaria: intense pruritic wheals are seen in response to sweating, exercise, emotions, and hot foods
 - Dermographism: linear wheals noticed as a result of scratching or pressure

SYMPTOMS

- Itching
- Wheals

SIGNS

- Wheals
- Demographism
- Angioedema

INVESTIGATIONS

- Usually none
- Full blood count (may show eosinophilia related to allergy or parasitic infestation or low white blood count from systemic lupus erythematosus)
- Stool RE
- Thyroid antibodies and function (in chronic urticaria if autoimmune origin is considered likely)

CHAPTER 11: DISORDERS OF THE SKIN

- Skin biopsy (if wheals are prolonged, to identify vasculitis)

TREATMENT**Treatment Objectives**

- To provide immediate relief
- To prevent complications such as anaphylaxis, shock or asphyxiation
- To identify possible underlying cause and address it.

Non-Pharmacological Treatment

- Avoid contact with or further use of the suspected allergen or causative agent

Pharmacological Treatment**A. Control of wheals and itching**

Evidence Rating: [C]

- Cetirizine, oral,

Adults

10 mg daily for 7 days

Children

7-18 years; 10 mg daily for 7 days

2-6 years; 5 mg daily for 7 days

< 2 years; 2.5 mg daily for 7 days

Or

- Chlorphenamine, oral,

Adults

4 mg 4-6 hourly

Children

6-12 years; 2 mg 4-6 hourly

2-6 years; 1 mg 4-6 hourly

1-2 years; 1 mg 12 hourly

Or

- Promethazine, oral,

Adults

25-50 mg 8-12 hourly

Children

10-18 years; 12.5-25 mg 8-12 hourly or 25 mg at night

5-10 years; 6.25-12.5 mg 12 hourly or 10-25 mg at night

2-5 years; 6.25 mg 12 hourly or 5-15 mg at night

< 2 years; not recommended

REFERRAL CRITERIA

Refer cases of chronic urticaria to a dermatologist.

94. Reactive Erythema and Bullous Reaction

These are immunologic reactions characterized by reddening 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 lesions 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, retrovirus, cytomegalovirus
- Mycoplasma pneumoniae infection
- Adverse drug reaction e.g. to sulphonamides, penicillin, NSAIDS, anticonvulsants etc.
- Malignancy

SYMPTOMS

- Fever
- Blisters
- Itchy rash
- Sore throat
- General malaise
- Discharging painful eyes
- Asymptomatic

SIGNS

- Fever
- Flaccid bullae
- Genital and/or oral ulcerations
- Denuded area of skin

INVESTIGATIONS

- FBC
- BUE & creatinine
- HIV screen
- Blood and wound cultures (if indicated)

TREATMENT

Treatment objectives

- To maintain adequate hydration
- To maintain adequate nutrition
- To correct electrolyte imbalance

CHAPTER 11: DISORDERS OF THE SKIN

- To maintain normal body temperature
- To prevent secondary infection
- To identify and eliminate underlying cause
- To prevent further exposure to the causative agent or drug

Non-pharmacological treatment

- Withdrawal of identifiable causative agent or drug
- Maintenance of adequate input and output of fluid
- Adequate oral fluids
- Prevent contact of ulcerated skin with contaminated linen using a nursing cradle
- Early ophthalmological consultation
- Nutritious diet

Pharmacological treatment**A. For adequate rehydration**

- Normal saline, IV,

B. For Pain and Fever

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

C. For Control of the Immune Process in patients who can swallow

Evidence Rating: [C]

- Prednisolone, oral, (at onset of condition)

Adults

0.5-1 mg/kg daily and taper off over 7-10 days

Children

0.5 mg/kg daily and taper off over 7-10 days

D. For Control of the Immune Process in patients who cannot swallow

- Hydrocortisone, IV,

Adults

100 mg 6 hourly until able to swallow

Then

- Prednisolone, oral, as above

Children

4 mg/kg 6 hourly until able to swallow

Then

- Prednisolone, oral, as above

E. To treat Secondary Bacterial Skin Infection or Mycoplasma Pneumonia

Evidence Rating: [B]

- Azithromycin, oral,
Adults

500 mg daily for 5 days

Children

10 mg/kg once daily for 5 days

< 6 months; not recommended

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

F. For prevention of skin infections

Evidence Rating: [C]

- Chlorhexidine solution 4%, topical,
Or
- Cetrimide 15%, topical,
Or
- Povidone iodine solution 10%, topical,

Note 11-8

Do not use silver sulfadiazine as it is a sulfa drug for skin care.

G. For oral ulcers

- Povidone iodine 1% mouthwash, 12 hourly
Or
- Chlorhexidine 0.12% mouthwash, 12 hourly

REFERRAL CRITERIA

Refer all patients to appropriate specialist.

95. Acne Vulgaris

Acne vulgaris (pimples or spots) is a common chronic inflammatory skin disorder involving the hair follicle and sebaceous gland which presents mainly in adolescence. A variety of spots appear mostly on the face and other parts of the body. Severe acne may require evaluation to exclude an underlying hormonal disorder. This condition may induce some psychological disturbances. The choice of treatment depends on age, severity, and whether the acne is predominantly inflammatory or

comedonal.

CAUSES

- Increased sebum secretion
- Abnormal keratinisation of the hair follicles (hereditary)
- Increased sensitivity of the sebaceous glands to male hormones
- *Propionibacterium acnes*
- Prolonged use of systemic and topical steroids e.g. Anabolic steroids such as danazol, stanozolol and nandrolone
- Use of pomades, especially products that contain lanolin, petrolatum, vegetable oils, butyl stearate, lauryl alcohol and oleic acid
- Contraceptive agents: medroxyprogesterone injection, implanted or intrauterine progesterone, and oral contraceptives
- Pregnancy
- Polycystic ovarian syndrome
- Adrenal disorders

SYMPTOMS

- Pimples (on the face and occasionally on the trunk, chest and shoulders)
- Greasy skin
- Facial disfigurement

SIGNS

- Comedones (blackheads and whiteheads)
- Papules
- Cysts
- Scars
- Nodules
- Pustules
- Hirsutism (suggest excess androgens)

INVESTIGATIONS

- Usually none
- Serum testosterone (in females with accompanying hirsutism and virilising features)
- Pelvic ultrasound (in females to exclude polycystic ovaries if hirsutism present)

TREATMENT

Treatment objectives

- To improve cosmetic appearance
- To prevent complications particularly scarring
- To reassure patient
- To identify and avoid any causative or contributing factors

Non-pharmacological treatment

- Counselling of patients

Pharmacological treatment

A. For mild to moderate acne

Evidence Rating: [A]

- Benzoyl peroxide 5% lotion, topical, apply daily (avoiding mouth, eyes and the mucous membranes)

And

- Clindamycin, 1% lotion or gel, topical, apply daily

Or

- Tretinoin 0.01% gel, topical, apply nocte (avoiding the sun, eyes, nostrils, mouth, mucous membrane and broken skin)

Caution 11-2.

Topical retinoids (Tretinoin) are contraindicated in pregnancy

Or

- Adapalene 0.1% cream or gel, topical, apply thinly once daily (at night before sleep)

B. For moderate to severe acne (or where topical therapy is ineffective or not tolerated)

Evidence Rating: [B]

Topical treatment from above (A)

And

- Doxycycline, oral,

Adults

100 mg daily for 6 weeks-6 months (depending on response to treatment)

Children

Not recommended

Or

- Tetracycline, oral,

Adults

250-500 mg 12 hourly for 6 weeks-6 months (depending on response to treatment)

Change medication to erythromycin after 4 months if response is poor

Children

> 12 years; same dose as for adults above

< 12 years; not recommended

Or

- Erythromycin, oral,

Adult

500 mg 12 hourly for 6 weeks-6 months

Children

> 12 years; 500 mg 12 hourly for 6 weeks - 6 months

1-12 years; 125 mg 12 hourly **Or** 250 mg once daily for

6 weeks-6 months

REFERRAL CRITERIA

Refer patients not responding to treatment to a dermatologist. Suspected underlying endocrine conditions should be referred to an endocrinologist.

96. Eczema

Eczema or dermatitis is an acute or chronic inflammatory reaction in the skin often due to an external (exogenous) or internal (endogenous) factor. Exogenous eczema (contact eczema) includes primary irritant dermatitis and allergic contact dermatitis. Endogenous eczema includes atopic eczema, seborrhoiec eczema, discoid eczema, asteatotic eczema, varicose eczema and endogenous hand and soles dermatitis.

Contact dermatitis may be an irritant (concentration dependent) or allergic (delayed hypersensitivity) reaction to specific external substance such as metals, rubber, chemicals etc. In contrast to the endogenous types, the skin reaction is confined to the areas directly in contact with the offending substance or allergen.

Atopic eczema is a common chronic but self-limiting pruritic skin disorder mainly of childhood but sometimes persists into adult life. The rash usually appears within the first year of life, mostly between ages 2 and 4 months. In older children the rash characteristically involves the flexural areas. A familial background of atopy (asthma, hay fever, eosinophilia, allergic rhinitis and similar skin problem) is often present. The condition is characterised by relapses and remissions.

Seborrhoiec eczema presents as a scaly, flaking, dry and reddened rash of the scalp, eyebrows, nasolabial folds, perioral, periorbital and periauricular skins. Sometimes it presents as hypopigmented macules. It may be associated with *Pityrosporum ovale* infection. Extensive forms are associated with immunosuppressive states, particularly HIV/AIDS and diabetes mellitus.

CAUSES

- Genetic
- Irritants (e.g. acids, alkalis, detergents, petroleum products)
- Allergens (e.g. nickel, rubber, additives, chromates, hair dyes, topical medicaments, plants, nail varnish, cosmetics etc.)
- Fungal infections (e.g. *Pityrosporum ovale*, dermatophytosis)
- Venous stasis (e.g. varicose veins, heart failure, lymphoedema)

SYMPTOMS

- Itchy skin
- Dry skin
- Weeping, reddened rash
- Relapses and remissions pattern

SIGNS

- Dry skin
- Scaly skin
- Erythema
- Excoriations
- Lichenification
- Post inflammatory hyperpigmentation or hypopigmentation
- Papules
- Vesicles
- Fissuring

INVESTIGATIONS

- Patch testing for contact dermatitis
- Skin scraping for fungal elements
- HIV screen (seborrhoiec eczema in adults)
- Fasting blood sugar (seborrhoiec eczema in adults)

TREATMENT

Treatment objectives

- To relieve or control symptoms
- To identify and avoid any causative or predisposing factors

| Non-pharmacological treatment

- Counselling of patients
- Avoidance of identifiable precipitating factors

| Pharmacological treatment

| Evidence Rating: [C]

A. For Atopic Eczema

- E45 cream, topical,
Adults
Apply 12 hourly
Children
Apply 12 hourly
Or
- Aqueous cream, topical,
Adults
Apply 12 hourly
Children
Apply 12 hourly
Or
- Shea butter, topical,
Adults
Apply 12 hourly
Children
Apply 12 hourly
Or
- Salicylic Acid ointment 2%, topical,

Adults

Apply 12 hourly

Children

Apply 12 hourly

And

- Oilitum soap (or bath gel), topical,

Adults

Apply 8-12 hourly

Children

Apply 8-12 hourly

And

- Hydrocortisone cream/ointment 1-2.5%, topical,

Adults

Apply 8-12 hourly

Children (1% cream)

3 months-12 years; apply thinly 12 to 24 hourly in area of rash

Or

- Mometasone lotion/ointment 0.1%

Adults

Apply thinly once daily

Children

Apply thinly once daily

Or

- Betamethasone cream/ointment 0.05-0.1%, topical,

Adults

Apply thinly 12-24 hours

Children (0.05%)

1-18 years; apply thinly 12 to 24 hours

And

- Chlorphenamine, oral,

Adults

4 mg 4-6 hourly or 4 mg once at night for 7 days

Children

6-12 years; 2 mg 4-6 hourly or 2 mg once at night for 7 days

2-6 years; 1 mg 4-6 hourly or 1 mg once at night for 7 days

1-2 years; 1 mg 12 hourly or 1 mg once at night for 7 days

B. Seborrhoic Eczema

Evidence Rating: [C]

- Miconazole, 2% plus hydrocortisone 1% cream, topical,

Adults

Apply 12 hourly till rash resolves

Children

Apply 12 hourly till rash resolves

Or

- Clotrimazole, 1% plus hydrocortisone 1% cream, topical,

Adults

Apply 12 hourly till rash resolves

Children

Apply 12 hourly till rash resolves

Or

- Ketoconazole shampoo, topical,

Adults

Apply twice weekly for 4 weeks with at least 3 days between each application

Children

12 -18 years (shampoo); Apply twice weekly for 4 weeks with at least 3 days between each application

< 12 years; safety and efficacy not established

Or

- Selenium sulphide shampoo

Adults

Apply whole body 2 times per week for 2 weeks initially

Then

Once every 1-2 weeks to control symptoms.

Allow to remain on the scalp for 2-3 minutes then rinse thoroughly

Children

| 5-18 years; same as adult dose

| < 5 years; not recommended

Or

- Itraconazole, oral,

Adults

| 100 mg daily for 3 weeks

Children

| > 12 years; 100 mg daily for 3 weeks

| 1 month-12 years; 3-5 mg /kg daily for 3 weeks

Caution 11-3.

Use of itraconazole is associated with potentially life-threatening liver-toxicity.
Monitor liver function while on long-term therapy.

C. For Contact Dermatitis

- Betamethasone cream/ointment, topical,

Adults (0.05-0.1%)

Apply thinly 12 - 24 hourly for 7 days

Children (0.05%)

1-18 years; apply thinly 12 - 24 hourly for 7 days

Or

- Mometasone lotion/ointment 0.1%

Adults

Apply thinly once daily for 7 days

Children

Apply thinly once daily for 7 days

D. For facial contact Eczema

- Hydrocortisone cream, 1% topical,
Adults and children
Apply 12 hourly

REFERRAL CRITERIA

Refer patients not responding to treatment and those needing further investigations such as patch testing to a dermatologist.

97. Intertrigo

Intertrigo is the term used to describe a rash in body folds or apposing skin surfaces such as axillae, groin, submammary regions, beneath an abdominal apron of fat, finger or toe web spaces. Affected skin is reddened and uncomfortable. Intertrigo is particularly common in those who are overweight and patients with diabetes mellitus.

Body folds (flexures) are prone to inflammatory rashes because of relatively high skin temperature and moisture from insensible water loss. Sweating that is not easy to evaporate and friction from movement of adjacent skin, results in the sore skin.

CAUSES

- *Candida albicans* (monilia)
- Tinea infection
- Eczema (e.g. seborrhoiec, atopic, contact)
- Psoriasis (flexural)
- Erythrasma

INTERTRIGO

SYMPTOMS

- Itchy, scaly rash
- Dry skin
- Weeping, reddened rash
- Discharging lesions

SIGNS

- Dry, scaly skin
- Erythema
- Excoriations
- Papules
- Vesicles
- Creamy satellite pustules at the margins of affected area
- Persistent brown patches
- Well-demarcated patches
- Plaques

INVESTIGATIONS

- Patch testing for contact dermatitis
- Skin scraping for fungal elements

- Fasting blood glucose
- Swab for culture and sensitivity

TREATMENT

Treatment objectives

- To relieve symptoms and/or associated discomfort
- To identify and treat any predisposing factors

Non-pharmacological treatment

- Wear loose cotton clothing and open footwear for aeration of folds
- Weight loss
- Avoid precipitating factors if any

Pharmacological treatment

A. For candida intertrigo, seborrhoeic eczema or tinea infection

Evidence Rating: [C]

- Miconazole 2% plus 1% hydrocortisone cream, topical,
Adults
Apply 12 hourly for 14 days
Children
Apply 12 hourly for 7 days

| Then

- Miconazole 2% cream, topical,
Adults
Apply 12-24 hourly till rash resolves
Children
Apply 12-24 hourly till rash resolves

| Or

- Clotrimazole 1% cream, topical
Adults
Apply 12-24 hourly till rash resolves
Children
Apply 12-24 hourly till rash resolves

| Or

- Miconazole, 2% powder, topical,
Adults
Apply 12-24 hourly till rash resolves
Children
Apply 12-24 hourly till rash resolves

| Or

- Clotrimazole, 1% powder, topical,
Adults
Apply 12-24 hourly till rash resolves
Children
Apply 12-24 hourly till rash resolves

Evidence Rating: [B]

- Itraconazole, oral,

Adults

200 mg daily for 7 days

Children

> 12 years; 200 mg daily for 7 days

1 month-12 years; 3-5 mg /kg daily for 7 days

Caution 11-4.

Use of itraconazole is associated with potentially life-threatening liver-toxicity.
Monitor liver function while on long-term therapy.

B. For Erythrasma

- Fusidic Acid, 2% cream, topical,
Adults

Apply 6-8 hourly to affected parts

Children

Apply 6-8 hourly to affected parts

Or

- Clarithromycin, oral,
Adults

1g stat.

Children

250-500 mg stat.

Or

- Erythromycin, oral,
Adults

500 mg 12 hourly for 5 days

Children

8-18 years; 250-500 mg 12 hourly for 5 days

2-8 years; 250 mg of syrup 12 hourly for 5 days

Or

- Miconazole 2% cream, topical,
Adults

Apply 12-24 hourly till rash resolves

Children

Apply 12-24 hourly till rash resolves

Or

- Whitfield's ointment, topical,
Adults

Apply 12 hourly till rash resolves

Children

Apply 12 hourly till rash resolves

C. For Contact dermatitis, Atopic eczema or Flexural psoriasis

- Hydrocortisone cream, 1% topical,
Adults (1-2.5% cream/ointment)

Apply 2-3 times daily

Children (1% cream)

> 10 years; apply thinly 12-24 hourly in area of rash for

7 days

Or

- Mometasone lotion/ointment 0.1%

Adults

Apply thinly once daily for 7 days

Children

Apply thinly once daily for 7 days

Or

- Betamethasone cream/ointment, topical,

Adults (0.05-0.1%)

Apply thinly 12-24 hourly for 7 days

Children (0.05%)

1-18 years; apply thinly 12-24 hourly for 7 days

REFERRAL CRITERIA

Refer patients not responding to treatment to a dermatologist.

Chapter

ENDOCRINE AND METABOLIC DISORDERS

12

98. Diabetes Mellitus

Diabetes mellitus is characterised by persistently elevated blood glucose levels. If left untreated or improperly treated for long periods this will result in widespread blood vessel damage and complications relating to the eyes, kidneys, heart, brain and nerves. There is an increased risk of lower limb amputations, poor fertility and pregnancy outcomes with improper glucose control.

Although children and adolescents often present with acute symptoms, many adults with diabetes are asymptomatic. It is therefore necessary to exclude diabetes in all persons, especially adults, attending health facilities for routine medical examinations, first out-patient review, ante-natal care, elective and emergency admissions or undergoing surgical procedures.

The non-pharmacological and pharmacological interventions in diabetes management are usually life-long.

Individuals found to have venous or capillary plasma glucose levels in the pre-diabetes or diabetes ranges, as shown in the table below, will need further assessment to confirm the diagnosis.

Fasting plasma glucose	2-hr post prandial plasma glucose	HbA _{1c}	Status
< 5.6 mmol/L	< 7.8 mmol/L	<5.7%	Normal
< 5.6 mmol/L	7.8 – 11.1 mmol/L	5.7 – 6.4 %	IGT (Pre-diabetes)
5.7-6.9 mmol/L	< 7.8 mmol/L	5.7 – 6.4 %	IFG (Pre-diabetes)
> 7.0 mmol/L	> 11.1 mmol/L	> 6.5 %	Diabetes

HbA_{1c} – Glycated Haemoglobin

IGT – Impaired Glucose Tolerance

IFG – Impaired Fasting Glycaemia

Four forms of diabetes are encountered in practice:

- Type 1 diabetes
- Type 2 diabetes
- Gestational diabetes (See section on 'Diabetes in Pregnancy')
- Secondary diabetes (related to medication use, endocrine or pancreatic disease etc.)

CAUSES

- Autoimmune disorder (Type 1 diabetes)
- Idiopathic (Type 1 diabetes)
- Genetic factors causing a defect in the action or secretion of insulin (Type 2 diabetes)
- Environmental factors e.g. excessive calorie intake and lack of physical activity (Type 2 diabetes)
- Pregnancy (Gestational diabetes)
- Secondary diabetes:
 - Medication e.g. corticosteroid use or abuse
 - Pancreatic disease or pancreatectomy
 - Endocrine disorders e.g. Cushing's syndrome, acromegaly etc.

SYMPTOMS

- Usually none in many adults
- Polyuria and nocturia
- Polydipsia
- Unexplained weight loss
- Blurred vision
- Recurrent boils
- Recurrent pruritus vulvae
- Erectile dysfunction
- Symptoms related to chronic complications (e.g. 'pins and needles' sensation or numbness in the hands or feet, foot gangrene, poor vision etc.)
- Delivery of large babies (> 4 kg)

SIGNS

- Usually none in most patients
- Lack of sensation in the feet or hands
- Foot gangrene
- Pedal oedema
- Impaired visual acuity
- Cataract
- Retinal changes on fundoscopy

INVESTIGATIONS

Newly diagnosed patient

- Fasting or random blood glucose
- Oral glucose tolerance test (if required to confirm diagnosis)
- Blood urea, electrolytes and creatinine

- Fasting blood lipid profile (adults)
- Glycated haemoglobin (HbA1c)
- FBC
- ECG (adults)
- Urinalysis
- Urine ketones (with high initial glucose levels)

During routine follow ups

- 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 (HbA1c) (at least twice a year)
- 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 microalbumin (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 4-7 mmol/L (less intensive glycaemic targets in elderly patients)
 - 2-hour post-meal blood glucose between 5-9 mmol/L (less intensive glycaemic targets in elderly patients)
 - Glycated haemoglobin 7 % or less (less intensive glycaemic targets in elderly patients)
- 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

Box 12-1: Therapeutic lifestyle modification

Diet:

- Complex carbohydrates (e.g. kenkey, yam, plantain etc.) are preferred
- Avoid refined sugars as in soft drinks, or adding sugar to beverages. Artificial sweeteners and 'diet' soft drinks, which do not contain glucose, may however be used
- A day's diet must generally consist of;
- Carbohydrates (60%), protein (15%) and fat (20%) mostly of plant-origin and low in animal fat
- Salt (sodium chloride) < 5 g/day
- Fruits and vegetables \geq 400 g/day
- Soluble fibre (e.g. as found in oats, beans, apples, nuts etc.)
- A reduced total caloric content (portions) of food and an increase in the amount of fibre e.g. vegetables, fruits and cereals
- Owing to the special needs of children for a diet that will ensure optimal growth, their diet must be determined by a dietician in consultation with a paediatrician

Alcohol:

- Intake of alcohol is prohibited for individuals less than 18 years of age. While low consumption is permissible in adult patients, moderate to heavy drinking of alcohol increases the total caloric intake and may worsen overweight and obesity. It may also increase the risk of hypoglycaemia

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

A. Type 1 diabetes patients and Type 2 patients on insulin monotherapy

Note 12-1

Insulin dose requirements vary from patient to patient irrespective of age and body weight.

The total daily insulin requirement for most adults and pre-pubertal children is about 0.6-0.8 units/kg, which should be given 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 etc.

The usual route for insulin injections for outpatient diabetes treatment is subcutaneous, administered 30 minutes before a meal for regular/soluble insulin, premix insulin, or NPH insulin and immediately before the meal for rapid acting analogue insulins (e.g. aspart, lispro) according to the following regimens:

- Twice daily pre-mixed insulin (soluble + intermediate acting insulin) before breakfast and supper (preferred)

Or

- Twice daily injections of Soluble PLUS NPH 30 minutes before breakfast and Soluble PLUS NPH 30 minutes before supper. The Soluble and NPH insulins must be given in separate syringes.
- Evidence Rating: [A]
- Insulin Premix, SC, (30% soluble insulin and 70% NPH insulin), $\frac{1}{3}$ of total daily insulin requirement 30 minutes before breakfast
And
 $\frac{1}{3}$ of total daily insulin requirement 30 minutes before evening meal (supper)
- Or**
- Soluble insulin, SC,
 $\frac{1}{3}$ of total daily insulin requirement in 2 divided doses 30 minutes before breakfast and supper
And
 - Insulin NPH, SC,
 $\frac{2}{3}$ of total daily insulin requirement ($\frac{1}{3}$ of which would be given 30 minutes before breakfast and $\frac{1}{3}$ 30 minutes before supper)
- B. Type 2 diabetes patients on oral medications; initial management (Monotherapy)**
- 1st Line Treatment
- Evidence Rating: [A]
- Metformin, oral,
Adults
500 mg-1 g daily
Then
Increase every 3 months to a maximum of 1 g 12 hourly if necessary
Children
Refer to specialist
- C. Type 2 diabetes patients on oral medications; patients not achieving glycaemic targets with Metformin monotherapy after approximately 3 months (Dual Therapy)**
- Metformin, oral,
Adults
1 g 12 hourly
Children
Refer to specialist
- And**
- Glibenclamide, oral,
Adults
2.5-10 mg daily
(If required, not more than 5 mg of Glibenclamide could additionally be given in the evening maximum total dose 15 mg daily)
Children
Not recommended

Or

- Gliclazide, oral,
Adults
40-160 mg 12 hourly
Children
Not recommended
- Glimepiride, oral,
Adults
2-6 mg daily (as a single dose in the morning)
Children
Not recommended
- Tolbutamide, oral,
Adults
250-1000 mg 8-12 hourly
Children
Not recommended

Note 12-2

Tolbutamide is preferred in individuals with impaired renal function and in the elderly

- D. Type 2 diabetes patients on oral medications; patients not achieving glycaemic targets with combination of Metformin and Sulphonylurea e.g. Glibenclamide etc. after approximately 3 months (**Triple Therapy**)
- 1st Line Treatment
Evidence Rating: [A]
- Metformin and Glibenclamide (or alternative), oral, as in section C above
 - **And**
 - Saxagliptin, oral,
Adults
2.5-5 mg daily
Children
Not recommended
 - **Or**
 - Sitagliptin, oral,
Adults
50-100 mg daily
Children
Not recommended
 - **Or**
 - Vildagliptin, oral,
Adults
25-50 mg 12-24 hourly

Children

Not recommended

Or

- Pioglitazone, oral,

Adults

15-45 mg daily

Children

Not recommended

E. Type 2 diabetes patients on oral medications; not achieving glycaemic targets with Triple Therapy

- Triple Therapy

And

- Insulin NPH, SC,

Adults

2-20 units before bedtime

Children

Refer to specialist

Note 12-3

Refer to a diabetologist or physician specialist for insulin and oral medication combination therapy in type 2 diabetes

REFERRAL CRITERIA

All individuals with diabetes must be referred to a dietitian for dietary advice. All children with diabetes must be seen by a specialist (paediatrician or endocrinologist). All patients in whom glycaemic targets cannot be achieved as well as those with diabetes complications must be referred to the appropriate specialist.

All type 2 diabetics at diagnosis and type 1 diabetics 5 years after diagnosis should be referred to an eye specialist for screening for Diabetic Retinopathy.

99. Diabetic Ketoacidosis

Diabetic ketoacidosis (DKA) is a condition associated with high blood glucose (usually $> 18 \text{ mmol/L}$), 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 in DKA, especially low potassium. 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.

In contrast, the Hyperosmolar Non-Ketotic state (HONK) in diabetes occurs primarily in Type 2 patients, and 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.

CAUSES

- Severe deficiency of insulin
- Interruption of anti-hyperglycaemic therapy (usually for financial reasons or for alternative treatment)
- Stress of intercurrent illness (e.g. infection, myocardial infarction, stroke, surgery, complicated pregnancy etc.)

SYMPTOMS

- Polyuria
- Polydipsia
- Nausea, vomiting
- Abdominal pain
- Alteration in sensorium or collapse
- Symptoms of infection or other underlying condition

SIGNS

- Dehydration (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.

DIABETIC KETOACIDOSIS

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 may be high)
- Blood film for malaria parasites
- Full blood count (raised white cell count would suggest bacterial infection)
- Urine culture
- Blood culture
- Chest X-ray (for pneumonia)
- Arterial blood gases
- Electrocardiogram (to identify hypokalaemia, and in adult patients to exclude acute myocardial infarction as a precipitating factor)

TREATMENT

Treatment objectives

- To replace the fluid losses
- To replace the electrolyte losses, especially potassium

- To replace deficient insulin
- To seek the underlying cause and treat appropriately

Pharmacological treatment

A. Management of Diabetic Ketoacidosis (DKA)

Table 12-1: Regime for managing Diabetic Ketoacidosis in Adults

ADULTS	Blood Glucose & Urine Ketone Test Results	Intravenous Fluids		Soluble/ Regular Insulin	Potassium Chloride (KCl) Infusion
		Type of Fluid	Rate of IV Fluid Infusion		
Initiating Management ↓	Blood glucose >18 mmol/L Or Urine ketones >2+	Sodium Chloride 0.45%	1st litre over first 30 mins 2nd litre over next 1 hour 3rd litre over next 4 hours 4th litre over next 4 hours Subsequently, 1 litre every 6 hours or as required	Soluble/ regular insulin, IV or IM, 10-20 units stat. Thereafter, administer Soluble/regular insulin, IV Infusion 0.1 units/kg hourly Or 5-10 units IM hourly until blood glucose < 11 mmol/L	Start 2 hours after initiating insulin and Sodium Chloride Infusion Check adequate urine output (>30 ml/hour) Place 10-20 mmol KCl in 500 ml Sodium chloride 0.9% Run the IV infusion over at least one hour
Maintaining Management ↓					
Regular Management ↓	Blood glucose < 13 mmol/L	Glucose 5% This measure is necessary to prevent subsequent hypoglycaemia	Continue Glucose 5% 1 litre every 6 hours or 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 KCl 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 or premixed insulin	Potassium chloride, oral, if required

Table 12-2: Regime for managing Diabetic Ketoacidosis in Children

CHILDREN	Blood Glucose & Urine Ketone Test Results	Intravenous Fluids		Soluble/ Regular Insulin	Potassium Chloride (KCl) Infusion
		Type of Fluid	Rate of IV Fluid Infusion		
Initiating Management ↓	Monitor blood glucose hourly Monitor urine ketones twice daily	Blood glucose >18 mmol/L Or Urine ketones >2+	Sodium Chloride 0.9%	1st hour 15 ml/kg 2nd hour 15 ml/kg 3rd Hour 7.5 ml/kg 4th 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, IV infusion or IM 0.1 units/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 KCl 0.2 -0.4 mmol/kg (max. 10 mmol) in IV fluids. Run infusion over at least one hour
Maintaining Management ↓	Monitor blood glucose every 4 Hours Monitor urine ketones twice daily	Blood glucose < 13 mmol/L	Sodium Chloride in 4.3% Glucose This measure is necessary to prevent subsequent hypoglycaemia	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 KCl if blood level of potassium > 6 mmol/L
Regular Management ↓			Patient eating normally (recommended diet)	Change from 'sliding scale' to twice daily subcutaneous intermediate-acting or premixed insulin	Potassium chloride, oral, if required
Monitor blood glucose twice daily (pre-breakfast and pre-supper)	Blood glucose maintained between 6-11 mmol/L Urine ketones negative or trace				

Box 12-2: Sample Sliding Scale Chart

Blood Glucose Result (following 4-hourly testing)	Corresponding Dose of Regular Insulin to administer Subcutaneously	
mmol/L	ADULTS	CHILDREN

Box 12-2: Sample Sliding Scale Chart

< 6.0	No Insulin	No Insulin
6.1 - 9.0	4 units	0.06 units/kg
9.1 - 12.0	6 units	0.09 units/kg
12.1 - 15.0	8 units	0.12 units/kg
15.1 - 18.0	10 units	0.15 units/kg

Note 12-4

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 before changing to twice-daily intermediate or premixed insulin. This may take on average 12–72 hours.

B. Management of Hyperosmolar Non-Ketotic state (HONK)
(See 'Management of DKA' above)

C. Adjunct Treatment for DKA and HONK

- Broad-spectrum antibiotics for suspected infections (See appropriate section)
- Treat malaria if suspected or confirmed (See appropriate section)

REFERRAL CRITERIA

If there are inadequate resources for managing the patient, start 0.9% Sodium Chloride, IV, and give initial dose of soluble or 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.

100. Diabetes in Pregnancy

(See section on 'Diabetes in Pregnancy' under 'Obstetric care and Obstetric Disorders')

101. Treatment-Induced Hypoglycaemia

Hypoglycaemia refers to a blood glucose level below 3.6 mmol/L. It is more common in elderly diabetics and those with kidney function impairment as well as those on long-acting oral anti-hyperglycaemic 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-hyperglycaemic drug doses, should be taken to prevent its recurrence.

CAUSES

- Overdose of any anti-hyperglycaemic medication i.e. insulin or oral agent
- Antihyperglycaemic medication use in renal impairment and the elderly
- 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
- Unconsciousness
- Convulsions
- 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)
- Blood urea and electrolytes
- Liver function tests

TREATMENT

Treatment objectives

- To rapidly restore blood glucose levels to normal

- To maintain the level of blood glucose within the normal range until the patient can begin eating normally
- To identify and address the cause

Non-pharmacological treatment

- Mild hypoglycaemia
 - 2-3 teaspoons of granulated sugar or 3 cubes of sugar or $\frac{1}{2}$ a bottle of soft drink (sugar-containing, not 'diet' drinks) to individuals who are conscious.
 - A glass of milk or fruit drink and a tablespoonful of honey are useful alternatives
 - The above measures should be followed immediately by a meal or snack
- Moderate hypoglycaemia
 - Same as for mild hypoglycaemia, but repeat after 10 minutes. If no improvement is observed, treat as for severe hypoglycaemia

Pharmacological treatment

A. Severe hypoglycaemia

1st Line Treatment

Evidence Rating: [A]

- Dextrose, IV,
Adults
50% solution
25-50 ml over 1-3 minutes through a large vein

Then

5-10% solution

500 ml 4 hourly until the patient is able to eat normally

Children

10% solution

4 ml/kg body weight over 1-3 minutes through a large vein

Then

5% solution

According to total daily fluid requirement until blood glucose levels normalise

2nd Line Treatment

Evidence Rating: [A]

- Glucagon, IV, IM or subcutaneous,
Adults
1 mg stat.
Children
8-18 years (bodyweight > 25 kg); 1 mg stat.
8-18 years (bodyweight < 25 kg); 500 micrograms stat.
1 month-8 years; 500 micrograms stat.
Neonate; 20 microgram/kg stat.

REFERRAL CRITERIA

If the patient does not respond to the above treatment recommendations, refer to a specialist.

102. Dyslipidaemia

There is ample evidence linking high blood cholesterol levels to Cardiovascular Disease (CVD) events, including myocardial infarction, strokes, and peripheral vascular disease. On the other hand, there is also evidence for significant reduction in morbidity and mortality from CVDs by reducing blood cholesterol levels in those at risk (primary prevention) and those who have suffered a CVD event (secondary prevention).

The commonly assessed blood lipid parameters are total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides. However, the primary target for intervention is the LDL-cholesterol level. As treatment may be for long periods or lifelong, periodic monitoring of liver and muscle enzymes (transaminases and creatine kinase) and blood glucose are advisable to forestall medication-related side effects.

CAUSES

- High dietary intake of saturated fats (animal fat)
- Lack of physical activity
- Metabolic syndrome (a combination of several of the following; obesity, hypertension, type 2 diabetes, dyslipidaemia, gout etc.)
- Hereditary factors
- Excessive alcohol intake
- Hypothyroidism
- Nephrotic syndrome

DYSLIPIDAEMIA

SYMPTOMS

- Usually none
- Abdominal pain from pancreatitis related to hypertriglyceridaemia

SIGNS

- Usually none
- Occasionally
 - Whitish ring around the cornea (corneal arcus)
 - Yellowish skin eruptions around the eyes (xanthelasmata)
 - Whitish blood sample (lipaemic blood)

INVESTIGATIONS

- Fasting blood lipid profile
- Thyroid function test (if lipid levels very high)
- Plasma protein (if lipid levels very high, to exclude nephrotic syndrome)
- Urine protein (if lipid levels very high, to exclude nephrotic syndrome)

Treatment objectives

- To reduce the risk of clinical atherosclerotic cardiovascular events and related deaths in:
 - Healthy individuals at risk (primary prevention)
 - Individuals who have suffered a CVD event (secondary prevention)
- To reduce the LDL-C level to the following targets:
 - At least a 50 % LDL-C reduction for primary prevention (in the general population i.e. individuals ≥ 21 years of age with an untreated LDL-C ≥ 4.9 mmol/L)
 - 30-49 % LDL-C reduction for primary prevention (in individuals 40 to 75 years of age with diabetes with an untreated LDL-C 1.8-4.9 mmol/L)
 - LDL-C < 1.8 mmol/L for secondary prevention (in adults who have previously suffered a heart attack, stroke or peripheral vascular disease)

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

A. Low CVD risk - primary prevention

1st Line Treatment

Evidence Rating: [A]

- Simvastatin, oral,
Adults
10-20 mg at night

B. Moderate CVD risk - Diabetes and CVD risk equivalents

Evidence Rating: [A]

- Atorvastatin, oral,
Adults
10-20 mg daily
Or
- Rosuvastatin, oral,
Adults
5-10 mg daily
Or
- Simvastatin, oral,
Adults
20-40 mg at night

C. High CVD risk – Secondary prevention

- Atorvastatin, oral,
Adults
40-80 mg daily
Or
- Rosuvastatin, oral,
Adults
20-40 mg daily

REFERRAL CRITERIA

Refer all patients who remain outside the target values despite adequate dietary, exercise and medication therapy to a specialist.

103. Goitre

A goitre is a swelling of the front of the neck due to enlargement of the thyroid gland. It may affect persons of any age. Not all neck swellings are goitres. Goitres are usually benign but may occasionally be malignant. They could be associated with normal, reduced or excessive function of the thyroid gland. 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.

Proper diagnosis and selection of appropriate surgical or non-surgical treatment of benign and malignant goitres is 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 in some cases.

CAUSES

- Simple non-toxic goitre or endemic goitre
- Hypothyroidism (See section on ‘Hypothyroidism’)
- Hyperthyroidism or Thyrotoxicosis (See section on ‘Hyperthyroidism’)
- Thyroid neoplasm - benign or malignant

SYMPTOMS

- Swelling in the neck
- Breathing and swallowing difficulty, if large
- Symptoms of hypothyroidism (See section on ‘Hypothyroidism’)
- Symptoms of hyperthyroidism (See section on ‘Hyperthyroidism’)

SIGNS

- Diffuse (smooth) or nodular (irregular) thyroid swelling
- Signs of hypothyroidism (See section on ‘Hypothyroidism’)
- Signs of hyperthyroidism (See section on ‘Hyperthyroidism’)

INVESTIGATIONS

- Thyroid function tests – free T3, free T4, TSH

- Thyroid ultrasound scan
- Thyroid autoantibodies (if necessary)
- Radioisotope scan of thyroid (if necessary)
- Fine needle aspiration cytology (if necessary)
- X-ray of the neck including thoracic inlet view for large goitres

TREATMENT

Treatment objectives

- To assess and correct level of thyroid hormone production
- To reduce symptoms associated with thyrotoxicosis
- To reduce or prevent obstructive symptoms
- To identify thyroid neoplasms and manage appropriately

Non-pharmacological treatment

- Subtotal thyroidectomy where indicated

Pharmacological treatment

- Appropriate treatment of hypothyroidism or hyperthyroidism (See sections on 'Hypothyroidism' and 'Hyperthyroidism')

REFERRAL CRITERIA

Refer patients to a physician or surgical specialist where complications (e.g. hypothyroidism, hyperthyroidism, breathing difficulty etc.) or malignancy are suspected or if full clinical assessment and investigations are not possible.

104. Hypothyroidism

Hypothyroidism is a condition associated with reduction in thyroid hormone production. Thyroid hormone is required for normal metabolism and growth. Its deficiency has major consequences on foetal development as well as intellectual and physical development in infants and children (cause of cretinism).

In adults, it may be the cause of several problems including heart disease, menstrual irregularity and infertility, mental health conditions and dementia. Iodine replacement is not the treatment for hypothyroidism.

Screening for hypothyroidism in all new borns, and every 5 years in adults after age 35 years, especially females, by measuring TSH (thyroid stimulating hormone) levels in blood where this is possible, should be encouraged.

CAUSES

- Antibody-related thyroid gland destruction
- Subtotal thyroidectomy
- Pituitary surgery or lesions
- Congenital
- Severe iodine deficiency
- Drug induced (e.g. radioiodine therapy, amiodarone etc.)

SYMPTOMS

- General weakness and tiredness
- Intolerance to cold environments
- Constipation
- 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**

- Prolonged 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 T₃, free T₄, TSH
- Fasting blood lipids (for elevated cholesterol level)

TREATMENT**Treatment objectives**

- To correct blood level of thyroid hormones
- To maintain lifelong normal levels of thyroid hormones

Non-pharmacological treatment

- Surgical intervention for pituitary lesions where necessary

Pharmacological treatment**A. Initiation of Treatment and Maintenance****Note 12-5**

Start treatment with a low dose of levothyroxine, especially in the elderly and

children as well as individuals with heart disease (e.g. 25-50 microgram), and adjust dose as appropriate every 6-8 weeks until TSH levels are within normal reference range. Treatment is often life-long.

Evidence Rating: [A]

- Levothyroxine, oral,

Adults

25-200 microgram daily

Children

> 12 years; 25 microgram daily (max. 200 micrograms)

2-12 years; 25 microgram daily (max. 100 micrograms)

< 2 years; 25-75 micrograms daily

REFERRAL CRITERIA

Refer diagnosed or suspected cases of all ages, especially children with intellectual impairment, and individuals with pituitary disease to a specialist.

105. Hyperthyroidism

Excess thyroid hormone in the blood results in hyperthyroidism (thyrotoxicosis). If left untreated, significant weight loss, eye and cardiac complications, may occur. Addition of extra iodine to the diet (e.g. as in iodated salt) is not the recommended treatment and may, in fact, worsen the condition.

CAUSES

- Grave's disease
- Toxic multi-nodular goitre

SYMPTOMS

- Weight loss despite increased appetite
- Excessive sweating
- Heat intolerance
- Tremors of the hands
- Nervousness and irritability
- Menstrual irregularity and sub-fertility

SIGNS

- Staring gaze or protruding eyes
- Tremors of the hands
- Moist palms
- Rapid pulse rate (which may be irregular)
- Wide pulse pressure (High systolic BP with low diastolic BP e.g. 170/50 mmHg)
- Heart failure
- Goitre (often present but not always)
 - Smooth and diffuse in Grave's disease

- Irregular in toxic multi-nodular goitre

INVESTIGATIONS

- Thyroid function tests - free T3, free T4, TSH
- Thyroid ultrasound scan

TREATMENT

Treatment objectives

- To reduce thyroid hormone levels in the blood to normal
- To reduce symptoms associated with thyrotoxicosis
- To prevent or treat complications e.g. heart failure, ophthalmopathy

Non-pharmacological treatment

- Subtotal thyroidectomy

Pharmacological treatment

A. Initiation of Treatment and Maintenance

1st Line Treatment

Evidence Rating: [A]

- Carbimazole, oral,

Adults

20-40 mg daily

Children

3-18 years; Initial dose 15 mg daily (adjusted according to thyroid hormone level)

< 2 years; not recommended

Note 12-6

Decrease dose of carbimazole when thyroid hormone levels are within the normal range and adjust doses subsequently according to two-monthly thyroid function tests

2nd Line Treatment

Evidence Rating: [A]

- Propylthiouracil, oral,

Adults

100 mg 8 hourly

Children

12-18 years; 50-100 mg 8 hourly

5-12 years; 50 mg 8 hourly

1-5 years; 25 mg 8 hourly

1 month-1 year; initially 5-10mg/kg 8 hourly,

Then

2.5-5 mg/kg 8 hourly based on thyroid hormone levels

< 1 month; 2.5-5 mg/kg 12 hourly

Note 12-7

Propylthiouracil is preferred in pregnancy and in those who do not tolerate Carbimazole. Decrease the dose when thyroid hormone levels are within the

normal range and adjust doses subsequently according to two-monthly thyroid function tests.

B. Adjunct treatment (to reduce symptoms of thyrotoxicosis)

- Propranolol, oral,
 - Adults
10-40 mg 8 hourly (adjust dose till thyroid function normalises - avoid in asthmatics)
 - Children
> 1 year; 1 mg/kg (max. 40 mg) 8 hourly
 - Neonates; 1 mg/kg 12 hourly

REFERRAL CRITERIA

Refer all cases not responding to conventional treatment to specialists in a secondary or tertiary hospital for further investigations and management.

106. 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 produced from the adrenal gland is insufficient to meet the body's needs during periods of physical and psychological stress or severe illness. The condition is associated with severe fluid and electrolyte imbalance and results in acute circulatory collapse.

CAUSES

- Sudden cessation of prolonged corticosteroid use or abuse.
- Stress (e.g. infection, severe trauma, surgery, and dental procedures) in a patient with undiagnosed adrenal insufficiency or patients on prolonged corticosteroid treatment.
- Pituitary failure
- Auto-immune disease of the adrenal gland (Addison's disease)
- Severe infections affecting the adrenal gland (e.g. meningococcus, tuberculosis, HIV)
- Congenital adrenal hyperplasia in children

SYMPTOMS

- Nausea
- Vomiting
- Weakness
- Collapse
- Abdominal pain
- Diarrhoea

SIGNS

- Dehydration
- Low or unrecordable blood pressure

- Darkening of oral mucosa, gums, skin, palms and soles in some individuals
- Evidence of corticosteroid abuse e.g. skin bleaching, Cushingoid appearance
- Ambiguous genitalia, short stature and failure to thrive in children
- Variable states of consciousness

INVESTIGATIONS

- FBC (may show anaemia and eosinophilia)
- Blood urea and electrolytes (may show high potassium)
- Blood glucose (may be low)
- Plasma cortisol (low)
- Blood film for malaria parasites, if indicated
- Urine and blood cultures, if indicated

TREATMENT

Treatment objectives

- To correct the fluid and electrolyte imbalance
- To correct hypoglycaemia
- To replace corticosteroids
- To identify cause and treat any precipitating factor

Non-pharmacological treatment

- None

Pharmacological treatment

A. Acute treatment

1st Line Treatment

Evidence Rating: [B]

- Intravenous fluid replacement

Adults

0.9% Sodium Chloride in 5% Glucose (Dextrose Saline), IV,
1 litre 4-6 hourly, until condition is stable

Children

0.45% Sodium Chloride in 5% Glucose, IV, according to total fluid requirement

And

- Hydrocortisone, IV,

Adults

200 mg stat. followed by 100 mg 6 hourly until condition is stable

Children

6-12 years;	100 mg 6 hourly
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1-5 years;	50 mg 6 hourly
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< 1 year;	25 mg 6 hourly
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Note 12-8

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.

B. Adjunct treatment in acute cases

Treat infection (e.g. malaria, pneumonia, UTI) or stress-inducing condition, if present or suspected, with appropriate medication.

C. Maintenance - for patients not previously on corticosteroids

1st Line Treatment

Evidence Rating: [A]

- Prednisolone, oral, life-long

Adults

5 mg morning and 2.5 mg evening each day

Children

70 micrograms/kg 12 hourly

2nd Line Treatment

Evidence Rating: [A]

- Hydrocortisone, oral, life-long

Adults

10-20 mg morning and 5-10 mg evening each day

Children

280 micrograms/kg 12 hourly

D. Maintenance - For patients on long term corticosteroid therapy who go into adrenocortical crisis (e.g. asthma, nephrotic syndrome)

Adults and Children

- Restart the previous doses of oral corticosteroids given for the condition.

E. Maintenance - For patients who abuse corticosteroids

Adults

Restart oral corticosteroids, or replace topical corticosteroids with oral corticosteroids

- Prednisolone, oral, 20-40 mg daily

Gradually taper off the dose over several months (e.g. reducing by 2.5 mg per month) and eventually discontinue.

Caution 12-1.

- Long-term corticosteroid therapy requires specialist supervision. Healthcare practitioners should inform patients of the following;
 - Patients on corticosteroids should report to a hospital if they become ill and should tell their doctor, dentist, nurse or pharmacist that 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

REFERRAL CRITERIA

All patients suspected to have adrenal insufficiency should be referred, after resuscitation, to a regional or teaching hospital for assessment and long-term management.

107. 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 (for asthma, nephrotic syndrome etc.) or abuse of corticosteroids

SYMPTOMS

- Weight gain
- Excess body hair and acne (pimples)
- Easy bruising of skin
- Stretch marks (reddish or purplish)
- Menstrual irregularity and sub-fertility
- Weakness of the thigh muscles
- Lightening of the skin

SIGNS

- Rounded or 'moon' face
- Prominent supraclavicular fat pads
- Truncal obesity
- Excess facial and body hair
- Acne
- Striae (reddish or purplish stretch marks)
- Thin skin
- Easy bruising and bleeding into the skin after venepuncture
- Hypertension
- Inability to rise from the squatting position

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.

Note 12-9

Do not withdraw corticosteroids suddenly in patients with Cushing's syndrome due to corticosteroid abuse or prolonged use. Instead, the dose must be tapered off slowly over several weeks and months to prevent acute adrenal insufficiency (See section on 'Adrenal Insufficiency').

REFERRAL CRITERIA

Refer all suspected cases to an endocrinologist or specialist physician in a regional or teaching hospital for the appropriate investigations and management.

108. Overweight and Obesity

Overweight and obesity are associated with conditions that cause premature ill-health and death, such as type 2 diabetes, high blood pressure (hypertension), heart disease and stroke. Other conditions such as gout, obstructive sleep apnoea, gallstones, heartburn, arthritis, skin infections as well as various cancers have been linked to excess body weight. They also increase 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.

Weight reduction often corrects, or helps to control, these associated conditions. Occasionally rapid weight gain may be associated with an underlying endocrine condition such as hypothyroidism and Cushing's syndrome.

CAUSES

- Excess intake of calories
- Lack of regular physical activity
- Secondary causes e.g. hypothyroidism, Cushing's syndrome

SYMPTOMS

- Usually none

SIGNS

- Body Mass Index (BMI) increased
 - 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
- Mid-abdominal (waist) girth, taken roughly at the level of the umbilicus, increased

OVERWEIGHT AND OBESITY	Adult females:	
	< 80 cm or 32 inches	Ideal abdominal girth
	80 - 88 cm or 32-35 inches	Overweight
	> 88 cm or 35 inches	Obese
	Adult males:	
	< 94 cm or 37 inches	Ideal abdominal girth
	94 - 102 cm or 37 - 40 inches	Overweight
	> 102 cm or 40 inches	Obese

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 no more than 2-4 kg per month
- To attain the ideal BMI and/or abdominal girth
- To sustain the weight reduction achieved

Non-pharmacological treatment

- Weight reduction 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 if there are no

contraindications

- Appropriate management of associated co-morbid disorders

Pharmacological treatment

- Approved anti-obesity treatments are available but should only be given under specialist guidance

REFERRAL CRITERIA

Individuals with severe and morbid obesity may require referral to a physician specialist and occasionally may need 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.

Chapter

13

OBSTETRIC CARE AND OBSTETRIC DISORDERS

109. Antenatal 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.

The recommended approach to antenatal care is known as Focused Antenatal Care. It has the following principles: emphasizes quality of care rather than quantity of care (four comprehensive antenatal visits recommended for women with normal pregnancy); individualized care that meets each woman's own medical and psychosocial needs; and disease detection instead of risk categorization based on the simple principle that all pregnant women are at risk of complications.

Pregnant woman should be carefully assessed at booking and at all subsequent visits to identify problems that are likely to have an adverse effect on the pregnancy. Pregnancies with risk conditions (one or more risk factors) should be seen more frequently and also referred to a hospital and/or obstetrician for management.

Another important component of antenatal care is the health education and counselling that is given to clients. These promote healthy behaviour and lifestyle during the pregnancy and also enable the woman to recognize danger signs in pregnancy and prepare adequately for emergencies and safe delivery. Findings at each visit should be accurately documented.

Antenatal Visits Schedule for a Normal Healthy Woman

Women who are healthy at booking and who remain healthy at subsequent visits and do not have any identified potential risk conditions may have four comprehensive visits as follows:

Table 13-1: Recommended schedule for Antenatal Visits for a Normal Healthy Woman

Visit	Recommended schedule
Booking visit	As soon as woman suspects she is pregnant; (preferably before 14 weeks)

Visit	Recommended schedule
1 st scheduled visit	At 16–20 weeks
2 nd scheduled visit	In sixth month (about 24–28 weeks)
3 rd scheduled visit	In eighth month (28–32 weeks)
4 th scheduled visit	In ninth month (about 36 weeks) During the last visit, the woman should be asked to return if she does not give birth within 2 weeks after her expected date of birth

More frequent visits or follow up schedules are implemented to meet the client's individual needs.

In Ghana, many clients come for their first visit during their second trimester of pregnancy. In this case, the visit schedule must be modified to ensure that the client receives all the essential components of care before childbirth.

Assessment of the mother at the booking visit

- Take detailed history (present health, past medical and surgical history, past obstetric history, family and social history)
- Confirm the last menstrual period and established gestational age
- Examine from head to toe and all body systems including a check for anaemia, blood pressure, pulse, general health status and manage appropriately
- Conduct obstetric examination to confirm pregnancy, measure uterine size (SFH) and assess foetal wellbeing (FHR).
- Request for/ conduct screening test as per national protocol (See list of investigations)

Assessment of the mother at follow-up visits:

- Ask about mother's health status since last visit and ask about health concerns
- Enquire about foetal activity (gestation > 20 weeks)
- Test urine for albumin and sugar
- Examine mother for weight gain, anaemia, and for complications such as pre-eclampsia and manage appropriately
- Check blood pressure (the upper limit of normal is 140 mmHg for the systolic pressure and 90 mmHg for the diastolic pressure).
- Obstetric examination:
 - Measure 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 (3rd trimester). Check the foetal heart sounds. Normal rate is 120-160 beats per minute

INVESTIGATIONS

- Full blood count (at booking, 28 and 36 weeks or more frequently if indicated)
- Fasting blood glucose must be done on all pregnant women (at booking, 28 and 32 weeks) See note below
- Haemoglobin level (at booking, 28 and 36 weeks or more frequently if indicated)
- Blood film for malaria parasites
- Sickling (if necessary Hb electrophoresis)
- G6PD activity
- Urine analysis at each visit (proteinuria, glucosuria)
- Stool analysis at booking
- Blood group and antibody screen
- VDRL/TPHA/RPR test
- HBsAg test
- HIV antibody testing (counselling required before testing)
- Ultrasound scan
 - Early ultrasound scan for foetal age estimation and to exclude ectopic pregnancy
 - Foetal anomaly scanning at 18-24 weeks is beneficial
 - Late screening at 36 weeks (placenta position, foetal well being etc.)

Box 13-1: Screening tests for diabetes in pregnancy

Fasting blood glucose test must be done on all pregnant women at booking and also at 28-32 weeks

Test for urine glucose at each antenatal visit

- Urine glucose 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

TREATMENT**Treatment objectives**

- To ensure good health throughout pregnancy, labour/delivery and the puerperium
- To detect and treat adequately any existing or potential health problems
- To prevent anaemia and malaria
- To ensure delivery of a healthy baby

Non-pharmacological treatment

- Encourage use of insecticide treated nets
- Counselling and education on the following topics:
 - Healthy balanced diet
 - Avoid smoking and alcohol intake

- Avoid non-prescribed medications and herbs
- Pregnancy discomforts and management
- Malaria prevention
- Family planning
- Breast feeding and new born care
- Immunisation
- Danger signs and symptoms in pregnancy
- 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 are danger signs such as any of the following: bloody vaginal discharge, persistent headaches and or visual disturbances, faintness or dizziness, chest pain and unexplained abdominal pain
- Exercise is contraindicated in:
 - Pregnancy-induced hypertension
 - Preterm rupture of membranes
 - Preterm labour in women with incompetent cervix second/third trimester bleeding
 - Unexplained Intra uterine growth retardation
- Develop a birth preparedness and complication readiness plan with the woman

Pharmacological treatment

A. Anaemia prevention

1st Line Treatment

Evidence Rating: [A]

- Ferrous sulphate (dried or anhydrous), oral, 200 mg (65 mg elemental iron) daily
 - Or**
 - Ferrous fumarate, oral, 200 mg (65 mg elemental iron) daily
 - Or**
 - Iron (III) hydroxide Polymaltose complex, oral, 100 mg elemental iron daily

And

- Folic Acid, oral, 5 mg once daily
Where combination pre-natal drug formulations of Iron, folate and other micronutrients are preferred, ensure that the iron content meets the minimum requirement dose of 65 mg/dayNte

B. Malaria prophylaxis

(See section on 'Malaria in Pregnancy')

- Sulphamethoxazole-Pyrimethamine (SP), oral,
5 doses, one month apart starting from week 16 or 1st quickening (prophylactic treatment should not exceed week 36).

C. 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 pregnant woman including 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.

Box 13-2: High-risk pregnancies

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 symphysio-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 (foetal 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)
- Rhesus Negative mothers with Rhesus positive husbands and/or with other antibodies
- Women who are at risk for sensitization must be given Anti-D Immunoglobulin (500 IU) at 28 week and repeated within 72 hours of delivery

REFERRAL CRITERIA

High-risk pregnancies (See note above) should be referred to a hospital or obstetrician for management and delivery.

Table 13-2: Antenatal Care Protocol Chart

VISIT	TIMING OF VISIT	GOALS	HISTORY TAKING	EXAMINATION	LABORATORY INVESTIGATIONS	HEALTH PROMOTION	ACTIONS
BOOKING VISIT	Anytime before 16 weeks	<ul style="list-style-type: none"> Patient assessment Plan for ANC Develop birth and emergency plan 	<ul style="list-style-type: none"> Medical Surgical Obstetric LMP Confirm period of gestation Give health education Check foetal growth and maternal wellbeing Start preventive interventions 	<ul style="list-style-type: none"> General exam, including BP Vulval exam. (use speculum if indicated) SFH (symphysio-fundal height) Abdominal exam. Vital observations *Mood *Evidence of trauma 	<ul style="list-style-type: none"> Syphilis test (RPR) VCT Check urine for protein, glucose Check Hb Determine blood group Check for sickness, GPD 	<ul style="list-style-type: none"> Educate on ANC visits Address any observed or volunteered problems Involve husband in ANC Develop birth and emergency plan Teach danger signs during pregnancy Discuss STI/HIV/AIDS Provide VCT. If HIV-positive, ask to come back at 14 weeks to begin ARV for PMTCT Discuss pregnancy discomforts, sexual relations Counsel on nutrition and self-care Counsel on TN use Advise on common discomforts of pregnancy 	<ul style="list-style-type: none"> Give TT1 Give iron/folic acid HIV/counselling, testing and post-test counselling If HIV-positive, begin PMTCT at 14 weeks gestation Treat any problems Counsel woman Start IPT with SP after 16 weeks gestation
FIRST VISIT	At 16-20 weeks	<ul style="list-style-type: none"> Give health education Check foetal growth and maternal wellbeing Start preventive interventions 	<ul style="list-style-type: none"> Contraceptive (type, duration) STI Social: smoking, alcohol/drugs Social supports 				
2ND VISIT	24-28 weeks	<ul style="list-style-type: none"> Give TT Exclude multiple pregnancy Check for pregnancy induced hypertension Check foetal growth Exclude anaemia 		<ul style="list-style-type: none"> Ask for problems Ask date of first foetal movements Ask if any vaginal bleeding 	<ul style="list-style-type: none"> If BP >140/90, check urine for protein Check Hb 	<ul style="list-style-type: none"> Address problems Update birth and emergency plan Review danger signs in pregnancy If HIV-positive, counsel on PMTCT Counsel on TN use Advise on common discomforts of pregnancy 	<ul style="list-style-type: none"> Give TT2 Refill iron/folic acid IPT/SP dose 2 Mebendazole If HIV-positive, PMTCT Treat any problems Counsel woman

VISIT	TIMING OF VISIT	GOALS	HISTORY TAKING	EXAMINATION	LABORATORY INVESTIGATIONS	HEALTH PROMOTION	ACTIONS
3RD VISIT	30–32 weeks	<ul style="list-style-type: none"> Check foetal growth Exclude anaemia Check for PIH Update birth and emergency plan 	<ul style="list-style-type: none"> Ask for problems if any vaginal bleeding 	<ul style="list-style-type: none"> Measure BP Check for pallor Measure SFH Abdominal exam Check foetal heartbeat 	<ul style="list-style-type: none"> If BP >140/90, check urine for protein Check Hb 	<ul style="list-style-type: none"> Address problems Teach danger signs in pregnancy/labour Discuss labour Update birth and emergency plan Discuss family planning If HIV-positive, counsel on PMTCT Counsel on ITN use 	<ul style="list-style-type: none"> Refill iron/folic acid IPT/SP dose 3 Treat any problems If HIV-positive, PMTCT Use dual protection for FP/HIV Counsel woman
4TH VISIT	>36 weeks	<ul style="list-style-type: none"> Check foetal growth Check for PIH Check for pre-eclampsia Exclude cephalo-pelvic disproportion, abnormal presentation/lie Update birth and emergency plan 	<ul style="list-style-type: none"> Ask for problems Ask if there is vaginal bleeding 	<ul style="list-style-type: none"> Measure BP Measure SFH Count foetal heart rate Abdominal exam Check lie Check presentation 	<ul style="list-style-type: none"> If BP >140/90, check urine for protein Check Hb 	<ul style="list-style-type: none"> Early exclusive breastfeeding, thermal care, cord care, danger signs Address problems Discuss labour Update birth and emergency plan Teach PMTCT in labour, birth, postpartum Counsel on ITN use Re-discuss FP and HIV prevention 	<ul style="list-style-type: none"> Refill iron/folic acid Treat any problems If HIV-positive, PMTCT Dual protection for FP/HIV prevention Counsel woman

110. Hyperemesis Gravidarum

This refers to excessive vomiting usually during the early part of pregnancy, and is usually common. It is a diagnosis of exclusion and therefore important to rule out other causes of vomiting such as malaria, urinary tract infection, gastritis, peptic ulcer disease, hepatitis and hypoglycaemia. Surgical conditions such as acute appendicitis, bowel obstruction, cholecystitis and twisted ovarian cyst, should also be excluded. Hyperemesis gravidarum may be associated with multiple pregnancy or molar pregnancy.

CAUSES

- Pregnancy

SYMPTOMS

- Excessive vomiting (sometimes with inability to keep anything down throughout the day)
- Inability to eat or drink (due to fear of vomiting)
- Weight loss

SIGNS

- The patient looks unwell
- Dehydration (dry skin, dry tongue, sunken eyes in extreme cases)
- The pulse is rapid and thready in extreme cases
- The BP may be low
- Deep and fast breathing in extreme cases

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Urinalysis and culture
- Blood urea and electrolytes
- Abdominopelvic ultrasound

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
- Dry foods such as biscuits may be very helpful
- Drink fluids in sips or small volumes, if able to

Pharmacological treatment

A. Mild cases

1st Line Treatment

Evidence Rating: [A]

- Metoclopramide, oral, 10 mg 8-12 hourly

2nd Line Treatment

Evidence Rating: [A]

- Promethazine theoclinate, oral, 25 mg 8-12 hourly

Or

- Promethazine hydrochloride, oral, 25 mg 8-12 hourly

B. Severe Cases

- Normal saline, IV, (alternate with 5% Dextrose to meet requirements)

Or

- Ringers lactate, IV, (alternate with 5% Dextrose to meet requirements)

And

1st Line Treatment

Evidence Rating: [A]

- Metoclopramide, IM or IV, 5-10 mg 8 hourly

If body weight < 60 kg, give 5 mg 8 hourly. Do not exceed 500 microgram/kg in a day

2nd Line Treatment

Evidence Rating: [A]

- Ondansetron, oral, IM, IV, 4-8 mg 8 hourly as needed

3rd Line Treatment

Evidence Rating: [A]

- Promethazine hydrochloride, IM or IV, 25 mg 8-12 hourly
(max. daily dose, 100 mg)

REFERRAL CRITERIA

Refer severe cases with dehydration and/or shock and metabolic disturbances to a hospital for intravenous fluid replacement and antiemetic therapy.

111. 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 on 2 occasions at least 5 minutes apart using an appropriate-sized cuff especially in obese patients. It is severe when systolic blood pressure is 160 mmHg or higher and diastolic blood pressure is 110 mmHg or higher. This includes women whose hypertension was diagnosed prior to

pregnancy as well as during pregnancy.

Known hypertensives on ACE inhibitors, ARBs and alpha-blockers should be switched to medications considered safe during pregnancy.

CAUSES

- Pregnancy-induced hypertension (no proteinuria)
- Pre-eclampsia (hypertension with proteinuria)
- Eclampsia (hypertension with proteinuria and fits)
- Chronic hypertension (existing before pregnancy)
- Chronic hypertension with super-imposed pre-eclampsia or eclampsia
(See sections on 'Hypertension', 'Pre-eclampsia' and 'Eclampsia')

SYMPTOMS

(See section on 'Hypertension')

SIGNS

(See section on 'Hypertension')

INVESTIGATIONS

- FBC
- Clotting profile
- Serum Uric Acid
- BUE and Creatinine
- Urinalysis and culture
- Liver function tests
- Random blood glucose
- Daily assessment of urine proteins (if patient on admission)
- Repeated ultrasound scans for close foetal growth monitoring

TREATMENT

Treatment objectives

- To control blood pressure
- To detect or treat any complications that may arise especially super imposed pre-eclampsia
- To prevent foetal complications
- To deliver a healthy baby

Non-pharmacological treatment

(See section on 'Antenatal Care' and on 'Hypertension')

Pharmacological treatment

A. Hypertension in Pregnancy not associated with pre-eclampsia or eclampsia

1st Line Treatment

Evidence Rating: [A]

- Methyldopa, oral, 250-500 mg 8-12 hourly (max. 2g daily)

2nd Line Treatment

Evidence Rating: [A]

- Nifedipine sustained release, oral, 10-40 mg 12 hourly
 - B. **Hypertension in Pregnancy associated with pre-eclampsia and eclampsia**
(See sections on 'Hypertension', 'Pre-eclampsia' and 'Eclampsia')
- REFERRAL CRITERIA**
- Refer all cases of super-imposed pre-eclampsia or other obstetric complication promptly to a hospital or obstetrician after initiation of treatment.

112. 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 140/90 mmHg
- 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 rest if possible
- Encourage patients to lie on their sides to avoid supine hypotension

Pharmacological treatment

A. 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).

Evidence Rating: [B]

- Methyldopa, oral, 250-500 mg 8-12 hourly (max. 2 g/day)
Or
- Nifedipine retard, oral, 10-40 mg 12 hourly
Or
- Nifedipine slow release, oral, 30-60 mg daily

113. 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

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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.

SYMPOTOMS

- 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 < 30 ml/hour or < 400 ml/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]

A. BP management in severe pre-eclampsia and imminent eclampsia

- 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: 40 mg; 80 mg; 80 mg boluses to a cumulative dose of 220 mg

When the BP < 160/110 mmHg commence an infusion of 40 mg per hour.

Double the infusion rate at 30-minute intervals until satisfactory response or a dose of 160 mg per hour is attained.

Then

- Nifedipine retard, oral, 20-40 mg daily
Or
- Methyldopa, oral, 250-500 mg 8-12 hourly

| B. Management or prevention of seizures in severe pre-eclampsia and imminent eclampsia

- 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 10 g)

REFERRAL CRITERIA

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.

114. Eclampsia

Eclampsia occurs as a complication of worsening pre-eclampsia. The blood pressure is high with associated proteinuria and convulsion or eclamptic fit, which is similar to an epileptic 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

- Convulsions
- Coma
- Elevated blood pressure
- Proteinuria

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Urinalysis and culture
- Blood urea and electrolytes
- Ultrasound examination of the uterus to exclude multiple pregnancy and/or molar pregnancy

TREATMENT

Treatment objectives

- To protect the patient from injury
- To prevent further fits
- To lower the blood pressure
- To monitor for organ failures (e.g. renal) as well as obstetric complications e.g. placental abruption and foetal distress
- To prevent maternal mortality
- To deliver the baby when the mother is stable

ECLAMPSIA

Non-pharmacological treatment

- Lay patient in the recovery position
- Prevent patient from falling
- Avoid restricting patient to prevent limb fractures and joint dislocations
- Do not put anything in patient's mouth to prevent tongue biting
- Maintain the airway by either holding up the chin or if possible, inserting a mechanical airway to hold down the tongue
- If postpartum and patient remains unconscious for a long period, consider turning them every hour to prevent sores from developing
- Artificial respiration may be required following general anaesthesia

After the fits

- Obtain IV access
- Catheterise the patient
- If no further fits and after patient is stabilized, deliver the foetus by the most appropriate method to ensure safety of both mother and baby
- Mode of delivery will depend on the patient's clinical condition, the status of the foetus and her preference

Pharmacological treatment

Evidence Rating: [A]

A. Fluid replacement

- Sodium Chloride 0.9%, IV,
Or
- Ringer's lactate, IV, (Maximum 1 Litre in 6 hours or 4 Litres in 24 hours)

B. Treatment of convulsions

- Magnesium sulphate, IV, 20 ml of the 20% solution (4 g)
Administer slowly over 5 to 15 minutes

Then

- Magnesium sulphate, IM, 10 ml of the 50% solution, (5 g) into each buttock (total of 10 g)

C. Treatment of recurrent convulsions

If fits recur within 20 minutes, do not repeat Magnesium sulphate.
(See other treatment options below)

If fits recur after 20 minutes, repeat Magnesium Sulphate, IV,

> 70kg; 20 ml of the 20% solution (4g)

< 70kg; 10 ml of the 20% solution (2 g) once

D. Maintenance

- Magnesium sulphate, IM, 5 g in alternating buttocks every 4 hours till 24 hours after last seizure or delivery, whichever is later

Note 13-1

Toxicity to Magnesium Sulphate presents as slowing or arrest of the heartbeat 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

- Give assisted respiration
- Administer 10 ml of 10% Calcium Gluconate, IV, slowly in suspected magnesium sulphate toxicity

**E. Treatment of convulsions not responding to Magnesium sulphate
And**

Evidence Rating: [A]

- Diazepam, IV, 10 mg slowly over 2-3 minutes (not exceeding 2.5 mg every 30 seconds,

Then

> 60kg; 5-10 mg 8 hourly

< 60kg; 5 mg 8 hourly

(Do not exceed 500 microgram/kg in a day or 30 mg in 24 hours)

F. Treatment of Hypertension in Eclampsia

- Hydralazine, IV, 5-10 mg stat. (over 5-10 mins)
Boluses can be repeated every 20-30 mins. BP should not fall below 140/90 mmHg
Then
- 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 13-2

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

Then

Repeat at 10-minute intervals if the BP remains >160/110mmHg as follows: 40 mg; 80 mg; 80 mg boluses to a cumulative dose of 220 mg

When the BP < 160/110 mmHg start an infusion of 40 mg per hour. Double the infusion rate at 30-minute intervals until satisfactory response or a dose of 160mg per hour is attained.

REFERRAL CRITERIA

Transfer all cases of eclampsia immediately to a hospital or obstetrician in a facility with operative capacity.

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 a referral facility.

If the IV dose cannot be given, simply give the IM dose of 5 g into each buttock and transfer.

115. Malaria in Pregnancy

(See section on 'Malaria')

116. Anaemia in Pregnancy

Anaemia in pregnancy is a haemoglobin concentration of < 11 g/dL (World Health Organisation). It is described as severe if the Hb is < 7 g/dL. Anaemia has adverse effects on the health of the woman and the outcome of the pregnancy. It is associated with an increased rate of

miscarriage, preterm delivery, foetal growth restriction, foetal death and increased perinatal loss. It is also associated with ante- and post-partum haemorrhage and an increased maternal mortality rate.

Ideally no woman should go into labour with anaemia. Appropriate measures including blood transfusion may be required to correct the anaemia especially if a woman is close to her expected delivery date.

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
- Bleeding complications in pregnancy e.g. APH

SYMPTOMS

- Dizziness
- Swelling of the feet
- General weakness
- Easy fatigability

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 schistosoma ova and urobilinogen

TREATMENT

Treatment objectives

- To relieve symptoms
- To correct haemoglobin level before patient reaches term or goes into labour
- To identify and treat underlying cause
- To recognize and manage the associated complications in mother e.g. cardiac failure, and baby e.g. intrauterine growth restriction

Non-pharmacological treatment

- Encourage intake of foods such as red meat, poultry, fish, dark

leafy vegetables, shell fish, dried fruits which are rich in iron, folate, Vitamins B and C

- Avoid tea, coffee, bran, cola and unhealthy habits such as eating of clay, which inhibits iron absorption
- Encourage intake of folate and vitamin rich foods including beans, avocado, citrus fruits, spinach and mangoes
- Protein rich foods must also be included in the diet
- Ensure these anaemic patients are seen more frequently in the antenatal clinic and their response to treatment monitored with haemoglobin level checks.

Pharmacological treatment

Evidence Rating: [A]

- Ferrous sulphate, oral, 325 mg 8 hourly
Or
- Ferrous gluconate, oral, 300 mg 8-12 hourly. Evaluate after 4-6 weeks
And
- Folic Acid, oral, 5 mg daily
- Blood transfusion

Note 13-3

In severe anaemia ($Hb < 7 \text{ g/dL}$), blood transfusion may be necessary.

In labour severe anaemia is best treated by blood transfusion

When there is heart failure preferably transfuse packed cells.

Add

- Furosemide IV, 20-40 mg if giving whole blood

REFERRAL CRITERIA

Refer patients with anaemia to a dietitian or diet nurse for counselling and support. Treatment for severe anaemia ($Hb < 7\text{g/dL}$) is best given in health facilities with blood transfusion capability.

All women who do not respond satisfactorily to oral treatment should be referred for further evaluation.

Those with associated conditions like HIV and Haemoglobinopathies should be managed in the hospital. HIV patients on antiretroviral medication may need modification of their drug combinations to exclude those that aggravate anaemia e.g. zidovudine.

FLOWCHART

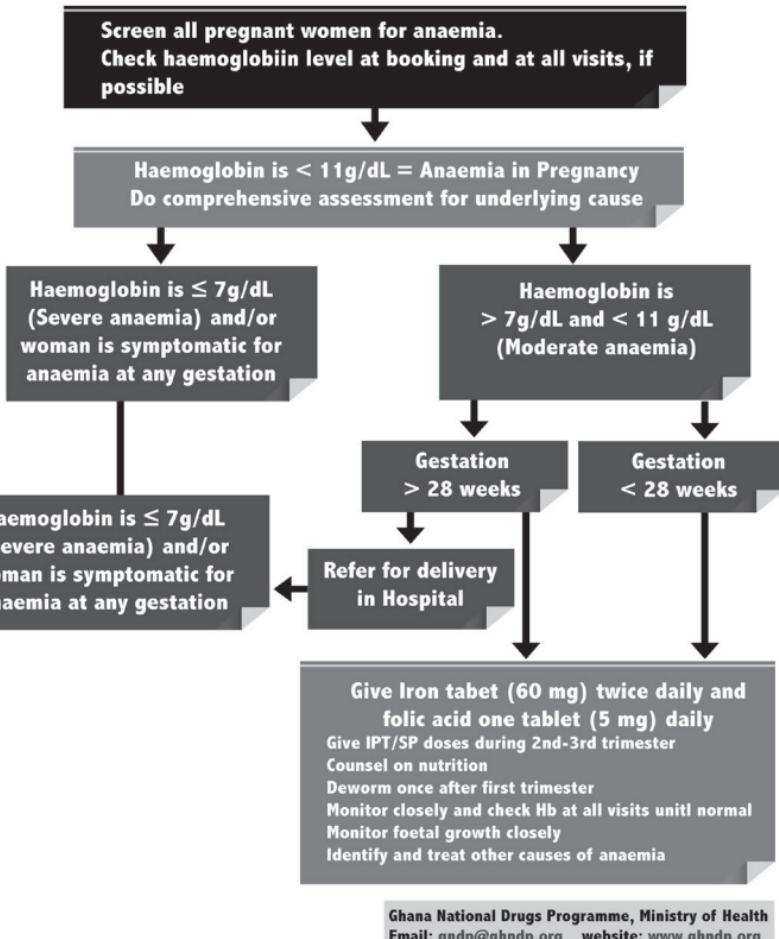


Fig 13-3: Flowchart: management of anaemia in pregnancy

117. Sickle Cell Disease in Pregnancy

Pregnancy in the Sickle Cell Disease (SCD) patient is associated with poor obstetric outcomes for both the mother and her baby. Data from referral centres in Ghana show that sickle cell complications during pregnancy leads to high maternal and perinatal mortality.

Common pregnancy complications of the mother with SCD include miscarriages, frequent vaso-occlusive crises, severe anaemia, recurrent urinary tract infections, acute chest syndrome, preterm labour and

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pulmonary embolism. In the foetus, complications include intrauterine growth restriction, prematurity and intrauterine foetal death.

Care by a multidisciplinary team consisting of the Obstetrician, Physician specialist, Haematologist, Clinical Pharmacist, Anaesthetist, Nurse and Midwife ensures good health outcomes for these patients.

CAUSES

(See section on 'Sickle Cell Disease')

SYMPTOMS

- Recurrent Jaundice
- Bone and joint pain (recurrent episodes)
- Delayed puberty
- Sub-fertility
- Anaemic complications (easy fatigability, palpitations)

SIGNS

(See section on 'Sickle Cell Disease')

INVESTIGATIONS

- Sickling test and Haemoglobin electrophoresis
- Full blood count including reticulocyte count
- RDT or blood film for malaria parasites
- Midstream urine for Culture and sensitivity at booking and whenever indicated
- Renal function test (BUN, Creatinine, electrolytes)
- Liver function tests
- Serum iron, TIBC and Ferritin (if possible)
- All other antenatal screening test

TREATMENT**Treatment objectives**

- To identify patients with condition early during pregnancy for closer monitoring
- To correct anaemia
- To prevent known crises triggers
- To detect and manage promptly all associated complications and crises
- To deliver client safely as soon as baby is viable

Non-pharmacological treatment**Pre-pregnancy Care**

- Provide genetic counselling
- Assist patient to plan pregnancy in a status of optimum health
- Educate on potential risk and health problems of SCD in Pregnancy

Care during Pregnancy

At booking

- Assess patient carefully for risk of frequent crises, and previous obstetric complications
- Examine for nutritional status, anaemia, jaundice, and hepatosplenomegally
- Perform ultrasound to date pregnancy and exclude foetal abnormality and growth retardation
- Perform the above listed investigations to screen for and detect complications
- Manage identified problems at booking (e.g. urinary tract infection, malaria etc.) appropriately and promptly

Follow up visits

- If low risk, schedule follow up visits monthly until 2nd trimester, then 2 weekly until 28th week and thereafter weekly
- If high-risk, schedule visits 2 weekly until third trimester, then weekly until term
- At review visits, enquire about maternal well-being, symptoms of crises, infection and foetal activity. Examine for pallor, jaundice, fever and proteinuria. Check for foetal growth and compare to gestational age

Labour and delivery

- Stress and pain of labour and delivery can trigger crisis. Risks of crisis is increased if dehydration, fever, infection, hypothermia develop during labour. Care during labour/delivery is targeted at preventing these triggers
- All women with Sickle cell Disease must deliver in hospital, and the most experienced midwife and obstetrician should be involved in their care
- In uncomplicated pregnancies, spontaneous vaginal delivery must be aimed at until 40 weeks (term). Induction must be undertaken only if the woman has not delivered after this time.
- For the high risk women with recurrent complications deliver as soon as baby is viable
- At admission in labour;
 - Labour should be monitored closely with partograph
 - Check for haemoglobin level
 - Group and cross-match a unit of blood on standby
 - Maintain good hydration with IV fluids
 - Provide adequate pain relief (See section on 'Analgesia in Labour')
 - Provide prophylactic antibiotics (See section on 'Antibiotic prophylaxis in labour and puerperium' below)
- Vaginal delivery should be the aim unless there are obstetric reasons for cesarean section

- Prolonged second stage labour should be avoided by offering assisted delivery (vacuum)
- Active Management of Third Stage of Labour (AMTSL) is recommended to prevent PPH

Postpartum care

- All Sickle Cell Disease patients must be hospitalized and monitored closely for at least 72 hours postpartum
- Check for pallor, puerperal sepsis, acute chest syndrome, vaso-occlusive crises and urinary tract infection
- Continue with prophylactic antibiotics for at least 72 hours postpartum
- Counsel women and their support persons to avoid crises triggers such as stress, pain, lack of sleep, fatigue etc.
- Encourage early ambulation (especially after operative delivery)
- Review client at 7 days postpartum and thereafter weekly until 6 weeks
- Refer patient to physician for continuing care
- Counsel on family planning and offer contraception

Baby

- The baby should be screened for sickle cell disease
- Closely monitor the babies with associated complications e.g. IUGR, prematurity etc.

Sickling crises in pregnancy

- Admit all sickle cell patients with sickling and/or obstetric complications during pregnancy to a hospital
- Avoid NSAIDs e.g. Diclofenac in the 3rd trimester
- Opioids like pethidine and morphine for pain management should be used with care during labour due to respiration depression effects on baby (See section on Analgesia in Labour)
- Identify and treat underlying triggers e.g UTI, malaria, dehydration etc. (See appropriate sections)
- Blood transfusion is recommended if haemoglobin level is less than 7g/dl at 36 weeks and/or during crises (See section on 'Sickle Cell Disease')
- If in vaso-occlusive crises maintain hydration with IV fluids (crystalloids) 2-4 litres in 24 hours, and provide analgesia (See section on 'Sickle Cell Disease')
- Acute chest syndrome (ACS)- foetal monitoring is essential during this crisis (See section on 'Acute Chest Syndrome')

Pharmacological treatment

A. Antenatal treatments

(See section on Pharmacological treatments under 'Antenatal Care')

And

- Multivitamin, oral, once daily

B. Antibiotic prophylaxis in labour and puerperium

- Ceftriaxone, IV/IM, 1 g daily for 72 hours

Or

- Amoxicillin + Clavulanic Acid, IV, 1.2 g stat.

Then

- Amoxicillin + Clavulanic Acid, oral, 625 mg 12 hourly for 72 hours

REFERRAL CRITERIA

All patients with sickle cell disease with obstetric complications should be referred to a specialist for continuing care.

118. Diabetes Mellitus in Pregnancy

Diabetes Mellitus in pregnancy includes individuals known to be diabetic prior to pregnancy and those who develop impaired glucose tolerance during pregnancy. Gestational diabetes refers to impaired glucose tolerance of any degree that develops or is first recognized during the current pregnancy, irrespective of whether it resolves after delivery or not. Diabetes is associated with poor health outcomes for a mother and her baby if not properly managed. Many patients with gestational diabetes are asymptomatic making screening for all pregnant women mandatory to identify those at risk. A fasting 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 and the puerperium involves close monitoring of the woman by a multidisciplinary approach comprising a team of obstetricians, midwives, nurses, dieticians, physicians, anaesthetists and paediatricians.

Labour (induced or spontaneous) and Caesarean section are best supervised in hospital under specialist care.

Anti-diabetic treatment requirements reduce dramatically after delivery hence, post delivery treatment doses must be tailored to each individual patient's needs.

The newborn baby of a diabetic mother 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 1 hour) breastfeeding. They may also require management for respiratory distress syndrome, electrolyte imbalances (e.g. hypercalcaemia, hypokalaemia, hypomagnesaemia) and hyperbilirubinaemia.

All diabetic mothers must be counselled on family planning.

CAUSES

- Pre-existing Type 1 diabetes mellitus
- Pre-existing Type 2 diabetes mellitus
- Gestational diabetes mellitus

SYMPTOMS

- Usually asymptomatic
- Previous history of large babies (> 4 kg)
- Previous poor obstetric history (foetal deaths, miscarriages etc.)
- Other features of diabetes (See section on 'Diabetes Mellitus')

Signs

- Foetus larger than gestational age (as assessed by serial symphysio-fundal height or by ultrasound scan)
- Foetus smaller than gestational age (IUGR)
- Presence of polyhydramnios
- Other signs of diabetic complications (See section on 'Diabetes Mellitus')

INVESTIGATIONS

- All basic Antenatal Care Investigations
- Ultrasound scan
 - Foetal anomaly scan at 16-22 weeks
 - Serial scans for growth assessment in third trimester
- Urine culture and sensitivity (monthly)
- High vaginal swab for candidiasis
- Blood urea, electrolytes and creatinine
- Blood glucose profile (Fasting blood glucose and 2-hour post-prandial blood glucose monthly in the lab; more frequently by self-monitoring)
- Glycated haemoglobin (HbA1C) every 6-8 weeks

Note 13-4

There is no place for urine glucose estimation in the management of diabetes in pregnancy except for screening.
Self-monitoring of blood sugar should be encouraged for those who can afford a glucose meter.

TREATMENT**Treatment objectives**

- To achieve normal blood glucose and glycated haemoglobin levels throughout pregnancy, labour, delivery and puerperium
- To prevent maternal and foetal complications
- To prevent neonatal morbidity and mortality
- To detect and manage other associated complications e.g. pre-eclampsia

Non-pharmacological treatment

- General measures (dietary modification, exercise, patient counselling and education, blood glucose monitoring must be discussed with a dietitian, obstetrician or midwife, respectively)
- Frequent ANC visits are required
- Delivery
 - by 40 weeks gestation: in well controlled patients with no complications
 - by 38 weeks gestation; in Insulin treated patients and those with complications
 - Caesarean section; for patients with either of the following;
 - severe pre-eclampsia, previous caesarean section,
 - advanced maternal age, malpresentation or foetal macrosomia
 - If elective preterm delivery is necessary, mature the foetal lungs with corticosteroids under specialist care
- Puerperium
 - Close blood glucose monitoring in the first 48 hours after delivery

Pharmacological treatment

Box 13-4: Notes on glycaemic control of diabetes in pregnancy

Before planned pregnancy

Optimise glycaemic control in known diabetics before pregnancy.

During pregnancy

If diet alone cannot control the blood glucose level consider hypoglycaemic agents: metformin, glibenclamide and insulin

- Diabetic patients on oral medication who become pregnant can be maintained on their oral medication if sugar control is satisfactory (fasting glucose levels between 4-6 mmol/L and 2-hour postprandial glucose between 4-7 mmol/L; glycated Hb [HbA1c] less than 6.5%)

Indications for oral antidiabetic agents use:

- Gestational Diabetics who fail to achieve satisfactory control with diet and exercise alone ($FBS > 6.1\text{mmmol/l}$)
- Poor compliance to insulin e.g. poor administration skills
- Poor glycaemic self monitoring
- Insulin therapy poses financial burden or is not readily available

Absolute Indications for Insulin use

- Significant diabetic related morbidity exists e.g. nephropathy, retinopathy, neuropathy
- Persistently high Haemoglobin A1c
- Persistent ketonuria
- Significant obstetric morbidities e.g. foetal macrosomia, polyhydramnios, IUGR
- During antenatal corticosteroid therapy with expected deterioration of glycaemic control
- Poor glycaemic control with oral antidiabetic agents

Evidence Rating: [B]

- Metformin, oral, 500 mg 8-12 hourly. (max. dose 2g per day)
And/Or

CHAPTER 13: OBSTETRIC CARE AND OBSTETRIC DISORDERS

- Glibenclamide, oral, 2.5-5 mg 12-24 hourly. Increase dose by 5 mg if necessary until max. dose of 15 mg/day

Note 13-5

Metformin can be given as monotherapy or in combination with insulin and/or Sulphonylurea

The use of sulphonylureas (e.g. glibenclamide) in pregnancy should generally be avoided because of the risk of neonatal hypoglycaemia. However, glibenclamide can be used in the 2nd and 3rd trimester in women with gestational diabetes.

And/Or

- Insulin

Evidence Rating: [A]

(See section on Insulin Therapy in 'Diabetes Mellitus')

- 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 2-4 weekly FBS (and 2-hour post-prandial blood glucose where possible) up to 34 weeks then weekly till delivery.
- Keep fasting glucose levels between 4-6 mmol/L and 2-hour postprandial 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.
- 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

REFERRAL CRITERIA

Refer to hospital for specialist care. For the convenience of patients shared care between specialist and medical officer may be appropriate.

119. Cardiac Disease in Pregnancy

Cardiac diseases are associated with high maternal and foetal mortality and morbidity. They may be present before the pregnancy or develop during the pregnancy or puerperium (e.g. peripartum cardiomyopathy). Pregnancy places additional burden on the heart and makes pre-existing cardiac disease worse.

Some of the signs of pregnancy may mimic cardiac disease. Careful assessment of all patients must be undertaken to determine if they have cardiac disease or not.

Management requires a multi-disciplinary team including the obstetrician, neonatologist, anaesthetist and physician specialist or cardiologist.

Patients with known cardiac disease must plan their pregnancies carefully in full consultation with their cardiologist and obstetrician. They must book early as soon as they become pregnant for antenatal care in hospital.

All patients needing pharmacological treatment must be managed by a physician specialist or cardiologist and obstetrician.

CAUSES

- Rheumatic heart disease e.g. mitral incompetence and stenosis
- Hypertension
- Cardiomyopathy
- Anaemia
- Congenital heart diseases
- 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
- Chest X-ray (with protection of foetus)
- All other antenatal investigations

TREATMENT

Treatment objectives

- To maintain good cardiac function throughout the pregnancy, labour,

delivery and puerperium

- To prevent maternal and foetal complications
- To prevent maternal death

Non-pharmacological treatment

(See appropriate cardiac disease)

Pharmacological treatment

(See appropriate cardiac disease)

REFERRAL CRITERIA

All patients with cardiac disease must be referred to a specialist physician or cardiologist and an obstetrician.

120. Jaundice in Pregnancy

Jaundice occurring in pregnancy may be a symptom or sign 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: malaria, sickle cell disease, G6PD defect, septicaemia, drugs and herbal medications
- Surgical: acute cholecystitis, cholelithiasis, obstructive jaundice

SYMPTOMS

- Yellowish discolouration of eyes
- Deep yellow or dark urine
- Generalized itching
- Other symptoms relating to the cause (e.g. general malaise, dizziness, fever etc.)

SIGNS

- Yellow discolouration of mucous membranes and skin
- Delirium and coma (if severe)
- Liver enlargement (If associated with liver disease)
- Other signs relating to the cause (e.g. fever, elevated blood pressure)

INVESTIGATIONS

- FBC, blood film for malaria parasites, RDT
- Sickling status
- G6PD status

- Blood 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

Treatment objectives

- To identify and treat cause
- To prevent related maternal and foetal complications

Non-pharmacological treatment

- Depends on the underlying cause (See appropriate sections)

Pharmacological treatment

- Depends on the underlying cause (See appropriate sections)

REFERRAL CRITERIA

Severe cases of jaundice and those associated with abdominal pain

I must be referred for specialist care.

121. Post-Partum Haemorrhage

Post-partum haemorrhage may be primary or secondary. Primary postpartum 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

- Uterine atony (70-90% of cases)
- Retention of all or part of placental tissue within the uterine cavity
- Infection within the uterine cavity (endo-myometritis)
- Genital tract trauma
- Clotting disorders

SYMPTOMS

- Excessive or prolonged vaginal bleeding after delivery
- Lower abdominal pains

SIGNS

- Active bleeding from the genital tract

- Conjunctival pallor
- Rapid pulse
- Blood pressure may be low or normal
- Deterioration of maternal levels of consciousness
- Flabby poorly contracted uterus
- Obvious tears in birth canal and/or perineum
- Obvious retained placenta
- Suprapubic tenderness

INVESTIGATIONS

- FBC, sickling status
- Bedside clotting test
- Blood grouping and cross-matching
- Ultrasound scan (if patient is stable to check for retained placenta tissue)

TREATMENT

Treatment objectives

- To identify the cause and stop bleeding as quickly as possible
- To correct hypotension
- To correct resulting anaemia

Non-pharmacological treatment

Due to uterine atony (70-90% of cases), with no placental retention

- Massage fundus of uterus to stimulate contraction
- Encourage woman to empty bladder or pass a urethral catheter to empty the bladder and monitor urine output
- Bimanual compression of the uterus and balloon tamponade if uterus fails to contract with massage

Due to retained placenta

- 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 placenta has been delivered and is incomplete, exploration the uterus and manual removal under anaesthesia is indicated
- If the facilities for manual removal of placenta under anaesthesia are not immediately available refer to hospital

Bleeding with uterus well contracted and placenta completely delivered

- Examine the patient in the lithotomy position with adequate analgesia and/or anaesthesia, good lighting to identify and suture perineal, vaginal and cervical tears
- If the tear(s) extends into the uterine body, effective suturing cannot

- be performed and repair will involve a laparotomy
- For ruptured uterus, repair or hysterectomy is required

Bleeding associated with coagulopathy

- Bedside clotting test - 5 ml of blood placed in a 10 ml round bottomed glass tube should clot in 6 minutes

Pharmacological treatment

A. If the uterus is poorly contracted (Atony)

1st Line Treatment

Evidence Rating: [A]

- Oxytocin, IM, 10 units stat.

Then

- Oxytocin, IV, infusion, 10-40 units in 500 ml Dextrose saline or 0.9% or Normal saline

Note 13-6

Dose not to exceed 40 units

If intravenous oxytocin is unavailable, or if the bleeding does not respond to oxytocin, the following second line drugs are recommended.

2nd Line Treatment

Evidence Rating: [B]

- Misoprostol, sublingual, 600 microgram (for PPH prophylaxis within 1 minute of delivery)
- Misoprostol, sublingual, 800 microgram stat if patient is conscious (for PPH treatment)

Or

3rd Line Treatment

Evidence Rating: [B]

- Ergometrine, IV, 500 microgram stat.

Or

Evidence Rating: [B]

- Oxytocin-ergometrine, IM, (Oxytocin 10 units and Ergometrine 500 microgram) stat.

Or

Evidence Rating: [B]

- Oxytocin-misoprostol, (Oxytocin, IV, 10 units and Misoprostol, rectal, 600 micrograms) stat.

Note 13-7

High rates of adverse effects (nausea, vomiting, and high blood pressure) occur in women treated with ergometrine.

They should not be given to women with hypertension in pregnancy or heart disease.

B. Protracted bleeding uncontrolled by Oxytocin and other**Uterotonics or if bleeding is due partly to trauma**

Evidence Rating: [B]

- Tranexamic Acid, slow IV (not to exceed 100 mg per minute), 1 g stat.

Then

1 g 8 hourly (Maximum 3 g in 24 hours)

C. Hypovolaemia

- Sodium Chloride 0.9% or Ringers lactate, IV, and blood transfusion as clinically indicated
(See section on 'Shock')

D. Anaesthesia for manual removal of placenta

- Morphine, IV, 2.5 - 5 mg stat. as required (if no anaesthetist is available)

Or

- Pethidine, IV slowly or IM, 1 mg/kg 6 - 8 hourly as required (max. 100 mg per dose)

And

- Diazepam, slow IV, 5-10 mg 8 hourly as required (NOT more than 2.5 mg per minute)

Note 13-8

Do not mix pethidine and diazepam in the same syringe. Monitor respiratory rate of patient closely. Stop drugs if respiratory rate is less than 12 per minute.

Or

- Ketamine, IM, 5-10 mg/kg stat.

Or

- Ketamine, IV, 0.5-2 mg/kg stat.

Note 13-9

Ketamine must be used only by trained Medical Officer/anaesthetist
Provide antibiotics prophylaxis after manual removal of placenta or exploration of uterus or repair of birth canal tears.

E. Secondary Postpartum Haemorrhage

- Oxytocin, IV infusion, 20 units in 1 L of Normal Saline

Or

- Ergometrine, oral, 500 microgram 8 hourly for 3 days

F. Antibiotic prophylaxis

- Amoxycillin, oral, 500 mg 8 hourly for 7 days

And

- Metronidazole, oral, 400 mg 8 hourly for 7 days

REFERRAL CRITERIA

Refer patients who do not respond to the treatments above to a specialist. Also refer promptly to a hospital with theatre and blood transfusion facilities for examination under anaesthesia and/or laparotomy if these are not immediately available.

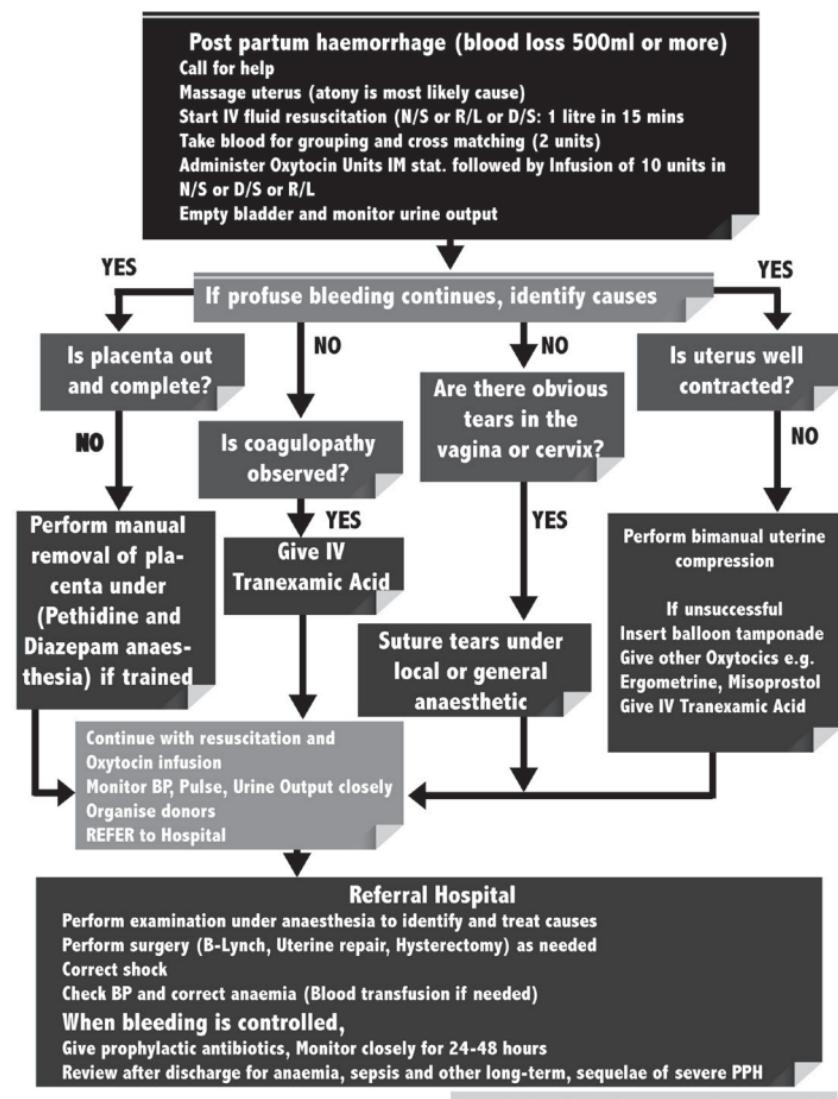


Fig 13-5: Flowchart: Post partum haemorrhage

122. Post-Partum Pyrexia

Post-partum pyrexia refers to body temperature of 38°C or more on 2 or more occasions during the first 10 days of the puerperium excluding the first day. Risk Factors include prolonged labour, prolonged premature rupture of membranes, retained placental tissue, instrumental deliveries and birth canal injuries.

CAUSES

- Malaria
- Uterine infection (endo-myometritis)
- Perineal Infections (e.g. infected episiotomy)
- Breast problems (engorgement, mastitis, abscess formation)
- Urinary tract infection
- Respiratory tract infection

SYMPTOMS

- Fever
- Other symptoms as related to cause

SIGNS

- Fever
- Other signs as related to cause

INVESTIGATIONS

- FBC
- RDT
- 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 and treat the underlying cause

Non-pharmacological treatment

- Examination under anaesthesia with possible uterine curettage for retained products of conception
- Encourage frequent emptying of breasts if cause is due to engorgement
- Incision and drainage for breast and perianal abscess

Pharmacological treatment

A. Breast problems - engorgement

Evidence Rating: [B]

- Paracetamol, oral, 1 g 6-8 hourly as required

B. Breast problems - mastitis/abscess

Evidence Rating: [A]

- Flucloxacillin, oral, 500 mg 6 hourly for 5-7 days

C. Endo-myometritis and perineal infections

Evidence Rating: [B]

- Amoxicillin + Clavulanic Acid, IV, 600 mg-1.2 g 8 hourly for 72 hours
And
- Metronidazole, IV, 500 mg 8 hourly for 72 hours

Then

- Amoxicillin + Clavulanic Acid, oral, 625 mg-1 g 12 hourly for 7 days
And
- Metronidazole, oral, 400 mg 8 hourly for 7 days

REFERRAL CRITERIA

Refer all cases of severe sepsis to hospital for management.

FLOWCHART

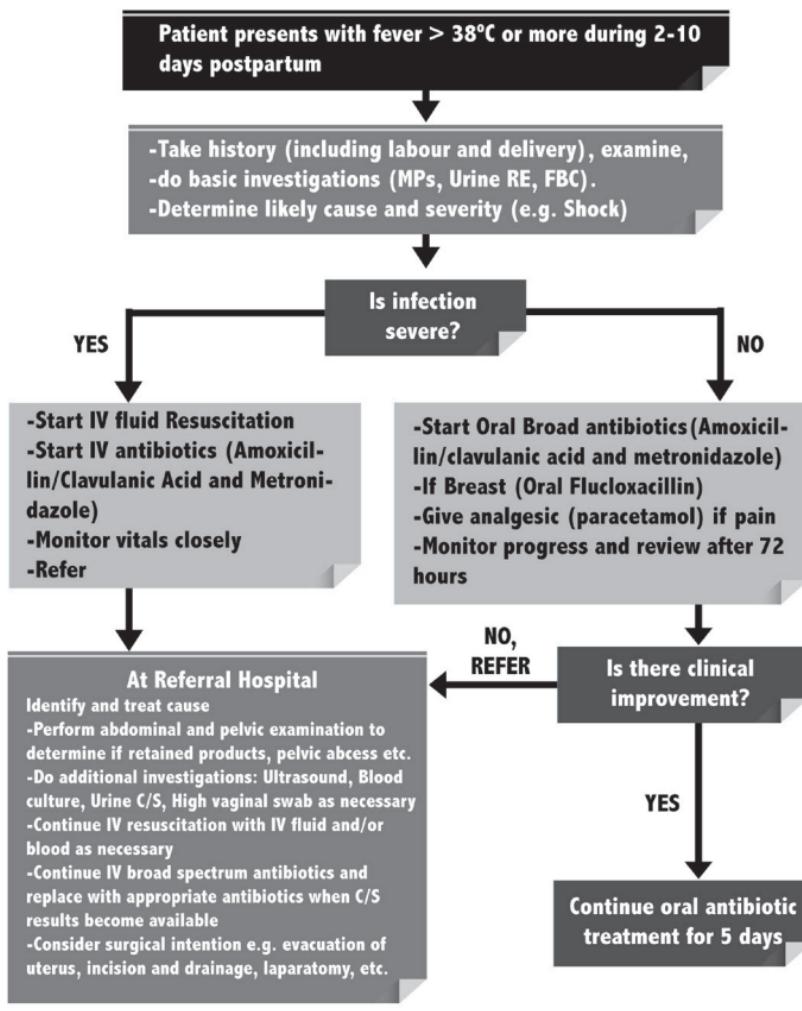


Fig 13-6: Flowchart: Management of Postpartum pyrexia

123. Analgesia in Labour

The pain threshold may be low during labour on account of fear, anxiety and uncertainty. Adequate pain relief during labour results in less anxiety and good progress.

In the first stage of labour pain relief may be required for painful uterine contractions, whereas in the second stage of labour, analgesia is required for instrumental delivery and when an episiotomy is given.

Pharmacological treatment

A. During the first stage of labour - parenteral

Evidence Rating: [C]

- Morphine, IV, 2.5-5 mg 4 hourly as required
And
- Metoclopramide, IV, 5-10 mg 8 hourly as required for vomiting
Or
- Pethidine hydrochloride, IM, 50-100 mg stat. repeated as required 3-4 hours later (Maximum 400 mg in 24 hours)
And
- Promethazine, IV/IM, 25 mg as required (Maximum 25 mg 6 hourly) as required to reduce the chances of vomiting and to potentiate the analgesic effect of Pethidine

Box 13-7:

- 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, 100 microgram/kg stat. (If no response, give subsequent dose of 100 microgram after 3-8 minutes). Continue resuscitation with oxygen via a facemask or through an endotracheal tube and self inflating (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 IM Pethidine with 12.5-25 mg Promethazine may be given intravenously.

B. During the first stage of labour – inhalational

- Nitrous oxide and Oxygen mixture, 50:50

Note 13-10

To be used in the late first stage when delivery is expected within 1 hour.

C. During the first stage of labour - epidural**Note 13-11**

This procedure is best carried out by an anaesthetist.

D. During the second stage of labour

- Local Anaesthetics for episiotomy and pudendal block anaesthesia to facilitate instrumental delivery.
- Lidocaine hydrochloride (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

E. Anaesthesia for short obstetric procedures e.g. manual removal of placenta, repair of large vaginal and cervical tears

- Pethidine, IM or IV, 1 mg/kg slowly (max. 100 mg) if no anaesthetist is available
And
- Promethazine hydrochloride, IM, 25 mg stat. (if vomiting occurs)
Or
- Metoclopramide, IV, 5-10 mg 8 hourly as required
And
- Diazepam, slow IV, 5-10 mg (at a rate of 2.5 mg per minute)

Note 13-12

Monitor respiratory rate closely. Stop Diazepam if respiratory rate is less than 10 /minute).

Do not mix the two drugs in the same syringe.

2nd Line Treatment

- Ketamine, IM, 5-10 mg/kg stat.
Or
 - Ketamine, IV slowly, 1-2 mg/kg
Or
 - Ketamine, IV infusion, (For longer procedures) 1 mg per ml of ketamine in dextrose 5% or normal saline (maintenance dose 10-45 microgram per kg per minute adjusted according to response).
 - And**
 - Diazepam, slow IV, 5-10 mg, administered over 2-3 minutes (approximately 2.5 mg per minute) to prevent Hallucinations
- F. Premedication before Ketamine administration**
- Atropine, IM, 600 microgram stat.
And
 - Oxygen, by face mask, 6-8 L/minute

Note 13-13

Ketamine is contraindicated in patients with high blood pressure (Hypertension) and heart disease.

124. Preterm Labour in Premature Delivery

Preterm labour refers to labour occurring after 28 weeks but before 37 completed weeks resulting in premature delivery. The preterm newborn is at risk of death because all its body systems such as lungs, brain, digestive and immune systems are not fully developed. There is increased susceptibility to infection and impaired clotting mechanisms. The baby is also at risk of birth injuries such as cerebral haemorrhage because the fragile cranial bones do not provide sufficient protection for the brain. Some risk factors for preterm labour include young age of mothers, poor socio-economic class and smoking.

CAUSES

- Maternal infections e.g. pyelonephritis, malaria
- Incompetent cervix
- Premature rupture of membranes
- Multiple pregnancies
- Abruptio placentae
- Diabetes mellitus
- Pre-eclampsia/eclampsia

SYMPTOMS

- Regular and painful uterine contractions or abdominal pains
- There may be a 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
 - Gestational age
 - Foetal lie
 - Presentation
 - Amniotic fluid volume
 - Placental site
 - Estimation of the foetal weight

TREATMENT

Treatment objectives

- To stop uterine contractions if labour is not fully established
- To allow foetal growth and maturation in utero if feasible
- To promote foetal lung maturity (gestations 28-34 weeks)
- To allow labour to progress if it is already well established
- To treat any underlying cause (e.g. malaria, pyelonephritis)

Non-pharmacological treatment

- Avoid sexual intercourse
- Avoid strenuous physical activity
- Bed rest
- Cervical cerclage suture for cases diagnosed as due to cervical incompetence

Pharmacological treatment

A. Tocolysis

Evidence Rating: [B]

- Salbutamol, IV infusion, 2.5 mg in 500 ml of Dextrose 5%; Start infusion at 10 micrograms per minute (i.e. 2 ml per minute) and increase rate gradually according to response at 10 min intervals until contractions diminish, then increase rate slowly until contractions cease (Maximum rate 45 micrograms per minute); Maintain rate for one hour after contraction has stopped, then gradually reduce by 50% every 6 hours; (Maximum duration 48 hours.)

Or

Evidence Rating: [A]

- Nifedipine, oral, 20 mg initially,

Then

20 mg after 90 minutes

If contractions persist therapy can be continued with 20 mg every 3-8 hours for 48-72 hours as tolerated by patient (max. 160 mg per day)

Note 13-144

Monitor blood pressure

- Magnesium sulphate, IV, 6 g intravenous load initial over 20 minutes

Then

2 g infusion per hour

After

Infusion rate is based on response

B. Foetal lung Maturation with Antenatal corticosteroids Gestations between 28-34 weeks

Evidence Rating: [A]

- Betamethasone, oral, 0.6-7 mg every 24 hours (2 doses)

Or

- Dexamethasone, 6 mg 12 hourly for (4 doses)

Note 13-15

Treatment is most effective if delivery occurs at least 24 hours after the first dose of the medicine has been given and less than 7 days after the last dose of the medicine.

Caution 13-1.

AVOID Dexamethasone/Bethamethsone use when infection is present.
Dangers of steroid use include susceptibility to infection, fluid retention and pulmonary oedema and maternal postpartum collapse.

REFERRAL CRITERIA

Treatment is best done in a hospital where the facilities can support the adequate care of the preterm neonate. Therefore, 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.

125. Premature Rupture of the Membranes

This is the rupture of the membranes before the onset of labour. The two types are preterm (before 37 completed weeks) and term (after 37 weeks, but ≥ 1 hour before onset of labour).

CAUSES

- Cervical Incompetence
- Genital tract infection
- Trauma

SYMPOTOMS

- Gush or leakage of copious fluid from the vagina

SIGNS

- Speculum examination reveals clear fluid from the cervical os or pool of fluid in the posterior vaginal fornix
- Smaller uterine size for the gestational age
- If complicated by infection (chorioamnionitis)
 - Fever
 - Purulent vaginal discharge
- Foetal tachycardia or bradycardia
- 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 and/or treat infection
- To prevent labour if preterm and baby is very immature
- To improve foetal survival through improved foetal lung maturity

Non-pharmacological treatment

- Bed rest

Pharmacological treatment

A. Infection Prevention

1st Line Treatment

Evidence Rating: [B]

- Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly for 7 days
And
- Metronidazole, oral, 400 mg 8 hourly for 7 days

2nd Line Treatment

Evidence Rating: [C]

- Amoxicillin + Clavulanic Acid, oral, 625 mg - 1 g 12 hourly for 7 days

B. Infection Prevention – patients with penicillin allergy

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

And

- Metronidazole, oral, 400 mg 8 hourly for 7 days

C. Foetal lung maturation – for babies 28-34 weeks

Evidence Rating: [A]

- Betamethasone, oral, 0.6-7 mg every 24 hours (2 doses)

Or

- Dexamethasone, oral, 6 mg 12 hourly for (4 doses)

Note 13-16

Treatment is most effective if delivery occurs at least 24 hours after the first dose of the medicine has been given and less than 7 days after the last dose of the medicine. They also benefit the premature newborn by lowering the risk of intraventricular hemorrhage and death.

REFERRAL CRITERIA

If at sub-district level refer patients to hospital or specialist for further management if signs of maternal infection, pregnancy is less than 37 weeks and or premature labour occurs.

Chapter

GYNAECOLOGICAL DISORDERS

14

126. Dysmenorrhoea

Dysmenorrhea refers to cyclical lower abdominal pain associated with menstruation. The pain is thought to result from uterine contractions. It may be primary when there is no identifiable cause or secondary when associated with an underlying cause.

CAUSES

- Often no underlying cause (primary)
- 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

- Bed rest
- Warm pads applied to the lower abdomen

Pharmacological treatment

A. Mild Cases

1st Line Treatment

Evidence Rating: [A]

- Paracetamol, oral, 1 g 6-8 hourly

B. Severe cases

- Ibuprofen, oral, 200-400 mg 8 hourly

Or

- Mefenamic Acid, oral, 500 mg 8 hourly

REFERRAL CRITERIA

Refer to a gynaecologist if pain interferes with normal activity especially if treatment is ineffective or an underlying cause is identified.

127. Abortion

Abortion refers to the expulsion of the foetus and other products of conception before the 28th week of pregnancy. It may occur spontaneously (threatened, inevitable, incomplete, complete or missed) or be induced (therapeutic, criminal). Both spontaneous and induced abortion may become complicated by infection (sepsis) and/or profuse bleeding.

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. A follow up review should also be done in two weeks.

| ABORTION |

CAUSES

- Spontaneous Abortions
 - Infections e.g. malaria, UTI, bacterial vaginosis etc.
 - Foetal abnormalities
 - Incompetent cervix
 - Chronic illness e.g. diabetes, thyroid disorders, sickle cell disease etc.
 - Trauma
- Unsafe Abortions
 - Interference of the pregnancy with medications (oral, parenteral or douches) or instrumentation

THREATENED ABORTION

SYMPTOMS

- Scanty to moderate painless vaginal bleeding
- Mild pelvic discomfort

SIGNS

- The uterine size is compatible with the gestational age

- There is no cervical effacement or dilatation

INVESTIGATIONS

- FBC and sickling
- Ultrasound scan (to confirm viable foetus in utero with closed cervix)
- Other investigations for potential underlying causes e.g. malaria

TREATMENT

Treatment objectives

- To maintain a viable pregnancy to term if possible

Non-pharmacological treatment

- Bed rest at home or hospital
- To abstain from sexual intercourse
- To report back if bleeding or pain increases

Pharmacological treatment

- No specific treatment required
- Treat any underlying illnesses e.g. malaria

INEVITABLE ABORTION

SYMPTOMS

- Lower abdominal pain
- Heavy vaginal bleeding
- No foetus or products of conception passed per vagina
- Painless loss of liquor per vaginam

ABORTION

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 and/or prevent shock
- 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
- To prevent risk of Rhesus incompatibility in future pregnancies

Non-pharmacological treatment

- 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 paracervical block or general anaesthesia (Gestations 12 weeks or less)
- Uterine evacuation under anaesthesia especially when the uterine size is larger than 12 weeks size

Pharmacological treatment

A. If patient is in shock or bleeding is severe

- IV fluids and blood transfusion as necessary

B. To relieve severe pain

Evidence Rating: [C]

- Morphine, IV, 2.5-5 mg 4 hourly as required
And
- Metoclopramide, IV, 5-10 mg 8 hourly as required for vomiting

Or

- Pethidine, IM, 75-100 mg stat.

Then

50-100 mg 6-8 hourly if required

And

- Promethazine, IV/IM, 25 mg as required (max. 25 mg 6 hourly) as required to reduce the chances of vomiting and to potentiate the analgesic effect of Pethidine

C. Evacuate uterus

If uterine size > 12-14 weeks

Evidence Rating: [A]

- Oxytocin, IV, 10-20 units per litre of Normal saline

Or

Uterine size <12 weeks

Evidence Rating: [C]

- Misoprostol, oral/SL, 600 microgram stat.

D. To Prevent Infection

- Amoxicillin, oral, 500 mg 8 hourly for 5-7days
And

- Metronidazole, oral, 400 mg 8 hourly for 5-7days

E. To prevent Rhesus Isomunization in Rhesus negative women

Evidence Rating: [A]

- Anti D Rh Immune Globulin, IM, 300 microgram (1,500 Units), stat. within 72 hours of abortion

INCOMPLETE ABORTION

SYMPTOMS

- Passage of large blood clots and/or the foetus and some products per vaginam
- Severe lower abdominal pain

SIGNS

- If bleeding is severe: Pallor and/or Shock (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 present 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 during vaginal examination to remove as much of the retained tissues as possible
- Surgical evacuation of retained products of conception e.g. manual vacuum aspiration (MVA) with or without anaesthesia
- Post abortion abstention from sexual intercourse for at least 2 weeks
- Post abortion counselling and psychological support (including Family Planning)

Pharmacological treatment

A. If in shock and/or severe bleeding

- IV fluids and blood transfusion as necessary

B. Abortion with uterine size < 12 weeks

Evidence Rating: [A]

- Ergometrine, IM/IV, 500 microgram stat.

Or

- Misoprostol, oral, 600 microgram stat.

Or

- Misoprostol, sublingual, 400 microgram stat.

C. Abortion with uterine size > 12 weeks and ≤ 24 weeks

Evidence Rating: [A]

- Misoprostol, oral, 600 micrograms stat.

Or

- Misoprostol, sublingual, 400 micrograms stat.

D. Abortion with uterine size > 24 weeks

Evidence Rating: [B]

- 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.

Or

- Misoprostol, sublingual, 400 micrograms stat.

E. To prevent infection

- Amoxicillin, oral, 500 mg 8 hourly for 5-7days

And

- Metronidazole, oral, 400 mg 8 hourly for 5-7days

F. To prevent infection – in patients with penicillin allergy

- Erythromycin, oral, 500 mg 8 hourly for 5-7days

And

- Metronidazole, oral, 400 mg 8 hourly for 5-7days

G. To prevent Rhesus Isommunization

Evidence Rating: [A]

(See section under 'Inevitable Abortion' above)

COMPLETE ABORTION

SYMPOTOMS

- Cessation or reduction of vaginal bleeding following heavy bleeding with passage of clots and/or the foetus and placenta.
- Resolution or abatement of pain

SIGNS

- The uterus is smaller than the gestational age
- The cervix is closed and firm
- No pelvic tenderness

INVESTIGATIONS

- FBC
- Blood grouping and cross matching
- Ultrasound scan: to confirm empty uterine cavity

TREATMENT

Treatment objectives

- To confirm abortion is complete
- To assess for and manage anaemia if present
- To assess for and manage pelvic infection if present
- To prevent risk of Rhesus incompatibility in future pregnancies

Non-pharmacological treatment

- Counselling and psychological support (including family Planning)

Pharmacological treatment

- Treat anaemia if present (See section on 'Anaemia in Pregnancy')
- Provide antibiotics if needed (See section on treatment of 'Incomplete Abortion')
- Provide Anti D Immune globulin if Indicated (See section under 'Inevitable Abortion' above)

SEPTIC ABORTION

This is a life threatening complication of abortion. Most often there is a history of criminal interference with the pregnancy. It may 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.

ABORTION

CAUSES

- Infected retained products of conception

SYMPTOMS

- Severe lower abdominal pain
- Fever
- Vomiting
- Headache
- Offensive, bloody vaginal discharge

SIGNS

- Fever (but temperature may be normal)
- Tachycardia
- If in septic shock: low blood pressure
- Peritonism
- Bulky tender uterus
- Cervix may be opened or closed
- Retained offensive products of conception

INVESTIGATIONS

- FBC and sickling test
- 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, presence of products in uterus, fluids and gas in the pelvis)

TREATMENT

Treatment objectives

- To resuscitate patient
- To treat infection
- To evacuate uterus
- To provide post-abortion counselling

Non-pharmacological treatment

- Evacuate the retained products of conception (careful evacuation of the uterus must be done as risk of uterine perforation is high)
- Gentle digital curettage followed by the instrumental curettage under general anaesthesia within 6 hours of initiation of antibiotic therapy
- Examine to confirm if uterus is perforated and determine if surgery is required
- Psychological support and family planning counselling

Pharmacological treatment

- A. Resuscitation for shock
- Evidence Rating: [A]
- IV fluids and blood transfusion as necessary
- B. Treatment of Sepsis
- Amoxicillin + Clavulanic Acid, IV, 1.2 g 8 hourly for 24-72 hours
And
- Gentamicin, IV, 80 mg 8 hourly for 5 days
And
- Metronidazole, IV, 500 mg 8 hourly for 24-72 hours

Note 14-1

Culture and sensitivity test results will direct further antibiotic therapy. IV antibiotic therapy should be continued until the patient is afebrile for at least 24 hours. Oral therapy should be continued for at least seven days. If Gentamicin is to be continued give 80 mg IM or IV 8 hourly for at least 5 days.

C. Evacuate uterus

Note 14-2

To abort foetus if still in utero and/or if surgical evacuation of products is not immediately possible.

- Oxytocin, IV infusion
(See section on 'Inevitable Abortion')
Or
 - Misoprostol, sublingual oral or vaginal, 600 microgram stat.
(See section on 'Incomplete Abortion' above)
- D. Severe Pain management**
- Evidence Rating: [C]
- Morphine, IV, 2.5-5 mg 4 hourly as required
And
 - Metoclopramide, IV, 5-10 mg 8 hourly as required for vomiting
Or
 - Pethidine, IM, 50-100 mg 4-6 hourly (Maximum 400 mg in 24 hours)
And
 - Promethazine, IV/IM, 25 mg 8-12 hourly as required (max. 25 mg 6 hourly) to reduce the chances of vomiting and to potentiate the analgesic effect of Pethidine
 - E. Tetanus Prophylaxis
 - Tetanol, IM, 0.5 ml stat.
And
 - Human Immune Tetanus Globulin, IM, 250-500 units stat.

ABORTION

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 gestational age / dates
- Foetal heart tones are not heard either with the Pinards stethoscope or with a foetal Doppler device such as Sonicaid

INVESTIGATIONS

- FBC and sickling test
- 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

- Evacuation of the uterus by suction curettage (manual or with machine); < 12 weeks gestation
- Surgical evacuation of uterus (D&E) after cervical ripening with medication; second trimester

Pharmacological treatment**A. Ripening of cervix to facilitate surgical evacuation**

Evidence Rating: [A]

- Misoprostol, oral or vaginal, 400 micrograms stat. at least 3 hours prior to surgical evacuation

B. Emptying uterus with Medication in Missed Abortion

(See section on Misoprostol treatment under 'Induced Abortion' below)

Or

Evidence Rating: [B]

- Oxytocin drip may be used for induction where other cervical ripening methods (e.g. Foleys catheter balloon) are used.

Note 14-3

Oxytocin should not be used concurrently together with Misoprostol for uterine sizes greater than 20 weeks. A 4 to 6 hour time interval must be given between use of the two drugs. If both must be used this must be done with extreme caution as risk for uterine rupture is great.

INDUCED (SAFE) 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 and 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 or offensive vaginal discharge.

INVESTIGATIONS

- FBC
- Blood group and Rhesus factor

- Special Investigations for medico-legal indications e.g. rape (DNA, HIV status etc.)

TREATMENT

Treatment objectives

- To ensure that legal requirements for termination are met
- To ensure safe abortion
- To provide family planning counselling and services as needed
- To prevent risk of Rhesus incompatibility in future pregnancies

Non-pharmacological treatment

- Manual Vacuum Aspiration (4-12 week gestation)
- Dilatation and curettage (4-12 week gestation)
- Cervical ripening followed by Dilatation and Evacuation (D&E)
- (> 12 weeks gestation)

Pharmacological treatment

A. Medication Abortion

Evidence Rating: [A]

- Mifepristone
Then
- Misoprostol

(See Table below for dosage regimes for the various gestational ages.)

ABORTION

Table 14-1: Dosage regimes for Mifepristone and Misoprostol for various gestational ages

Gestational ages	Mifepristone and Misoprostol (Evidence Rating A)	Misoprostol Only (Evidence Rating A)
4-8 weeks	Mifepristone 200 mg stat. PLUS followed 24-48 hours later by Misoprostol, 800 micrograms (oral, vaginally) stat followed if needed by 2 repeat doses of 800 micrograms vaginally or sublingually every 3-12 hourly (max. 3 doses)	Misoprostol only: 800 microgram stat. vaginally followed by 2 repeat doses of 800 microgram vaginally or sublingually if needed every 3-12 hourly (max. 3 doses)
9-12 weeks	Mifepristone 200 mg orally, PLUS 36 -48 hours later: Misoprostol 800 microgram vaginally, follow with up to 2 additional doses of Misoprostol 400 microgram sublingually or vaginally at 3 -12 hour intervals (max. 3 doses)	Misoprostol 800 microgram vaginally stat., Followed by 2 repeat doses of 800 microgram every 3-12 hours if needed (max. 3 doses)

Gestational ages	Mifepristone and Misoprostol (Evidence Rating A)	Misoprostol Only (Evidence Rating A)
13-24* weeks	Mifepristone 200 mg orally, PLUS 36-48 hours later Misoprostol 800 microgram vaginally. Follow by repeated dose of Misoprostol 400 microgram every 3-4 hourly vaginally (or sublingually if there is significant bleeding) until expulsion (max. 5 doses)	Misoprostol 800 microgram vaginally followed by 400 microgram vaginally (or sublingually if there is significant bleeding) at 3-6 hourly intervals. Repeat dosing until expulsion (max. 5 doses)
24 -28* weeks	Mifepristone 200 mg orally, PLUS 36-48 hours later Misoprostol 100- 200 microgram vaginally or orally every 4 hours Repeat dosing until expulsion (max. 5 doses. Decrease dose of misoprostol with increasing gestational age.	Misoprostol 100-200 microgram vaginally or orally every 4 hours Repeat dosing until expulsion (max. 5 doses). Decrease dose of misoprostol with increasing gestational age.

Note 14-4

- Uterine sensitivity to Misoprostol increases with gestational age. Lower doses of misoprostol are therefore used for older gestations
- *Medication Abortions in second trimester should only be done by doctors

REFERRAL CRITERIA

For all types of abortion, refer early for specialist care if the uterus is suspected or found to be perforated or if complications e.g. infection or profuse bleeding are severe.

Table 14-2: Misoprostol Uses and Dosage in Management of Pregnancy Complications

Indication	Dosage	Notes
Induced abortion (0-8 weeks)	Misoprostol 800 microgram vaginally or orally or sublingually 3-12 hourly (max. 3 doses)	Ideally used 24-48 hours after Mifepristone, oral, 200 mg.
Induced abortion (9-12 weeks)	Misoprostol 800 microgram vaginally followed by Misoprostol 400 microgram vaginally or sublingually every 3 hours hourly (max. 3 doses)	Ideally used 24-48 hours after Mifepristone, oral, 200 mg

I ABORTION	Missed abortion (0-12 weeks)	Misoprostol 800 microgram vaginally if needed repeat dose in 24 to 72 hours OR Misoprostol 600 microgram sublingually followed by two additional doses if needed 3 hourly	Give 2 doses and leave to work for 1-2 days (unless heavy bleeding or infection)
	Incomplete abortion (0-12 weeks)	600 microgram orally stat	Leave to work for 2 days (unless heavy bleeding or infection).
	Induced abortion (13-24 weeks)	400 microgram vaginally 3-4 hourly (max. 5 doses)	Ideally used 48 hours after Mifepristone, oral, 200 mg. A lower Misoprostol dose of <200 microgram may be used with caution in women with caesarean scar only under specialist supervision
	Intrauterine foetal death (<28 weeks)	13-17 weeks: Misoprostol 200 microgram 6 hourly 18-28 weeks: Misoprostol 100 microgram 6 hourly	Misoprostol should be used with caution in women with caesarean scar and only under specialist supervision
	Intrauterine foetal death (>28 weeks)	28-42 weeks: Misoprostol 25-50 microgram 4 hourly	Do not administer to women with previous caesarean section or other uterine scar
	Induction of labour (live fetus > 28 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.	Use as second line drug if oxytocin is not available or is ineffective.
	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

Note: Misoprostol is associated with an increase in shivering, diarrhoea, and temperature higher than 38°C.

128. 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 in these age groups as it is mostly due to immaturity or ageing of the ovaries and its pituitary controls.

Bleeding may be mild or severe and life threatening.

In other age groups, the causes are multiple and may be associated with the identifiable disorders. Postmenopausal bleeding is said to occur when a woman who has stopped having menstruation for 6-12 or more months begins to bleed per vagina. Occasionally bleeding from the rectum and urethra may be confused with genital tract bleeding.

Treatment is directed at the cause found.

CAUSES

Pre-pubertal girls

- Urethral mucosal prolapse
- Coital lacerations due to rape and defilement
- Trauma

Young Adolescents

- Dysfunctional uterine bleeding
- Complications of pregnancy
- Coital lacerations due to rape and defilement
- Accidental traumatic lesions of vulva and vagina

Women of Child Bearing Age

- Complications of pregnancy, including ectopic pregnancy, abortion and choriocarcinoma
- Coital lacerations
- Use of hormonal methods of contraception or intrauterine contraceptive device (IUCD)
- Cervical cancer
- Fibroids
- Dysfunctional bleeding

Peri-menopausal Women

- Dysfunctional uterine bleeding
- 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

SYMPTOMS

- Vaginal bleeding which deviates from normal menstrual pattern
- May be associated lower abdominal pain or dysmenorrhoea
- Symptoms of anaemia (dizziness, palpitations, easy fatigue etc.)

SIGNS

- Signs of anaemia (if heavy bleeding)
- Other signs related to cause

INVESTIGATIONS

- FBC
- Sickling test
- Blood clotting screen e.g. Prothrombin time, INR
- Pelvic ultrasound scan (to rule out pelvic lesions)
- Urinalysis
- Diagnostic Dilatation and Curettage (DD & C) for women of child bearing age and postmenopausal women

TREATMENT

Treatment objectives

- To resuscitate patient where necessary
- To find the cause of bleeding
- To treat and stop the bleeding

Non-pharmacological treatment

- Vaginal coital tear - suturing in theatre
- Inevitable or incomplete abortion - uterine evacuation
- Surgery (myomectomy, hysterectomy, oophorectomy etc.)
- Radiation therapy for cancers

| Pharmacological treatment

A. Dysfunctional uterine bleeding – mild bleeding

1st Line Treatment

Evidence Rating: [B]

- Norethisterone acetate, oral, 5 mg 8 hourly for 10-12 days (to stop bleeding)

Then

5 mg 12 hourly (days 19 to 26 of cycle to prevent bleeding)

2nd Line Treatment

Evidence Rating: [B]

- Mefenamic Acid, oral, 500 mg 8 hourly on days 1 to 5 of cycle (Especially if associated with dysmenorrhoea)

B. Life threatening bleeding

1st Line Treatment

Evidence Rating: [A]

- IV fluids and blood transfusion as required

And

Evidence Rating: [A]

- Tranexamic Acid, oral or IV, 1 g 6-8 hourly for 4-7 days

2nd Line Treatment

Evidence Rating: [B]

- Mefenamic Acid, slow IV injection, 500 mg 8 hourly (days 1 to 5 of cycle)

C. For recurrent or protracted abnormal bleeding

1st Line Treatment

Evidence Rating [A]

Low dose oral contraceptive pill daily for 3-6 cycles or longer

- Ethinylestradiol + levonorgestrel

Or

- Ethinylestradiol + norethisterone

2nd Line Treatment

Evidence Rating: [C]

- Conjugated oestrogen, oral, 1.25-2.5 mg daily for 10-12 days

And

Evidence Rating: [A]

- Norethisterone, oral, 5-10 mg 8 hourly for 21 days (days 5-25)

Or

Evidence Rating: [B]

- Medroxyprogesterone acetate, oral, 5-10 mg daily for 5-10 days (days 19 to 26 of cycle)

REFERRAL CRITERIA

Refer all women with heavy menstrual bleeding and/or abnormal vaginal bleeding not responding to therapy to a gynaecologist for comprehensive assessment and management.

129. Abnormal Vaginal Discharge

While a vaginal discharge is a notable clinical feature of a Sexually Transmitted Infection (STI), not all forms of vaginal discharge are abnormal or indicative of an STI. Vaginal discharge may be associated with normal physiological changes such as the menstrual cycle or pregnancy. Increased discharge may also occur with the presence or use of foreign substances such as the Intra Uterine Contraceptive Device (IUCD).

Careful history taking should reveal whether a vaginal discharge is abnormal and if it is associated with use of chemical substances e.g. topical self-medication, repeated douching with abrasive substances or indeed due to STI. Changes in the characteristics of a woman's vaginal discharge either in colour, odour, amount and presence of additional

symptoms and signs such as soreness and itchiness indicate a need for medical attention.

Abnormal vaginal discharge due to STIs may result in serious pelvic inflammation with sequelae such as ectopic pregnancy and infertility. Careful risk assessment is therefore required (see note below) of women presenting with a vaginal discharge in order to identify the possible causes and provide appropriate treatment regimens based on the most likely aetiology of the vaginal discharge. Factors that must also be considered when selecting treatment for patients include pregnancy status and patient discomfort.

Additionally, the syndromic approach must be used to assess the patient, identify risk factors and treat the likely cause of infection.

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)
 - *Gardnerella vaginalis*
 - Foreign bodies
 - Herbal preparations

SYMPTOMS

- Abnormal vaginal discharge - change in colour, odour, consistency or amount
- Vulval itching
- Vulval swelling
- Pain on urination
- Lower abdominal or back pain

SIGNS

- Abnormal 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

- Promote good peri-anal and genital hygiene
- Encourage use of loose cotton underwear
- Dry underwear out in the sun
- Keep underwear dry
- Avoid douching with herbal or chemical preparations
- Avoid use of medicated soaps

Pharmacological treatment

Box 14-1: Risk assessment

Parameters used in the risk assessment for cervicitis are:

- i. Patient's partner is symptomatic (i.e. partner has a urethral discharge)
- ii. Patient is less than 21 years old
- iii. Patient is single
- iv. Patient has more than one sexual partner
- v. 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.

A. Treatment for Vaginitis due to trichomoniasis and bacterial vaginosis

Evidence Rating: [B]

- 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
- Secnidazole, oral, 2 g stat. (contraindicated during the 1st trimester of pregnancy)

B. Treatment for Vaginitis due to trichomoniasis and bacterial vaginosis for pregnant women in the 1st trimester

- Clindamycin cream, 2%, vaginal, One applicator full at bedtime for 7 days

C. Treatment for Vaginitis due to Candidiasis

- Fluconazole, oral,
Uncomplicated: 150 mg stat. as a single dose
Complicated: 150 mg 72 hourly for 3 doses
Recurrent: 150 mg daily for 10 to 14 days followed by 150 mg once weekly for 6 months

Or

- 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

And

- Clotrimazole cream, vaginal, 1% or 2%, Apply twice daily for 3 to 7 days (for vulval irritation)

D. Treatment for Cervicitis due to gonorrhoea

1st Line Treatment

Evidence Rating: [B]

- Cefixime, oral, 400 mg stat.

And

- Azithromycin, oral, 1 g stat.

2nd Line Treatment

Evidence Rating: [B]

- Ceftriaxone, IM, 250 mg stat.

And

- Azithromycin, oral, 1 g stat.

E. Treatment for Cervicitis due to Chlamydia

1st Line Treatment

Evidence Rating: [A]

- Doxycycline, oral, 100 mg 12 hourly for 7 days (avoid in pregnant and nursing mothers)

Or

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

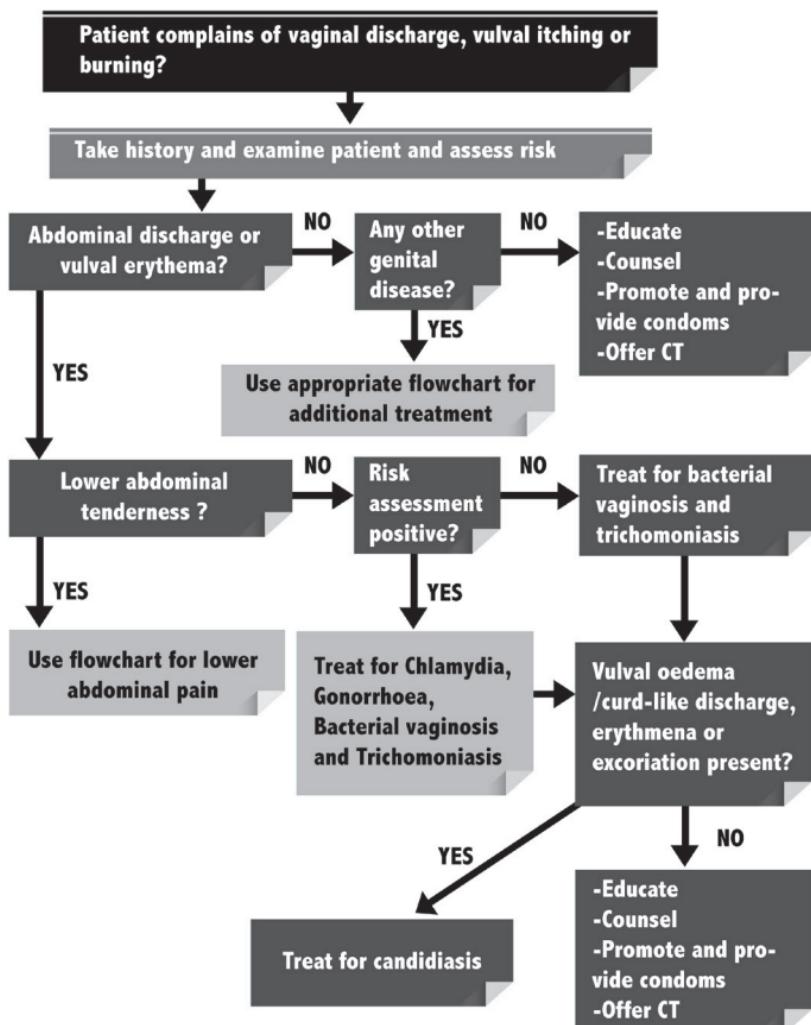
Or

- Azithromycin, oral, 1 g stat. (recommended in pregnancy)

REFERRAL CRITERIA

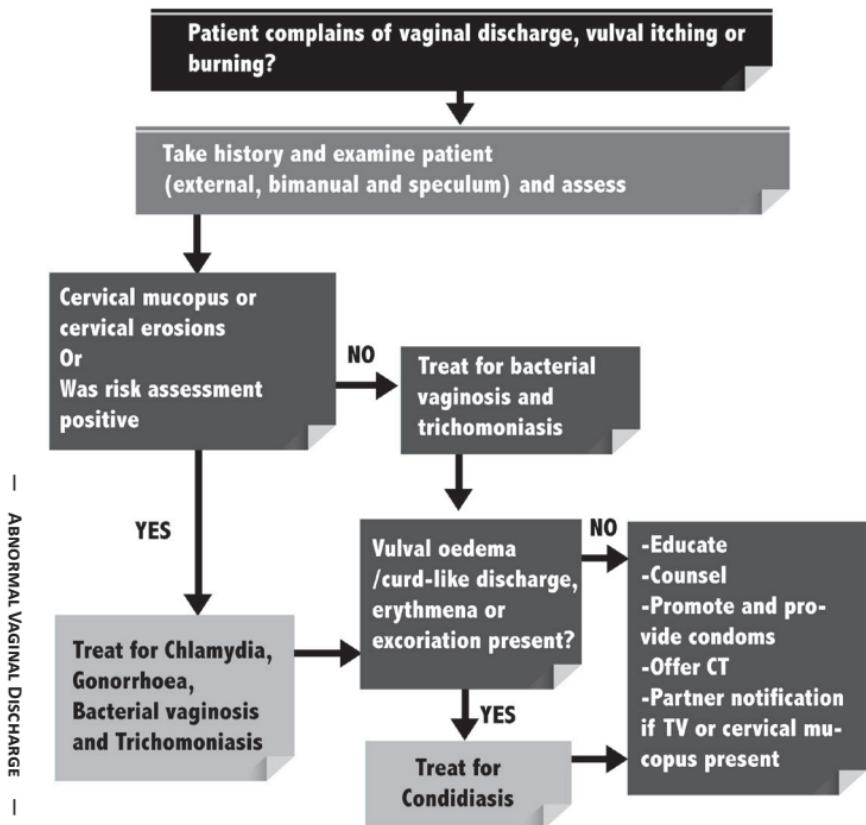
Refer all cases of recurrent vaginal discharge and/or treatment failures to a health facility where speculum examination can be carried out and microbiological culture and antimicrobial sensitivity tests can be done on the vaginal discharge.

FLOWCHART



Ghana National Drugs Programme, Ministry of Health
 Email: gndp@ghndp.org website: www.ghndp.org

Fig 14-2: Flowchart: Abnormal Vaginal Discharge (Without Speculum)

FLOWCHART

- Abnormal Discharge = offensive, coloured, profuse discharge with or without pain
- Positive Risk Assessment -
 - Partner with symptoms
 - Or any two of the following
 - Being single
 - Having more than 1 partner
 - New partner in past 3 months

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Fig 14-3: Flowchart: Vaginal Discharge with Speculum And Bimanual Examination

130. Acute Lower Abdominal Pain

Acute 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 Sexually Transmitted Infection (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 (IUCD) favours the development of PID particularly in the month following insertion.

CAUSES

- Ectopic pregnancy
- Appendicitis
- Ovarian torsion
- STI-related
- Non STI-related (e.g urinary tract infection)
- Septic abortion
- Post partum sepsis
- Foreign body including IUCD

SYMPTOMS

- Fever
- Lower abdominal pain
- Pain with sexual intercourse (dyspareunia)
- Offensive vaginal discharge
- Dysuria or urethral discomfort

SIGNS

- Abnormal vaginal discharge
- Tenderness on moving the cervix (cervical excitation) on bimanual vaginal examination
- Lower abdominal tenderness
- Adnexal tenderness
- Adnexal masses

INVESTIGATIONS

- Pelvic ultrasound
- Pregnancy test (if sexually active and amenorrhoea present)
- High vaginal swab culture and sensitivity

TREATMENT

Treatment objectives

- To identify and manage potential life threatening causes e.g. ectopic
- To treat any underlying bacterial infection
- To relieve pain and inflammation

Non-pharmacological treatment

- Surgery where indicated
- Remove IUD, if present, 3 days after initiation of drug therapy

Pharmacological treatment

A. For Pelvic inflammatory Disease (mild cases)

1st Line Treatment

Evidence Rating: [B]

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days
And
- Doxycycline, oral, 100 mg 12 hourly for 14 days
And
- Metronidazole, oral, 400 mg 12 hourly for 14 days

Box 14-4:

Consider hospitalization or referral in the following cases:

- Where surgical emergencies e.g. ectopic, appendicitis cannot be excluded.
- The patient is pregnant (PID is uncommon in pregnancy, especially after the first trimester).
- The patient does not respond clinically to oral antimicrobial therapy.
- The patient is unable to follow or tolerate an outpatient oral regimen.
- The patient has severe illness, associated with nausea and vomiting, or high fever.
- The patient has a tubo-ovarian abscess.
- HIV infection
- Youth/adolescents (particularly if compliance is an issue)

B. For Pelvic inflammatory Disease (severe cases)

- Ceftriaxone, IM, 250 mg daily for 3 days

And

- Doxycycline, oral, 100 mg 12 hourly for 3 days

And

- Metronidazole, IV, 500 mg 8 hourly for 3 days

Then

- Doxycycline, oral, 100 mg 12 hourly for 14 days

And

- Metronidazole, oral, 400 mg 12 hourly for 14 days

Note 14-5

The use of ciprofloxacin and doxycycline is contraindicated in pregnant and lactating women.

C. Pain relief

- Diclofenac, rectal, oral, IM, 50-100 mg 8 to 12 hourly (max. 100 mg twice daily)
Or
- Mefenamic Acid, oral, 500 mg 8 hourly

REFERRAL CRITERIA

Refer to a gynaecologist or general surgeon if there is no improvement or if a pelvic abscess is suspected.

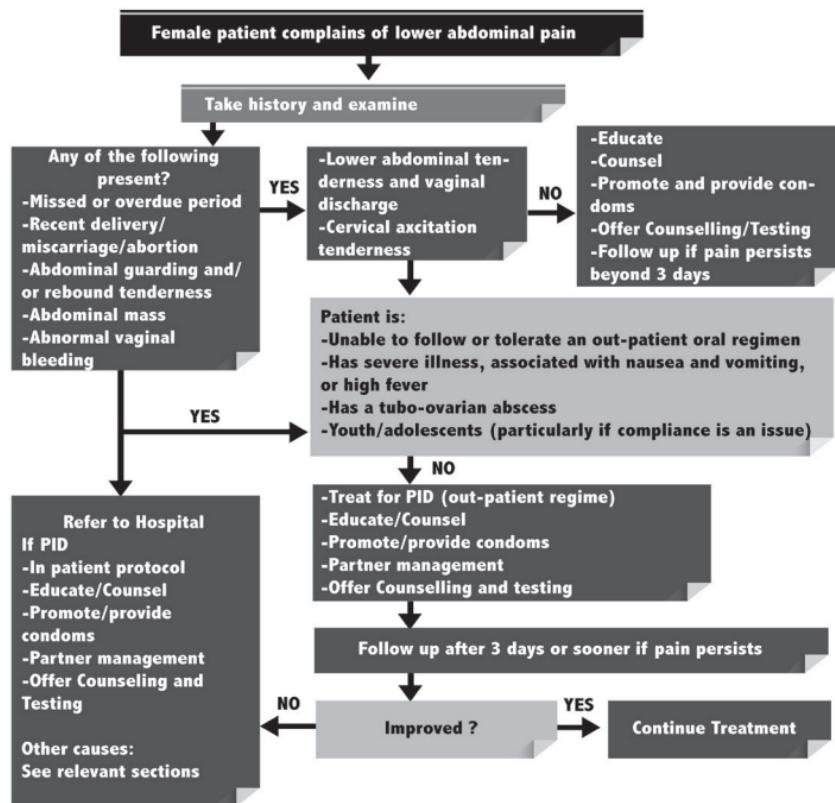
FLOWCHART

Fig 14-5: Flowchart: Acute Lower Abdominal Pain

131. 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 sexual, menstrual and obstetric history, a past history of Pelvic Inflammatory Disease (PID) and Sexually Transmitted Infections (STIs), contraception use and other significant past medical history.

CAUSES

Female factors

- Ovulation failure
- Polycystic ovarian syndrome (PCOS)
- Hyperprolactinaemia
- Pelvic factors
- Congenital malformations of uterus etc.
- Tubal disease
- Pelvic adhesions
- Uterine fibroids
- Endometriosis
- Cervical factors

Male factors

- Oligospermia
- Azoospermia
- Penile and testicular abnormalities
- Erectile dysfunction

SYMPTOMS

- Inability to achieve pregnancy despite regular unprotected sex at least 2-3 times weekly
- Amenorrhoea (females)
- Impotence (males)

SIGNS

Female

- Absence of secondary sexual characteristics
- Virilisation changes (hirsutism, clitoromegaly, deepening of voice etc.)
- Galactorrhoea
- Abdominal masses due to uterine or ovarian enlargement
- Abnormal vaginal discharge indicative of infection

Male

- Abnormal penile discharge indicative of infection
- Absence of secondary sexual characteristics
- Testicular abnormalities e.g. varicoceles, small or absent testes

INVESTIGATIONS

- FBC, Sickling
- High vaginal swab
- 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
- Uterine, Tubal and Testicular surgery where needed
- Assisted Reproduction Technologies e.g. Artificial insemination, In-vitro-fertilization with embryo transfer where indicated

Pharmacological treatment**A. Failure of ovulation**

1st Line Treatment

Evidence Rating: [A]

- Clomifene citrate, oral, 50 mg daily for 5 days, starting between the 2nd and 5th day of the menstrual cycle.

B. Hyperprolactinaemia

1st Line Treatment

Evidence Rating: [A]

- Bromocriptine, oral, 1.25 mg nocte for 7 days (with the evening meal or at bedtime). Increase weekly to a max. of 2.5 mg 8 hourly

REFERRAL CRITERIA

Early referral of all patients with infertility to a specialist is preferred, particularly women with uterine, ovarian or tubal disease requiring surgery or who require ovulation induction not responsive to clomifene citrate. Also refer male partners for review by a urologist.

132. Menopause

Menopause refers to the point in time when permanent cessation of menstruation occurs due to loss of ovarian function. The cessation of menses is preceded by a peri-menopausal phase during which there may be menstrual irregularity. The age at onset is usually between 45 and 55 years. A woman is considered to be menopausal if there has not been menstruation for a period of at least 12 months in the absence of pregnancy. Menopause may be associated with physical, emotional, and psychological upheaval of varying intensity in some women. Sixty percent of menopausal women however have mild symptoms or are asymptomatic. The risk of osteoporosis and cardiovascular disease increase after the menopause.

CAUSES

- A natural life event due to the ageing of the individual
- Surgical removal of the ovaries (bilateral oophorectomy)
- Pelvic irradiation
- Premature ovarian failure
- Pituitary damage from primary post-partum haemorrhage (Sheehan's syndrome)
- Cytotoxic (anticancer) therapy

MENOPAUSE

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
- Vaginal dryness and dyspareunia
- Symptoms due to atrophic changes in the genital tract:
 - Increased frequency of micturition and dysuria.
 - Stress incontinence (urinary incontinence with coughing or straining)

SIGNS

- Usually none

INVESTIGATIONS

- Serum LH, FSH, Oestradiol
- Routine investigations e.g. FBC, blood glucose, lipid profile
- Urine or blood pregnancy tests (to exclude pregnancy)

TREATMENT**Treatment objectives**

- To control bothersome symptoms e.g. severe hot flushes, atrophic vaginitis and recurrent cystitis
- To prevent cardiovascular morbidity
- To prevent osteoporosis especially in individuals with premature menopause

Non-pharmacological treatment

- Counselling and reassurance
- Encourage active lifestyles, healthy diet, exercise and regular physical checkups for common medical problems

Pharmacological treatment**A. Hormone Replacement Therapy (HRT) for women with intact uterus**

1st Line Treatment

Evidence Rating: [A]

- Combined conjugated oestrogens and progestogen, oral, (28 tablets each containing conjugated oestrogens-625 micrograms including 12 tablets containing norgestrel-150 micrograms)
One tablet daily

Or

- Conjugated oestrogen and norgestrel tablet, oral, (625 microgram and 150 microgram)
1 tablet daily on days 17-28 of each 28-day treatment cycle;

B. Hormone Replacement Therapy (HRT) for women with previous hysterectomy

Evidence Rating: [A]

- Conjugated oestrogens, oral, 625 microgram daily

C. For relief of vaginal symptoms only

Evidence Rating: [A]

- Oestrogen cream, vaginal, apply topically once daily

Note 14-6

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

REFERRAL CRITERIA

Refer cases with osteoporosis or severe unremitting symptoms to the specialist.

133. Carcinoma of the Cervix

Carcinoma of the cervix is the commonest form of female genital cancer seen in Ghana. While the disease is preventable, in Ghana, the absence of an effective screening system has resulted in most cases presenting late with advanced disease. In developed countries, the incidence of cervical cancer has fallen considerably due to regular screening procedures (e.g. Pap smear, visual inspection with acetic acid, Human Papilloma Virus [HPV] test).

Vaccination against cancer-causing HPV infection is the ideal method for primary prevention of cervical cancer. Treatment of cervical cancer requires the services of a gynaecological oncologist and radiotherapist. Treatment includes surgery and/or radiation and/or chemotherapy. Surgery involves removal of the central tumour as well as the lymphatics draining the area (Wertheim's hysterectomy). This extensive surgery should be carried out only by trained specialists. Radiation treatment often involves localized pelvic irradiation.

CAUSES

- Human papilloma virus (accounts for 80% of cases)
- Associated risk factors include:
 - 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 cervical screening)
- Symptomatic (advanced disease)
 - Abnormal vaginal bleeding
 - In between regular menstrual periods
 - After sexual intercourse
 - Post menopausal bleeding
 - Abnormal vaginal discharge
 - Lower abdominal pain
 - Pain during sexual intercourse
 - Weight loss
 - Urinary symptoms e.g. dysuria, frequency, incontinence
 - Rectal pain

SIGNS

- Early disease: Erosion of cervix or changes of chronic cervicitis
- Late/advanced disease: Ulcerative or fungating cervical lesion on speculum examination

INVESTIGATIONS

- Cervical biopsy
- FBC and sickling status
- Blood urea and electrolytes
- Serum Creatinine
- Serum uric acid
- Chest X-ray
- Ultrasound of Kidneys
- CT Scan and or Magnetic Resonance Imaging (to detect aortic nodes and metastases to the lungs and liver)
- Pelvic examination under anaesthesia
- Cystoscopy and proctoscopy with or without biopsy 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

- Surgery
- Radiotherapy
- A combination of surgery, and radiotherapy

Pharmacological treatment

Evidence Rating: [A]

- Adjuvant chemotherapy (See section on referral below)

REFERRAL CRITERIA

All patients must be referred to a specialist for evaluation to decide on stage of disease and best mode of treatment. Treatment of carcinoma of the cervix is best done in hospital under specialist team care.

Chapter

14

DISORDERS OF THE KIDNEY AND GENITOURINARY SYSTEM

134. 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. This condition may be associated with hypertension and fluid retention.

CAUSES

- Post streptococcal infections (pharyngeal or skin infections)
- Infected scabies
- Other bacterial Infections e.g. salmonella
- Hepatitis B virus, Hepatitis C virus, HIV
- Parasitic e.g. Schistosoma, Malaria
- Systemic lupus erythematosus and other vasculitides

SYMPTOMS

- A history of preceding infection
- Generalized oedema most marked around the eyes
- Breathlessness
- Anorexia (sometimes associated with vomiting and abdominal pain)
- Fever
- Seizures
- Scanty urine
- Haematuria

SIGNS

- Oedema
- Oliguria (urine volumes < 400 ml/day)
- Hypertension
- Haematuria
- Dark coloured urine
- Acute heart failure
- Coma

INVESTIGATIONS

- Urinalysis

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- 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 (e.g. ANA, AntiDsDNA)
- ASO (antistreptolysin O) titres
- Ultrasound of kidneys

TREATMENT**Treatment objectives**

- To identify and stop the cause of renal injury
- To prevent and control complications

Non-pharmacological treatment

- Bed rest
- Salt restriction in diet
- Control fluid 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**A. For fluid retention in Post-infectious Glomerulonephritis**

Evidence Rating: [B]

- Furosemide, oral or IV,
Adult

40 mg daily, increasing to 80 mg daily

Children

1 month-12 years; 1-2 mg/kg/day initially. Increase by 1-2 mg/kg 8 hourly to a max. of 6 mg/kg per day, not to exceed 80 mg per day.

Neonates

0.5-1 mg/kg 8 to 24 hourly; max. 2 mg/kg.

B. For hypertension in Post-infectious Glomerulonephritis

- Treat blood pressure (See section on 'Hypertension')

REFERRAL CRITERIA

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, should also be referred to a physician specialist or a nephrologist.

135. Nephrotic Syndrome

This condition is associated with proteinuria in excess of 3-3.5 g/1.73 m² daily accompanied by hypoalbuminaemia, oedema, hyperlipidaemia and hypercoagulable state. Diuretics should be used with caution and not given as a routine in children with nephrotic syndrome.

CAUSES

- Primary Glomerular Disease
 - Minimal change disease - common in children
 - Focal and segmental glomerulosclerosis
 - Membranous nephropathy
 - Membranous proliferative glomerulonephritis
- Infections
 - Bacterial (Post streptococcal infection)
 - Viral-Hepatitis B and C, HIV
 - Parasitic (*Plasmodium malariae*, *Schistosoma mansoni*, Filariasis)
- Systemic Diseases
 - Diabetes mellitus
 - Systemic Lupus Erythematosus
 - Amyloidosis
- Drug-related
 - Non steroidal anti-inflammatory drugs

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 disease

INVESTIGATIONS

- Urinalysis
- BUE and creatinine
- Serum albumin
- Serum lipids
- Fasting blood glucose

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- Serology - Hepatitis B, C, HIV
- Hb electrophoresis
- Antinuclear antibody (ANA)
- Ultrasound of kidneys

TREATMENT**Treatment objectives**

- To relieve symptoms
- To treat 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 1st class protein (eggs, meat, fish, dairy products) per day for adult and 2-4 g/kg per day for children

Pharmacological treatment**A. For control of oedema**

1st Line Treatment

Evidence Rating: [C]

- Furosemide, IV,
Adult
40-80 mg 8-12 hourly (max. 160 mg daily)
Children
Refer to specialist.

Note 14-1

In children, furosemide is used in conjunction with albumin infusion only in severe oedema.

Or

- Furosemide, oral,
Adult
40 mg daily, increasing to 80 mg daily; max. 240 mg daily
Children
Refer to specialist.

B. For control of resistant oedema

- Furosemide, IV or oral. (as above for adults and children)
And
- Metolazone, oral,
Adults
2.5-10 mg once daily
Children
Refer to specialist.

Note 14-2

Diuretics should be used with caution and not given as a routine in nephrotic syndrome in children.

C. For control of proteinuria

- Lisinopril, oral,

Adult

5-20 mg daily

And

- Prednisolone, oral,

Adults

1 mg/kg daily

Children

60 mg/m² or 2 mg/kg daily (max. 80 mg). For long-term management, refer to a paediatrician.

Note 14-3

Corticosteroids should be given to children and selected adults with minimal change nephrotic syndrome by specialists only.

REFERRAL CRITERIA

Refer all patients to a physician specialist, paediatrician or nephrologist immediately after diagnosis and stabilisation.

136. Acute Kidney Injury

Acute Kidney Injury (AKI) is a term that has now replaced the term Acute Renal Failure (ARF). It describes a sudden decrease in renal function occurring over a period of hours to days resulting in accumulation of nitrogenous waste products and disruption of blood volume, electrolyte and acid-base balance.

The differential diagnosis of AKI includes prerenal azotaemia, renal (intrinsic) and post renal (obstructive nephropathy) forms of AKI. The most important risk factor for the development of AKI is the presence of pre-existing chronic kidney disease. Other than good medical care with avoidance of volume contraction, prevention of hypotension and avoidance of nephrotoxic agents, no specific interventions have been reliably demonstrated to prevent the development of AKI. During management, a strict fluid input and output chart should be maintained.

AKI has been staged by the Kidney Disease: Improving Global Outcomes (KDIGO), AKI working group for severity according to the criteria below:

KDIGO AKI DEFINITION

Injury, based on the AKIN Criteria

Stage	Serum creatinine criteria	Urine output criteria
1	1.5-1.9 times baseline or increase of > 26.4 micromol	< 0.5 ml/kg/hour for 6-12 hours
2	2.0-2.9 times baseline	< 0.5 ml/kg/hour for > 12 hours
3	3.0 times baseline or increase in serum creatinine to > 353.6 micromol/L Or initiation of dialysis	< 0.3 ml/kg/hour for > 24 hours Or anuria for > 12 hours

CAUSES**Obstetric**

- Septic abortion
- Post-caesarean section
- Severe pre-eclampsia/Eclampsia
- Postpartum Haemorrhage (PPH)
- HELLP (Haemolysis Elevated Liver Enzymes Low Platelet) Syndrome

Gynaecological

- Bilateral ligation of ureters following abdominal hysterectomy

Medical

- Acute Glomerulonephritis
- Haemolysis due to:
 - Malaria
 - Infection
 - Herbal medicines
 - Typhoid fever
 - G6PD deficiency
- Diarrhoea, vomiting and dehydration

Surgical

- Haemorrhage
- Peritonitis
- Acute Pancreatitis
- Obstructive uropathy
- Burns

SYMPTOMS

- Nausea and vomiting
- Oliguria
- Anuria
- Oedema
- Decreased appetite
- Metallic taste in mouth
- Hiccups
- Change in mood
- Flank pain
- Fatigue

- Diarrhoea

SIGNS

- Usually no specific signs

INVESTIGATIONS

- Urinalysis
- FBC
- BUE and creatinine
- Serum uric acid
- Blood culture
- Urine culture
- Abdomino-pelvic ultrasound scan
- 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
- To remove toxic waste from the body (dialysis)

Non-pharmacological treatment

- Nutrition: Give protein of high biological value at 40 g protein/day in adults. In children 0.8-1 g/kg of 1st class protein/day
- Daily weighing
- Maintain fluid balance
- Beware of hyperkalaemia - avoid potassium containing foods e.g. bananas, coconut

Pharmacological treatment

1st Line Treatment

Evidence Rating: [C]

A. Treatment of hypovolaemia

- Sodium Chloride, 0.9%, IV,
Or
- Ringers lactate (if there is no hyperkalaemia) in cases of diarrhoea and vomiting
Or
- Blood transfusion (in severe bleeding)
Or
- Plasma replacement (in cases of severe burns).

Note 14-4

In children, give 10-20 ml/kg fluid boluses.

- B. To re-establish diuresis after adequate fluid replacement
- Furosemide, IV,

Adult

40-80 mg stat.

Children

2-4 mg/kg stat. Do not repeat.

C. Control of hyperkalaemia

Adult

- Calcium gluconate 10%, IV, 10-20 ml, slow IV, over 2-5 minutes

And

- Soluble Insulin, IV, 10 units in 50-100 ml Dextrose 5%

And

- Sodium bicarbonate, IV, 8.4% (50 mEq in 50ml) 1-2 ml/kg over 5 minutes

Note 14-5

Do not mix calcium gluconate and bicarbonate in the same delivery system.

Children

- Salbutamol, nebulised, (preferred)
 > 25 kg; 5 mg
 < 25 kg; 2.5 mg

Or

- Calcium gluconate 10%, IV, 0.5-1 ml/kg, slow IV, over 5-10 minutes

And

- Soluble Insulin, IV, 0.2 units in 5 ml Dextrose 20%, give 2.5-5 ml/kg/hour. Keep blood glucose at 10-15 mmol/L.

And

- Sodium bicarbonate, IV, 8.4% (50 mEq in 50ml) 1-2 ml/kg over 5 minutes

Note 14-6

Do not mix calcium gluconate and bicarbonate in the same delivery system.

D. Treatment of hypertension crises/encephalopathy

(See section on 'Hypertension')

Note 14-7

Indications for dialysis

- Congestive heart failure
- Pulmonary Oedema
- Electrolyte abnormalities especially hyperkalaemia not controlled by conservative means
- Metabolic acidosis
- Uraemic symptoms (seizures, pericarditis)
- Hypertensive Crises/Encephalopathy

REFERRAL CRITERIA

All patients with clinical indications for dialysis must be referred promptly to a centre with facilities for dialysis.

137. Chronic Kidney Disease

Chronic Kidney Disease (CKD) refers to kidney damage of more than 3 months duration. The early stage of CKD is usually asymptomatic but can be detected through laboratory tests of serum creatinine and estimation of Glomerular Filtration Rate (eGFR), measurement of urine albumin creatinine ratio and screening of individuals at increased risk such as those with hypertension, diabetes mellitus or a past history of glomerulonephritis.

CKD may manifest either as urine abnormalities (e.g. persistent microalbuminuria, proteinuria, haematuria), blood abnormalities (e.g. elevated urea and creatinine and estimated GFR < 90 ml/minute/1.73 m²) and structural kidney changes on ultrasonography.

For all stages of CKD, patients should be encouraged to cease smoking, reduce weight if obese, check lipids and treat, and avoid NSAIDs and other nephrotoxic drugs.

Table 14-1: Stages of Chronic Kidney Disease

Stage	Description	eGFR (ml/min/1.73 m ²)
1	Kidney damage with normal or increased GFR	> 90
2	Kidney damage with mild reduction in GFR	60-89
3	Moderate reduction in GFR	30-59
4	Severe reduction in GFR	15-29
5	Kidney failure	< 15

CAUSES

- Chronic hypertension
- Chronic glomerulonephritis
- Diabetes mellitus
- Obstructive uropathy
- Renal calculi
- Polycystic kidney disease
- Toxins (drugs, herbs, heavy metals, etc.)
- Connective tissue disease

SYMPTOMS

- None in the early stages
- Reduced attention and concentration
- Anorexia, nausea, vomiting

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- Gastrointestinal bleeding
- Hiccups
- Breathlessness on exertion
- Thirst
- Nocturia, polyuria
- Muscle Cramps
- Paraesthesia
- Pruritus
- Insomnia

SIGNS

- Lethargy
- Bleeding tendency
- Pallor
- Hypertension
- Pericarditis
- Peripheral neuropathy
- Peripheral oedema
- Asterixis (flapping tremor)
- Increased skin pigmentation and/or excoriation

INVESTIGATIONS

- FBC, Sickling, Blood film comment
- Urinalysis
- Blood Urea, Electrolytes, Serum Creatinine
- Calcium, Phosphate
- Fasting blood glucose
- Lipids
- Chest X-ray
- Ultrasound of kidneys

TREATMENT**Treatment objectives**

- To detect chronic kidney disease early in susceptible individuals
- To control hypertension
- To control blood glucose
- To manage underlying causes
- To prevent complications and further worsening of kidney function

Non-pharmacological treatment

- Avoid nephrotoxins e.g. NSAIDs, herbal medication
- Daily intake of fluid of 600 ml over previous day's urine output for adults (400 ml/m² body surface area in children)
- Restrict salt intake
- Restrict dietary protein to 1 gram/kg/day
- Avoid potassium containing foods e.g. bananas
- Dialysis (refer to a nephrologist)

Pharmacological treatment

A. To control fluid overload

1st Line Treatment

Evidence Rating: [C]

- Furosemide, oral or IV, 40-120 mg daily

B. Treatment of hypertension

(See section on 'Hypertension')

C. Treatment of renal anaemia

(See section on 'Anaemia in Chronic Kidney Disease')

D. Control of hyperkalaemia

Adult

- Calcium gluconate 10%, IV, 10-20 ml, slow IV, over 2-5 minutes

And

- Soluble Insulin, IV, 10 units in 50-100 ml Dextrose 5%

And

- Sodium bicarbonate, IV, 8.4% (50 mEq in 50ml) 1-2 ml/kg over 5 minutes

|

Note 14-8

Do not mix calcium gluconate and bicarbonate in the same delivery system.

Children

- Salbutamol, nebulised, (preferred)

> 25 kg; 5 mg

< 25 kg; 2.5 mg

Or

- Calcium gluconate 10%, IV, 0.5-1 ml/kg, slow IV, over 5-10 minutes

And

- Soluble Insulin, IV, 0.2 units in 5 ml Dextrose 20%, give 2.5-5 ml/kg/hour. Keep blood glucose at 10-15 mmol/L.

And

- Sodium bicarbonate, IV, 8.4% (45 mEq) over 5 minutes, 1-2 mmol/kg (1-2 ml/kg)

Note 14-9

Do not mix calcium gluconate and bicarbonate in the same delivery system.

REFERRAL CRITERIA

Refer all patients with predisposing factors and complications to a physician specialist or nephrologist for further definitive management of chronic kidney disease. Refer all patients requiring dialysis to a nephrologist.

Table 14-2: Summary of management of various stages of CKD

CKD STAGE	DESCRIPTION	ACTION
1	Kidney damage with normal or reduced GFR	Diagnosis and treatment: Slow progression by meticulous BP control, Annual follow up, eGFR, Urinalysis and Urine Protein creatinine ratio measurements
2	Kidney damage with mildly decreased GFR	Estimate progression and manage as stage 1
3	Moderately decreased GFR	Estimate and treat complications: If Hb <11 g/dL check Ferritin, B ₁₂ and folate. Annual check of serum calcium, phosphate and PTH. Refer if eGFR ≤30 ml/min/1.73 m ²
4	Severely decreased GFR	Prepare for kidney replacement therapy: Refer
5	Kidney Failure	Kidney replacement therapy: Dialysis or transplantation: Refer

138. Anaemia in Chronic Kidney Disease

Anaemia develops early in the course of Chronic Kidney Disease (CKD) and is nearly universal in patients with CKD stage 5 (End-stage kidney disease). The prevalence of anaemia at higher levels of glomerular filtration rate (GFR) (i.e. CKD stage 1-2) is relatively low in individuals from the general population. Anaemia of CKD is primarily caused by deficiency of erythropoietin. The kidneys are the major source of erythropoietin and, as renal function declines, production of erythropoietin declines proportionately.

Though erythropoietin deficiency is common among patients with anaemia in CKD, other potential causes and contributing disorders should be identified or excluded if initial evaluation yields evidence for disorders other than iron deficiency or erythropoietin deficiency. Correction of anaemia in CKD patients improves survival and quality of life.

CAUSES

- Deficiency of erythropoietin
- Red cell destruction from microvascular disease from diabetes or hypertension
- Increased gastrointestinal bleeding
- Increased oxidative stress leading to shortened red cell survival

SYMPTOMS

(See section on 'Anaemia')

SIGNS

(See section on 'Anaemia')

INVESTIGATIONS

- FBC
- Reticulocyte count
- Transferrin saturation
- Serum ferritin
- Stool occult blood

TREATMENT

Treatment objectives

- To achieve and maintain a target-range Hb level of 11-12 g/dL

Non-pharmacological treatment

(See section on 'Anaemia')

Pharmacological treatment

A. CKD Stages 1-2

1st Line Treatment

Evidence Rating: [A]

- Ferrous sulphate, oral, 325 mg 8 hourly for 4 weeks

B. CKD Stages 3-4

Iron replacement: Target Hb should be 11-12 g/dL

- Ferrous sulphate, oral, 325 mg 8 hourly

Or

- Ferrous gluconate, oral, 300 mg 8-12 hourly. Evaluate after 4-6 weeks

Or

- Iron sucrose, IV, consult specialist

Or

- Ferric sodium gluconate complex, consult specialist

And

- Epoietin beta, SC, consult specialist

Or

- Methoxy polyethylene glycol epoietin beta (pegylated form of Epo), SC, consult specialist

Or

- Darbepoietin alfa, SC, consult specialist

REFERRAL CRITERIA

Refer all (adults and children) patients with CKD and anaemia to a specialist or nephrologist.

139. Urinary Tract Infection

Urinary tract infection (UTI) is the presence of micro-organisms in the urine or tissues of the normally sterile genitourinary tract. Infection may be localized to the bladder alone or the kidneys or, in men the prostate.

Acute uncomplicated UTI occurs in women with a normal genitourinary tract and usually manifests as acute cystitis (bladder infection or lower tract infection). Complicated UTI occurs in individuals with structural or functional abnormalities of the genitourinary tract, including those with indwelling devices such as urethral catheters.

Congenital abnormalities of the genito-urinary tract predispose children to UTI. Proven UTI in a child or recurrent UTI requires further urogenital evaluation.

Definitive treatment of UTI depends on culture and sensitivity reports. However, empirical treatment may be initiated while awaiting the report.

CAUSES

- Bacteraemia or septicaemia
- Urinary tract 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 - may be persistent and unexplained (in children)
- There may be feeding problems, diarrhoea, and failure to thrive as well (in children)

Note 14-10

UTI symptoms can be non-specific in young children.

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 such as fever and pain (See section on 'Fever' and 'Pain Management')
- 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 defaecation

Pharmacological treatment**A. Treatment of Uncomplicated UTI**

1st Line Treatment

Evidence Rating: [C]

- Ciprofloxacin, oral,
 - Adults
500 mg 12 hourly for 7 days (female); 10-14 days (male)
 - Children
15-20 mg/kg 12 hourly; (max. of 750 mg daily in two divided doses)
 - Or**
 - Cefuroxime, oral,
250-500 mg 12 hourly for 5-7 days (female); 10-14 days (male)
 - Children
12-18 years; 250 mg 12 hourly for 5-7 days
2-12 years; 15 mg/kg 12 hourly (max. 250 mg) for 5-7 days
3 months-2 years; 10 mg/kg 12 hourly (max. 125 mg) for 5-7 days

B. Treatment of Complicated UTI (including catheter-related, stones, prostate enlargement, urologic abnormalities and pregnancy)

1st Line Treatment

Evidence Rating: [C]

- Ciprofloxacin, IV,
 - Adults
400 mg 8-12 hourly for 7 days (to be administered over 60 minutes)
 - Or**
 - Gentamicin, IV, (if kidney function is normal)
Adults
40-80 mg 8 hourly for 7 days
 - Children
12-18 years; 2 mg/kg 8 hourly for 7 days
1 month-12 years; 2.5 mg/kg 8 hourly for 7 days
 - Or**
 - Ceftriaxone, IV,
Adults
1-2 g daily for 7 days

CHAPTER 14: DISORDERS OF THE KIDNEY AND GENITOURINARY SYSTEM**Children**

All ages 25 mg/kg 12 hourly (max. 75 mg/kg daily)

Or

- Amoxicillin + Clavulanic Acid, IV,

Children

1 month-18 years; 20-30 mg/kg 8 hourly (max. 500 mg) for 5-7 days

Neonates (dose doubled in severe infection)

7-28 days; 30 mg/kg 8 hourly for 5-7days

< 7 days; 30 mg/kg 12 hourly for 5-7days

And

- Gentamicin, IV, (slow intravenous injection over at least 3 minutes)

Children

12-18 years; 2 mg/kg 8 hourly

1 month-12 years; 2.5 mg/kg 8 hourly

Or

- Cefuroxime, IV,

Children

1 month-18 years; 20 mg/kg 8 hourly max. 750 mg, (increase to 40-50 mg/kg max. 1.5g 6-8 hourly in severe infections)

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

< 7 days; 25 mg/kg 12 hourly

REFERRAL CRITERIA

Refer patients who are very ill, with recurrent UTI, persistent haematuria and congenital abnormalities to the appropriate specialist.

140. Medicines and the Kidney

Medicines can lead to renal damage in a number of different ways and examples are given below. In the wrong circumstances life-saving medicines can do more harm than good. Doctors, pharmacists and nurses can help their patients by checking their treatment charts in hospital or at the outpatients department. The medicines listed below may cause renal impairment and must therefore be stopped or not prescribed in patients with deteriorating renal function. All medicines in this table should be dosed based on kidney function (estimated GFR). Avoid concomitant use of nephrotoxic medications and diuretics. Monitor renal function before and during treatment. Patient-related risk factors for all these medicines include age, pre-existing chronic kidney disease, volume depletion, and concurrent use of nephrotoxic medicines.

Medication	Risk Factor	Pathophysiology	Prevention
Aciclovir	High dose, IV bolus dose	Deposition of Aciclovir crystal -intratubular obstruction and foci of interstitial inflammation -crystal nephropathy proximal tubulopathy	Avoid bolus dose, Prior hydration (maintain urine output > 75 ml/hour Slow drug infusion over 1-2 hours
Aminoglycosides (e.g. gentamicin)	Dose, duration and frequency of administration. Concurrent renal ischaemia or administration of nephrotoxins. Liver disease plasma concentration >10mg/dl peak	In proximal tubule aminoglycoside bound to anionic phospholipid, delivered to megalin, endocytic uptake into the cell. Within cell, accumulates –direct toxicity- AKI	Maintain therapeutic range. Give once daily dose if necessary
Angiotensin Converting Enzyme inhibitors/ Angiotensin Receptor blockers (e.g. Lisinopril/ Losartan)	Vasoconstriction – pre-renal ARF	Avoid in bilateral renal artery stenosis	
Non Steroidal Anti-inflammatory drugs (NSAIDs) e.g. Ibuprofen	Volume and sodium depletion. Diuretic use. Large dose and long therapy. Severe liver disease	Haemodynamically induced AKI due to vasoconstriction via reduced prostaglandin production Acute and chronic tubulointerstitial nephritis, with or without nephrotic syndrome. Direct toxicity- chronic interstitial nephritis and papillary necrosis	Avoid coprescription of diuretics Avoid large dose
Radiocontrast	Dose and frequency Osmolarity of contrast media	High osmolarity, medullary vasoconstriction , active transport in thick ascending loop of Henle – increased oxygen demand	Hydration before and after administration Acetylcysteine unproven

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Medication	Risk Factor	Pathophysiology	Prevention
Methotrexate	Acidic urine High dose	Precipitates in the urine and induces tubular injury	Prior hydration Alkaline urine to pH>7.0 (3L of 5% Dextrose in water + 44-66 mmol of NaHCO ₃ per day)
Cisplatin	Low chloride, high dose	Chloride in cis- position replaced by H ₂ O - highly reactive hydroxyl radical via CYP450 –DNA injury tubular cell death Nephrogenic diabetes insipidus, Hypomagnesaemia (may be persistent)	Mesna
Cyclosporin / Tacrolimus	Dose Age Postoperative AKI Diabetes Hypertension	Decreased PG, and increased 20-HETE acid production – vasoconstriction generation of H ₂ O ₂ resulting in depleted glutathione – decreased GFR, ischaemic collapse or scarring of the glomeruli, vacuolization of the tubules, and focal areas of tubular atrophy and interstitial fibrosis	Maintain in therapeutic range Avoid drugs that raise (CYP 3A4 inhibitors) Calcium channel blockers
Interferon		Pre-renal AKI Tubulointerstitial nephritis Thrombotic microangiopathy Membranoproliferative glomerulonephritis	
Tenofovir	Dose , Duration	Tubular cell karyomegaly, degeneration and necrosis – interstitial nephritis, AKI, Fanconi syndrome	

Medication	Risk Factor	Pathophysiology	Prevention
Lithium	Renal impairment Dehydration Hyponatremia Diuretic use especially thiazide	Impairment of collecting duct concentrating ability – diabetes insipidus Chronic tubulointerstitial nephropathy	Therapeutic range (0.6-1.2 mmol/L) Prevent dehydration Avoid low-sodium diet Avoid thiazide

AKI – Acute Kidney Injury

ACE – Angiotensin converting enzyme

HETE – Hydroxyeicosatetraenoic acid

PG – Prostaglandin

141. 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. Risk factors include urethral catheterization and diabetes.

CAUSES

- *E. coli* (about 80%)
- *Staphylococcus saprophyticus*
- Klebsiella
- *Proteus mirabilis*
- Gonococcus
- Enterococci

SYMPTOMS

- Low grade fever
- Frequency
- Nocturia
- Urgency
- Dysuria
- Haematuria
- Cloudy and foul smelling urine
- Low back and suprapubic pain

SIGNS

- Low grade fever
- Suprapubic tenderness
- Haematuria

INVESTIGATIONS

- Urinalysis

- Mid-stream urine for culture and sensitivity
- FBC
- FBS
- Imaging of urinary tract in recurrent or persistent cases to exclude anatomical abnormalities, lower urinary tract obstruction etc.
- Urethrocytostoscopy in selected cases

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 especially in females

Pharmacological treatment

A. Acute uncomplicated cystitis (absence of fever and flank pain)

1st Line Treatment

Evidence Rating: [A]

- Nitrofurantoin, oral,
Adults

100 mg 6 hourly for 5-7 days

Children

12-18 years; 50 mg 6 hourly for 7 days

3 months-12 years; 750 micrograms/kg 6 hourly for 7 days

2nd Line Treatment

Evidence Rating: [A]

- Ciprofloxacin, oral,
Adults

500 mg 12 hourly for 5-7 days

Children

12-18 years; 250-750 mg 12 hourly

1 month-12 years; 7.5 mg /kg 12 hourly (dose doubled in severe cases)

Neonates

7.5 mg/kg 12 hourly

Or

- Cefuroxime, oral,
Adults

500 mg 12 hourly for 5-7days

Children

12-18 years; 250 mg 12 hourly (dose reduced to 125 mg 12 hourly in lower urinary tract infections)

2-12 years; 15 mg/kg 12 hourly (max. 250 mg 12 hour-

ly)

3 months-2 years; 10 mg/kg 12 hourly (max. 125 mg 12 hourly)

And

Evidence Rating: [C]

- Mist Potassium citrate, oral,
10 ml 8 hourly if urine is acidic (pH of 6 or below). To reduce bladder pain and dysuria.

Note 14-11

Monitor potassium levels and avoid in hyperkalaemia. Do not give with ciprofloxacin.

Or

- Paracetamol, oral, 500 mg-1g 6-8 hourly when required

B. For symptomatic cystitis and UTI in pregnancy

- Cefuroxime, oral,

Adults

500 mg 12 hourly for 5-7days

And

Evidence Rating: [C]

- Mist Potassium citrate, oral,
10 ml 8 hourly if urine is acidic (pH of 6 or below). To reduce bladder pain and dysuria.

Note 14-12

Monitor potassium levels and avoid in hyperkalaemia. Do not give with ciprofloxacin.

REFERRAL CRITERIA

Refer all cases, which require cystoscopy and all cases of persistent haematuria, recurrent cystitis or bacterial resistance to the specialist.

142. Benign Prostatic Hyperplasia

Benign Prostatic Hyperplasia (BPH) refers to non-cancerous enlargement of the prostate gland which results in obstruction of urine flow from the bladder. BPH is the commonest cause of male urinary symptoms in Ghana. The average age at which lower urinary tract symptoms (LUTS) related to BPH occurs is about 50 years. Men may seek treatment for LUTS either because the symptoms are bothersome or they feel that it may lead to acute urinary retention or out of fear that it may be an indication of prostate cancer.

It is important to establish what the patient wants from the consultation. In some patients, once reassured that the likelihood of urinary retention and prostate cancer is low, they may not wish treatment

for the symptoms.

Currently available medicines can either relax prostatic smooth muscles or cause reduction in the prostate size and therefore ease the symptoms of BPH. A combination of available medications, especially in patients with a prostate size more than 40 ml, produce better responses than monotherapy.

BPH may lead to complications such as recurrent urinary tract infection, acute urine retention with painful distension of the bladder, chronic urine retention with painless gross distension of the bladder, haematuria, and renal failure.

CAUSES

- Increase in number of prostate cells due to stimulation by testosterone

SYMPTOMS

- Lower Urinary Tract Symptoms (previously referred to as prostatism)
 - Hesitancy - delay in initiating urination
 - Poor or weak urinary stream
 - Straining
 - Terminal dribbling
 - Sensation of incomplete bladder emptying
 - Urinary incontinence (overflow) or bedwetting
 - Frequent passage of urine especially at night (Nocturia)
 - Urgency and urge incontinence

SIGNS

- Enlarged prostate gland on rectal examination
- Tender palpable bladder (acute urinary retention)
- Non-tender palpable bladder (chronic retention)
- Uraemic signs (e.g. drowsiness, confusion etc.)
- Palpable kidneys in hydronephrosis

INVESTIGATIONS

- Serum creatinine
- Prostate specific antigen (PSA) - to exclude prostate cancer
- Urine for culture and sensitivity
- Abdominal and pelvic ultrasound – to exclude hydronephrosis if serum creatinine is elevated

TREATMENT

Treatment objectives

- To exclude prostate cancer and reassure patients accordingly
- To relieve symptoms and prevent development of complications
- To identify and treat any associated complications

Non-pharmacological treatment

- Programme of monitoring and watchful waiting through regular check-ups for mild symptoms

- Urethral catheterization for acute retention of urine or suprapubic cystostomy if urethral catheterization fails
- Suprapubic needle puncture and aspiration/drainage of urine to partially decompress the bladder and relieve pain, when suprapubic cystostomy is delayed.

Pharmacological treatment

- A. **Patients with bothersome symptoms and prostate size less than 40 ml (small prostate)**
- 1st Line Treatment
Evidence Rating: [A]
- Terazosin, oral, 2-10 mg at night, (start with 2 mg at night; double dose at weekly intervals) max. 10 mg.
Or
 - Tamsulosin, oral, 400 microgram once daily
Or
 - Alfuzosin, oral, 10 mg daily
- B. **Patients with bothersome symptoms and prostate size more than 40 ml (big prostate)**
- Evidence Rating: [A]
- Finasteride, 5 mg daily
And
 - Terazosin, oral, 2-10 mg at night, (start with 2 mg at night; double dose at weekly intervals) max. 10 mg.
Or
 - Tamsulosin, oral, 400 microgram daily
Or
 - Alfuzosin, oral, 10 mg daily

REFERRAL CRITERIA

Refer patients who don't respond to pharmacological treatment, or have complications (urine retention, haematuria, renal failure and recurrent urinary tract infection) to a Urologist or Surgical specialist.

143. Bacterial Prostatitis

Prostatitis is inflammation of the prostate gland, which may be bacterial or abacterial. Bacterial prostatitis is more common than abacterial prostatitis. It may present as an acute condition which may either be sexually transmitted or result from urethral reflux of infected urine into the prostatic ducts. Other potential sources may be bacteria spread from rectum or bloodstream.

If inadequately treated this may progress to chronic prostatitis. It is more common in men below 50 years.

CAUSES

- Gram-negative bacterial infections e.g. from *E. coli*, *Pseudomonas*, *Streptococcus faecalis*, *Proteus*, *Klebsiella*, *Serratia* and *Enterobacteria*.
- Sexually transmitted infections e.g. from Gonococcus and Chlamydia.

SYMPTOMS

Acute

- Fever
- Chills and malaise
- Low back and waist pain
- Myalgia and arthralgia
- Rectal /perineal pain
- Urinary urgency and frequency
- Nocturia
- Dysuria
- Difficulty in urination/retention of urine
- Haematuria
- Haemospermia and loss of libido

Chronic

- Insidious onset
- Relapsing UTI
- Persistence of bacteria in seminal fluid despite antibiotic treatment
- Low back and waist pain
- Urinary urgency and frequency
- Nocturia
- Difficulty in urination
- Haematuria
- Haemospermia

SIGNS

Acute

- Swollen and tender prostate on Digital Rectal Examination (DRE). (Avoid prostatic massage as this could lead to septicaemia).
- The rectum feels “hot” from the inflammation.

Chronic

- Findings on DRE may be normal or a tender prostate occasionally for longstanding disease it may feel very firm or hard as in prostate cancer.

INVESTIGATIONS

- Urinalysis and culture
- FBC, ESR
- PSA
- Blood culture
- Expressed prostatic secretions for culture and sensitivity through DRE. Voided specimen before and after prostate massage compared

TREATMENT

Treatment objectives

- To relieve pain and fever
- To control infection
- To relieve lower urinary tract obstruction
- To prevent chronic prostatitis

Non-pharmacological treatment

- Bed rest
- Hydration
- Hospitalisation may be required in severe cases or when the condition is complicated by acute urinary retention and significant haematuria.
- Suprapubic cystostomy for acute urinary retention. (Urethral catheterization should be avoided.)

Pharmacological treatment

A. Mild to Moderate infections

1st Line Treatment

Evidence Rating: [B]

- Ciprofloxacin, oral, 500 mg 12 hourly for 4-6 weeks
And
- Doxycycline, oral, 100 mg 12 hourly for 4-6 weeks

2nd Line Treatment

- Levofloxacin, oral, 500 mg daily for 4-6 weeks
And
- Doxycycline, oral, 100 mg 12 hourly for 4-6 weeks

B. Severe infections

- Ciprofloxacin, IV, 400 mg 8-12 hourly (to be administered over 60 minutes)

Or

- Levofloxacin, IV, 500 mg 12 hourly
Or

- Ceftriaxone, IV, 1-2g Daily
And

- Gentamicin, IV, 80 mg 12 Hourly

Note 14-13

Initial therapy with parenteral antibiotics is indicated in severe cases. Follow up should be for at least 4 months

C. For improvement of urinary flow

- Tamsulosin, 400 micrograms daily (at night)
Or

- Alfuzosin, 10 mg daily
Or

- Terazosin, 2-5 mg daily (at night)

D. Adjunct treatment in severe presentations

Evidence Rating: [C]

- Sodium chloride 0.9%, IV, as required in severe systemic infections.
And
- Ibuprofen, oral, 400 mg 8 hourly when required
Or
- Diclofenac, oral, 75 mg 12 hourly when required
And
- Lactulose, oral, 10-15 ml 12 hourly and adjust dose accordingly

REFERRAL CRITERIA

Refer all cases of severe infections or chronic prostatitis for specialist care.

144. Scrotal Masses

These are swellings found in the scrotum.

CAUSES

Painless Swellings

- Testicular tumour
- Inguinoscrotal hernia
- Hydrocoele
- Hydrocoele of spermatic cord
- Spermatocoele/epididymal cysts
- Varicocoele
- Epididymal tumours
- Chronic epididymo-orchitis

Painful Swellings

- Testicular torsion
- Acute epididymitis (STI or non-STI related)
- Acute epididymo-orchitis
- Strangulated inguinoscrotal hernia
- Testicular tumour (usually painless except rapidly growing type or tumour necrosis)
- Varicocoeles 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. spermatocoele, hydrocoele
- Gradual onset becoming suddenly painful e.g. obstructed hernia
- Fever, may be present in infections e.g. Acute epididymitis and acute epididymo-orchitis

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. hydrocoele 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
- To expedite emergency intervention eg Testicular Torsion

Non-pharmacological treatment

- Surgery: elective or emergency
- Emergency surgery within 6 hours is required for testicular torsion to salvage the testis

Pharmacological treatment**A. For sexually transmitted infection**

Evidence Rating: [B]

- Ciprofloxacin, oral, 500 mg single dose
And
- Doxycycline, oral, 100 mg 12 hourly for 10 days

Or

- Ceftriaxone, IM, 250 mg single dose
And
- Doxycycline, oral, 100 mg 12 hourly for 10 days

REFERRAL CRITERIA

Refer all emergency cases and those suspected to be tumours to a urologist or surgical specialist.

145. 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 undescended of the testis is associated with an increased

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risk of malignancy, subfertility, atrophy of the testis and torsion. 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
- Retractile testis
- Severe atrophy
- Orchidectomy
- 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

None

REFERRAL CRITERIA

Refer patients aged over one year with no evidence of testicular descent to a urologist or surgical specialist.

146. Priapism

This refers to a spontaneous, prolonged, persistent, usually painful erection, which is unwanted and not associated with sexual desire and not relieved by coitus. Priapism is classified into three types namely: Low-flow or ischaemic (commonest), High-flow (non-ischaemic) and Stuttering Priapism. 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
- Drugs e.g. marijuana and herbal concoctions
- Other causes:
 - 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

PRIAPISM

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

Evidence Rating: [A]

- Maintain adequate hydration
- Winter's Procedure
- Corpora Irrigation
- Surgery: Shunts

Pharmacological treatment**A. Conservative management**

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

And

- Pethidine, IM,
 - Adults
100 mg 8 hourly if required
 - Children
1 mg/kg (max. 50 mg) 8 hourly if required
- And
- Diazepam, IV,
 - Adult
10 mg stat. (given slowly over 2-3 minutes, approximately 2.5 mg every 30 seconds) then refer
 - Children
0.3 mg/kg stat. (given slowly over 2-3 minutes) then refer

B. Specialist management

- Intracavernosal injections (see referral criteria)

REFERRAL CRITERIA

Patients not responding to conservative management should be promptly referred to a urologist or surgical specialist.

147. 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 obstruction starts in-utero, secondary changes in the bladder and upper urinary tract are advanced at birth.

Some patients may be born with severe renal impairment or this may develop 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 posterior urethra

SYMPTOMS

- Poor urinary stream
- Crying while voiding
- Straining to void with dribbling of urine
- Intermittent stream
- Failure to thrive
- Fever
- Poor feeding
- Abdominal distension

SIGNS

- Voiding dysfunction
- Palpable bladder and kidneys
- Respiratory distress
- Signs of sepsis e.g. Fever
- Azotaemia/uraemia
- 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)

REFERRAL CRITERIA

Refer immediately after diagnosis for specialist evaluation and

treatment.

148. 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. Some risk factors in developing stones include crystalluria, affluence, diet, occupation, climate (dehydration), family history and medications. 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

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

LOCATION OF CALCULI	SYMPTOMS	SIGNS
Bladder/Urethra	<ul style="list-style-type: none"> • Suprapubic pain • Frequency • Urgency • Haematuria • Strangury: an uncontrollable and often painful desire to pass urine, which results in little urine (may be blood-stained) or no urine being voided • Retention of urine 	<ul style="list-style-type: none"> • Suprapubic tenderness • Palpable bladder (from retention or a large stone) • Hard urethral lump (impacted stone) • Haematuria

INVESTIGATIONS

- Urinalysis
- Urine culture
- Blood urea, electrolytes and creatinine
- Serum uric acid, calcium, phosphate, magnesium
- Plain X-ray of abdomen
- Ultrasound scan of abdomen
- Intravenous urogram
- Retrograde ureteropyelogram
- CT scan
- Stone analysis

URINARY TRACT CALCULI

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
- To treat associated infections

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 12 hourly
Or
- Diclofenac, rectal, 100 mg 12 hourly

And

- Hyoscine butylbromide, IV, 20 mg 8 hourly
- Or
- Mebeverine, oral, 135 mg 8 hourly may be useful

Caution 14-1.

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')

REFERRAL CRITERIA

Refer to a urologist or surgical specialist for definitive treatment after initial management.

149. 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, retention of urine and post-renal renal failure.

CAUSES

- Gonococcal or non-gonococcal urethritis
- External trauma e.g. road traffic injuries, falls, straddle or astride injury and pelvic fractures
- Iatrogenic: Urethral instrumentation e.g. catheterisation, endoscopy
- Postoperative e.g. prostatectomy
- Congenital strictures (rare)

SYMPTOMS

- Lower Urinary Tract Symptoms (LUTS) e.g. poor urinary stream, split or splayed stream, reduced caliber of stream improved by straining, frequency and dysuria, post-void dribbling, incomplete emptying of bladder
- Urinary (overflow) incontinence
- Urinary retention (acute or chronic)

SIGNS

- There may be none in uncomplicated cases
- Palpable induration of urethra
- Periurethral abscesses
- Extravasation of urine into scrotum and superficial tissue
- Urethrocutaneous fistulas/watering-can scrotum

- 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
- Ultrasound Scan of kidneys, bladder, postvoid residual urine and spongiosofibrosis
- Retrograde urethrogram
- Antegrade urethrogram/Micturating Cysto-urerogram (MCUG) 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 in patients who present with retention of urine. Confirmation of site of obstruction is still needed by urethrography or urethroscopy.
- If catheterization fails and patient is 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 except for Urinary Tract Infection (See appropriate section)

REFERRAL CRITERIA

Refer to specialist for further investigations prior to definitive treatment.

150. 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.

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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. Reversal of vasectomy is a difficult surgery using loupes/microscope with success rate of 60-80% if done in less than 3 years after vasectomy.

Box 14-1:

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

Box 14-2:

Effectiveness rates of various male contraceptive methods:

Evidence Rating: [B]

- Vasectomy - 99.85%
- Male condom - 86%
- Withdrawal method - 81%

Preoperative requirements

- Detailed counselling (ideally both partners must be present) and informed consent
- Counselling should mention irreversibility of procedure, possible recanalization and risk of chronic scrotal pain postoperative.
- Medical history
- Physical examination
- Laboratory investigations e.g. Hb, sickling, urinalysis
- Histopathology confirmation of the removed segment of vas deferens may be necessary for medicolegal reasons.

REFERRAL CRITERIA

Clients should be referred to a Family Planning Unit or Urologist for the procedure.

151. Acute Epididymo-orchitis

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/catheterization, untreated lower urinary

tract obstruction and genito-urinary surgery. It is a known complication of mumps. Poorly managed acute epididymo-orchitis may be complicated by septicaemia, abscess formation, chronic epididymo-orchitis, secondary hydrocoele, infertility and Fournier's gangrene.

Before managing as acute epidymoorchitis make sure testicular torsion has been conclusively excluded.

CAUSES

- Mumps virus (orchitis)
- *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 hydrocoele
- 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

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- Scrotal support
- Surgical drainage of abscess
- Avoid unprotected sex until treatment has been completed successfully and follow up counseling.
- Trace and treat sexual contacts

Pharmacological treatment

1st Line Treatment

- Ciprofloxacin, oral,
Adult
500 mg 12 hourly for 14 days

Children

5-15 mg/kg 12 hourly for 14 days

And

- 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

10 mg/kg daily for 3 days

2nd Line treatment

- Norfloxacin, oral, 400 mg 12 hourly for 14 days

And

Doxycycline or Azithromycin (as above in 1st Line Treatment).

Or

- Levofloxacin, 500 mg daily for 14 days

And

Doxycycline or Azithromycin (as above in 1st Line Treatment)

And

- Diclofenac sodium, oral, 50 mg 8 hourly

Or

- Ibuprofen, oral, 400 mg 8 hourly

REFERRAL CRITERIA

Refer all cases of persistent fever and complications to the surgical specialist or urologist.

152. Testicular Torsion (Torsion of Spermatic Cord)

This is cessation of blood supply to the testis due to twisting of the spermatic 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 intravaginal 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)
- Pain may occur typically early in the morning
- 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 14-3: Distinguishing between Torsion and Epididymo-orchitis

Parameter	Torsion	Epididymo-orchitis
Age	< 15 years	> 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
Position of testis	Changed	Unchanged

Parameter	Torsion	Epididymo-orchitis
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 10-20 ml

REFERRAL CRITERIA

Refer as soon as possible (if surgical intervention is not available) to a surgeon or urologist. Beware testicular torsion has potential medico-legal implications.

153. Fournier's Gangrene

It is an acute fulminant polymicrobial necrotising fascitis 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 spp*
- Microaerophilic Streptococcus
- *E. coli*
- Fusibacteria
- *Clostridium welchii*
- Bacteroides

SYMPTOMS

- Acute onset of painful anterior scrotal swelling in previously healthy tissue
- Fever
- Pain in affected scrotum
- General malaise

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

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- 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 (scrotoplasty)
 - Myocutaneous flaps
 - Nutrition supplement
 - Wound care
- Management of diabetes mellitus if present
- Management of HIV/AIDS if present

Pharmacological treatment

Evidence Rating: [C]

A. IV fluids, haemotransfusion and hyperbaric oxygen

As required for patients clinical state

B. Antibiotics

- Gentamicin, IV, 80 mg 8 hourly
And
 - Ampicillin, IV, 500 mg 6 hourly
And
 - Metronidazole, IV, 500 mg 8 hourly
- Or**
- Amoxicillin + Clavulanic Acid, IV, 1 g 12 hourly
And
 - Metronidazole, IV, 500 mg 8 hourly
- Or**
- Cefuroxime, IV, 750 mg 8 hourly
And
 - Metronidazole, IV, 500 mg 8 hourly

REFERRAL CRITERIA

Refer all cases with septic shock after resuscitation and all those who require reconstructive surgery to a urologist or surgical specialist.

154. 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

- Chronic Infections of the bladder like *Schistosoma haematobium* (Bilharzia) and chronic bacterial infections
- Smoking of cigarettes: cancer usually develops 10-20 years after smoking and 20 sticks a day/a packet carries a high risk of cancer development. Passive smoking may also carry the risk of cancer
- Occupational risks; environmental exposure to cancer-causing chemicals used in industries e.g. dye, textile, rubber, cable, printing etc.
- Genetic and familial factors

SYMPTOMS

- May be asymptomatic in early disease (25%)
- Haematuria (usually painless). Painful only in advanced disease and infection/UTI
- Irritative symptoms: frequency, urgency, dysuria
- Flank pain (hydronephrosis)
- Pelvic pain from cancer invasion
- Oedema of lower limbs from advanced disease

SIGNS

- Pallor
- Wasting
- Palpable bladder mass
- Palpable kidney from ureteric obstruction and hydronephrosis
- Lymphoedema of lower limb/limbs
- Secondary UTI in 30% of cases

INVESTIGATIONS

- FBC and ESR
- Urine analysis and culture
- Urine cytology
- Urea, creatinine, electrolytes
- Ultrasound scan: Abdominopelvic
- CT Scan /MRI for staging (By specialist)
- Special Investigations: Abdominopelvic IVU
- Urethrocytoscopy 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]

A. Early Stage

- BCG or Thiotepa bladder instillation for superficial tumours after Trans-Urethral Resection of Bladder Tumour (TURBT)

B. Advanced Disease

- Chemotherapeutic agents recommended for advanced stage include Methotrexate, Vinblastine, Adriamycin and Cisplatin.

REFERRAL CRITERIA

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.

155. 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. The benefit or otherwise of screening should be discussed with patients.

Patients with a family history of prostate cancer and should consider annual screening from 40 years and above with PSA and DRE. 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 of prostate cancer, breast cancer, ovarian cancer
- Race (more common in blacks)
- High dietary fat intake

SYMPTOMS

- Asymptomatic: prostate cancer may be present without symptoms in the early stage
- Lower Urinary Tract Symptoms (LUTS) and IPSS

- 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
- Pathological Fracture
- Impotence
- Haemospermia
- Tenesmus

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:

A. Antiandrogens

- Bicalutamide, oral, 50 mg daily (refer to specialist)
Or
- Flutamide, oral, 250 mg 8 hourly (refer to specialist)

B. Oestrogen

- Stilboestrol, oral, 2-5 mg daily (Avoid in clients with cardiovascular diseases), (refer to specialist)

C. LHRH Analogues

- Goserelin, SC, preferably in the abdominal wall (refer to specialist)
Or
- Leuprorelin acetate, IM, (refer to specialist)
And
- Biphosphonates and Fentanyl patches (refer to specialist)

REFERRAL CRITERIA

Refer all cases to a specialist centre for evaluation and management.

156. 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 organic, psychogenic or mixed in terms of aetiology; 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

- Vascular: 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 and curvature (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

Note 14-14

Erectile dysfunction may be the first warning sign of underlying cardiovascular disease like Myocardial Infarction

Non-pharmacological treatment

- Patients should avoid excessive alcohol consumption, cigarette smoking, recreational drug abuse and excessive weight gain
- Psychosexual counseling

Pharmacological treatment

Box 14-3:

- 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 (PDE5 inhibitors) can be prescribed as first line treatment after careful cardiovascular evaluation. They are contraindicated in ischaemic heart disease and those on nitrates
- Sildenafil citrate, 50 or 100 mg 30 minutes to 1 hour before coitus
Or
- Tadalafil, 20 mg 30-60 minutes before coitus
Or
- Verdanafil, 10 or 20 mg 30-60 minutes before coitus

Note 14-15

These medications require sexual stimulation for optimal results

- Prostaglandin E1 must only be used under specialist care.

REFERRAL CRITERIA

Referral to a specialist centre is necessary for proper evaluation and management in most cases.

157. 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. Components of infertility history include medical, surgical, fertility, sexual, family, medication, social and occupational history.

CAUSES

For practical purposes the main causes can be divided into three:

- Treatable causes
- Potentially treatable causes
- Untreatable causes

The causes can also be classified under three categories: Pre-testicular, Testicular and Post-testicular.

Table 14-4: Causes of Male Infertility

Treatable causes	Potentially treatable causes	Untreatable causes
Varicocoele	Idiopathic	Congenital abnormalities e.g. absence of both testis and chromosomal abnormalities

Treatable causes	Potentially treatable causes	Untreatable causes
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

MALE INFERTILITY

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
 - Varicocoeles
 - 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.

REFERRAL CRITERIA

Refer all cases that require special investigation, pharmacological or surgical treatment to specialist.

158. Haematuria

This is the passage of blood in the urine. It may be microscopic or macroscopic, intermittent or continuous. The pattern of blood in the urine may be initial, terminal or frank/total. Blood in urine is a serious symptom and must always be fully investigated especially to exclude cancer. Certain drugs and food products may colour urine red resulting in false haematuria and these should be differentiated from true haematuria, which is detected by microscopic examination of the urine. 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.

| HAEMATURIA |

Definitive treatment depends on the cause.

CAUSES**Glomerular**

- Glomerulonephritis usually presents with dysmorphic red blood cells in the urine or red blood cellcasts with proteinuria

Non-Glomerular

- Urethra: Trauma, Infection
- Bladder: Infection, stone, bladder cancer, varices, BPH, prostate cancer drug reaction (cyclophosphamide) radiation cystitis, parasite infestation (*S. haematobium*)
- Ureter: Infection, stone, tumour
- Kidney: Infection (pyelonephritis), stone, anatomic anomalies (Polycystic Kidney Disease, A-V Fistula) renal vein or artery thrombosis,
- Neoplasms: Renal cell carcinoma (Wilms Tumour)
- Trauma
- Sickle cell disease
- Benign Prostatic Hyperplasia (BPH)

- Carcinoma of prostate, bladder and kidney
- Urinary tract infection
- Urinary calculi
- Medical causes e.g. sickle cell disease, acute glomerulonephritis and anticoagulant therapy

SYMPOTMS

- Fever suggests infection e.g. pyelonephritis, cystitis and prostatitis
- Colicky flank pain suggests urinary stones
- Associated lower urinary tract symptoms suggest bladder or prostatic cause
- Blood in the urine (on initiation, mixed with the urine, or at the end of passing urine)
- Pain/discomfort on passing urine usually associated with infection, calculi or trauma
- Painless intermittent haematuria associated with cancers eg bladder and kidney cancers
- 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

HAEMATURIA 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

A. For Urinary Schistosomiasis

Evidence Rating: [A]

- Praziquantel, oral,
(See section on 'Urinary Schistosomiasis')

B. For Urinary Tract Infection

- Give appropriate antibiotics (See section on 'Urinary Tract Infection')

REFERRAL CRITERIA

Refer all other cases as well as those with persistent haematuria for appropriate investigations and treatment.

159. 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, malaise, lassitude, excessive sweating, headache and backache

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
- DRE may reveal a fibrosed prostate, enlarged seminal vesicle or thickened bladder base

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')

REFERRAL CRITERIA

Refer patient after adequate treatment if: haematuria and/or symptoms of urinary infection persist or if complications like hydronephrosis, bladder mass, retention of urine, severe wasting and severe anaemia are present.

160. Persistent or Recurrent Urethral Discharge

(See section on 'STI-related persistent or recurrent urethral discharge').

161. Retention of Urine

Retention of urine is inability to empty a full bladder. It is the commonest urological emergency in Ghana and worldwide. Adult males are more commonly affected. It is rare in children and in females. The causes differ in different age groups as well as in males and females. A family history of retention of urine in Benign Prostatic Hyperplasia (BPH), prostate cancer, breast cancer and ovarian cancer are risk factors.

Retention of urine can be classified into three:

1. Acute retention of Urine is of sudden onset with a palpable tender bladder.
2. Chronic Retention of Urine is of insidious onset and presents with a palpable non-tender bladder and overflow incontinence resulting in more damage to the bladder, ureters and kidneys. Post-renal renal failure may complicate this type of retention with hydronephroses and hydroureters.
3. Acute-on-chronic retention of urine is when a chronic retention of urine is suddenly complicated by acute retention of urine.

CAUSES

- Adult males - (above 50 years): BPH, urethral strictures, bladder neck stenosis
- Adult males - (below 50 years/young males): urethral strictures, urethral injuries, bladder neck stenosis, neurogenic bladder/spinal injury, paraphimosis, urethral calculi, acute prostatitis
- Male children - posterior urethral valves, meatal stenosis, phimosis, urethral calculi, congenital strictures
- Adult females - retroverted gravid uterus, uterine fibroids/myomas, impacted ovarian cysts, neurogenic (postoperative and pelvic inflammatory disease), carcinoma of cervix with infiltration into the urethra

SYMPTOMS

- Retention of urine in BPH precipitated by postponement of micturition, alcohol abuse and infection
- Sudden inability to pass urine with painful bulge in lower abdomen for acute retention of urine
- Gradual onset of inability to pass urine with painless bulge in lower abdomen for chronic retention of urine
- History of urethritis, urethral instrumentation (e.g. catheterisation) or perineal injury, pelvic fracture or surgery in urethral strictures
- International Prostate Symptom Score (IPSS)

SIGNS

- Palpable tender bladder in acute retention of urine
- Palpable non-tender bladder for chronic retention of urine
- Uraemia/Azotaemia in renal failure
- Fever in infections: UTI and prostatitis
- Palpable kidneys in hydronephrosis
- Haematuria in BPH, prostate cancer and urethral strictures

REFERRAL CRITERIA

Patients with hydronephroses on ultrasound scan and renal failure should be referred to specialist.

SEXUALLY TRANSMITTED INFECTIONS

162. Sexually Transmitted Infections in Adults

Sexually Transmitted Infections (STIs) result in several clinical syndromes caused by organisms that can be acquired and transmitted through sexual activity.

They cause acute morbidity in adults and may result in long-term complications such as urethral stricture, infertility, ectopic pregnancy, anal fistula, cervical cancer, foetal wastage, prematurity, low birth weight, ophthalmia neonatorum and congenital syphilis. Their control is the cornerstone 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.

It is therefore more practical in managing STIs to base treatment on a 'syndromic diagnosis', which identifies all STIs that could cause a particular symptom or sign and provide treatment for each of them simultaneously.

The common clinical syndromes associated with STIs include urethral discharge in males, persistent/recurrent urethral discharge, vaginal discharge, lower abdominal pain, genital ulcer, scrotal swellings, inguinal lymphadenopathy (buboës), ano-rectal syndromes (ano-rectal discharge, ulcers and vesicles), and genital warts. Scabies and pediculosis pubis may also be transmitted by sexual contact.

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.

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(See section on 'Sexually Transmitted Diseases in Children' for STIs in children)

163. STI-related Urethral Discharge in Males

CAUSES

- *Neisseria gonorrhoea* (Gonococcal urethritis)
- *Chlamydia trachomatis* (Non-gonococcal urethritis)

164. *Mycoplasma genitalium*

SYMPTOMS

- Urethral discharge
- Dysuria or discomfort on urination

SIGNS

- Urethral discharge

Note 16-1

Gentle milking of the urethra may reveal the discharge if it is not initially visible. In uncircumcised males, check that the discharge is coming from the urethral opening and not from the glans penis.

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]

A. For Gonorrhoea

- Ceftriaxone, IM, 250 mg stat
Or
- Cefixime, oral, 400 mg stat
Or
- Ciprofloxacin, oral, 500 mg stat
And

B. For 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
Or
- Azithromycin, oral, 1 g stat.

165. STI-related 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 genitalium* 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]

A. For Gonorrhoea, Chlamydia, Mycoplasma

Repeat treatment for urethral discharge

B. For *Trichomonas vaginalis*

- Metronidazole, oral, 400 mg 12 hourly for 7 days
Or
- Metronidazole, oral, 2 g stat.
Or
- Tinidazole, oral, 2 g stat.
Or
- Secnidazole, oral, 2 g stat.

REFERRAL CRITERIA

Refer all cases of treatment failure to a health facility where microbiological culture and antimicrobial sensitivity tests can be done on the urethral discharge.

166. STI-related 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 and chemicals in the vagina.

A careful risk assessment (See note below) of women with a vaginal discharge may help identify STIs and non-STIs and selection of 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

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- *Trichomonas vaginalis* (green or yellow, smelly, bubbly or frothy discharge associated with itching)
- Herpes simplex virus (following first episode of infection)

SYMPTOMS

- Vaginal discharge - change in colour, odour, consistency or amount
- 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 (especially candidiasis, which is frequently diagnosed in women being evaluated for STIs)
- 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

- None for STI-related discharge

Pharmacological Treatment

Evidence Rating: [C]

Note 16-2

Risk Assessment

Parameters used in the risk assessment for cervicitis are:

- i. Patient's partner is symptomatic (i.e. partner has a urethral discharge)
- ii. Patient is less than 21 years old
- iii. Patient is single
- iv. Patient has more than one sexual partner
- v. 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

A. Treatment for trichomoniasis and bacterial vaginosis

- Metronidazole, oral, 2 g stat. (contraindicated during the 1st trimester of pregnancy)

Or
- Metronidazole, oral, 400 mg 8 hourly for 5 days (contraindicated during the 1st trimester of pregnancy)

Or
- Secnidazole, oral, 2 g stat. (contraindicated during the 1st trimester of pregnancy)

Or
- Tinidazole, oral, 2 g stat. (contraindicated during the 1st trimester of pregnancy)

Or
- Clindamycin cream (2%), topical (preferred in pregnancy)

And

B. Treatment for candidiasis

- Miconazole vaginal tablets, 200 mg inserted into vagina at night for 3 days
- Or
- Clotrimazole, vaginal tablets, 200 mg inserted into vagina at night for 3 days
- And
- Clotrimazole cream, apply 12 hourly (for vulval irritation)

C. Treatment for gonorrhoea

- Ceftriaxone, IM, 250 mg stat.

Or

- Cefixime, oral, 400 mg stat

Or

- Ciprofloxacin, oral, 500 mg stat. (avoid in pregnant and lactating mothers)

And**D. Treatment for chlamydia**

- Doxycycline, oral, 100 mg 12 hourly for 7 days (avoid in pregnant and lactating mothers)

Or

- Tetracycline, oral, 500 mg 6 hourly for 7 days (avoid in pregnant and lactating mothers)

Or

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

Or

- Azithromycin, oral, 2 g stat.

REFERRAL CRITERIA

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.

167. STI-related Lower Abdominal Pain in Women**CAUSES**

- *Neisseria gonorrhoea*
- *Chlamydia trachomatis*
- Anaerobic bacteria (often relating to recurrent infections)

SYMPTOMS

- Lower abdominal pain
- Pain with sexual intercourse (dyspareunia)
- Vaginal discharge
- Dysuria or urethral discomfort
- Fever

SIGNS

- Lower abdominal tenderness
- Vaginal discharge
- Tenderness on moving the cervix (cervical excitation) on bimanual vaginal examination
- Adnexal tenderness
- Adnexal masses

INVESTIGATIONS

- High vaginal swab culture and sensitivity

- Pelvic ultrasound

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]

A. Out-Patients

- Cefixime, oral, 400 mg stat.
Or
- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days

And

- Doxycycline, oral, 100 mg 12 hourly for 14 days
And
- Metronidazole, oral, 400 mg 12 hourly for 14 days

B. In-Patients

- Ceftriaxone, IM, 250 mg daily for 3 days
And
- Doxycycline, oral, 100 mg 12 hourly for 17 days
And
- Metronidazole, oral, 400 mg 12 hourly for 17 days

168. STI-related Genital Ulcer

CAUSES

- Herpes simplex
- *Treponema pallidum* (syphilis)
- *Haemophilus ducreyi* (chancroid)
- *Calymmatobacterium granulomatis* (granuloma inguinale)

SYMPTOMS

- Genital ulcer (painful or painless)
- Urethral discharge
- Inguinal swelling (lymphadenopathy)

SIGNS

- Inguinal lymphadenopathy
- Herpes simplex
 - Multiple, recurrent vesicular lesions (Herpes simplex)
- Syphilitic ulcers
 - Often single, painless and indurated lesions with a clear base and well-defined edges

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- 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 with trauma
 - Edges are well defined
 - Healing is not spontaneous and is accompanied by extensive scarring

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 herpes simplex, syphilis and chancroid concurrently

Non-pharmacological Treatment

- Keep lesions dry and clean

Pharmacological Treatment

Evidence Rating: [C]

A. For Herpes simplex

- Aciclovir, oral, 200 mg 4-6 hourly for 7-10 days (5 doses daily)
Or
- Aciclovir, oral, 400 mg 8 hourly for 7-10 days
For individuals with herpes and HIV co-infection
- Aciclovir, oral, 400 mg 8 hourly for 7-10 days
Or
- Aciclovir, oral, 800 mg 12 hourly for 7-10 days
Episodic therapy for recurrent episodes
- Aciclovir, oral, 400 mg 8 hourly for 5 days
Or
- Aciclovir, oral, 800 mg 12 hourly for 5 days
Or

- Aciclovir, oral, 800 mg 8 hourly for 2 days
Suppressive therapy in HIV infected individuals
 - Aciclovir, oral, 400-800 mg 8-12 hourly for 2-6 years
- B. For Syphilis**
- Benzathine Penicillin G, IM, 1.2 MU in each buttock (total dose 2.4 MU) stat.
Or
 - Procaine Penicillin Aqueous, IM (by deep injection), 1.2 MU daily for 10 days
For persons allergic to penicillin
 - Doxycycline, oral, 100 mg 12 hourly for 14 days
Or
 - Tetracycline, oral, 500 mg 6 hourly for 14 days
For pregnant women allergic to penicillin
 - Erythromycin, oral, 500 mg 6 hourly for 14 days
Or
 - Azithromycin, oral, 500 mg daily for 10 days

C. For Chancroid

- Ceftriaxone, IM, 250 mg stat.
Or
- Azithromycin, oral, 1 g stat.
Or
- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days
Or
- Erythromycin, oral, 500 mg 6 hourly for 7 days

169. STI-related Scrotal Swelling

CAUSES

- *Chlamydia trachomatis*
- *Neisseria gonorrhoea*
- *Treponema pallidum* (very rarely)

SYMPTOMS

- Scrotal swelling
- Scrotal pain
- Urethral discharge
- Dysuria
- Frequency of micturition
- Fever

SIGNS

- Scrotal swelling, oedema and/or erythema
- Scrotal tenderness
- Urethral discharge

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- 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
- To treat for gonorrhea and chlamydia simultaneously

Non-pharmacological treatment

- Bed rest
- Scrotal support until inflammation and fever subside

Pharmacological Treatment

Evidence Rating: [C]

A. For Gonorrhoea

- Ceftriaxone, IM, 250 mg stat.
Or
- Cefixime, oral, 400 mg stat.
Or
- Ciprofloxacin, oral, 500 mg stat.
And

B. For Chlamydia

- Doxycycline, oral, 100 mg 12 hourly for 7 days
Or
- Tetracycline, oral, 500 mg 6 hourly for 7 days
Or
- Azithromycin, oral, 1 g stat.
Or
- Erythromycin, oral, 500 mg 6 hourly for 7 days

170. STI-related Inguinal Bubo

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 the swelling
- To treat the infection of lymphogranuloma venereum and chancroid concurrently

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

A. For Lymphogranuloma Venereum (LGV) and Chancroid

Evidence Rating: [C]

- Doxycycline, oral, 100 mg 12 hourly for 21 days
Or
- Azithromycin, oral, 1 g stat.
Or
- Erythromycin, oral, 500 mg 6 hourly for 14 days

171. STI-related Genital Warts

CAUSES

- Human papilloma virus

SYMPTOMS

- Usually no symptoms
- Small painless swellings in the ano-genital region
- Itching or discomfort in the genital area
- May cause increased vaginal discharge
- Anal or vaginal bleeding during or after sex

SIGNS

- Small, flat, papular, pedunculated, flesh-coloured swellings on the skin and mucous membranes of the genitals (penis, vulva, vagina, cervix, urethra, perianal region)

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- 4 hours after application of Podophyllin and 6-10 hours after application of Imiquimod.
- Cryotherapy with liquid nitrogen, solid carbon dioxide, or a cryoprobe. Repeat applications every 1-2 weeks
- Electrosurgery
- Surgical removal

Pharmacological treatment

Evidence Rating: [C]

- Podophyllin 10-25% tincture of benzoin, topical, apply directly to the warts avoiding normal skin tissue.
- Protect normal skin with vaseline (paraffin).
Repeat treatment at weekly intervals until complete resolution.

Or

- Trichloroacetic Acid (TCA) (80-90%), topical,
apply carefully to the warts avoiding normal tissue, followed by
powdering of the treated area with talcum powder to remove unreacted
acid.

Repeat treatment at weekly intervals until complete resolution.

Or

- Podophyllotoxin, 0.5%, topical, apply 12 hourly three times a week
for 4 weeks

Or

- Imiquimod, 5% cream, topical, apply three times a week for 16
weeks. Should be washed 6-10 hours after application.

Note 16-3

Do not use TCA during pregnancy and lactation.

Do not use Podophyllin or TCA on cervical warts.

172. STI-related Ano-rectal Related Syndromes**CAUSES**

- *C. Trachomatis*
- Herpes Simplex Virus-2 (HSV-2)
- N. Gonorrhoea

- *Treponema pallidum*

SYMPOTMS

- Anal discharge
- Rectal Bleeding
- Pruritus
- Rectal pain,
- Tenesmus
- Constipation

SIGNS

- Anal ulcers or blisters
- Anal growth
- Tenderness on rectal examination
- Anal discharge or bleeding

TREATMENT

Treatment objectives

- To relieve pain
- To treat for the major causes simultaneously

Non-pharmacological treatment

- Keep lesions dry and clean

Pharmacological treatment

- A. **For anorectal discharge, treat for gonorrhea and chlamydia**
(See sections above)

- B. **For anorectal ulcers or vesicles**

For 1st episode of vesicular lesions treat for herpes simplex virus

- Aciclovir, 200 mg, 4-6 hourly for 7 days (5 doses per day)

Or

- Aciclovir, 400 mg, 8 hourly for 7 days

Episodic treatment for recurrent HSV vesicular lesions to be started on first day of appearance of lesions

- Aciclovir, 400 mg, 8 hourly for 5 days

Or

- Aciclovir, 800 mg, 12 hourly for 5 days

Or

- Aciclovir, 800 mg, 8 hourly for 2 days

And

- C. **For Syphilis**

- Benzathine Penicillin G, IM, 1.2 MU in each buttock (total dose 2.4 MU) stat.

Or

- Procaine Penicillin Aqueous, IM (by deep injection), 1.2 MU daily for 10 days

Or

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- 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
And

E. For Chlamydia

- 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
And

F. For Chanchroid

- 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

REFERRAL CRITERIA

If the symptoms or lesions do not improve after treatment refer to a health facility with microbiology support for appropriate treatment and exclusion of other causes to exclude other causes.

173. Sexually Transmitted Infections in Children

Neonates, pre-pubertal and pubertal children are also at risk of contracting STIs. The modes of transmission in these children are mostly through maternal infections, sexual abuse or exploitation and voluntary sexual activity in older children. The STIs in this age group include neonatal conjunctivitis (ophthalmia neonatorum), and other STI-related syndromes similar to that in adults.

Some of these STIs (e.g., gonorrhea, syphilis, and chlamydia), if acquired after the neonatal period, are indicative of sexual contact. For other STIs, (e.g. HPV infections and vaginitis), the association with sexual contact is not clear.

174. STI-related Neonatal Conjunctivitis (Ophthalmia Neonatorum)

(See section on 'Neonatal Conjunctivitis' under Neonatal Disorders)

Management of specific STI and STI syndromes in children

175. STI-related Urethral Discharge Syndrome in Children

A. For Gonorrhea

Children < 12 years (or child < 45 kg)

- Ceftriaxone, IM, 125 mg stat.

Children > 12 years (or child > 45 kg)

- Cefixime, oral, 400 mg stat.

Or

- Ceftriaxone, IM, 250 mg stat.

And

B. For Chlamydia

Children < 12 years

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

Children > 12 years

- Azithromycin, oral, 1g stat.

Or

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

Or

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

176. STI-related Vaginal Discharge Syndromes in Children

Note 16-4

Examination should be carried out without a speculum. Intravaginal treatment is not recommended for younger girls. Oral treatment may be more appropriate.

I Non-pharmacological treatment

- Ensure good genital hygiene
- Encourage use of loose underwear
- Dry underwear in the sun or iron with hot plate
- Ensure good peri-anal hygiene
- Avoid douching with herbal or chemical preparations
- Avoid medicated soaps

Pharmacological treatment

A. For Vaginitis (Trichomoniasis and Bacterial vaginosis)

Children < 12 years (or < 45 kg)

- Metronidazole, oral, 7.5 mg/kg 12 hourly for 7 days

Children > 12 years (or > 45 kg)

- Metronidazole, oral, 400 mg 12 hourly for 7 days

CHAPTER 16: SEXUALLY TRANSMITTED INFECTIONS**Or**

- Metronidazole, oral, 2 g stat.

And**B. For Candidiasis**

- Clotrimazole 2% cream, topical (vaginal), apply 8-12 hourly for 7 days
Or
- Fluconazole, oral, 3-6 mg/kg stat.

Note 16-5

Intravaginal treatment is not recommended for younger girls. Oral treatment may be more appropriate.

And**C. For Cervicitis**For GonorrheaChildren < 12 years (or < 45 kg)

- Ceftriaxone, IM, 125 mg stat.
Children > 12 years (or > 45 kg)
- Cefixime, oral, 400 mg stat.
Or
- Ceftriaxone, IM, 250 mg stat.

AndFor ChlamydiaChildren < 12 years

- Erythromycin, oral, 12.5 mg/kg 6 hourly for 14 days
Children > 12 years
- Azithromycin, oral, 1 g stat.
Or
- Doxycycline, oral, 100 mg 12 hourly for 7 days
Or
- Erythromycin, oral, 500 mg 6 hourly for 7 days

177. STI-related Lower Abdominal Pain or Pelvic Inflammatory Disease Syndrome in ChildrenChildren < 12 years (or < 45 kg)

- Ceftriaxone, IM, 125 mg stat.
And
- Erythromycin, oral, 12.5 mg/kg 6 hourly for 14 days
And
- Metronidazole, oral, 7.5 mg/kg 12 hourly for 14 days
Children > 12 years
- Ceftriaxone, IM, 250 mg stat.
And

- Doxycycline, oral, 100 mg 12 hourly for 14 days
And
- Metronidazole, oral, 400 mg 12 hourly for 14 days

178. STI-related Genital Ulcer Syndrome in Children

A. For Syphilis

- Benzyl penicillin, IV,
Children
> 12 years; 50,000 units/kg 4-6 hourly for 10 days
< 12 years; 50,000 units/kg 4-6 hourly for 10 days
Or
- Procaine penicillin, IM (deep),
Children
> 12 years; 1.2 MU daily for 10 days
< 12 years; 50,000 IU/kg daily for 10 days (max. daily dose 750,000 units)
Or
- Benzathine Penicillin, IM,
> 12 years; 1.2 MU into each buttock during one clinic visit (total 2.4 MU)
For persons allergic to penicillin:
- Doxycycline, oral, 100 mg 12 hourly for 14 days
Or
- Tetracycline, oral, 500 mg 6 hourly for 14 days
And

B. For Chancroid

- Children > 12 years
- Cefixime, oral, 400 mg stat.
Or
- Azithromycin, oral, 1 g stat.
Or
- Doxycycline, oral, 100 mg 12 hourly for 7 days
Or
- Erythromycin, oral, 500 mg 6 hourly for 7 days
Children < 12 years (or < 45 kg)
- Ceftriaxone, IM, 250 mg stat.
Or
- Erythromycin, oral, 12.5 mg/kg 6 hourly for 7 days
And

C. For Genital Herpes Simplex

- Aciclovir, oral,
Children

CHAPTER 16: SEXUALLY TRANSMITTED INFECTIONS

> 2 years; 200 mg 4-6 hourly for 5 days
 1 month-2 years; 100 mg 4-6 hourly for 5 days

For Infants with Known or Suspected Neonatal Herpes

- Aciclovir, IV,
Children < 1 month
 20 mg/kg every 8 hours for 14 days (for disease limited to the skin and mucous membranes)
- **Or**
 20 mg/kg every 8 hours for 21 days (for disseminated and CNS disease)

179. STI-related Ano-Rectal Related Syndromes in Children**ANO-RECTAL DISCHARGE****A. For Gonorrhea**

Children > 12 years (or > 45 kg)

- Cefixime, oral, 400 mg stat.

Or

- Ceftriaxone, IM, 250 mg stat.

Children < 12 years (or < 45 kg)

- Ceftriaxone, IM, 125 mg stat.

And

B. For Chlamydia

Children > 12 years

- Azithromycin, oral, 1 g stat.

Or

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

Or

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

Children < 12 years

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

ANORECTAL ULCERS / VESICLES**A. For Syphilis**

(See sections above under 'Genital Ulcer Syndrome in Children' for treatment of Syphilis')

B. For Chancroid

(See sections above under 'Genital Ulcer Syndrome in Children' for treatment of Chancroid')

C. For Genital Herpes

(See sections above under 'Genital Ulcer Syndrome in Children' for

treatment of Genital Herpes')

GENITAL WARTS IN CHILDREN

(See section on treatment of 'Genital Warts' in adults. Podophyllotoxin and Imiquimod are not used in children)

SCABIES

(See section on 'Pruritus')

PUBLIC LICE

- Malathion liquid 0.5% in aqueous base
Apply over whole body and allow to dry naturally. Wash off after 12 hours or overnight. Repeat after 1 week

REFERRAL CRITERIA

If the symptoms or lesions do not improve after treatment refer to a health facility with microbiology support for appropriate treatment and exclusion of other causes to exclude other causes.

Chapter

HIV INFECTIONS AND AIDS

17

180. HIV Infection and AIDS

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 main risk factors for HIV/AIDS remain transmission by exchange of body fluids and blood products through sexual contact, transfusion, needle-stick injury, non-sterile surgical practices and mother to child transfer.

HIV infection is currently not curable. However, for persons living with HIV infection (PLHIV), effective 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.

Prevention of infection remains the key to reducing its spread.

CAUSES

- Human Immunodeficiency Virus

SYMPTOMS

- Persistent cough
- Persistent or recurrent diarrhoea
- Weight loss
- Skin rashes
- Persistent or recurrent fever
- Mouth ulcers

SIGNS

- Weight loss
- Chronic diarrhoea
- Prolonged fever
- Generalised lymphadenopathy

- Oropharyngeal candidiasis
- Persistent cough
- Generalised dermatitis
- Recurrent herpes zoster (adults)
- Chronic progressive and disseminated herpes simplex infections (adults)
- Finger nail changes e.g. blue discolouration of the nails (adults)
- Failure to thrive or slow growth (infants and children)
- Recurrent common infections e.g. otitis media, pharyngitis (infants and children)

INVESTIGATIONS

- Confirmatory HIV test (HIV1, HIV2, HIV1 and 2)
- HIV Viral load
- CD4 count
- Other tests as required (See Table 17-1 on page 462)

Table 17-1: Other baseline tests for HIV

HIV INFECTION AND AIDS	Haematological test	Full blood count
	Biochemical test	Blood Urea Electrolytes and Creatinine Liver Function tests Fasting Blood Sugar Cholesterol and lipid profile
	Routine examinations	Urinalysis (Urine R/E) Stool R/E
	Respiratory examinations	TB screening Chest X-ray
	Serological Test	Serological Test Hepatitis B Surface antigen
	Supplementary tests These tests are performed depending on signs and symptoms	Histology on skin and lymph node biopsy Kidney biopsy Screening for STIs Pregnancy test Pap smear, HPV DNA

TREATMENT

Treatment objectives

- To suppress HIV replication to as low as possible and for as long as possible
- To preserve and enhance the immune function (CD4 restoration)
- To improve quality of life
- To reduce morbidity and mortality related to HIV
- To promote growth and neurological development in children

Pharmacological treatment

A. Standard Treatment

1st Line Treatment

Table 17-2: Standard Treatment (1st Line Treatment) for HIV-AIDS

Medicines	Caution	Comment
Preferred Regimen		
Tenofovir (TDF) + Lamivudine (3TC) (or Emtricitabine) + Efavirenz (EFV)	Caution with Tenofovir in renal dysfunction	Monitor renal function including urinalysis
Alternative Regimen		
Tenofovir + Lamivudine (or Emtricitabine (FTC)) + Nevirapine (NVP)	Caution with Tenofovir in renal dysfunction Nevirapine is contraindicated in liver dysfunction and NVP hypersensitivity	Monitor renal function including urinalysis Stop NVP if client develops jaundice or severe rashes and refer to ART centre for further management.
Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP)	Zidovudine is contraindicated in severe anaemia Nevirapine is contraindicated in liver dysfunction and NVP hypersensitivity	TDF to be used where Hb is < 8 g/dL or drops >25% from the baseline value in a client on AZT. Stop NVP if client develops jaundice or severe rashes and refer to ART centre for further management
Zidovudine (AZT) + Lamivudine (3TC) + Efavirenz (EFV)	Zidovudine is contraindicated in severe anaemia	TDF to be used where Hb is < 8 g/dL or drops >25% from the baseline value in a client on AZT.

2nd Line Treatment

Table 17-3: Standard Treatment (2nd Line Treatment) for HIV-AIDS

	Medicines	Comments
First Alternative	Zidovudine + Lamivudine (or Emtricitabine) + Lopinavir/r (or Atazanavir/r)	If TDF based first line. If LPV/r was used for HIV2 in first line, use ATV/r
Second Alternative	Tenofovir + Lamivudine (or Emtricitabine) + Lopinavir/r (or Atazanavir/r)	If ZDV based first line. Consider Abacavir if patient has used both Tenofovir and Zidovudine

B. Special conditions

Table 17-4: Standard Treatment in special conditions for HIV-AIDS

Condition	Recommendation	Comments
HIV co-infection with Hepatitis B. (See section on 'Hepatitis B')	The recommended regimen shall be: Lamivudine + Tenofovir + Efavirenz	Lamivudine and Tenofovir are active against both HBV and HIV
Dual HIV-1 and HIV-2 or HIV-2 infections	Due to the ineffectiveness of non-nucleoside drugs (Nevirapine and Efavirenz) in HIV-2 infection combination of nucleosides and protease inhibitors such as LPV/r or ATV/r should be used.	

REFERRAL CRITERIA

Refer all HIV positive patients to an accredited treatment centre in Ghana.

181. HIV Post Exposure Prophylaxis (PEP) for exposed healthcare personnel

Post-exposure prophylaxis (PEP) is short-term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure by preventing the establishment of infection or preventing new infection. PEP reduces staff exposure to HIV infections at work and also clears possible HIV infection from infected dendritic cells. Workplace accidents or injury expose health workers to body fluids of patients. Risk of exposure to blood and blood borne pathogens is slightly higher for healthcare personnel. The risk of infection for HIV from a percutaneous injury is approximately 0-3% and that of mucous membranes or non-intact skin are much lower. PEP is particularly effective within 1-2 hours and not more than 72 hours after exposure.

CAUSES

- An exposure considered as possible risk is defined as “an exposure from possibly infected blood, tissue or other body fluids through:
 - A percutaneous injury (e.g. a needle stick or cut with a sharp object) or
 - A mucocutaneous membrane or non-intact (chapped, abraded skin) contact
- The risk of infection appears to be higher after:
 - Exposure to a large quantity of blood or to other infectious fluids
 - Exposure to the blood of a patient in an advanced HIV disease

- stage
- A deep percutaneous injury or an injury with a hollow bore, blood filled needle.

SIGNS

- None

SYMPTOMS

- None

Box 17-1: Steps to prevent occupational transmission of HIV

In the event of possible exposure to HIV the following actions should be taken:

- The wound site should be cleaned with soap and water
- For mucous membranes, the exposed area should be flushed with plenty of water (e.g. eyes with water or saline)
- Assess the level of risk: the risk of possible infection from the exposure should be assessed and classified based on the categories below:
- Very Low Exposure:
 - Exposure of potentially infectious material to intact skin)
- Low Risk Exposure:
 - Exposure to a small volume of blood or body fluids contaminated with blood from asymptomatic HIV-positive patient
 - Injury with a solid needle or any superficial injury or mucocutaneous exposure
- High Risk Exposure:
 - Exposure to a large volume of blood or potentially infectious fluids
 - Exposure to blood or body fluids contaminated with blood from an HIV positive patient with high viral load
 - Injury with a hollow bore needle/deep and extensive injury from a contaminated sharp instrument
 - Exposure to blood from an HIV drug resistant patient

INVESTIGATIONS

- Full blood count
- Liver and renal function tests
- Hepatitis B Surface Antigen
- HIV serology or PCR if available

TREATMENT**Treatment Objectives**

- To prevent establishment of HIV infection

Non-pharmacological treatment

- Counselling and Testing:
 - Exposed health workers must receive counselling and testing immediately from a trained counsellor. The session is to continue throughout the PEP period and thereafter if necessary. Refusal of HIV test by any exposed worker should be documented
 - Counsellor must emphasize safe sex including condom use.
 - All known source-patients shall also be counselled and tested

for HIV infection if this is not known.

Pharmacological treatment

Note 17-1

Timing: If PEP is necessary, it should be initiated promptly, preferably within 1-2 hours post-exposure and not more than 72 hours after exposure.

Evidence Rating: [A]

A. Very Low Risk

- Wash exposed area immediately with soap and water

B. Low Risk

- Tenofovir 300 mg daily for 28 days
And
- Emtricitabine 200 mg daily for 28 days
Or
- Zidovudine 300 mg 12 hourly for 28 days
And
- Lamivudine 150 mg 12 hourly for 28 days

C. High Risk

- Tenofovir 300 mg daily for 28 days
And
- Emtricitabine 200 mg daily for 28 days
And
- Lopinavir/r 400 mg/100 mg 12 hourly for 28 days
Or
- Zidovudine 300 mg 12 hourly for 28 days
And
- Lamivudine 150 mg 12 hourly for 28 days
And
- Lopinavir/r 400 mg/100 mg 12 hourly for 28 days

Note 17-2

If the source patient is HIV/HBV co-infected then a Tenofovir containing regimen should be used.

Follow up

During the period of prophylaxis a number of baseline and follow-up investigations need to be done to determine HIV sero-status, and to monitor the level of drug toxicity.

Table 17-5: Recommended Monitoring of Drug Toxicity & HIV Serology of Exposed Health Care Personnel

Baseline tests:	Full blood count Liver and renal function tests, Hepatitis B Surface Antigen HIV serology or PCR if available
Two weeks:	Full blood count Liver and renal function tests
Six weeks:	HIV serology
Three months:	HIV serology
Six months:	HIV serology

Individuals who sero-convert should have access to comprehensive care and ART services.

Box 17-2: Reporting and Documentation

All occupational exposures should be reported immediately to the supervisor; circumstances of the exposure and PEP management should be recorded.

Details should include:

- Date and time of exposure
- Where and how the exposure occurred, exposure site on the body and type of sharp device. Type and estimated amount of exposure fluid, severity (depth/extent) of the exposure
- Source of exposure and whether the source material contained HIV or blood.
- Clinical status of source patient.
- Relevant information about exposed health care worker (medical conditions, vaccination including Hepatitis B, and medications, pregnancy or breast-feeding)
- Document counselling, post exposure management and follow ups

INFECTIOUS DISEASES AND INFESTATIONS

182. 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
- Connective tissue disease
- Medicine-related

SYMPTOMS

- Chills, rigors
- Body aches

SIGNS

- Temperature > 37.5 oC
- Evidence of dehydration e.g. sunken eyes
- Evidence of underlying conditions (refer guidelines below)
- Tachypnoea
- Tachycardia

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Rapid diagnostic test for malaria
- Cultures of urine, blood, sputum, ear discharge, throat swab, wound swab, cerebrospinal fluid depending on presentation

TREATMENT

Treatment objectives

- To reduce body temperature to normal
- To relieve symptoms
- To identify and 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
- Tepid sponge the child. (Wet a towel with lukewarm water and apply to the body starting from the extremities and gradually work your way upwards to the head. Leave a film of water on the body to dry on the skin. Repeat the process as often as needed)

Pharmacological treatment

Evidence Rating: [A]

- Paracetamol, oral,
Adults
1 g 6-8 hourly
Children
10-15 mg/kg/dose. May repeat dose 6-8 hourly as necessary
Or
- Paracetamol, rectal suppository,
Adults
1 g 6-8 hourly
Children
125-250 mg 6-8 hourly
Or
- Ibuprofen, oral,
Adults
200-400 mg 6-8 hourly
Children
7-18 years; 200 mg 6-8 hourly
2-7 years; 100 mg 8 hourly
6 months-2 years; 50 mg 8 hourly
1-6 months; 5 mg/kg 6-8 hourly

Treat the cause of the fever appropriately (See appropriate section)

Note 18-1

DO NOT give Aspirin to children under the age of 16 years. Control convulsions with diazepam (See section on 'Seizure Disorders')

REFERRAL CRITERIA

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.

Table 18-1: Guidelines for the treatment of the patient with fever

Complaints	Diagnosis	Action	
	(See appropriate section)	(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	
FEVER	Headache, vomiting, drowsiness, stiff neck, seizures	Meningitis	Do not delay treatment while awaiting results of lumbar puncture
	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, Erysipelas or impetigo	Give appropriate antibiotic
	Fever in a child with cough, sore throat and red ear drums	Otitis media	Give appropriate antibiotic

Complaints	Diagnosis	Action
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
Sore throat or pain on swallowing	Tonsillitis and pharyngitis	Manage as appropriate
Abrupt fever, chills and malaise; weakness, muscle pain, rash, diarrhoea, bleeding	Viral haemorrhagic fever e.g. Ebola virus disease	Manage according to standard protocol

183. Tuberculosis

Tuberculosis (TB) may affect any part of the body, but the commonest site is the lung (Pulmonary TB). Other sites affected include the spine, bone and joints, brain, urinary tract, abdomen and lymph nodes etc. Pulmonary TB patients who have acid-fast bacilli (AFB) in their sputum (bacteriologically positive TB) are most infectious and spread the disease through airborne droplets when they cough, spit or sneeze. Drinking unpasteurized milk may cause bovine TB, which manifests as abdominal TB. Persons with lowered resistance to infection, such as HIV/AIDS and diabetes, are especially at risk of developing TB. Such individuals tend not to have the typical symptoms and signs of TB. They may have features such as fever, weight loss and diarrhoea, which could also be attributed to the condition.

In children with severe malnutrition who show poor response to dietary treatment, TB must be considered and excluded.

CAUSES

- *Mycobacterium tuberculosis*
- *Mycobacterium bovis* (bovine TB)
- *Mycobacterium africanum* I and II
- *M. microti*, *M. kansasii* and *M. malmoensi* (rarer causes)

SYMPTOMS

Adults

- Cough often for 2 weeks or more
- Chest pain
- Loss of weight
- Loss of appetite
- Blood stained sputum
- Fever
- Drenching night sweats

Children

- All adult symptoms and the following
- Malnourished and chronically ill looking (cachexia)
- Persistent low grade fever (lasting ≥ 2 -3 weeks)
- Failure to thrive
- Fatigue, malaise, poor appetite
- Back pain and/or lower limb weakness
- Irritability
- Vomiting and impaired consciousness (due to TB meningitis)

SIGNS

- Signs of malnutrition
- Cachexia
- Pallor
- Signs of pneumonia or pleural effusion
- Lymphadenopathy
- Neck stiffness, altered level of consciousness in TB meningitis
- Spinal tenderness, gibbus, paraplegia/paresis in Pott's disease
- Signs of extrapulmonary disease

INVESTIGATIONS

- Sputum smear microscopy
- Chest X-ray
- Mantoux test
- Gene Xpert (Xpert MTB/Rif)
- Line Probe Assay
- Mycobacterial culture
- Full blood count
- ESR
- Liver function test (for monitoring medication side effects)
- HIV screening

TREATMENT**Treatment objectives**

- To cure the disease
- To prevent further transmission
- To prevent the development of drug resistance
- To manage drug side effects
- To offer psychosocial support
- To investigate close contacts. Where a child is affected, always check adult contacts with productive cough

Non-pharmacological treatment

- Counselling
- Encourage good nutrition (some food supplementation is provided by National TB Programme)
- Encourage adequate rest
- Admit severely ill patients
- Assign a treatment supporter

Pharmacological treatment**Note 18-2**

For the purposes of TB management, consider the following definitions:

- Adults – All persons aged 15 years and above
- Children – All persons aged below 15 years
- New Patients – All persons who have never had TB treatment or have taken TB treatment for less than one month.
- Previously Treated Patients – All patients who have previously received TB treatment for one month or more.

Refer to the TB Client Card (TB 01) for guidance on formulations and dosing by weight.

A. Standard treatment1st Line Treatment

TB Treatment Category	TB Patient Type	Treatment Regimen		Comments
Adults		Initial Phase	Continuation Phase	
New Patients Cat I + III	All New Cases (including): New smear-positive PTB; New smear negative PTB; Concomitant HIV disease; Extra-pulmonary TB	2 months of HRZE = 56 doses of HRZE	4 months of HR = 112 doses of HR	Treatment is once daily In HIV disease, treatment can be extended to 8 months

TB Treatment Category	TB Patient Type	Treatment Regimen		Comments
Previously Treated Patients Cat II	Previously treated sputum smear-positive PTB: - Relapse - Treatment after interruption - Treatment failure	2 months of S + 3 months of HRZE = 56 doses of S and 84 doses of HRZE	5 months of HRE = 140 doses of HRE	Request Drug susceptibility testing (DST) before start of treatment Treatment is once daily
TB Meningitis* & Osteo-articular TB	All cases	2 months of HRZE = 56 doses of HRZE	10 months of HR = 280 doses of HR	Treatment is once daily
Children		Initial Phase	Continuation Phase	Comments
New Patients	All New Cases (including): New smear-positive PTB; New smear negative PTB; Concomitant HIV disease; Extra-pulmonary TB	2 months of HRZE = 56 doses of HRZE	4 months of HR = 112 doses of HR	Treatment is once daily In HIV disease, treatment can be extended to 8 months
Previously Treated Patients	Previously treated sputum smear-positive PTB: - Relapse - Treatment after interruption - Treatment failure	2 months of S + 3 months of HRZE = 56 doses of S and 84 doses of HRZE	5 months of HRE = 140 doses of HRE	Request DST before start of treatment Treatment is one daily
TB Meningitis* & Osteo-articular TB	All cases	2(HRZE) = 56 doses of HRZE	10(HR) = 280 doses of HR	Treatment is daily

Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E), Streptomycin (S)

Note 18-3

Treatment month is 28 days.

All patients taking Isoniazid (H) should take 25 mg of Pyridoxine (Vitamin B6) to prevent peripheral neuropathy.

Dose of Pyridoxine should be doubled in HIV patients

* Indications for steroid use in childhood TB include Endobronchial TB, Large Pleural Effusions, Pericardial Effusion and TB Meningitis. The duration of steroid use should not exceed one month.

All children under 5 years and all HIV positive children who are contacts of a TB patient should be given prophylactic Isoniazid at a dose of 10 mg/kg body weight for at least 6 months.

Table 18-2: Dosing for TB Medicines

Anti-TB Drug (Abbreviation)	Recommended Daily Dosage (Maximum Dose)	
	Adult Dosing	Children Dosing
Isoniazid (H)	4-6 mg/kg (375mg)	10 – 15 mg/kg (300 mg)
Rifampicin (R)	8-12 mg/kg (750 mg)	10 – 20 mg/kg (600 mg)
Pyrazinamide (Z)	20-30 mg/kg (2000 mg)	30 – 40 mg/kg (2000 mg)
Ethambutol (E)	15-20 mg/kg (1375 mg)	15 – 25 mg/kg (1200 mg)
Streptomycin (S)	12-18 mg/kg (1000mg)	20 – 40 mg/kg (1000mg)

B. Adjunctive treatment

- Pyridoxine (Vitamin B6), oral,
Adults
 50-100 mg daily for 3- 8 months
Children
 25-50 mg daily for 8 months
And
- Prednisolone, oral, (in cases of TB meningitis and TB pericarditis)
Adults
 40-60 mg daily, 2-4 weeks then taper off on improvement over 2-4 weeks and discontinue
Children
 1-2 mg/kg daily, 2-4 weeks then taper off on improvement over 2-4 weeks and discontinue

C. Treatment in Special Situations

Chronic kidney disease

New cases (Adults and children)

Owing to a high risk of uveitis, give the following

- Intensive phase - HRZ for 2 months
- Continuation phase - HR for 4 months

Pregnancy and breastfeeding

- Give standard treatment.
- Do not use streptomycin (ototoxic to foetus)

Note 18-4

Prevention of drug resistance

- To prevent the development of drug resistance to Rifampicin it is recom-

mended that Isoniazid + Rifampicin combination tablet is used instead. Prescribing Rifampicin alone is not approved and must be discouraged

- During treatment 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 a responsible person or member of the community with support from health staff during the full duration of treatment

Monitoring

During the course of treatment, all smear positive pulmonary TB patients should have repeat sputum smears examined after 2 (or 3 months if retreatment), at 5 months and at the end of treatment. If result is smear positive, request for mycobacterial culture and drug sensitivity testing.

184. Drug resistant tuberculosis (DR-TB)

Drug resistant tuberculosis (DR-TB) must be presumed (suspected) in persons who remain bacteriologically positive (either smear positive, culture positive or Gene Xpert positive) after intensive phase of standard first-line TB treatment with or without clinical improvement. Persons who test rifampicin resistance positive at initial diagnosis with Gene Xpert must also be treated as cases of DR-TB. These persons must be further evaluated using TB culture and Drug Susceptibility Testing (DST) or newer molecular diagnostic tests such as Line Probe Assays (LPA).

Persons at high risk of drug resistance are TB patients failing Category I+II or Category II treatment, contacts of confirmed DR-TB patients and TB/HIV co-infected patients not improving on treatment.

Persons at medium risk of drug resistance are relapsed TB patients, return after lost-to-follow up and health care workers newly diagnosed with TB. Patients are classified according to the pattern of documented drug resistance profile.

The drug regimen for treatment is selected based on the following principles:

- History of drugs used to treat TB patients, profile of drug resistance in Ghana and/or DST profile of the patient
- A minimum of four new core medicines that are known to be effective
- Kanamycin/Capreomycin an injectable medicine, is the backbone of the four core medicines and should be used in the intensive phase
- An effective fluoroquinolone should be used due to the extensive use of earlier generation fluoroquinolones
- May include a first line drug to which the strain is susceptible.
- Cross-resistance may occur between drugs of the same group and this is taken into consideration.
- Drugs are administered daily under strict DOT throughout the injectable and continuation phases.

Treatment of Multi Drug Resistant-TB (MDR-TB) and Rifampicin Resistant-TB (RR-TB) patients is prioritised. Treatment duration is 20-24

months and is determined by sputum smear and culture (bacteriological) conversion (Treatment lasts 16-18 months after bacteriological conversion). Progression from initial to continuation phase is dependent on at least four (4) consecutive months of negative sputum cultures.

Community-based care is promoted in Ghana over facility-based care except in situations requiring admission for management of complications. The practice of infection prevention and control should be maintained at all times during treatment of these patients.

Treatment adherence is critical in the treatment of DR-TB due to limited number of available, effective medicines. Treatment is challenging due to long duration, drug toxicities and side effects. Clinical teams must use a patient-centred care approach and support patients throughout treatment until cured. Psychosocial and economic support is required from treatment supporters, patient families and clinical teams throughout treatment. Early detection and prompt management of drug side effects ensures successful outcomes.

TREATMENT

Pharmacological treatment

Note 18-5

Treatment of Multi Drug Resistant-TB (MDR-TB) and Rifampicin Resistant-TB (RR-TB) patients is prioritised. Treatment duration is 20-24 months and is determined by sputum smear and culture (bacteriological) conversion (Treatment lasts 16-18 months after bacteriological conversion). Progression from initial to continuation phase is dependent on at least four (4) consecutive months of negative sputum cultures.

2nd Line Treatment

B. Multi Drug Resistant-TB (MDR-TB)

TB Treatment Category	TB Patient Type	Treatment Regimen		Comments
Adults and Children		Initial Phase	Continuation Phase	
Multi Drug Resistant Tuberculosis (MDR-TB)	All Newly Diagnosed MDR-TB with or without HIV & Symptomatic contacts of Confirmed MDR-TB with or without HIV	8 months of Z-Cm-Lfx-Pto-Cs#(PAS*)	12 months Z-Lfx-Pto-Cs# (PAS*)	Treatment is daily (Treatment month is 28 days). Modify treatment according to culture results.

For every 250mg of Cycloserine give 50mg of Pyridoxine (Vitamin B6) to prevent Peripheral Neuropathy. Dose of Pyridoxine should be doubled in HIV patients.

* PAS is an alternative to Cs

C. Treatment Protocol for Other Resistant Types

Table 18-3: Treatment Protocol for Other Resistant Types

Resistance Pattern	TB Patient Type	Treatment Regimen		Comments
		Initial Phase	Continuation Phase	
Adults and Children				
Streptomycin resistant (S)	Mono-Resistant	2 months of HRZE	4 months of HR	
Ethambutol resistant (E)	Mono-Resistant	3 months of HRZ	6 months of HR	
Isoniazid resistant (H)	Mono-Resistant	9 months of HRZE		Add extra dose of Isoniazid up to a maximum of 300 mg daily for treatment duration
Streptomycin and Isoniazid resistant (S-H)	Poly-Resistant TB	9 months of HRZE		Add extra dose of Isoniazid up to a maximum of 300 mg daily for treatment duration
Isoniazid and Ethambutol resistant (H-E)	Poly-Resistant TB	9 months of R-Z-Lfx		Extend treatment to 12 months if extensive lung destruction from x-ray image
H, E, and S (\pm Z)	Poly-Resistant TB	3 months of Km-Pto-Lfx-R-Z	15 months of Pto-Lfx-R-Z	Modified MDR regimen plus R
R mono- or poly-resistance	Rifampicin-Resistant TB	8 months of H-Z-Cm-Lfx-Pto-Cs (PAS*)	12 months of H-Z-Lfx-Pto-Cs (PAS*)	Full MDR regimen plus H

* PAS is alternative to Cs

Note 18-6

Definitions

Mono-resistant TB:

TB bacilli have resistance to only one from the first line anti-tuberculosis medicines: streptomycin, isoniazid, rifampicin, pyrazinamide or ethambutol.

Poly-Resistant:

TB bacilli have resistance to at least two medicines but not to both isoniazid and rifampicin.

Rifampicin-Resistant (RR-TB):

TB bacilli have resistance to rifampicin, with or without resistance to other first line anti-tuberculosis medicines. This may be mono, poly, multi or extensively drug resistant TB.

Multi-Drug Resistant (MDR-TB):

TB bacilli have resistance to at least both rifampicin and isoniazid.

Extensively Drug Resistant (XDR-TB): TB bacilli have resistance to one of the fluoroquinolones and at least one of the three injectable second-line drugs (kanamycin, capreomycin or amikacin), in addition to MDR TB.

Table 18-4: Dosing of Second-Line Medicines

Anti-TB Drug (Abbreviation)	Recommended Daily Dosage (Maximum Dose)	
	Adult Dosing	Children Dosing
Pyrazinamide (Z)	20-30 mg/kg once daily (2000 mg)	30-40 mg/kg once daily (2000 mg)
Kanamycin (Km)	15-20 mg/kg once daily (1000 mg)	15-30 mg/kg once daily (1000 mg)
Capreomycin (Cm)	15-20 mg/kg once daily (1000 mg)	15-30 mg/kg once daily (1000 mg)
Levofloxacin (Lfx)	750-1000 mg once daily (1000 mg)	15-20 mg/kg/day in 2 divided doses (1000 mg)
Ethionamide (Eto)	500-750 mg daily in 2 divided doses (1000 mg)	15-20 mg/kg/day in 2 divided doses (1000 mg)
Prothionamide (Pto)	500-750 mg daily in 2 divided doses (1000 mg)	15-20 mg/kg/day in 2 divided doses (1000 mg)
Cycloserine (Cs)	500-750 mg daily in 2 divided doses (1000 mg)	10-20 mg/kg/day in 2 divided doses (1000 mg)
Para-aminosalicylic acid (PAS)	8g once daily or in 2 divided doses (12g)	200-300 mg/kg/day in 2-3 divided doses (8g)

Note 18-7

Ghana will be adopting a shorter treatment regime (9-12 months) for management of DR-TB. Please keep checking with the National TB Control programme.

REFERRAL CRITERIA

Refer all patients to a DOTS treatment centre for management and monitoring under Ghana National Tuberculosis Programme.

185. 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. Organisms may continue to be present in the stool of healthy carriers, i.e.

patients with positive stool cultures, 12 months after treatment or those with long-term subclinical disease.

If improperly treated typhoid fever may result in complications such as intestinal perforation with peritonitis, bloody stools, acute psychosis and severe intravascular haemolysis leading to acute kidney injury (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 may occur

SIGNS

- High fever with a relatively slow pulse rate (occasionally pulse is fast especially with myocarditis or intestinal perforation)
- Abdominal tenderness
- Hepato-splenomegaly (tender)
- Confusion
- Signs of chest infection (pneumonitis)

INVESTIGATIONS

- FBC, differential,
- RDT / blood film for malaria parasite (to exclude malaria)
- Blood culture
- Stool culture
- Urine culture

Note 18-8

Notes on Diagnosis

- 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 10th day up to 4th or 5th week
 - Urine cultures, positive during 2nd and 3rd week
- The above tests are superior to the Widal test, which is unreliable and rarely useful in confirming a diagnosis of typhoid fever

TREATMENT

Treatment objectives

- To eradicate the infection
- To detect and manage complications
- To prevent transmission of infection to other people

Non-pharmacological treatment

- Tepid sponging to reduce body temperature if required

Pharmacological treatment

Evidence Rating: [B]

- Ciprofloxacin, oral,
 - Adults
500 mg 12 hourly for 10-14 days
 - Children
10 mg/kg 12 hourly for 10-14 days
- Or
- Ciprofloxacin, IV, (to be administered over 60 minutes)
 - Adults
400 mg 8-12 hourly for 10-14 days
 - Children
10 mg/kg (max. 400 mg) 12 hourly for 10-14 days

Note 18-9

Ciprofloxacin should be used with 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.

2nd Line Treatment

Evidence Rating: [B]

- Ceftriaxone, IV,
 - Adults
2-4 g daily for 7-10 days
 - Children
100 mg/kg daily for 7-10 days
- Or
- Azithromycin, oral,
 - Adults
500 mg daily for 7 days
 - Children
10-20 mg/kg for 7 days

REFERRAL CRITERIA

Refer very ill patients and those with complications such as intestinal perforation, intravascular haemolysis and peritonitis to the appropriate specialist. Healthy carriers should also be referred for specialist management.

186. Malaria

Malaria is a very common infection in Ghana. It follows the introduction of protozoan malaria parasites into the bloodstream by the bite of an infected female Anopheles mosquito. Malaria is a major cause of significant morbidity and mortality especially among vulnerable individuals, such as 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 (blood film and/or Rapid Diagnostic Test) must demonstrate the malaria parasites or their components since the clinical presentation of the condition can be similar to other common diseases such as typhoid fever, urinary tract infection, septicaemia, 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 Test (RDT) 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. This phenomenon is largely the result of 'over-diagnosis' and wrong diagnosis of malaria by healthcare practitioners and patients alike, with its attendant over-treatment and sometimes partial or incomplete treatment, leading to over-exposure of the parasites to the anti-malarial drug (drug pressure). Additionally, Artemisinin Combination Therapy (ACT), rather than monotherapy with artemisinin derivatives, is currently recommended for the treatment of uncomplicated malaria to prevent the development of drug resistance.

It is therefore necessary to obtain laboratory confirmation of a diagnosis of malaria before starting treatment. Exceptions to this principle are children under 5 years and cases of suspected severe malaria where laboratory confirmation is not immediately possible. In such circumstances, a complete course of the appropriate anti-malarial medication(s) must be given.

CAUSES

- *Plasmodium falciparum* (commonest and responsible for most of the deaths and morbidity associated with malaria in Ghana)

- *Plasmodium malariae*
- *Plasmodium ovale*

187. Uncomplicated Malaria

SYMPOTMS

- 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
- Mild pallor
- Mild jaundice
- Splenomegaly

INVESTIGATIONS

- Microscopy - thick and thin blood films for malaria parasites
- Rapid Diagnostic Test (RDT)
- FBC
- Other tests as indicated

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

1st Line Treatment

Evidence Rating: [A]

- Artesunate + Amodiaquine, oral, (See Table 18-5 on page 484, Table 18-6 on page 484, Table 18-7 on page 484)
Or
- Artemether + Lumefantrine, oral, (See Table 18-8 on page 485)
Or
- Dihydroartemisinin + Piperaquine, oral, (See Table 18-9 on page 485)

Table 18-5: Artesunate + Amodiaquine co-blistered formulation (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	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

The dose in mg/body weight is: Amodiaquine 10 mg/kg + Artesunate 4 mg/kg, taken as a single dose daily for three (3) days, after meals.

Table 18-6: Artesunate + Amodiaquine co-blistered formulation (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

The dose in mg/body weight is: Amodiaquine 10 mg/kg + Artesunate 4 mg/kg, taken as two divided doses daily for three (3) days, after meals.

Table 18-7: Artesunate and Amodiaquine Fixed Dose Combination (Standard Regimen, using the 3 available dosing strengths)

		Artesunate (AS) + Amodiaquine (AQ) Number of Fixed Dose Combination Tablets to be given							
Weight	Age	Tablet Dosing Strength		Day 1		Day 2		Day 3	
<8 kg	2-11 mo.	AS: 25 mg AQ: 67.5 mg		1		1		1	

CHAPTER 18: INFECTIOUS DISEASES AND INFESTATIONS
Table 18-7: Artesunate and Amodiaquine Fixed Dose Combination (Standard Regimen, using the 3 available dosing strengths)

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

Each Fixed Dose Combination 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 200 mg/600 mg*

Table 18-8: Artemether and Lumefantrine (Dosing Regimen)

Weight	Age	Artemether (20 mg) + Lumefantrine (120 mg) Number of Tablets To Be Given					
		Day 1	Day 2	Day 3	AM	PM	AM
		First Dose	Second Dose (after 8hrs)				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 18-9: Dihydroartemisinin and Piperaquine (Dosing Regimen)

Weight	Age	Dihydroartemisinin (40 mg) / Piperaquine (320 mg base) Number of Tablets To Be Given		
		Day 1	Day 2	Day 3
5-10 kg	< 1 yr	¼	¼	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	1 ¼
36-50 kg	11-13 yr	1½	1½	1 ½
50-70 kg	14-18 yr	2	2	2
>70 kg	> 18 yr	3	3	2

188. Severe Malaria

Severe or 'complicated malaria' can arise from delay in diagnosis or inappropriate treatment of uncomplicated 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. Not all cases of severe malaria have high parasitaemia and initial blood film examination may be negative. Where the diagnosis is suspected, treatment must be started without delay while awaiting confirmation.

SYMPOTMS

- Poor oral intake (e.g. 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

| SEVERE MALARIA

SIGNS

- Hyperpyrexia (axillary temperature $> 38.5^{\circ}\text{C}$)
- Extreme pallor (severe anaemia; Hb $< 5 \text{ g/dl}$)
- Marked jaundice
- Circulatory collapse or shock (cold limbs, weak rapid pulse)
- Tachypnoea (Rapid breathing)
- Crepitations on chest examination
- Sweating (due to hypoglycaemia)
- Haemoglobinuria (dark or 'cola-coloured' urine)
- Oliguria
- Spontaneous unexplained heavy bleeding (disseminated intravascular coagulation)
- Altered consciousness (change of behaviour, confusion, delirium, coma)

INVESTIGATIONS

- Rapid diagnostic test
- Blood film for malaria parasites - thick and thin blood films (should be done where available)
- FBC
- Sickling test

- Random blood glucose
- BUE and creatinine
- Blood grouping and cross-matching
- Lumbar puncture in the convulsing or comatose patient to exclude meningitis or encephalitis

TREATMENT

Treatment objectives

- To ensure rapid clearance of parasitaemia
- To provide urgent treatment for life threatening complications or conditions e.g. convulsions, hypoglycaemia, dehydration, renal impairment
- To provide appropriate supportive care

Non-pharmacological treatment

- Place patients who are unconscious or having seizures in an appropriate position to prevent aspiration

Pharmacological treatment

Evidence Rating: [A]

A. Pre-referral treatment

- Artesunate, IM,
Adults and Children > 20 kg
2.4 mg/kg
Children < 20 kg
3 mg/kg
Or
- Artemether, IM,
Adults and Children
3.2 mg/kg
Or
- Quinine, IM, 10Artesunate, rectal, 10 mg/kg (preferred in children under 6 years; see Table 110)
Or
- Artesunate, rectal, 10 mg/kg (preferred in children under 6 years);

Table 18-10: Dosing Regimen for Quinine IM Injection in young Children

Weight	Volume of Quinine Dihydrochloride Injection (50 mg/ml dilution)
< 5 kg	1.0 ml
5.1-7.5 kg	1.5 ml
7.6-10.0 kg	2.0 ml
10.1-12.5 kg	2.5 ml
12.6-15.0 kg	3.0 ml
15.1-17.5 kg	3.5 ml - half to each thigh

Table 18-10: Dosing Regimen for Quinine IM Injection in young Children

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

The dosage for IM Quinine is 10 mg (0.2 ml) per kg of bodyweight every 8 hours.

Note 18-10

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 (not 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, sArtesunate, rectal, 10 mg/kg (preferred in children under 6 years;110).
- 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 18-11: 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 yrs	100	Two 50 mg suppositories
20 - 29 kg	1½ - 5 yrs	200	One 200 mg suppository
30 - 39 kg	6 - 13 yrs	300	Two 50 mg and one 200 mg suppositories
> 40 kg	> 14 yrs	400	Two 200 mg suppositories

B. Treatment in Referral Centre

Note 18-11

Parenteral antimalarials and follow-on treatment.

The current recommendation is to give parenteral antimalarials in the treatment of severe malaria for a minimum of 24 hours (irrespective of the patient's ability to tolerate oral medication) until the patient is able to tolerate oral medication as follow-on treatment. Recommended follow-on treatments include ACTs and Quinine + clindamycin.

- Artesunate, IV or IM,
Adults and Children > 20 kg

2.4 mg/kg 12 hourly

Given at time 0 hour (i.e. on admission), at 12 hours and 24 hours

Then

2.4 mg/kg daily until patient can swallow (max. 7 days)

Then

A full 3-day course of recommended oral artemisinin combination therapy (ACT)

Children < 20 kg

3 mg/kg 12 hourly

Given at time 0 hour (i.e. on admission), at 12 hours and 24 hours

Then

3.0 mg/kg daily until patient can swallow (max. 7 days)

Then

A full 3-day course of recommended oral ACT

Note 18-12

Artesunate reconstitution for parenteral injection

Reconstitution:

Use a syringe to draw and inject the solvent (sodium bicarbonate 50mg/ml solution) into the vial of artesunate powder. Shake the vial until the powder is completely dissolved and the solution is clear.

For intravenous injection: Add either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 10 mg/ml solution of artesunate. Draw required volume and give slowly by IV at about 3-4 ml/minAdd either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sitAdd either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sitAdd either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal

saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sites. (See Table 112)

For intramuscular injection:

Add either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sites.

Add either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sites.

Add either glucose 50 mg/ml (i.e. 5% Dextrose solution) or sodium chloride 9 mg/ml (i.e. 0.9% Normal saline solution) to the reconstituted artesunate solution to create a 20 mg/ml solution of artesunate. Draw required volume and give slowly by IM anterior thigh. If the required volume is more than 5 ml, divide it into two and inject at separate sites. (See Table 112)

Table 18-12: Approximate quantities for dilution

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Route	IV Injection			IM Injection		
Strength of medicine	30 mg	60 mg	120 mg	30 mg	60 mg	120 mg
Sodium bicarbonate 50 mg/ml solution for reconstitution (ml)	0.5	1	2	0.5	1	2
Glucose 50 mg/ml solution for injection Or Sodium chloride 9 mg/ml for injection (ml)	2.5	5	10	1	2	4
Total diluent needed (ml)	3	6	12	1.5	3	6
Artesunate concentration (mg/ml)	10	10	10	20	20	20

Note 18-13

Calculation of dose of Artesunate needed (ml):

Adults:

For IV route:

2.4 mg x body weight (kg)

IV Artesunate solution concentration 10 mg/ml

For IM route:

2.4 mg x body weight (kg)

IM Artesunate solution concentration 20 mg/ml

Children < 20kg:

For IV route:

3 mg x body weight (kg)

IV Artesunate solution concentration 10 mg/ml

For IM route:

3 mg x body weight (kg)

IM Artesunate solution concentration 20 mg/ml

Precautions:

- Inject immediately after reconstitution and discard if not used within 1 hour
- Discard if solution is not clear
- Do not use in IV drip, Give slowly by direct IV injection at about 3-4 ml/min

Or

- Artemether, IM,
Adults and Children

3.2 mg/kg stat.

Then (8 hours later)

1.6 mg/kg

Then (24 hours after initiation of treatment)

1.6 mg/kg once daily until patient can swallow (up to 5 days)

Then

A full 3-day course of recommended oral artemisinin combination therapy (ACT)

Or

- Quinine, IV, (in Dextrose saline or in 5% Dextrose [5-10 ml/kg])
Adults and Children

10 mg/kg (max. dose 600 mg) infused over 4-8 hours.

Repeat infusion 8 hourly until patient can swallow.

Then

- Quinine, oral, 10 mg/kg 8 hourly to complete 7 days of treatment

And

- Clindamycin, oral, 10 mg/kg, 12 hourly for 7 days

Note 18-14

Clindamycin should be administered with food and copious amounts of water. Quinine, IV, should always be given by a slow infusion, never by bolus intravenous injection as this may cause severe hypotension.

Or

- Quinine, IM,
Adults and Children

10 mg/kg (max. dose 600 mg), 8 hourly until patient can swallow

Then

- Quinine, oral, 10 mg/kg 8 hourly to complete 7 days of treatment

And

- Clindamycin, oral, 10 mg/kg, 12 hourly for 7 days

REFERRAL CRITERIA

Patients diagnosed as having severe malaria or who fail to respond to the recommended antimalarial medications must be referred. Appropriate treatment as indicated above 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.

189. Malaria in Pregnancy

Pregnancy makes women more likely to get malaria or die from malaria. Malaria infection is more severe during pregnancy while pregnancy and its outcomes can become complicated by it. The effects of malaria on the pregnant mother include a severe form of the illness, anaemia, miscarriage, pre-term labour, and post-partum haemorrhage.

- I Risks to the foetus include foetal anaemia, pre-maturity, intra-uterine growth restriction, low birth weight, stillbirth, congenital malaria, and increased perinatal mortality. Preventive measures must be emphasised (i.e. Insecticide-treated Nets [ITNs] and Intermittent Preventive Treatment in pregnancy [IPTp] under direct observation) while confirmed cases must be treated promptly.

Treatment objectives

- To ensure prompt and effective case management

Non-pharmacological treatment

- None

Pharmacological treatment**A. Treatment of Uncomplicated Malaria in the First Trimester**

- Quinine, oral, (may be given as monotherapy if Clindamycin is not available)
10 mg/kg (max. 600 mg) 8 hourly for 7 days

And

- Clindamycin, oral, 10 mg/kg, twice daily for 7 days

Note 18-15

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.

B. Treatment of Uncomplicated Malaria in the Second and Third Trimesters

- Artesunate + Amodiaquine co-blistered formulation (Regimen for TWICE DAILY DOSING) or The dose in mg/body weight is: Amodiaquine 10 mg/kg + Artesunate 4 mg/kg, taken as two divided doses daily for three (3) days, after meals. Table 15, Table 16, Table 17)
- Or**
- Artemether efantrine, oral, (See Table 18)
- Or**
- Quinine, oral, (See section Treatment of Uncomplicated Malaria in the First Trimester)

C. Treatment of Severe Malaria in Pregnancy (All trimesters and puerperium)

Evidence Rating: [A]

- Artesunate, IV or IM,
- Then**
- ACT, oral, for 3 days
(See section on Treatment of 'Severe Malaria' above)

Or

- Quinine, IV or IM,
- Then**
- Quinine + clindamycin combination, oral,
(See section on Treatment of 'Severe Malaria' above)

D. Treatment of Severe Malaria in Pregnancy (Second and Third trimesters and Puerperium)

- Artemether, IM,
- Then**
- 3 days of oral ACT
(See section on Treatment of 'Severe Malaria' above)

E. Intermittent Preventive Treatment in Pregnancy (IPTp)

IPTp consists of giving the fixed-dose combination medication Sulphadoxine Pyrimethamine (SP) in treatment doses at predefined intervals after quickening (16 gestational weeks). Current recommendation is that IPTp with sulfadoxine-pyrimethamine (IPTp-SP) be given to all pregnant women at each scheduled antenatal care visit except during the first trimester. WHO recommends a schedule of four focused antenatal care visits for normal pregnancy. 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 (500 mg)-Pyrimethamine (25 mg), oral,

Note 18-16

Co-administered as Directly Observed Therapy (DOT) during antenatal visits on at least 3 occasions and at most on 7 occasions

Dose of IPTp	Antenatal visit	Recommended gestational weeks	Health worker to administer
IPTp1	First ANC visit after quickening	16	Midwives, Medical officers, Family physicians, Obstetricians
IPTp2	At least one month after the first dose.	20	Midwives, Medical officers, Family physicians, Obstetricians
IPTp3	At least one month after the second dose.	24	Physician assistants, Community Health Officers, Community Health Nurses
IPTp4-7	At least one month after each dose.	28, 32, 36, 40	

Note 18-17

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 pyrimethamine
- 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.

190. Seasonal Malaria Chemoprevention (SMC)

This is the intermittent administration of full treatment courses using the recommended anti-malarial medicine during peak malaria transmission seasons to prevent malaria illness. A complete treatment course is given to children aged between 3 and 59 months at monthly intervals to a maximum of 4 doses during the malaria transmission season. In Ghana, SMC has been implemented in the Northern Savannah using Sulphadoxine-Pyrimethamine and Amodiaquine (SP + AQ)

- Sulphadoxine-Pyrimethamine, oral,
And
- Amodiaquine, oral,

191. Meningitis

This is an infection of the coverings of the brain, and is most commonly caused by bacteria, viruses, fungi and protozoa. One type, Cerebrospinal Meningitis (CSM), caused by *Neisseria meningitidis*, is common in the Northern and Upper Regions of Ghana, and usually occurs in epidemics during the harmattan season. The presentation may sometimes be confused with cerebral malaria. Meningitis is a medical emergency. Failure to recognise and adequately manage meningitis results in serious complications.

Inform regional or district health authorities immediately in epidemic meningitis.

CAUSES

- Bacterial
 - *Neisseria meningitidis*
 - *Streptococcus pneumoniae*
 - *Haemophilus influenza*
 - *Mycobacterium tuberculosis*
 - *Staphylococcus aureus*
 - *Escherichia coli* (neonates)
- Viruses e.g. Herpes viruses
- Protozoa e.g. Toxoplasma in HIV-AIDS
- Fungi e.g. *Cryptococcus neoformans*

SYMPTOMS

For Adults and Children > 5 years

- Fever
- Neck pains
- Severe headaches
- Photophobia
- Change in behaviour
- Convulsions
- Vomiting

Children < 1 year

- Fever
- Irritability
- Refusal to eat
- Poor sucking
- Vomiting
- Drowsiness and weak cry

- Focal or generalized convulsions after which the child is sleepy
- Lethargy
- Bulging fontanelle

SIGNS

For Adults and Children > 5 years

- Fever
- Neck stiffness
- Positive Kernig's sign
- Altered consciousness
- Coma

Children < 1 year

- Neck retraction
- Presence or absence of neck stiffness
- Presence or absence of fever
- Bulging fontanelle
- Coma
- Hypotonia or hypertonia
- Convulsion

INVESTIGATIONS

- FBC
- Rapid diagnostic test (to exclude cerebral malaria)
- Blood film for malarial parasites (to exclude cerebral malaria)
- Lumbar puncture (only after excluding raised intracranial pressure)
- Blood culture and sensitivity

TREATMENT

Treatment objectives

- To identify and eradicate the causative organisms
- To prevent complications
- To prevent spread to contacts
- To maintain good nutrition

Non-pharmacological treatment

- Tepid sponging
- Keep the airway clear
- Nasogastric tube feeding if applicable

Pharmacological treatment

A. Bacterial Meningitis

1st Line 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

CHAPTER 18: INFECTIOUS DISEASES AND INFESTATIONS

< 12 years;	50-80 mg/kg for 10-14 days
<u>Neonates;</u>	20-50 mg/kg once daily for 21 days

And

- **Vancomycin, IV,**
Adults
15 mg/kg 12 hourly for 7-10 days
Children
> 12 years; 15 mg/kg 12 hourly for 7-10 days
2-12 years; 15 mg/kg 12 hourly for 7-10 days
1 month-2 years; 15 mg/kg 8 hourly for 10-14 days
< 1 month; not recommended

Or

- Evidence Rating: [B]
- **Benzylpenicillin, IV,**
Adults
4 MU 4 hourly for 14 days
Children
0.2 MU/kg 6 hourly for 14 days
 - **Chloramphenicol, IV,**
Adults
1 g 6 hourly for 14 days
Children
25 mg/kg 6 hourly for 14 days
This may be subsequently changed to oral therapy with significant clinical improvement
 - **Or**
Chloramphenicol, IM, (oily preparation)
Adults
100 mg/kg as a single dose
Children
100 mg/kg as a single dose

Note 18-18

Not recommended for children below 2 months, and also for pregnant and lactating mothers.

C. For penicillin allergy

- **Clindamycin, IV,**
Adults
600-900 mg 8 hourly for 14 days
Children
13 mg/kg 8 hourly for 14 days
- **And**
Chloramphenicol, IV,
Adults
1 g 6 hourly for 14 days

Children

25 mg/kg 6 hourly for 14 days

2nd Line Treatment

Evidence Rating: [B]

- Cefotaxime, IV,

Adults

2g 6 hourly for 7 days

Children

> 12 years or body weight > 50kg; 2 g 6 hourly

< 12 years or body weight < 50kg; 50 mg/kg 6 hourly

And

- Vancomycin, IV,

Adults

15 mg/kg 12 hourly for 7-10 days

Children

> 12 years;	15 mg/kg 12 hourly for 7-10 days
-------------	----------------------------------

2-12 years;	15 mg/kg 12 hourly for 7-10 days
-------------	----------------------------------

1 month-2 years;	15 mg/kg 8 hourly for 10-14days
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< 1 month;	not recommended
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D. 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 18-19

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.

- Dexamethasone, IV, 4-10 mg 6 hourly for 5-7 days

REFERRAL CRITERIA

Refer all patients not responding to treatment within the first 48 hours for specialist care.

Table 18-13: Summary of treatment options for Bacterial Meningitis

Age	Pathogens	1st line Empirical treatment	Alternatives (Specialist care)
< 50 years	Meningococcus, Pneumococcus, Haemophilus Influenza	Ceftriaxone And Vancomycin	Cefotaxime Meropenem Fluoroquinolones
> 50 years	Pneumococcus, Listeria, Gram-negative bacilli	Ceftriaxone Or Ampicillin And Vancomycin	Fluoroquinolone
Hospital Acquired	Staphylococci, Gram-negative bacilli, Pneumococcus Pseudomonas	Ceftazidime +/- Gentamycin	Meropenem Vancomycin

192. 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
- Strongyloides
- Tape worm
- Thread worm
- Whip worm

SYMPTOMS

- Generalised Itching
- Perianal itching (threadworm)
- Dry cough (when the larvae pass through the lungs)
- Wheeze (when the larvae pass through the lungs)
- Abdominal discomfort and or pain
- Easy fatigability
- Passage of worm(s) in the stool
- Altered bowel habit
- Vomiting of worms

SIGNS

- Pallor
- Features of malnutrition

- Poor physical growth in children
- Large distended abdomen in children
- Wheezing

INVESTIGATIONS

- Stool for routine examination
- FBC

TREATMENT

Treatment objectives

- To eliminate the worms
- To treat the complications of infestation e.g. anaemia, malnutrition
- To ensure proper sanitation

Non-pharmacological treatment

- Ensure proper nutrition
- Proper hand washing with soap and running water

Pharmacological treatment

| (See table below on 'Pharmacological treatment of Worm Infestations')

REFERRAL CRITERIA

Refer patients with intestinal obstruction from a heavy load of suspected worm infestation to a surgical specialist.

Pharmacological treatment of Worm Infestations			
Worm	Treatment	Note	Evidence Rating
Hookworm	Mebendazole, oral, Adults 500 mg as single dose Or 100 mg 12 hourly for 3 days Children > 12 months 100 mg 12 hourly for 3 days	Not recommended for children below 12 months and in pregnant women	B
	Or Albendazole, oral, Adults and children > 12 months 400 mg as a single dose Children below 12 months 200 mg as a single dose	Not recommended during pregnancy	B

Pharmacological treatment of Worm Infestations			
Worm	Treatment	Note	Evidence Rating
Ascaris	Mebendazole, oral, Adults and children above 12 months; 100 mg 12 hourly for 3 days Or 500 mg as single dose	Not recommended for children below 12 months and in pregnant women	A
	Or Albendazole, oral, Adults and children above 12 months 400 mg as a single dose Children below 12 months 200 mg as a single dose	Not recommended during pregnancy	A
Whipworm	Mebendazole, oral, Adults and children above 12 months; 100 mg 12 hourly for 3 days Or 500 mg as single dose	Not recommended for children below 12 months and in pregnant women	B
	Or Albendazole, oral, Adults and Children above 12 months 400 mg as a single dose Children below 12 months 200 mg as a single dose	Not recommended during pregnancy	B
Threadworm	Mebendazole, oral, Adults and children above 12 months; 100 mg 12 hourly for 3 days Or 500 mg as single dose	Not recommended for children below 12 months and in pregnant women Repeat treatment after 3 weeks	C
	Or Albendazole, oral, Adults and Children above 12 months 400 mg as a single dose Children below 12 months 200 mg as a single dose	Not recommended during pregnancy Repeat treatment after 3 weeks	C

Pharmacological treatment of Worm Infestations			
Worm	Treatment	Note	Evidence Rating
Strongyloides	Albendazole, oral, Adults and Children above 12 months 400 mg 12 hourly for 3 days Children below 12 months 200 mg 12 hourly for 3 days Or Tiabendazole (Thiabendazole), oral, Adults 1.5 g 12 hourly for 3 days Children 25 mg/kg 12 hourly for 3 days	Not recommended during pregnancy Repeat treatment after three weeks. Alternatively, a 7-days treatment without repeat is acceptable. Ivermectin is the drug of choice but has the danger of precipitating life-threatening encephalopathy in microfilaria endemic areas.	B
Tapeworm	Praziquantel, oral, Adults and children; 5-10 mg/kg as a single dose. (25 mg/kg as a single dose for <i>Hymenolepis nana</i> ; repeated in 10 days) Or Niclosamide, oral, Adults and children above 6 years; 2g as a single dose	Taken after a light breakfast	C
	Children < 2 years; 500 mg as a single dose 2-6 years; 1 g as a single dose Chew tablets 2 hours before a meal		C

Chapter

EYE DISORDERS

19

193. Neonatal Conjunctivitis

(See section on 'Neonatal Conjunctivitis' under Neonatal Disorders)

194. 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. nkantomire, yellow fruits and vegetables, palm oil, milk, eggs).

Parents and other caregivers should be discouraged from putting any traditional preparations such as herbs, sea water, saliva, urine, etc. or drugs into the eye unless prescribed by a physician.

CAUSES

- Vitamin A deficiency resulting from
 - 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 easy ulceration)

INVESTIGATIONS

- Nil

TREATMENT**Treatment objectives**

- To recognize and correct vitamin A deficiency
- To prevent complications e.g. blindness

Non-pharmacological treatment

- High vitamin A containing foods should be encouraged

Pharmacological treatment

Give Vitamin A to children as soon as the illness is diagnosed and also in patients with measles and malnutrition

Evidence Rating: [A]

- Vitamin A, oral,
Children

Immediately after diagnosis

1-6 years;	200,000 Units
6-11 months;	100,000 Units

Then (after 24 hours)

1-6 years;	200,000 Units
6-11 months;	100,000 Units

Then (after 1 week)

1-6 years;	200,000 Units
6-11 months;	100,000 Units

REFERRAL CRITERIA

Refer all established cases of xerophthalmia to an eye specialist if the condition is severe with an uneven or bulging cornea.

195. 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. Adequate lighting is needed to detect corneal foreign bodies.

CAUSES

- Specks of dust
- Small insects
- Ferrous metallic specs (such as occurs with metal grinders)
- 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
- Chemosis
- Sub-conjunctival haemorrhage
- Irregular pupil in penetrating eye injury with retained intraocular foreign body
- Blood in the anterior chamber (hyphaema)

INVESTIGATIONS

- X-ray of the orbit (suspected metallic foreign body)

TREATMENT**Treatment objectives**

- To remove superficial foreign bodies
- To treat associated injury
- To prevent complications

Non-pharmacological treatment

- Where 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.

Pharmacological treatment**A. Foreign body identification**

- Tetracaine hydrochloride, 0.5% eye drop, Instill one or two drops prior to evaluation

B. For eye irrigation

- Normal Saline, 0.9%,

C. Prevention of infection

1st Line Treatment

Evidence Rating: [C]

- Chloramphenicol eye ointment, 1% topical, (After removal of foreign body)

D. Pain control

- Paracetamol, oral,

Adults

500 mg-1 g 6 -8 hourly as required

Children

6-12 years;

250-500 mg 6-8 hourly as required

1-5 years;

120-250 mg 6-8 hourly as required

3 months-1 year;

60-120 mg 6-8 hourly as required

REFERRAL CRITERIA

Refer patients with corneal foreign bodies, intraocular foreign bodies, persistent pain and redness of the eye to the eye specialist.

196. Red Eye

Red eyes are either the result of inflammation of ocular tissue or bleeding into the sub conjunctival space. The pattern of the redness, nature of the discharge, associated pain and its intensity, vision loss and appearance of the cornea are helpful in characterising the red eye. Red eye is a potentially very serious condition especially in situations where the redness is around the cornea.

CAUSES

- Conjunctivitis
- Corneal ulcer or keratitis
- Acute anterior uveitis (inflammation of the uveal tract)
- Acute angle closure glaucoma
- Episcleritis
- Scleritis
- Subconjunctival haemorrhage

RED EYE

Table 19-1: Characterising Acute Red Eye with no history of injury

Diagnosis	Predominant Pattern of Redness	Nature of Discharge	Vision Loss	Corneal Appearance	Associated Pain
Conjunctivitis	Palpebral (inner lining of the eyelids)	Watery, mucoid, mucopurulent or purulent	Nil except when cornea is involved	Clear, may show punctate epithelial stains with fluorescein in keratoconjunctivitis	Nil to mild pain
Corneal Ulcer	Around the cornea	Watery or muco-purulent	Variable	Grey or greyish white patch when bacterial or fungal or dendritic when Herpes Simplex	Severe pain
Acute anterior Uveitis	Around the cornea	Watery	Variable	Clear to hazy	Moderately severe
Acute Angle Closure Glaucoma	Around the cornea	Watery	Profound	Uniformly hazy	Very severe
Episcleritis	Sectorial	Nil or watery	Nil	Clear	Mild to severe
Scleritis	Sectorial	Nil or watery	Nil except when associated with uveitis	Clear	Very severe

CHAPTER 19: EYE DISORDERS

Diagnosis	Predominant Pattern of Redness	Nature of Discharge	Vision Loss	Corneal Appearance	Associated Pain
Subconjunctival Haemorrhage	Sectorial	Nil	Nil	Clear	Nil

Table 19-2: Summary of the common types of Conjunctivitis and their management

	Age and Background of Patients	Type of Discharge	Predominant type of ocular discomfort	Duration	Treatment
Bacterial	All ages	Purulent	Nil to mild itching or pain	1-2 weeks	Antibiotic eye drops
Viral	All ages	Watery to Mucopurulent	Nil to mild itching or pain	1-8 weeks	Symptomatic
Allergic	Children and adolescents	Stringy mucoid	Itching	Chronic intermittent	Mast cell stabilizing agents, sodium chromoglycate 2 %
Trachoma*	All ages, associated with dirty, dry, dusty and poor environment	Mucopurulent	Nil to mild itching or pain	1 month to 1 year or more	Tetracycline eye ointment Azithromycin tablets

*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

| RED EYE |

INVESTIGATIONS

- Conjunctival swab for culture and sensitivity (purulent or mucopurulent discharge)

TREATMENT

Treatment objectives

- To treat the infection in the case of acute conjunctivitis
- To relieve pain and refer immediately to the specialist for urgent management to prevent blindness in the case of corneal ulcers, acute anterior uveitis, acute angle closure glaucoma, episcleritis and scleritis.

Non-pharmacological treatment

Acute conjunctivitis

- Wipe discharges with tissue, discard it and wash hands after each wipe
- Don't share towels with others
- Adults and children should avoid close contact with others e.g. from

school, work, camp and swimming

Pharmacological treatment

A. For treatment of Acute conjunctivitis

1st Line Treatment

Evidence Rating: [C]

- Tetracycline, 1% ointment, apply at night for 7 days
And
- Chloramphenicol, 0.5% eye drops,
1 drop 2 hourly for 48 hours

Then

1 drop 6-8 hourly for 7 days

Or

- Ciprofloxacin, 0.3% eye drops, 1-2 drops 6-12 hourly

REFERRAL CRITERIA

Refer corneal ulcers, acute anterior uveitis, acute angle closure glaucoma, episcleritis and scleritis immediately to the eye specialist. Also refer acute conjunctivitis, which shows no improvement after 48 hours of treatment.

197. Glaucoma

GLAUCOMA

Glaucoma is an optic neuropathy usually but not always associated with raised intraocular pressure. It is the second leading cause of preventable blindness in the world. Chronic 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. Acute glaucoma is however associated with very high intraocular pressures and very severe pain and inflammation of the eye and can lead to blindness quickly if not treated. When congenital, glaucoma causes enlargement of the eyeball associated with increased sensitivity to light and watering.

Pharmacological treatment may vary from patient to patient according to local availability, affordability, and individual response to treatment.

CAUSES

- Acute closure of the drainage angle (due to pupil block in primary angle closure glaucoma)
- Inadequate drainage of aqueous from the anterior chamber (despite open drainage angles in chronic open angle glaucoma)
- Neovascular membrane in the drainage angle in ischaemic eye diseases such as proliferative diabetic retinopathy
- Displaced lens in secondary angle closure glaucoma
- Malformation of the drainage angle in congenital glaucoma

SYMPTOMS AND SIGNS**Table 19-3: Characteristics of the various types of the common types of Glaucoma**

Symptoms and signs	Chronic open angle	Acute angle closure	Congenital
Onset	Usually 40 years and above	Elderly	Infants and toddlers
Symptoms	Nil till late then progressive visual loss	Sudden visual loss, Severe eye pain, very inflamed eye, watery discharge, headache and vomiting sometimes	Photophobia, watering,
Intraocular pressure	Usually high, may be normal	Very high	High
Cornea	Normal	Hazy	Enlarged and hazy with linear breaks

INVESTIGATIONS

- Gonioscopy
- Central retinal thickness measurement
- Visual field analysis
- Optic Disc photography
- Retinal Nerve Fibre Thickness Analysis
- Examination of children under anaesthesia

TREATMENT**Treatment objectives**

- To prevent progression of the disease and halt further deterioration of vision
- To normalise intraocular pressure

Non-pharmacological treatment

- Drainage Surgery
- Laser Surgery
- Glaucoma Drainage device
- Various other implants

Pharmacological treatment**Note 19-1**

Consult an ophthalmologist on the treatment of glaucoma.

1st Line Treatment

Evidence Rating: [B]

Treatment is with one medication from one or more of the following groups:

- Latanoprost, eye drops, 50 microgram/ml

- Bimatoprost, eye drops, 300 microgram/ml
- Travoprost, eye drops, 40 microgram/ml

And/Or

- Timolol 0.5% eye drops
- Levobunolol 0.5% eye drops
- Betaxolol 0.5% eye drops

And /Or

- Brimornidine, 1 mg/ml or 1.5 mg/ml

And/Or

- Acetazolamide, oral, 250 mg
- Brinzolamide, eye drops, 10 mg/ml
- Dorzolamide, eye drops, 20 mg/ml

And/Or

- Pilocarpine 1-4%, eye drops

REFERRAL CRITERIA

Refer all suspected cases of glaucoma to the ophthalmologist for assessment and initial treatment.

198. Cataract

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 such as diabetes mellitus
- Congenital

SYMPTOMS

- Variable disturbance of vision (sometimes worse when sunny or reading)
- Glare especially at night during driving
- Monocular double vision in the affected eye
- Change in refractive status:
 - more short sighted (myopic shift)
 - more long sighted (hypermetropic shift)
- White spot in the eye (children)

SIGNS

- Lens opacity
- Reduced visual acuity
- Reduced contrast sensitivity

INVESTIGATIONS

- Fasting blood sugar
- FBC

TREATMENT**Treatment objectives**

- To improve vision
- To prevent the development of amblyopia in the child

Non-pharmacological treatment

- Use of spectacles
- Surgical removal of cataract

Pharmacological treatment

- Nil

REFERRAL CRITERIA

Refer all cases to the eye specialist.

199. Exposure Keratopathy

Exposure keratopathy is the drying of the cornea as a result of inability to close the eyelids or blink adequately. If not detected and treated can result in corneal ulceration and perforation leading to blindness.

CAUSES

- Facial nerve palsy e.g. Bell's palsy or leprosy
- Scarring of the eyelids
- Coma
- Thyroid eye disease
- Parkinson's disease
- Proptosis
- Steven Johnson's Syndrome

SYMPTOMS

- Feeling of drying of the eye
- Foreign body sensations in the eye
- Photophobia
- Blurring of vision

SIGNS

- Lagophthalmos (inability to close the eyes)
- Incomplete blink (the upper eyelid does not cover the whole cornea during blink)
- Infrequent blink
- Superficial punctate stains on the cornea
- Large coalescent corneal epithelial defect
- Corneal ulceration
- Corneal perforation

INVESTIGATIONS

- Nil

TREATMENT**Treatment objectives**

- To moisten the cornea artificially
- To prevent the complications of dry eyes

Non-pharmacological treatment

- Taping the eyelids closed in the comatose patient
- Partial tarsorrhaphy
- Education of patients with Parkinson's or thyroid eye disease to to blink frequently voluntarily rather than rely on reflex blink

Pharmacological treatment1st Line Treatment

Evidence Rating: [C]

- Hydroxymethyl cellulose, 0.3% eye drops, 1-2 hourly during waking time

2nd Line Treatment

Evidence Rating: [C]

- Polyvinyl alcohol, 1.4-2% eye drops, 1-2 hourly during waking time

And

- Chloramphenicol, 1% eye ointment, at night before bedtime
- Or
- Tetracycline, 1% eye ointment, at bedtime

REFERRAL CRITERIA

Refer patients whose exposure keratopathy is not improving to the eye specialist.

200. Strabismus

Strabismus is misalignment usually of one eye preventing simultaneous viewing of an object by both eyes. Onset in children under 7 years interferes with the development of the visual system of the deviating eye in the brain leading to amblyopia. Acute onset at an older age causes double vision. Diplopia does not occur in children because of the ability to suppress the second image or development of amblyopia. Amblyopia does not occur if the deviation alternated from one eye to the other. The more frequent types are horizontal misalignment. Esotropia is convergent deviation and exotropia is divergent deviation.

CAUSES

- Congenital misalignment
- Acquired deviation
- Paralysis of the cranial nerve VI, III or IV

- Fibrosis in an extraocular muscle
- Myasthenia gravis
- Intraocular lesion e.g. retinoblastoma and macular scar

SYMPTOMS

- Misalignment of the eye
- Impaired judgement of depth or distance
- Diplopia or double vision

SIGNS

- Deviation of the corneal light reflex in one eye from a central position
- Movement of the deviating eye to take up fixation when the fixing eye is covered
- Normal extraocular eye movement (in non-paralytic strabismus)
- Limitation of eye movement (in paralytic or restrictive strabismus)
- Hypermetropia on refraction in children
- Retinal lesion e.g. retinoblastoma

INVESTIGATIONS

- Cycloplegic refraction in children
- Other specific tests for suspected causes e.g. myasthenia gravis or retinoblastoma

TREATMENT**Treatment objectives**

- To identify and correct any significant refractive error
- To treat any amblyopia
- To relieve any diplopia
- To correct the misalignment
- To treat any underlying condition

Non-pharmacological treatment

- Spectacle correction of any refractive error
- Treatment of amblyopia in the deviating eye by patching the non-deviating eye
- Use of prisms to correct small deviations
- Patching of the deviating eye to relieve diplopia in older patients

Pharmacological treatment

- Nil

REFERRAL CRITERIA

All patients diagnosed with strabismus must be referred to the eye specialist for further management.

201. Sickle Cell Disease – Retinopathy**SYMPTOMS**

- Sudden loss of vision especially in sickle cell “SC” patients

REFERRAL CRITERIA

All Sickle Cell “SC” patients 12 years and above should be referred to the eye specialist for screening for proliferative sickle cell retinopathy. Refer all sickle cell patients with eye complications to the eye specialist.

202. Endocrine and metabolic disorders with eye complications

REFERRAL CRITERIA

Patients with persistently poor blood glucose control, poor blood pressure control, frequent diabetes-related admissions, visual impairment, cataract or any retinal changes, foot ulcers or gangrene, persistent proteinuria, or other chronic complications of diabetes should be referred to the eye specialist.

Chapter

20

EAR, NOSE AND THROAT DISORDERS

203. Stridor

Stridor is an emergency condition. It has 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. The obstruction is usually in the subglottic area.

It is commonly a viral illness, and may be preceded usually by the common cold. Measles may also be complicated by Laryngotracheobronchitis (LTB). Two important causes of stridor in children are viral croup (LTB) and acute epiglottitis.

In the management of stridor, steroids are most useful when given within 6 hours of onset of symptoms. Cough syrups containing opiates and atropine are contraindicated.

STRIDOR IN CHILDREN

CAUSES

- Viral (laryngotracheobronchitis)
- Bacterial infection
- Acute epiglottitis
- Inflammatory obstruction
- Inhalation of hot fumes e.g. in fire outbreaks
- Angioneurotic oedema
- Retropharyngeal abscess
- Inhalation of a foreign body
- Congenital malformation of the larynx e.g. laryngomalacia

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
- Barking cough
- Laboured breathing e.g. suprasternal, supraclavicular, substernal and intercostals retractions
- Tachypnoea
- Cyanosis in severe obstruction
- Reddened throat

INVESTIGATIONS

- Sputum culture
- Lateral soft tissue X-ray of neck
- Chest X-ray

TREATMENT

Treatment objectives

- To avoid aggravation of the obstruction with thick or crusted secretions
- To ensure early and timely relief of obstruction

Non-pharmacological treatment

- | ● Ensuring good hydration including liberal oral fluids
- | ● Ensure maximum rest for the child
- | ● Establish the airway by intubation or tracheostomy in severe obstruction

Pharmacological treatment

A. For hydration of very sick patients who cannot drink

1st Line Treatment

Evidence Rating: [C]

- Dextrose saline, IV, 5%

B. For restless and distressed children who require oxygen

- Oxygen, 1-6 L as required (based on oxygen saturation level)

C. For steroid therapy

- Dexamethasone, oral/IM/IV,
Children

0.6 mg/kg stat.

Or

- Budesonide, nebulised,
Children

2 mg stat.

Or

- Prednisolone, oral,
Children

1-2 mg/kg stat.

Or

- Hydrocortisone, IV,
Children
4 mg/kg 6 hourly for 2-3 days

Note 20-1

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

D. In superimposed bacterial infection

1st Line Treatment

Evidence Rating: [C]

- Cloxacillin, IV,
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

And

- Gentamicin, IV,
Children
1-12 years; 2.5 mg/kg 8 hourly for 7 days
< 1 year; 2.5 mg/kg 12 hourly for 7 days

And

- Metronidazole, IV,
Children
7.5 mg/kg 8 hourly for 7 days

2nd Line Treatment

Evidence Rating: [C]

- Cefuroxime, IV,
Children
20 mg/kg 8 hourly
- Metronidazole, IV,
Children
7.5 mg/kg 8 hourly for 7 days

E. For severe Croup

- Adrenaline, 1:1000 solution, nebulised, 2 ml stat.

Then

Repeat hourly if effective

STRIDOR IN ADULTS

CAUSES

- Inflammatory obstruction
- Acute epiglottitis
- Laryngeal tumour
- Vocal cord paralysis

- Retropharyngeal abscess
- Inhalation of a foreign body

SYMPOTMS

- Hoarse voice
- Breathing difficulty
- Restlessness

SIGNS

- Stridor
- Laboured breathing
- Tachypnoea
- Cyanosis in severe obstruction

INVESTIGATIONS

- Lateral soft tissue X ray of neck
- Chest X-ray

TREATMENT

Treatment objectives

- To ensure early and timely relief of obstruction

Non-pharmacological treatment

- Establish the airway by intubation or tracheostomy in severe obstruction

STRIDOR

Pharmacological treatment

1st Line Treatment

Evidence Rating: [C]

A. For oxygen therapy

- Oxygen, 1-6 L as required (based on oxygen saturation level)

B. For steroid therapy

- Hydrocortisone, IV,
Adults

100 mg 6 hourly for 2-3 days

C. For superimposed bacterial infection

1st Line Treatment

Evidence Rating: [C]

- Amoxicillin + Clavulanic Acid, IV,

Adults

600 mg 8 hourly

Or

1.2 g 12 hourly

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 7 days

2nd Line Treatment

Evidence Rating: [C]

- Cefuroxime, IV,
Adults
750 mg 8 hourly
And
- Metronidazole, IV,
Adults
500 mg 8 hourly for 7 days

REFERRAL CRITERIA

Refer cases with severe obstruction and complications in children to a Paediatrician or ENT specialist. Also refer all cases of stridor if there is no expertise to intubate or perform tracheostomy to a specialist.

204. 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 significantly due to the current immunisation schedule with the pentavalent vaccine.

Examination of the throat in patients with this condition must be done only in the presence of a doctor capable and ready to intubate.

CAUSES

- *Haemophilus influenzae* type B
- *Streptococcus pyogenes*
- *Streptococcus pneumoniae*
- *Staphylococcus aureus*

SYMPTOMS

- Sudden onset of high fever
- Drooling of saliva
- Dysphagia
- Breathing difficulty

SIGNS

- Extremely ill and toxic child
- Fever
- Head is held forward to extend the neck
- Breathing difficulty
- Weak voice (not hoarse)
- Reduced air entry on auscultation
- Stridor

- Cyanosis in very sick children
- Swollen and reddened epiglottis

INVESTIGATIONS

- FBC
- Blood culture
- Lateral soft tissue X-ray of the neck

TREATMENT

Treatment objectives

- To relieve obstruction
- To treat bacteraemia

Non-pharmacological treatment

- Establishment of airway if necessary by intubation or tracheostomy

Pharmacological treatment

A. For treatment of bacterial infection

1st Line Treatment

Evidence Rating: [B]

- Cefuroxime, IV,
Adults
750 mg-1.5 g 8 hourly for 7 days
Children
25 mg/kg 8 hourly for 7 days
And
• Metronidazole, IV,
Adults
500 mg 8 hourly for 7 days
Children
7.5 mg/kg 6 hourly for 7 days

2nd Line Treatment

Evidence Rating: [B]

- Cefotaxime, IV,
Adults
1-2 g IV or IM 8 hourly for 7 days
Children
50 mg/kg 8 hourly for 7 days
Or
• Amoxicillin + Clavulanic Acid, IV,
Adults
1.2 g 12 hourly,
Increased to 1.2 g 8 hourly for 7 days in severe infections
Children
12-18 years; 600 mg to 1.2 g 12 hourly,
Increased to 1.2g 8 hourly for 7 days in severe infections
3 months-12 years; 30 mg/kg 12 hourly,
Increased to 30 mg/kg 8 hourly for 7 days in severe infections

7 days-3 months; 30 mg/kg 8 hourly for 7 days
Preterm and < 7 days; 30 mg/kg 12 hourly for 7 days

Note 20-2

Treatment should be changed to oral antibiotics when appropriate and continued for a total of 7 days

REFERRAL CRITERIA

Refer all patients immediately to a specialist if there is no expertise available for intubation or tracheostomy.

205. Retropharyngeal Abscess

This emergency condition refers to collection of pus in the retropharyngeal space. Early diagnosis and treatment will prevent mortality.

CAUSES

- Group A *-haemolytic Streptococcus*
- *Staphylococcus aureus*
- Osteomyelitis of cervical vertebrae from tuberculosis

SYMPTOMS

- Fever
- Sore throat
- Difficulty in swallowing
- Hyperextension of neck
- Laboured and noisy breathing

SIGNS

- Fever
- Reddened throat, large and inflamed tonsils
- Laboured respiration with intercostal retractions
- Stridor
- Bulge in the posterior pharyngeal wall

INVESTIGATIONS

- FBC
- Throat swab for culture and sensitivity testing
- Ziehl-Neelsen stain to exclude tuberculosis
- 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**A. For pain relief**1st Line Treatment

Evidence Rating: [B]

- Paracetamol, oral,

Adults

500 mg-1 g 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

B. For treatment of infection1st Line Treatment

Evidence Rating: [B]

- Cefuroxime, IV,

Adults

750 mg-1.5 g 8 hourly for 72 hours

Children

25 mg/kg 8 hourly for 72 hours

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 72 hours

Children

7.5 mg/kg 8 hourly for 72 hours

Then

- 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 (max. 250 mg) 12 hourly for 7 days

3 months-2 years; 10 mg/kg (max. 125 mg) 12 hourly for 7 days

And

- Metronidazole, oral,

Adults

400 mg 8 hourly for 7 days

Children

7.5 mg/kg 8 hourly for 7 days

2nd Line Treatment

Evidence Rating: [B]

- Flucloxacillin, IV,
 - Adults
500 mg 6 hourly for 72 hours
 - Children
50-100 mg/kg 6 hourly for 72 hours
- And
- Metronidazole, IV,
 - Adults
500 mg 8 hourly for 72 hours
 - Children
7.5 mg/kg 8 hourly for 72 hours
- Then
- Metronidazole, oral,
 - Adults
400 mg 8 hourly for 7 days
 - Children
7.5 mg/kg 8 hourly for 7 days
- And
- Flucloxacillin, oral,
 - Adults
500 mg 6 hourly for 7 days if patient is able to swallow
 - Children
50 mg/kg 6 hourly for 7 days if patient is able to swallow

REFERRAL CRITERIA

Refer all cases to the ENT specialist.

206. 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 3 to 5 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
- *Haemolytic streptococcus*
- *Haemophilus influenza*
- Other gram positive bacteria

SYMPTOMS

- Fever
- Difficulty in swallowing
- Sore throat

- Runny nose
- Cough

SIGNS

- Reddened throat
- Enlarged and reddened tonsils
- Sustained high grade fever
- Palpable tonsillar lymph glands (streptococcal pharyngitis)
- Runny nose (suggests viral)
- Cough (suggests viral)
- Red eyes (suggests viral)
- Whitish exudate at the back of the throat as well as whitish tonsillar exudate
- Scarlet fever rash

INVESTIGATIONS

- FBC
- Monospot test
- Throat swab for culture and sensitivity

TREATMENT

Treatment objectives

- To relieve symptoms
- To recognise and treat streptococcal throat infection
- To relieve pain

Non-pharmacological treatment

- Warm, salty water gargles

Pharmacological treatment

A. For pain relief

1st Line Treatment

Evidence Rating: [A]

- Paracetamol, oral,
Adults

500 mg-1 g 6-8 hourly

Children

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

- Ibuprofen, oral,
Adults

200-400 mg 8 hourly

Children

7-12 year;	7.5-10 mg/kg 6-8 hourly (max. 30 mg/kg or 600 mg per day)
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4-7 years;	7.5-10 mg/kg 8 hourly (max. 30 mg/kg or 450 mg per day)
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B. For treating the infection1st Line Treatment

Evidence Rating: [A]

- 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

- Amoxicillin + Clavulanic Acid, oral,
Adults

1 gram 12 hourly for 10 days

Children

> 12 years; One 500/125 mg strength tablet, 12 hourly for 10 days

6-12 years; 5 ml of 400/57 mg suspension 12 hourly (5 ml of 250/62 mg suspension 8 hourly for 10 days; dose doubled in severe infection)

1-6 years; 5 ml of 200/28.5 mg suspension 12 hourly for 10 days; dose doubled in severe infection

1 month-1 year; 2.5 ml of 200/28.5 mg suspension 12 hourly for 10 days; dose doubled in severe infection

Neonate; 2.5 ml of 200/28.5 mg suspension 12 hourly for 10 days; dose doubled in severe infection**Or**

- Amoxicillin + Clavulanic Acid, IV,
Adults

600 mg-1.2 g 12 hourly for 10 days

Children

1-12 years; 15 mg/kg 12 hourly for 10 days

Or

- Crystalline Penicillin, IV,
Adults

2-4 MU 6 hourly for 10 days

Children

> 12 years; 2-4 MU 6 hourly for 10 days

1-12 years; 0.6-1.2 MU (25 mg/kg) 6 hourly for 10 days

Note 20-3

Do not give co-trimoxazole for acute streptococcal throat infections

2nd Line Treatment

Evidence Rating: [B]

- Cefuroxime, oral,

Adult

250 mg 12 hourly for 10 days

Children

> 12 years; 250 mg 12 hourly for 10 days

3 months-12 years; 10 mg/kg 12 hourly for 10 days

Or

- Cefuroxime, IV,

Adult

750 mg 8 hourly for 10 days

Children

> 12 years; 750 mg 8 hourly for 10 days

3 months-12 years; 25-50 mg/kg 8 hourly for 10 days

C. For treating the infection in patients allergic to penicillin

- Erythromycin, oral,

Adults

500 mg 6 hourly for 10 days

Children

2-8 years; 250 mg 6 hourly for 10 days

1 month-2 years; 125 mg 6 hourly for 10 days

Neonates; 12.5 mg/kg 6 hourly**Or**

- Azithromycin, oral,

Adults

500 mg daily for 3 days

Children

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

REFERRAL CRITERIA

Refer patients with recurrent tonsillitis, retropharyngeal and peritonsillar abcess to an ENT specialist.

207. Acute Sinusitis

This is an acute infection of the para-nasal sinuses. It may lead to complications with attendant morbidity and mortality. Early recognition of this clinical condition is mandatory.

Swimming in dirty waters, dental infection or dental extraction, fractures involving the sinuses, nasal obstruction from polyps and allergic rhinitis are predisposing factors to developing acute sinusitis.

CAUSES

- Viral (common cold)
- Bacterial
- Group A haemolytic Streptococci

- *S. pneumonia*
- *S. aureus*
- *H. influenzae*
- *M. catarrhalis*
- Allergy

SYMPOTMS

- 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
- Halitosis
- Persistent fever
- Tenderness above and below the eyes, when patient bends over or when these areas are tapped lightly

INVESTIGATIONS

- FBC
- X-ray of paranasal sinuses

TREATMENT

Treatment objectives

- To reduce symptoms of pain and fever
- To eradicate infection
- To encourage drainage of sinuses

Non-pharmacological treatment

- Adequate hydration
- Steam inhalation
- Tooth extraction under antibiotic cover (if dental focus of infection is present)

Pharmacological treatment

A. For treatment of bacterial infection

1st Line Treatment

Evidence Rating: [B]

- 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

- Amoxicillin + Clavulanic Acid, oral,

Adults

1g 12 hourly for 7 days

Children

>12 years; One 500/125 mg tablet 12 hourly for 10 days

6-12 years; 5 ml of 400/57 mg suspension 12 hourly for 10 days

1-6 years; 5 ml of 200/28.5 mg suspension 12 hourly for 10 days

1 month-1 year; 2.5 ml of 200/28.5 mg suspension 12 hourly; dose doubled in severe infection

2 weeks-1 month; 1.25 ml of 200/28.5 mg suspension 12 hourly; dose doubled in severe infection

2nd Line Treatment

Evidence Rating: [B]

- Cefuroxime, oral,

Adults

250-500 mg 12 hourly for 5 - 7 days

Children

3 months-12 years; 125 mg 12 hourly, double in severe infection

| **B. For treatment of bacterial infection in patients with penicillin allergy**

- Erythromycin, oral,

Adults

500 mg 6 hourly for 10 days

Children

2-8 years; 250 mg 6 hourly for 10 days

| 1 month-2 years; 125 mg 6 hourly for 10 days

Neonate; 12.5 mg/kg 6 hourly

Or

- Azithromycin, oral,

Adults

500 mg daily for 5 days

Children

10 mg/kg daily for 5 days

C. For pain relief

- 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-1 year; 60-120 mg 6-8 hourly

D. For nasal decongestion

- Ephedrine nasal drops

Adults (1%)

1-2 drops into each nostril up to 4 times daily when required

Children (0.5%)

1-2 drops into each nostril up to 4 times daily when required

Or

- Neomycin 0.5%/Hydrocortisone 1.5% nasal drops,

Adults

2 drops 12 hourly

Children

1 drop 12 hourly

REFERRAL CRITERIA

Refer all cases, which do not improve after 1 week of treatment to the ENT Specialist

208. Acute Otitis Media

This is an infection of the middle ear, which communicates with the throat. 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.

Precursors to the bacteria infections are viral upper respiratory tract infections.

CAUSES

- *Haemophilus influenzae*
- *Haemolytic streptococcus*
- *Streptococcus pneumoniae*
- *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
- 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

- Adequate hydration
- Surgical repair and drainage of abscess

Pharmacological treatment**A. For pain relief**1st Line 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

B. For treatment of infection1st Line Treatment

Evidence Rating: [B]

- 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

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly for 7 days

Children

> 12 years; One 500/125 mg tablet 12 hourly for 10 days

6-12 years; 5 ml of 400/57mg suspension 12 hourly for 10 days

1-6 years; 5 ml of 200/28.5 mg suspension 12 hourly for 10 days

1 month-1 year; 2.5 ml of 200/28.5 mg suspension 12 hourly; dose doubled in severe infection

2 weeks-1 month; 1.25 ml of 200/28.5 mg suspension 12 hourly; dose doubled in severe infections

2nd Line Treatment

Evidence Rating: [B]

- Cefuroxime, oral,
Adults
250 mg 12 hourly for 5 days
Children
125 mg 12 hourly for 5 days

C. For treatment of infection in patients with penicillin allergy

- Erythromycin, oral,
Adults
250-500mg 6 hourly for 10 days
Children
2-8 years; 250 mg 6 hourly for 10 days
1 month-2 years; 125 mg 6 hourly for 10 days
Neonate; 12.5 mg/kg 6 hourly
Or
- Azithromycin, oral,
Adults
500 mg once daily for 5 days
Children
10 mg/kg once daily for 5 days

REFERRAL CRITERIA

Refer patient to ENT specialist if there is no response after 10 days of treatment.

209. 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.

CAUSES

- Secondary bacterial infections:
 - *Pseudomonas aeruginosa*
 - *Proteus vulgaris*
 - Pnuemococci

SYMPTOMS

- Chronic ear discharge (otorrhoea)
- Hearing loss

SIGNS

- Perforation of tympanic membrane
- Conductive hearing loss
- Ear discharge

INVESTIGATIONS

- Ear swab for culture and sensitivity

TREATMENT**Treatment objectives**

- To keep the ear dry
- To treat any acute exacerbations and complications e.g. mastoiditis

Non-pharmacological treatment

- Roll a piece of clean absorbent gauze into a wick and insert carefully into the ear. Leave for one minute then remove and replace with a clean wick. Do frequently (at least 4 times a day)
- 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

Pharmacological treatment**A. For acute exacerbations**

(See section on Treatment for 'Acute Otitis Media')

B. For topical antibiotic therapy

Evidence Rating: [B]

- Gentamicin ear drops, 0.3%, 2-3 drops 6-8 hourly and at night
Or
- Ciprofloxacin eye/ear drops, 0.3%, 1 drop 6 hourly daily

REFERRAL CRITERIA

Refer all chronically discharging ears to the ENT Specialist.

210. Epistaxis

Epistaxis also called nosebleed is a common medical emergency, which requires prompt management to avoid morbidity and mortality.

CAUSES

- Picking of the nose, especially when there is an upper respiratory tract infection
- Trauma
- Sinonasal and nasopharyngeal neoplasms
- Hypertension
- Bleeding disorders
- Atrophic rhinitis

SYMPTOMS

- Nose bleed

SIGNS

- Nose bleed

- Signs related to underlying cause
- Signs of shock (if severe)

INVESTIGATIONS

- FBC
- Sickling test
- Coagulation screen
- Liver function test
- Retroviral screen, if indicated

TREATMENT

Treatment objectives

- 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 and airway
- Pinch soft part of nose for 10 minutes (patient must breathe through mouth)
- Apply ice-pack to nasal bridge

Pharmacological treatment

- A. For haemostasis
- 1st Line Treatment
- Oxymetazoline, nasal spray, 2-3 sprays per nostril 12 hourly
Or
 - Adrenaline, topical, (as nose pack, on cotton wool) 1:1000 solutions

REFERRAL CRITERIA

Refer patients with recurrent or severe epistaxis to the ENT specialist.

21.1. Dental Caries

Dental caries is a tooth surface cavity caused by acid demineralization of tooth hard tissue. It occurs as a result bacterial conversion of refined carbohydrates to acids, which in prolonged contact with tooth surface leads to the demineralisation. This process is entirely preventable but can progress to severe decay and tooth loss or complicated by infection.

CAUSES

- Acid demineralisation of hard tooth surface

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 arrest process by excavation and filling of cavities
- To educate on good dental habits
- To prevent complications

Non-pharmacological treatment

- Regular mouth rinse after refined carbohydrate intake
- Brushing of teeth before bedtime

Pharmacological treatment

A. For pain relief

Evidence Rating: [C]

- 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

Or

- Ibuprofen, oral,

Adults

200-400 mg 8 hourly

Children

4-7 years; 150 mg 8 hourly (max. 7.5-10 mg/kg daily)

6-8 hourly)

7-12 year; 200 mg 8 hourly (max. 7.5-10 mg/kg daily)

6-8 hourly)

REFERRAL CRITERIA

Refer patient to a dentist for definitive treatment.

212. Oral Candidiasis

Oral candidiasis (oral thrush) is an infection of the mouth by yeast. 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 and those with poor oral hygiene.

CAUSES

Candida albicans (monilia)

SYMPTOMS

- White patches in the mouth
- Burning sensation in the mouth
- Difficulty in swallowing
- Breast fed babies may refuse to suck
- Sore mouth

SIGNS

- Well defined white or cream-coloured pustules and patches in the mouth

INVESTIGATIONS

- Buccal mucosal scraping for fungal elements
- FBS
- Retroscreen

TREATMENT**Treatment objectives**

- To eradicate infection
- To identify and treat any underlying condition

Non-pharmacological treatment

- Proper oral hygiene and toileting

Pharmacological treatment

A. For treatment of uncomplicated oral candidiasis

1st Line Treatment

Evidence Rating: [B]

- Nystatin suspension, oral,

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.

2nd Line Treatment

- Miconazole, oral gel,

Adults and Children

2.5 ml smeared on the oral mucosa twice daily for 7-10 days

B. For immunocompromised patients with oral candidiasis

Evidence Rating: [B]

- Fluconazole, oral,

Adults

50-100 mg daily for 7-14 days

Children

12-18 years; 50-100 mg daily for 7-14 days

14 days-12 years; 3-6 mg/kg on first day,

Then

3 mg/kg (max. 100 mg) daily for 14 days

7-14 days; 3-6 mg/kg on first day

Then

3 mg/kg every 48 hours for 14 days

< 7 days; 3-6 mg/kg on first day

Then

3 mg/kg every 72 hours for 14 days

REFERRAL CRITERIA

Refer patients not responding to above treatment or if there is the presence of an underlying illness e.g. diabetes mellitus, immunosuppression to appropriate specialist.

213. Acute Necrotising Ulcerative Gingivitis

It is a specific gum disease affecting mainly the interdental papillae and gum margin. It affects usually healthy young adults with poor oral hygiene.

CAUSES

- Spirochaetes
- Gram-negative fusiforms
- Host factors of poor oral hygiene, cigarette smoking and immune-suppression

SYMPTOMS

- Gum margin soreness or pain of sudden onset
- Bleeding
- Malaise
- Bad taste and foul breath

SIGNS

- Crater-like ulcers and necrosis mainly limited to gum margin and inter-dental gingiva
- Poor oral hygiene
- Fever
- Lymph node enlargement

INVESTIGATIONS

- Swab for culture and sensitivity

TREATMENT**Treatment objectives**

- To eradicate bacterial overgrowth
- To establish good oral hygiene
- To control fever and pain

Non-pharmacological treatment

- Improve oral hygiene habits e.g. brushing at least two times daily, frequent antiseptic oral rinse

Pharmacological treatment**A. For treatment of infection**

1st Line Treatment

Evidence Rating: [B]

- Amoxicillin (Amoxycillin), oral,
Adult
1 g stat.

Then

500 mg 6 hourly for 7 days

Children

7-10 years;	250 mg	6 hourly for 7 days
3-7 years;	125 mg	6 hourly for 7 days
1-3 years;	62.5 mg	6 hourly for 7 days

B. For Individuals with penicillin allergy

Evidence Rating: [C]

- Clindamycin, oral,

Adults

150-300 mg 6-8 hourly for 7 days

Children

12-18 years; 150-300 mg 6 hourly for 7 days

1 month-11 years; 3-6 mg/kg 6 hourly for 7 days

C. For pain and fever control

- Paracetamol, oral,

Adults

500 mg-1 g 6 hourly as required

Children

6-12 years; 250-500 mg 6 hourly as required

1-5 years; 125-250 mg 6 hourly as required

3 months-1 year; 62.5-125 mg 6 hourly as required

REFERRAL CRITERIA

Refer all patients after initiating therapy to a dentist.

214. Bacterial Endocarditis and Prophylaxis in Dentistry

Antibiotic prophylaxis is an established requirement in the management of patients with cardiac related diseases at risk of bacterial endocarditis in the course of dental manipulation.

Predisposing risk factors include previous history of bacterial endocarditis, history of heart valve disease and a history of heart valve replacement.

CAUSES

- Streptococcus sanguis*
- Streptococcus mitis*
- Streptococcus mutans*
- Streptococcus salivarius*
- Other oral bacterial flora

TREATMENT**Treatment objectives**

- To prevent seeding of oral bacteria during the transient bacteraemic phase during dental manipulation unto intra-cardiac defects and valvular lesions

Pharmacological treatment1st Line Treatment

Evidence Rating: [B]

- Amoxicillin (Amoxycillin), oral,

Adults

2 g stat. (2 hours before procedure)

Children

50 mg/kg stat. (2 hours before procedure)

Or

- Clindamycin, oral,
 - Adults
600 mg stat. (1 hour before procedure)
 - Children
20 mg/kg stat. (1 hour before procedure)

REFERRAL CRITERIA

Refer to a cardiologist if cardiac status cannot be ascertained or history is not clear.

215. Acute Bacterial Sialoadenitis

Bacterial infection usually of the parotid glands. It is mostly unilateral. Seen exclusively in debilitated, elderly, dehydrated patients or who have drug or disease-induced xerostomia.

CAUSES

- *Staphylococcus aureus*
- Anaerobes
- *Streptococcus* (occasionally)

SYMPTOMS

- Painful parotid swelling of sudden onset
- Fever
- Chills

SIGNS

- Erythematous swelling
- Tense and shiny overlying skin
- Purulent discharge from duct

INVESTIGATIONS

- FBC
- Culture and sensitivity of discharge

TREATMENT**Treatment objectives**

- To treat infection
- To provide pain relief

Non-pharmacological treatment

- Encourage bed-rest
- Adequate fluid intake
- Discontinue medications that can cause xerostomia
- Surgical drainage if indicated

Pharmacological treatment

A. For treatment of infection

1st Line Treatment

Evidence Rating: [B]

- Flucloxacillin, oral,

Adults

500 mg 6 hourly for 7-10 days

Children

5-12 years;	250 mg 6 hourly for 7-10 days
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1-5 years;	125 mg 6 hourly for 7-10 days
------------	-------------------------------

< 1 year;	62.5 mg 6 hourly for 7-10 days
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B. For treatment of infection in patients with penicillin allergy

Evidence Rating: [C]

- Clindamycin, oral,

Adults

150-300 mg 6-8 hourly for 7 days

Children

12-18 years;	150-300 mg 6 hourly for 7 days
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1 month-11 years;	3-6 mg/kg 6 hourly for 7 days
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C. For pain relief

- Paracetamol, oral,

Adults

500 mg-1 g 6 hourly as required

Children

6-12 years;	250-500 mg 6 hourly as required
-------------	---------------------------------

1-5 years;	125-250 mg 6 hourly as required
------------	---------------------------------

3 months-1 year;	62.5-125 mg 6 hourly as required
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REFERRAL CRITERIA

Refer to a dentist after initiation of treatment.

216. Ludwig's Angina/Cervico-Facial Abscess

It is a spreading infection originating usually from a molar tooth into the fascial spaces of the sub-lingual, sub-mandibular and para-pharynx. This happens when a periapical abscess erodes through the lingual cortical plate of the mandible and gains access to these neck fascial spaces. The infection can then track down and enter the thorax. Another source of infection is the tonsillar crypt abscess. The initial presentation with swelling of the floor of the mouth and spread, with upper neck involvement is termed Ludwig's angina. As it spreads down the neck, the term cervico-facial abscess is used. This condition is an emergency and must be treated as such.

CAUSES

- Odontogenic infection
 - α-haemolytic Streptococci
 - Staphylococci
 - Bacteroides
- Tonsillar crypt abscess

SYMPTOMS

- Facial swelling with floor of the mouth elevated with oedema
- Protruding tongue
- Drooling of saliva
- Fever
- Chills

SIGNS

- Tense and tender jaw swelling
- Board-like firmness of jaw swelling
- Severe systemic upset
- Raised floor of the mouth with limitation of mouth-closing and saliva drooling
- Dehydration

INVESTIGATIONS

- FBC
- BUE/CR
- X-ray of jaw

TREATMENT**Treatment objectives**

- To treat the infection
- To prevent dehydration
- To control fever and pain

Non-pharmacological treatment

- Adequate hydration
- Intubation if airway obstruction present
- Incision and drainage as appropriate
- Extraction of tooth if it is the source of infection

Pharmacological treatment**A. For treatment of infection in patients unable to swallow and toxæmic**

1st Line Treatment

Evidence Rating: [B]

- Amoxicillin + Clavulanic Acid, IV,
Adults

1.2 g 8 hourly for 7-10 days

Children

3 months-18 years; 30 mg/kg 8 hourly (max. 1.2 g 8 hourly for

7-10 days)

< 3 months;

30 mg/kg 12 hourly for 7-10 days

And

- Ceftriaxone, IV,

Adult

2 g daily for 7-10 days,

Children

All ages 25 mg/kg 12 hourly (max. 75 mg/kg daily)

2nd Line Treatment

Evidence Rating: [B]

- Clindamycin, IV,

Adults

300-600 mg 6 hourly for 7-10 days

Children

3-6 mg/kg 6 hourly for 7-10 days

And

- Ceftriaxone, IV,

Adult

2 g daily for 7-10 days

Children

All ages 25 mg/kg 12 hourly (max. 75 mg/kg daily)

3rd Line Treatment

Evidence Rating: [C]

- Procaine Penicillin, IM,

Adult

600,000-1,000,000 units daily

Children

> 27 kg; 600,000 units daily

< 27 kg; 25,000-50,000 units/kg daily

Neonates; not recommended

And

- Gentamicin, IV,

Adults

40-80 mg 8 hourly for 7-10 days

Children

1-12 years; 2.5 mg/kg 8 hourly for 7-10 days

< 1 year; 2.5 mg/kg 12 hourly for 7-10 days

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 7-10 days

Children

7.5 mg/kg 8 hourly for 7-10 days

REFERRAL CRITERIA

Refer to the specialist as soon as possible.

217. Chronic Periodontal Infections

Chronic periodontal infections are due to prolonged bacterial infection around the teeth, which leads to destruction of periodontal and bony supporting tissue of the tooth. This usually leads to pocket formation, gum recession, tooth mobility and or loss.

CAUSES

- Bacteria

SYMPTOMS

- Recurrent painful chewing
- Mobility of teeth
- Bleeding gum margin

SIGNS

- Gum recession
- Pocket formation
- Loss of supporting bony tissue

INVESTIGATIONS

- X-ray of involved teeth and supporting tissues

TREATMENT

Treatment objectives

- To restore tooth function
- To treat infection
- To relieve pain

Non-pharmacological management

- Debridement
- Reconstructive surgery

Pharmacological treatment

A. Adjunctive Antimicrobial therapy

- Clindamycin, oral,
Adults

300-450 mg 6-8 hourly for 7 days

Children

12-18 years; 150-300 mg 6 hourly for 7 days

1 month-11 years; 3-6 mg/kg 6 hourly for 7 days

Or

- Amoxicillin + Clavulanic Acid, oral,
Adults

1 g 12 hourly for 14-21 days

Children

>12 years; One 500/125 tablet 12 hourly

6-12 years; 5 ml of 400/57 suspension 12 hourly

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

B. For pain relief

- Paracetamol, oral,

Adults

500 mg-1 g 6 hourly as required

Children

6-12 years;

250-500 mg 6 hourly as required

1-5 years;

125-250 mg 6 hourly as required

3 months-1 year;

62.5-125 mg 6 hourly as required

REFERRAL CRITERIA

Refer all patients to the dental specialist.

218. Mouth Ulcers

Mouth ulcers are generally due to infection (bacterial, viral or fungal), neutropaenia, malignancy-related or trauma. The common ones are aphous and viral ulcers.

APHTHOUS ULCERS

Aphous ulcer is a recurrent ulcer of non-viral origin that occurs on the movable surfaces of the oral cavity. Size is variable but may have a rim of erythema with yellowish base, and later becoming a greyish hue. They are classified into minor, major or herpetiform on clinical presentation. The minor is < 1 cm, and the major 1-3 cm in diameter. The herpetiform comes in multiple crops of 1-3 cm. Though the cause is unknown, systemic conditions associated with aphous ulcer include Behcet's syndrome, HIV, Vitamin deficiency states (vitamin B group, folic acid).

Herpetiform ulcers are a crop of oral aphous ulcers resembling oral viral ulcers.

Behcet's disease is a more severe and generalised form involving the eye, skin and genitalia.

CAUSES

- Unknown

SYMPTOMS

- Tingling on the oral mucosa (prodromal phase)
- Painful ulcer

SIGNS

- Crater-like soft tissue ulcer with a yellowish-grey floor
- Tenderness

INVESTIGATIONS

- Nil

TREATMENT**Treatment objectives**

- To control pain
- To treat ulcer
- To control stress
- To prevent secondary infection

Non-pharmacological treatment

- Proper oral hygiene
- Relaxation

Pharmacological treatment**A. To control pain**

1st Line Treatment

Evidence Rating: [C]

- Local anaesthetic gel, oral, applied with a cotton tip locally to the ulcer base

Adults

Applied not less than every 3 hours as needed and not more than 6 applications daily

Children

Applied not less than every 3 hours as needed and not more than 6 applications daily.

And

- Ibuprofen, oral,

Adults

400 mg 6-8 hourly as needed

Children

6-12 years;	200-400 mg 6-8 hourly as needed
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1-5 years;	100-200 mg 6-8 hourly as needed
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3 months-1 year;	not recommended
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REFERRAL CRITERIA

Refer to a dentist if the ulcer does not heal within 2 weeks.

219. Odontogenic Infections

Odontogenic infections are infections arising primarily from the tooth. This occurs as the result of intraoral bacteria gaining access to pulp via a dental cavity such as a carious lesion. The pulp undergoes necrosis and an abscess collects at the tooth apex over time.

CAUSES

- Streptococci

SYMPTOMS

- Pain on chewing
- Jaw swelling with persistent gnawing pain
- Fever
- Chills

SIGNS

- Tooth tenderness to percussion
- Lymphadenopathy

INVESTIGATIONS

- X-ray of affected tooth

TREATMENT**Treatment objectives**

- To control infection
- To control pain
- To remove source of infection
- To restore tooth integrity and function

I Non-pharmacological treatment

- Root canal therapy with drainage, debridement, epicectomy etc.
- Restoration of structure and function

Pharmacological treatment**A. For treatment of mild infection**

1st Line Treatment:

Evidence Rating: [B]

- Amoxicillin, oral,
Adults
500 mg 8 hourly for 7 days
Children
5-18 years; 500 mg 8 hourly for 7 days
1-5 years; 250 mg 8 hourly for 7 days
1 month-1 year; 125 mg 8 hourly for 7 days

B. For treatment of mild infection-in patients allergic to penicillins

Evidence Rating: [B]

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

Note 21-1

Not recommended in pregnancy, lactating mothers and in children < 8 years of age.

C. For treatment of severe infection

1st Line Treatment

Evidence Rating: [B]

- Amoxicillin + Clavulanic Acid, oral,

CHAPTER 21: ORAL AND DENTAL CONDITIONS**Adults**

625 mg 8 hourly for 7 days

Children

> 12 years;	One 500/125 tablet 12 hourly for 7-10 days
4-12 years;	5 ml of 400/57 suspension 12 hourly for 7-10 days
1-4 years;	5 ml of 200/28 suspension 12 hourly for 7-10 days
3 months - 1 year; days	20 mg/kg (of amoxicillin) 12 hourly for 7-10 days
< 3 months; days	15 mg/kg (of amoxicillin) 12 hourly for 7-10 days

Or

- Azithromycin, oral,

Adults

500 mg daily for 5 days

Children

10 mg/kg body weight daily for 5 days.

Not recommended for children less than 6 months because of a risk of pyloric stenosis.

D. For treatment of severe infection-in patients allergic to penicillins

Evidence Rating: [B]

- Azithromycin, oral,

Adults

500 mg daily for 5 days

Children

10 mg/kg body weight daily for 5 days

Not recommended for children less than 6 months because of a risk of pyloric stenosis.

Or

- Clindamycin, oral,

Adults

150-300 mg 6-8 hourly for 7 days

Children

12-18 years; 150-300 mg 6 hourly for 7 days

1 month-11 years; 3-6 mg / kg 6 hourly for 7 days

E. For pain relief

Evidence Rating: [B]

- Paracetamol, oral,

Adults

500 mg-1 g 6 hourly as required

Children

6-12 years; 250-500 mg 6 hourly as required

1-5 years; 125-250 mg 6 hourly as required

3 months-1 year; 62.5-125 mg 6 hourly as required

REFERRAL CRITERIA

Refer all patients with odontogenic infections to a dental specialist after initiation of treatment.

220. Oral Squamous Cell Carcinoma

This condition presents as a non-healing ulcer of more than two weeks in the mouth. There may be a genetic predisposition but environmental causes have been identified. For an oral ulcer, 2 weeks observation for healing is usually adequate. If suspected to be due to an infection, an appropriate antimicrobial is given.

CAUSES

- Usually unknown
- Associations:
 - Tobacco/betel nut chewing
 - Alcohol
 - Smoking
 - HPV infections

SYMPTOMS

- Non-healing ulcer in the mouth
- Pain
- Jaw swelling and deformity

SIGNS

- Intra-oral mass ulcer
- White mucosal patch
- Neck mass

INVESTIGATIONS

- Incisional biopsy for histopathology

TREATMENT

Treatment objectives

- To eradicate tumour mass/cells
- To control pain
- To carry out definitive treatment

Non-Pharmacological treatment

- Surgery +/- radiotherapy

Pharmacological treatment

- Chemotherapy (+/- surgery +/- radiotherapy)

REFERRAL CRITERIA

Refer immediately to the oncologist for further management.

221. Temporo-mandibular Joint dysfunction and masticatory muscle dysfunction

Temporo-mandibular Joint (TMJ) dysfunction and or masticatory muscle dysfunction is a complex of derangements affecting only the joint, the muscles of mastication or both. The pathological process may be due to joint arthropathy, disc disease or tension in tendons and masticatory muscles from abnormal movement behaviour or occlusal disharmony.

CAUSES

- Behavioural induced bruxism
- Arthropathy
- Trauma (physical)
- Occlusal disharmony

SYMPTOMS

- Pre-auricular pain associated with opening and closing the mouth
- Clicking noise on opening and closing
- Dull, persistent pain in masticatory muscles

SIGNS

- Tenderness in the TMJ associated with mouth opening
- Clicking in TMJ on mouth opening and closing
- Tenderness in muscles of mastication on contraction
- Occlusal abnormalities

INVESTIGATIONS

- X-ray-TMJ views
- ESR

TREATMENT

Treatment objectives

- To control pain
- To relax muscles of mastication
- To correct any stress inducing imbalance

Non-pharmacological treatment

- Occlusal splints
- On-lays
- Reduce stress and encourage relaxation in masticatory apparatus

Pharmacological treatment

A. For muscle relaxation

1st Line Treatment

Evidence Rating: [C]

- Diazepam, oral,
Adults
5 mg 12 hourly

Children

12-18 years;	5 mg 12 hourly
5-12 years;	2.5 mg 12 hourly

B. For pain relief

- Ibuprofen, oral,

Adults

400 mg 12 hourly as required

Children

6-12 years;	200-400 mg 6-8 hourly as required
1-5 years;	100-200 mg 6-8 hourly as required
3 months-1 year;	not recommended

REFERRAL CRITERIA

Refer all cases to the dentist for further management.

222. Trigeminal Neuralgia

Trigeminal neuralgia is a condition characterised by unilateral facial

I pain that follows the distribution of the trigeminal nerve. It presents with recurrent, sudden onset sharp-shooting pain in the face and may have a trigger-point. The patient may present with marked anxiety and may mimic a psychiatric disorder.

CAUSES

- Degenerative
- Inflammatory
- Pressure-induced

SYMPTOMS

- Sudden sharp-shooting pain in the face
- Severe anxiety

SIGNS

- Anxiety
- Hypesthesia of affected area (transient)

INVESTIGATIONS

- X-ray to rule out a fractured tooth
- MRI to rule out intracranial pathology

TREATMENT

Treatment objectives

- To reassure patient
- To allay anxiety
- To manage the neuropathy

Non-pharmacological treatment

- Reassurance and counseling

Pharmacological treatment

A. For the control of anxiety

1st Line Treatment

Evidence Rating: [C]

- Diazepam, oral,

Adults

5 mg at night

Children

12-18 years; 2.5-5 mg at night

5-12 years; 2.5 mg at night

B. For treatment of neuropathic pain

1st Line Treatment

Evidence Rating: [A]

- Carbamazepine, oral,

Adults

50-150 mg 12 hourly till resolution (max. 600 mg 12 hourly)

Children

12-18 years; 50-100 mg 12 hourly

Then

Increase to 600 mg 12 hourly if necessary

1 month-12 years; 2.5 mg/kg 12 hourly

Then

Increase slowly to 5 mg/kg 12 hourly

Or

- Pregabalin, oral,

Adults

75 mg 12 hourly till resolution

Children

Not recommended

C. For additional pain relief

- Ibuprofen, oral,

Adults

400 mg 8 hourly as required

Children

6-12 years; 200-400 mg 8 hourly as required

1-5 years; 100-200 mg 8 hourly as required

3 months-1 year; not recommended

REFERRAL CRITERIA

Refer to the neurologist for further management.

DISORDERS OF THE MUSCULOSKELETAL SYSTEM

223. Osteoarthritis

This is a degenerative articular cartilage disease of varied aetiology. It can affect all joints, but mostly the hips and knees. Important differentials include, rheumatoid arthritis and tuberculosis affecting the joints.

Primary osteoarthritis is usually age-related (old age), whilst secondary osteoarthritis may be due to other causes.

CAUSES

- Trauma
- Infections
- Inflammatory arthritides

SYMPTOMS

- Pain on activity and relieved by rest initially
- Joint stiffness
- Joint swelling
- Limping

SIGNS

- Limping
- Joint swelling
- Joint effusion
- Deformities
- Leg length discrepancy

INVESTIGATIONS

- X-ray of affected joint

TREATMENT

Treatment objectives

- Relieve pain
- Prevent progression
- Improve function of joint
- Prevent deformities or complications

Non-pharmacological treatment

- Physiotherapy
- Weight loss
- Walking aid
- Braces
- Surgery
 - Aspiration of excessive synovial fluid
 - Osteotomies
 - Arthroplasties
 - Arthrodesis

Pharmacological treatment

A. For pain relief

1st Line Treatment

Evidence Rating: [A]

- Naproxen EC, oral,
Adults
250-500 mg 12 hourly as required
Children
Not indicated
Or
- Celecoxib, oral,
Adults
400 mg stat.

Then

200 mg 12-24 hourly as required

Children

Not indicated

Or

- Diclofenac, oral,
Adults
50 mg 8 hourly or 100 mg 12 hourly
Children
> 12 years; 50 mg 12 hourly
< 12 years; not recommended

Or

- Ibuprofen, oral,
Adults
200-800 mg 6-8 hourly as required (max. 2.4 g daily)
Children
10-15 mg/kg 6-8 hourly as required (max. 40 mg per kg daily)

And

- Diclofenac gel, topical,
Adults and Children
Apply 12 hourly as necessary

Or

- Diclofenac spray, topical,
Adults and Children
Apply 12 hourly as necessary
- 2nd Line Treatment
Evidence Rating: [C]
For any of the following therapy, consult a specialist
- Methyl prednisolone acetate, Intra-articular
- Triamcinolone, Intra-articular
- Betamethasone, Intra-articular

REFERRAL CRITERIA

Refer complicated cases to the orthopaedic specialist.

224. Rheumatoid arthritis

Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease of unknown cause. An external trigger (e.g. cigarette smoking, infection, or trauma) triggers an autoimmune reaction, leading to synovial hypertrophy

I and chronic joint inflammation along with the prospect for extra-articular manifestations. It is believed to occur in genetically susceptible individuals and more common in middle aged women.

CAUSES

- Unknown
- Autoimmune disorder
- Likely a combination of genetic and environmental factors

SYMPTOMS

- Joint stiffness
- Painful joints
- Swelling of affected joints
- Deformity of affected joints
- Limitation of motion
- Skin nodules
- Difficulty in breathing
- Easy fatigability

SIGNS

- Persistent symmetric polyarthritis (synovitis) of hands and feet
- Joint stiffness
- Joint tenderness
- Joint swelling
- Joint deformity
- Limitation of joint movement
- Rheumatoid nodules
- Signs relating to extra-articular involvement e.g. lung disease, uveitis, pericardial or pleural effusions

INVESTIGATIONS

- FBC, ESR
- C-reactive protein level
- Rheumatoid Factor assay
- Antinuclear Antibody (ANA) assay
- Anti-Cyclic Citrullinated Peptide (Anti-CCP)
- Joint aspiration and analysis of synovial fluid
- Hepatitis B and C tests
- HIV test
- X-rays of hands and feet
- MRI of cervical spine (to detect subluxation)
- Ultrasonography of joints

TREATMENT**Treatment objectives**

- To reduce pain, swelling and stiffness
- To prevent deformities
- To delay disease progression and long-term complications
- To reduce drug side effects

Non-pharmacological treatment

- Heat and cold therapies
- Orthotics and splints
- Physiotherapy
- Occupational therapy
- Adaptive equipment
- Joint-protection education
- Counselling and education
- Synovectomy
- Tenosynovectomy
- Tendon realignment
- Reconstructive surgery or arthroplasty
- Arthrodesis

Pharmacological treatment**A. Symptoms present more than 6 weeks or antibody positive**1st Line Treatment

Evidence Rating: [B]

- Prednisolone, oral, 0.5-1 mg/kg body weight

Caution 22-1.

Take corticosteroids after food.

High-dose glucocorticoids may cause insomnia; immediate-release formulation is typically administered in morning to coincide with circadian rhythm.

And

- Omeprazole, oral,
Adults
20 mg daily

Children

> 20 kg;	20 mg daily
10-20 kg;	10 mg daily
5-10 kg;	5 mg daily

Or

- Esomeprazole, oral,

Adults

20-40 mg daily

Children

12-18 years;	20-40 mg daily
1-12 years;	10-20 mg daily
< 1 year;	not recommended

And

- Diclofenac, oral,

Adults

50 mg 8 hourly or 100 mg 12 hourly as required

Children

>12 years;	50 mg 12 hourly as required
<12 years;	not recommended

Or

- Diclofenac, rectal,

Adults

100 mg 12 hourly as required

Children

> 12 years;	75-100 mg daily as required
< 12 years;	not recommended

Or

- Celecoxib, oral,

Adults

400 mg stat.

Then

200 mg 12-24 hourly as required

Children

> 2 years (> 25 kg);	100 mg 12 hourly as required
> 2 years (and 10-25 kg);	50 mg 12 hourly as required
< 2 years;	not recommended

Or

- Paracetamol, oral,

Adults

500 mg-1 g 6 - 8 hourly as required

Children

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

And

- Calcium supplements

Adults and Children

As required

B. Maintenance treatment for symptoms present more than 6 weeks or antibody positive

1st Line Treatment

Evidence Rating: [B]

- Hydroxychloroquine, consult specialist
- Sulfasalazine, consult specialist
- Methotrexate, consult specialist
- Leflunomide, consult specialist

Or

- Etanercept, consult specialist
- Infliximab, consult specialist
- Adalimumab, consult specialist
- Certolizumab, consult specialist
- Golimumab, consult specialist

Or

- Rituximab, consult specialist
- Anakinra, consult specialist
- Abatacept, consult specialist
- Tocilizumab, consult specialist
- Tofacitinib, consult specialist

2nd Line Treatment

Evidence Rating: [C]

- Cyclosporine, consult specialist
- Azathioprine, consult specialist
- Gold salts, consult specialist
- D-penicillamine, consult specialist
- Minocycline, consult specialist

REFERRAL CRITERIA

Refer all cases to a physician specialist or rheumatologist.

225. Juvenile Idiopathic Arthritis

Juvenile idiopathic arthritis results from abnormally regulated immune responses that lead to inflammation of joints, surrounding tissues and other organs. Often, non-rheumatic diseases that can cause similar features need to be excluded during evaluation.

Rheumatoid arthritis in children may present in one of three forms; a systemic onset arthritis (Still's disease), poly-articular onset arthritis (5 or more joints usually of both large and small affected) or pauci-articular onset arthritis (fewer than 5 of mainly large joints affected) either of which may be rheumatoid factor positive or negative. Those with positive

Antinuclear Antibodies (ANA) tests need regular eye checks for uveitis.

For this condition, it is mandatory for arthritis to be present for at least 6 weeks for the diagnosis to be made.

CAUSES

- Autoimmune disease

SYMPTOMS

- Morning stiffness
- Joint pain
- Painful red eyes
- Rash
- Joint swelling
- Fever

SIGNS

- Swollen warm joints
- Restricted range of joint movement
- Systemic onset
 - Fever
 - Macular rash
 - Hepatosplenomegaly
 - Lymphadenopathy
 - Serositis e.g. pericardial effusion
 - Red eyes

INVESTIGATIONS

- FBC
- ESR
- BUE and creatinine
- Liver function tests
- C-reactive protein
- Rheumatoid Factor (RF)
- Anti-Cyclic Citrullinated Peptide (CCP) antibody
- Antinuclear Antibodies (ANA)
- X-Ray of affected joints
- Slit lamp examination
- Other tests as determined by specialist

TREATMENT

Treatment objectives

- To control pain and inflammation
- To prevent deformities and growth retardation
- To control extra articular complications
- To minimise drug side effects
- To optimise chance for normal social development

Non-Pharmacological Treatment

- Physiotherapy

- Psychotherapy
- Occupational therapy
- Diet therapy
- Patient counselling

Pharmacological Treatment

A. To control pain and inflammation

1st Line Treatment

Evidence Rating: [A]

- Ibuprofen, oral,
Children
6-12 years; 200-400 mg 8 hourly as required
1-5 years; 100-200 mg 8 hourly as required
3 months - 1 year; not recommended

Or

- Indomethacin, oral,
Children
> 14 years; 25-50 mg 8-12 hourly (max. 200 mg per day)
2-14 years; 500 microgram-1 mg/kg 12 hourly (max.
150 mg per day)
< 2 years; not recommended
- Or**
- Naproxen, oral,
Children
> 5 years; 5-7.5 mg/kg 12 hourly (max. 1 g per day)
< 5 years; not recommended for this condition

2nd Line Treatment

Evidence Rating: [A]

- Celecoxib, oral,
Children
> 2 years (> 25 kg); 100 mg 12 hourly
> 2 years (and 10-25 kg); 50 mg 12 hourly
< 2 years; not recommended

Caution 22-2.

The long-term use of NSAIDs like diclofenac, naproxen, and ibuprofen (i.e. for more than two weeks) may cause renal impairment and gastritis.

Refer after two weeks of NSAIDs use.

B. Steroid therapy to control inflammation

(See treatment 'to control pain and inflammation' in (A) above)

And

- Prednisolone, oral,
Children
0.5-2 mg/kg daily or 12 hourly (max. 60 mg per day)

Note 22-1

If symptoms do not improve after 6 weeks of steroid use, treat as a chronic case.

C. For treatment of chronic symptoms1st Line Treatment

Evidence Rating: [A]

- Intra-articular corticosteroid injection, consult specialist
- Methotrexate, consult specialist
- Etarnecept, consult specialist
- Infliximab, consult specialist
- Adalimumab, consult specialist
- Anakinra, consult specialist

REFERRAL CRITERIA

Refer all suspected cases to a paediatrician or rheumatologist.

226. Back pain

This is the commonest cause of reported pain to healthcare facilities. More than 80% of people will have at least one episode in their lifetime. Most are benign and will resolve. However, 33%-66% will have a recurrence within a year. It is important to identify red, and yellow flags. It may be acute if it is less than 3 months and chronic if it is more.

BACK PAIN

Box 22-1: Notes of back pain

YELLOW flags

- Pessimistic attitude toward pain, excessive fear of movement and activity and little hope for improvement
- Work-related problems (e.g. dissatisfaction, conflicts)
- Emotional problems (e.g. depression, anxiety, worry)
- Generalized pain (e.g. headache, fatigue, dizziness)
- Desire for passive treatment, little ability to be proactive
- Previous episodes of low back pain that were followed for an extended period of time

RED flags

- Patients < 20 years or > 55 years of age experiencing back pain for the first time
- Patients experiencing pain significantly different from previous episodes
- Pain that is constant over time and does not disappear during sleep
- General malaise and poor general condition
- Traumatic injuries, tumours, steroid use or improper use of immunosuppressants
- Neurological compromise
- Spinal deformity
- Pronounced morning stiffness lasting for longer than 1 hour and/or high erythrocyte sedimentation rate

CAUSES

- Mechanical (e.g. disc degeneration, fractured vertebrae, instability,

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unknown cause [most cases])

- Neurogenic (e.g., herniated disc, spinal stenosis, osteophyte damage to nerve root)
- Non-mechanical spinal conditions (e.g., neoplasm, infections, inflammatory arthritis, Paget's disease)
- Referred visceral pain (e.g., gastrointestinal disease, kidney disease, abdominal aortic aneurism)
- Other (e.g., fibromyalgia, somatoform disorder, "faking" pain)

SYMPOTOMS

- Pain
 - Nociceptive
 - Diffuse pain
 - Neuropathic
 - Pricking, tingling, pins and needles
 - Electric shocks of shooting
 - Hot or burning
 - Numbness
 - Altered sensation
 - Radicular pain
- Incontinence of urine and faeces

SIGNS

- Deformity of spine
- Tenderness in affected region
- Weakness of the affected limb
- Muscle wasting in the affected limb
- Altered sensation in the affected limb

INVESTIGATIONS

Criteria - ACR	Recommendation
Uncomplicated, acute low back pain	Imaging usually not appropriate
Low-velocity trauma, osteoporosis or age > 70 years	MRI of lumbar spine without contrast usually appropriate
Low back pain and/or radiculopathy in surgical or interventional candidate	
Suspicion of cancer, infection or immunosuppression	MRI of lumbar spine with and without contrast usually appropriate
Prior lumbar surgery	
Cauda equina syndrome	

- FBC, ESR,
- Mantoux
- Chest X-ray (if TB is suspected)
- Rheumatoid factor

- HLA-B27 (if inflammatory arthritides is suspected)
- CT scan of spine
- CT myelogram
- Plain X-rays of spine

TREATMENT

Treatment objectives

- Pain relief
- Prevention of recurrence
- Identification of red and yellow flags
- Treatment of underlying cause
- Improvement of function

Non-pharmacological treatment

- Splints
- Physiotherapy
- Weight loss and lifestyle adjustment
- Acupuncture
- Sleep hygiene
- Occupational therapy

Pharmacological treatment

A. For relief of acute back pain

1st Line Treatment

Evidence Rating: [B]

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

And

- Naproxen EC, oral,
250-500 mg 12 hourly as required

Or

- Celecoxib, oral,
400 mg stat.

Then

200 mg 12-24 hourly as required

Or

- Diclofenac, oral, 50 mg 8 hourly or 100 mg 12 hourly

Or

- Ibuprofen, oral, 400 mg 6-8 hourly

And

- Diazepam, oral, 5 mg 12 hourly

Or

- Methocarbamol, consult specialist

Or

- Tizanidine, consult specialist

2nd Line Treatment

Evidence Rating: [B]

- Amitriptyline, oral, (when there are neuropathic signs and symptoms), 25-50 mg daily
 - Or
 - Pregabalins, oral, consult specialist
- And
- Tramadol, oral,
25 mg stat.
- Then
Increase by 25-50 mg daily up to 50-100 mg 6 hourly as necessary;
(max. 400 mg per day)
 - Or
 - Codeine, oral, 15-60 mg 4-6 hourly as required
 - Or
 - Morphine sulphate, oral, 5-10 mg 8-12 hourly

B. For Inflammatory Arthritis

- Prednisolone, oral, consult specialist
- Methotrexate, oral, consult specialist
- Rituximab, IV, consult specialist

REFERRAL CRITERIA

Individuals may need to be referred to the orthopaedic specialist, neurosurgeon or rheumatologist based on the red and yellow flag criteria above.

227. Fibromyalgia

Fibromyalgia is a disorder of chronic, widespread pain and tenderness. It typically presents in young women in the third decade or middle-aged women but can affect patients of either sex and at any age.

Fibromyalgia is a diagnosis of exclusion and often occurs in patients with other conditions, such as autoimmune inflammatory arthritis and osteoarthritis. The clinical evaluation may reveal objective evidence for other co-morbid illness, such as hypothyroidism, rheumatoid arthritis, systemic lupus erythematosus, polymyalgia rheumatica and other inflammatory or autoimmune disorders.

No clear pathophysiological mechanism for fibromyalgia has been established, but evidence suggests that there is an abnormality in central pain processing.

Although there is no cure for fibromyalgia, treatment can relieve some of the symptoms. Since symptoms are numerous and vary among patients, treatment programs must be individualized for each patient. Treatment includes patient education, stress reduction, regular exercise and medications. Always combine pharmacologic and non-pharmacologic

therapy in the treatment of fibromyalgia.

CAUSES

- Usually unknown

SYMPTOMS

- Chronic widespread pain
- Unrefreshing sleep and tiredness
- Anxiety
- Depression
- Migraine or tension headaches
- Numbness or tingling of different parts of the body
- Abdominal pain
- Constipation or diarrhoea
- Irritable bladder

SIGNS

- Tender Points (commonly found around the elbows, shoulders, knees, hips, back of the head, and the sides of the breastbone)
- Myalgia (more than three months)

INVESTIGATIONS

- FBC, ESR
- BUE and creatinine
- Urinalysis
- Thyroid stimulating hormone level
- 25-hydroxy vitamin D level
- Vitamin B12 level
- Iron studies
- Magnesium level

TREATMENT

Treatment objectives

- To reduce pain
- To aggressively treat co-morbid depression
- To improve sleep
- To reduce fatigue

Non-pharmacological treatment

- Stress management
- Exercise
- Balanced diet
- Sleep therapy
- Psychologic/behavioural therapy

Pharmacological treatment

A. For treatment of mild symptoms

1st Line Treatment

Evidence Rating: [B]

- Paracetamol
 - Adults**
500 mg-1 g 6-8 hourly as required
 - Children**
6-12 years; 250-500 mg 6-8 hourly as required
1-5 years; 125-250 mg 6-8 hourly as required
3 months-1 year; 62.5 mg-125 mg 6-8 hourly as required
- **Or**
- Diclofenac, oral,
 - Adults**
50 mg 8 hourly or 100 mg 12 hourly as required
 - Children**
> 12 years; 50 mg 12 hourly as required
< 12 years; not recommended
- **Or**
- Diclofenac, rectal,
 - Adults**
100 mg 12 hourly as required
 - Children**
> 12 years; 75-100 mg daily as required
< 12 years; not recommended
- 2nd Line Treatment
 - Evidence Rating: [B]
- Tramadol, oral,
25 mg stat.
 - Then**
Increase by 25-50 mg daily up to 50-100 mg 6 hourly as necessary;
(max. 400 mg per day)
 - And**
 - Amitriptyline, oral,
10 mg nocte
 - Then**
Gradually increase to 75 mg daily as required
- B. For treatment of chronic or severe symptoms with anxiety**
(See 'treatment for mild symptoms' as above)
 - And**
1st Line Treatment
 - Evidence Rating: [B]
 - Clonazepam, oral,
 - Adults**
250 microgram 12 hourly (max. 1 mg 12 hourly)
 - Children**
Not recommended for this condition
- C. For treatment of chronic or severe symptoms with depression**
(See 'treatment for mild symptoms' as above)

And

1st Line Treatment

Evidence Rating: [B]

- Fluoxetine, oral,
Adults

20 mg daily (max. 80 mg per day)

Children

> 8-18 years;

10 mg daily (max. 20 mg per day)

< 8 years;

not recommended

Or

- Amitriptyline, oral,
Adults

25-50 mg once daily (early evening),

Then

Increase by 25 mg every 3-5 days up to a max. of 150 mg

Children

> 16 years; 5-15 mg 12 hourly

< 16 years; not recommended

Or

- Duloxetine, oral,
Adults

20-30 mg 12-24 hourly (max. 60 mg per day)

Children

7-17 years; 20-30 mg daily (max. 60 mg per day)

D. For treatment of chronic or severe symptoms with myalgia
(See 'treatment for mild symptoms' as above)

And

1st Line Treatment

Evidence Rating: [B]

- Tizanidine, oral,
Adults

2 mg 8 hourly

May increase to 4 mg 8 hourly after 7 days

Children

Not recommended

Or

- Cyclobenzaprine, oral,
Adults

5-10 mg 8 hourly as required

Children

5 mg 8 hourly as required

E. For treatment of chronic or severe symptoms with neuropathic pain

(See 'treatment for mild symptoms' as above)

And

1st Line Treatment

- Evidence Rating: [B]
- Pregabalin, oral,
 - Adults
50-75 mg 12 hourly till resolution (max. 300 mg per day)
 - Children
Not recommended
 - Or**
 - Gabapentin, oral,
 - Adults
300 mg daily
 - Then**
Increase by 300 mg daily to a max. of 600 mg 8 hourly
 - Children
Not recommended

F. For treatment of chronic or severe symptoms with migraine
(See 'treatment for mild symptoms' as above)

- And**
- Clonidine, oral,
 - Adults
50-75 microgram 12 hourly
 - Children
Not recommended

REFERRAL CRITERIA

Refer patients not responding to treatment to the appropriate specialist.

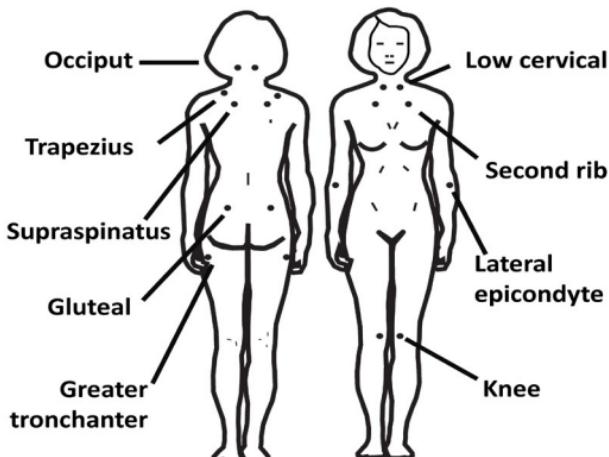


Fig 22-2: Fibromyalgia tender points

228. Idiopathic inflammatory myopathies

The idiopathic inflammatory myopathies (IIM) are systemic connective tissue diseases, which are characterized by symmetrical, proximal muscle weakness, reduced muscle strength and chronic inflammation in muscle tissue. These are rare disorders, and affects more women than men. Although the peak age of onset is in the 50s, the disorders can occur at any age. The word "juvenile" is used in the name when a child is affected by myositis.

Adults with inflammatory myopathies, have an increased risk of cancer including cancer of the lung, breast, prostate, and ovaries etc.

CAUSES

- Unknown
- Autoimmune

SYMPTOMS

- Muscle weakness (around the neck, shoulders and hips)
- Trouble climbing stairs, getting up from a seat, or reaching for objects overhead
- Pain in the muscles
- Choking while eating
- Aspiration of food

SIGNS

- Proximal muscle weakness
- Aspiration pneumonia
- Gottron's sign or Gottron's papules (rash over the back of the fingers, elbows or knees)
- Shawl sign (flat, reddened area that appears on the upper back, shoulders, and back of the neck)
- Photosensitive rash
- Heliotrope rash
- Nail bed abnormalities
- Mechanic's hands
- Alopecia
- Interstitial lung disease
- Calcium deposits in the skin (calcinosis)

INVESTIGATIONS

- Creatine kinase levels
- Antinuclear Antibodies (ANA)
- Hepatitis B and C screen
- HIV Test
- Muscle biopsy
- MRI scan of the muscles
- Electromyogram (EMG)

TREATMENT

Treatment objectives

- To improve muscle strength
- To minimise long-term muscle damage
- To prevent complications from muscle weakness
- To reduce treatment side effects

Non-pharmacological treatment

- Physical therapy and rehabilitation to prevent contractures
- Avoidance of exposure to direct sunlight
- Appropriate feeding techniques to prevent aspiration

Pharmacological treatment

A. For treatment of acute condition

1st Line Treatment

Evidence Rating: [B]

- Prednisolone, oral, 0.5-1 mg/kg body weight

And

- Omeprazole, oral,

Adults

20 mg daily

Children

> 20 kg;	20 mg daily
----------	-------------

10-20 kg;	10 mg daily
-----------	-------------

5-10 kg;	5 mg daily
----------	------------

Or

- Esomeprazole, oral,

Adults

20-40 mg daily

Children

12-18 years;	20-40 mg daily
--------------	----------------

1-12 years;	10-20 mg daily
-------------	----------------

< 1 year;	not recommended
-----------	-----------------

And

- Calcium supplements with vitamin D

Adults and Children

As required

Or

- Bisphosphonates

Adults and Children

Consult specialist

B. For treatment of rash in dermatomyositis

(See treatment for acute condition in (A) above)

And

- Hydroxychloroquine, oral,

Adults

200-400 mg daily

Children

5-6.5 mg/kg (max. 400 mg per day)

C. For treatment of acute condition with steroid resistance

1st Line Treatment

Evidence Rating: [B]

- Methotrexate, consult specialist
Or
- Azathioprine, consult specialist
Or
- Intravenous immunoglobulin, consult specialist
Or
- Mycophenolate mofetil, consult specialist
Or
- Rituximab, consult specialist

REFERRAL CRITERIA

Refer all patients to a physician specialist or rheumatologist.

229. Management of the Hot Swollen Joint

The hot swollen joint is a common presentation and has extensive differential diagnosis. Some of the most serious causes are septic arthritis (with a case fatality of 11%) and acute leukemia in children. Late diagnosis and poor treatment leads to joint damage and death.

The commonest affected joint is the big toe, typically due to gout and can be diagnosed on clinical grounds. Patients with a short history of a hot, swollen and tender joint (or joints) with restriction of movement should be regarded as having septic arthritis until proven otherwise. If clinical suspicion is high, then it is imperative to treat as septic arthritis even in the absence of fever.

CAUSES

- Septic arthritis
- Reactive arthritis
- Monoarticular presentation of polyarthritis
- Inflammatory arthritis
- Gout or crystal arthritis
- Haemarthrosis
- Trauma
- Bursitis/cellulitis
- Leukaemia (in children)
- Haemophilia

SYMPTOMS

- Fever
- Joint swelling (monoarthritis)

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- Joint pain
- Limited mobility of affected joints

SIGNS

- Hot swollen native joint
- Fever
- Joint tenderness

INVESTIGATIONS

- FBC, ESR
- Blood culture
- Blood film comment
- C-reactive protein (CRP)
- Serum uric acid level
- BUE and creatinine
- Liver function tests
- Synovial fluid aspirate for microscopy and culture
- X-ray of affected joint
- MRI of the affected joint
- Ultrasonography to aid diagnostic aspiration

TREATMENT**Treatment objectives**

- To reduce pain
- To reduce swelling and stiffness
- To prevent deformities
- To delay disease progression and long-term complications

Non-pharmacological treatment

- Rest of affected joints using bedrest, splints
- Physiotherapy
- Joint aspiration

Pharmacological treatment**A. For control of pain and inflammation**1st Line Treatment

Evidence Rating: [B]

- Diclofenac, oral,
Adults

50 mg 8 hourly or 100 mg 12 hourly as required

Children

> 12 years;

50 mg 12 hourly as required

< 12 years;

not recommended

Or

- Diclofenac, rectal,

Adults

100 mg 12 hourly as required

Children

- | | |
|-------------|-----------------------------|
| > 12 years; | 75-100 mg daily as required |
| < 12 years; | not recommended |

Caution 22-3.

The long-term use of NSAIDs like diclofenac, naproxen, and ibuprofen (i.e. for more than two weeks) may cause renal impairment and gastritis.

B. For control of inflammation in the absence of infection

- Prednisolone, oral,
Adults
0.5-2 mg/kg daily or 12 hourly (max. 80 mg per day)
Children
0.5 mg/kg daily or 12 hourly (max. 60 mg per day)
Or
- Intra-articular corticosteroid injection – consult specialist

C. For treatment of infection in Septic arthritis

(See section on 'Septic Arthritis')

REFERRAL CRITERIA

Refer patients with an acutely swollen joint to the orthopedic surgeon or rheumatologist.

I 230. Gout

Gout

This condition, which typically affects males with cardiovascular risk factors and women after menopause, results from the deposition of uric acid crystals in joints and periarticular tissues. Gout is characterised by pain and inflammation of the affected joints. It is often, but not always, associated with raised blood uric acid levels and 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. Individual gout flares are often triggered by acute increases or decreases in uric acid levels which may be associated with acute alcohol ingestion, acute overindulgence in foods high in purines, rapid weight loss, dehydration, or trauma.

CAUSES

- Overproduction of uric acid in disorders that cause high cell turnover with release of purines found in cell nuclei
 - Myeloproliferative and lymphoproliferative disorders
 - Psoriasis
 - Haemolytic anemias
 - Cell lysis from chemotherapy, especially those of the haematopoietic or lymphatic systems
 - Excessive exercise
 - Metabolic syndrome (obesity, diabetes, hypertension, elevated cholesterol etc.)
- Impaired excretion of uric acid

- Renal impairment
- Lead nephropathy
- Starvation or dehydration
- Drugs e.g. thiazide and loop diuretics, cytotoxic drugs, pyrazinamide
- Alcohol ingestion
- Inherited purine metabolic disorders e.g. Lesch-Nyhan syndrome

SYMPOTOMS

- Excruciating pain and swelling usually of a joint (classically the big toe but may affect the knee, ankles or wrists)
- Multiple joint pain
- Joint swelling

SIGNS

- Inflamed, swollen and tender joint
- Migratory polyarthritis
- Tophi in soft tissues (helix of the ear, fingers, toes, prepatellar bursa, olecranon)
- Fever

INVESTIGATIONS

- FBC, ESR
- BUE, creatinine
- Serum uric acid
- Blood glucose
- Serum lipids
- X-ray of affected joint
- Joint aspirate for culture and polarised microscopy

Gout

TREATMENT

Treatment objectives

- To relieve acute pain
- To reduce joint inflammation
- To prevent recurrent attacks and joint damage
- To prevent uric acid crystal deposition in soft tissues

Non-pharmacological treatment

- Optimize weight
- Reduce protein in diet e.g. liver, kidneys, shellfish and yeast extracts
- Reduce alcohol intake to < 14 units/week (men and women)
- Avoid highly sweetened soft drinks and other beverages or foods
- Encourage to drink > 2 litres of water daily and avoid dehydration.
- Affected joints should be elevated and exposed in a cool environment. 'Bed cages' and ice packs can be effective adjuncts to therapy
- Intense physical exercise should be avoided but moderate physical exercise encouraged
- Identify and treat underlying cardiovascular (metabolic syndrome) risk factors

Pharmacological treatment

A. Acute Gout

1st Line Treatment

Evidence Rating: [C]

- Diclofenac, oral

Adults

50 mg 8 hourly or 75 mg 12 hourly ORDERS ORY

Children

> 12 years; 50 mg 8 hourly

< 12 years; not recommended

Or

- Diclofenac, rectal,

Adults

100 mg daily

Children

> 12 years; 75-100 mg daily

< 12 years; not recommended

Caution 22-4.

Long-term NSAIDs for more than two weeks, e.g. diclofenac may cause gastritis and should therefore be given together with a proton pump inhibitor e.g. omeprazole.

2nd Line Treatment

- Colchicine, oral,

500 microgram 6-12 hourly until symptoms relieved (max. 6 mg per course. Course should not to be repeated within 3 days)

Or

- Prednisolone, oral,

Adults

10-40 mg for 1-3 days

B. Chronic Gout – following treatment of acute gout

Evidence Rating: [B]

- Allopurinol, oral,

100 mg daily

Then

Increase by 100 mg every 2-5 weeks, adjusted if necessary for renal function, until the therapeutic target (Serum Uric Acid [SUA] < 300 micromol/L) is reached (max. dose 900 mg)

Caution 22-5.

Do not start Allopurinol until 1-2 weeks after inflammation has settled to prevent acute flare. But in patients already on allopurinol, it should be continued and the acute attack treated as usual.

Prescribe lower doses in renal or hepatic failure.

REFERRAL CRITERIA

Refer patients to a dietician for dietary modification and a weight reducing diet in obese and overweight individuals.

Patients with co-morbid conditions such as Type 2 diabetes, hypertension, dyslipidaemia, renal impairment or not responding to Allupurinol etc. should be referred to a physician specialist or rheumatologist.

231. Pseudo-gout (chondrocalcinosis)

This refers to attacks of synovitis induced by deposition of Calcium Pyrophosphate Dihydrate (CPPD) crystals. Most patients are old females.

It behaves like gout in many respects, but unlike gout, attacks persist longer and affect the knee most commonly.

Common risk factors include trauma, surgery, severe illness, parathyroidectomy, pamidronate therapy. Co-morbidities for this condition are usually cardiovascular, renal and metabolic diseases e.g. diabetes mellitus.

CAUSE

- Deposition of Calcium Pyrophosphate Dihydrate (CPPD) crystals in and around joints

SYMPTOMS

- Joint pain
- Swollen joint

SIGNS

- Swollen joint
- Tenderness
- Joint effusion

INVESTIGATIONS

- Serum uric acid
- X-ray of joint
- Microscopic examination of joint or bursa fluid aspirate

TREATMENT**Treatment objectives**

- Relieve pain
- Prevent joint stiffness
- Eradicate disease and correct underlying metabolic derangement

Non-pharmacological treatment

- Physiotherapy

Pharmacological treatment**A. For acute flare up**

1st Line Treatment

- PSEUDO-GOUT (CHONDROCALCINOSIS)
- Evidence Rating: [C]
 - Naproxen EC, oral,
Adults
250-500 mg 12 hourly as required
Children
Not indicated
Or
 - Celecoxib, oral,
Adults
400 mg stat.
Then
200 mg 12-24 hourly as required
Children
Not indicated
Or
 - Diclofenac, oral,
Adults
| 50 mg 8 hourly or 100 mg 12 hourly
Children
> 12 years; 50 mg 12 hourly
< 12 years; not recommended
Or
 - Ibuprofen, oral,
Adults
| 200-800 mg 6-8 hourly as required (max. 2.4 g daily)
Children
10-15 mg/kg 6-8 hourly as required (max. 40 mg per kg daily)
Or
 - Colchicine, oral,
Adult
| 500 micrograms 6-12 hourly
Children
Not recommended
- 2nd Line Treatment
- Evidence Rating: [C]
- Prednisolone, oral, consult specialist
 - Methyl prednisolone acetate, Intra-articular, consult specialist
 - Triamcinolone, Intra-articular, consult specialist
 - Betamethasone, Intra-articular, consult specialist
- 3rd Line Treatment
- Probenecid, consult specialist
 - Methotrexate, consult specialist
 - Phosphocitrate, consult specialist
 - Anakinra, consult specialist

REFERRAL CRITERIA

Start analgesia and refer to rheumatologist/orthopaedic surgeon.

232. Systemic lupus erythematosus

Systemic Lupus Erythematosus (SLE) is a chronic multisystem autoimmune inflammatory disease that has variable signs and follows a relapsing and remitting course. More than 90% of cases of SLE occur in women, commonly of childbearing age.

This condition can lead to complications such as acute or chronic renal failure, seizures, psychosis, pleurisy, pleural effusion, pneumonitis, pulmonary hypertension, pericarditis, myocarditis, leukopaenia, lymphopaenia, thrombocytopaenia and interstitial lung disease.

Management of SLE often depends on the individual patient's disease severity and disease manifestations.

CAUSES

- Autoimmune
- Genetic and environmental factors

SYMPTOMS

- Fatigue
- Malaise
- Fever
- Weight loss
- Rash
- Hair loss
- Mouth sores
- Joint pains
- Sensitivity to sunlight
- Seizures
- Nausea
- Dyspepsia
- Abdominal pain

SIGNS

- Lymphadenopathy
- Fever
- Malar rash
- Discoid rash
- Fatigue
- Arthralgia
- Arthropathy
- Myalgia
- Arthritis
- Photosensitivity rash

- Anaemia

INVESTIGATIONS

- FBC, ESR
- BUE and Creatinine
- Urinalysis with microscopy
- C - reactive protein
- Antinuclear Antibodies (ANA)
- Anti-Double stranded DNA (dsDNA)
- Complement levels
- Liver function tests
- Spot Urine protein/spot creatinine ratio
- Other Autoantibody tests e.g. Extractable Nuclear Antigens (ENA)
- Hepatitis B and C screen
- HIV screen
- Joint radiography
- Chest radiography
- Echocardiography
- Brain MRI/MRA

TREATMENT

Treatment objectives

- To control symptoms
- To adequately control underlying disease
- To prevent and treat complications
- To avoid possible long-term side effects of the drugs

Non-pharmacological treatment

- Avoidance of excessive sunlight
- Rest as appropriate
- A low-fat diet with added fish oil
- Avoidance of oestrogen-containing contraceptive pills
- Counselling and Education

Note 22-2

Vaccinations: avoid 'live' vaccines in patients on greater than 10 mg prednisolone and/or immunosuppressives. In patients on immunosuppressives, there may be a reduction in vaccine efficacy but there is adequate humoral response to hepatitis B, influenza and pneumococcal vaccine.

Pharmacological treatment

A. Acute flare and maintenance therapy

1st Line Treatment

Evidence Rating: [B]

- Methylprednisolone, IV infusion, (infuse over 1 hour)
Adults
1 g daily for 3-5 days

CHAPTER 22: DISORDERS OF THE MUSCULOSKELETAL SYSTEM**Children**

1 month-18 years; 10-30 mg/kg every other day for 6 doses (max. 1 g daily)

Then

- Prednisolone, oral,
Adults and Children
0.5-1 mg/kg body weight

Caution 22-6.

Take corticosteroids after food.

High-dose glucocorticoids may cause insomnia; immediate-release formulation is typically administered in morning to coincide with circadian rhythm.

And

- Omeprazole, oral,
Adults
20 mg daily
Children
> 20 kg; 20 mg daily
10-20 kg; 10 mg daily
5-10 kg; 5 mg daily
- Or
- Esomeprazole, oral,
Adults
20-40 mg daily
Children
12-18 years; 20-40 mg daily
1-12 years; 10-20 mg daily
< 1 year; not recommended

And

- Diclofenac, oral,
Adults
50 mg 8 hourly or 100 mg 12 hourly as required
Children
> 12 years; 50 mg 12 hourly as required
< 12 years; not recommended
- Or
- Diclofenac, rectal,
Adults
100 mg 12 hourly as required
Children
> 12 years; 50-100 mg daily as required
< 12 years; not recommended

Or

- Celecoxib, oral,
Adults
400 mg stat.

Then

200 mg 12-24 hourly as required

Children

- > 2 years (>25kg); 100 mg 12 hourly as required
- > 2 years (and 10-25kg); 50 mg 12 hourly as required
- < 2 years; not recommended

Or

- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly as required

Children

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

And

- Calcium with Vitamin D supplements

Adults and Children

As required

And

The following medications will be used in addition to the treatments above under specialist care.

Biologic DMARDs:

- Belimumab, consult specialist
- Rituximab, consult specialist
- Intravenous immunoglobulin, consult specialist

Non-Biologic DMARDs:

- Cyclophosphamide, consult specialist
- Methotrexate, consult specialist
- Azathioprine, consult specialist
- Mycophenolate, consult specialist
- Cyclosporine, consult specialist

Antimalarials:

- Hydroxychloroquine, consult specialist

REFERRAL CRITERIA

Refer all cases to a physician or rheumatologist.

Table 22-1: Recommendations for use of conventional immunosuppressive drugs in lupus

Symptom	Medicines to try	Dose and duration
Arthralgia	Non-steroidal anti-inflammatory drugs	Avoid in renal involvement Use briefly
Myalgia	Hydroxychloroquine	Specialist care

CHAPTER 22: DISORDERS OF THE MUSCULOSKELETAL SYSTEM

Symptom	Medicines to try	Dose and duration
Lethargy		Annual retinal checks yearly Baseline and frequent monitoring for those with baseline eye problems
Rash	Hydroxychloroquine Topical steroids or Tacrolimus	Specialist care
Arthritis	Prednisolone	Prednisolone: 20–40 mg per day initially for 2–4 weeks, reducing in 5–10 mg increments per week, if patient is responding; treatment is likely to be required for several months
	Hydroxychloroquine	Refer to Specialist
	Methotrexate in refractory cases	
Pleuritis and pericarditis	NSAIDs	20–30 mg prednisolone per day then tapering doses, along the lines of arthritic treatment (above)
	Antimalarials	Refer to Specialist
	Low dose corticosteroids	
	Refractory cases - azathioprine, Mycophenolate mofetil or cyclophosphamide.	
Autoimmune haemolytic anaemia/thrombocytopenia	Corticosteroids often accompanied by azathioprine or Cyclophosphamide	60–80 mg prednisolone for 1–2 weeks reducing in 10 mg increments in response to the blood test results
	Rituximab	Refer to Specialist
Renal	Prednisolone plus cyclophosphamide or mycophenolate mofetil	Refer urgently to Specialist
	Azathioprine or mycophenolate mofetil for maintenance	
	Rituximab for refractory cases	
Central nervous system	Corticosteroids plus an appropriate drug, e.g. an antidepressant, anticonvulsant, etc.	Controversial— 20–60 mg prednisolone daily
	Cyclophosphamide	Refer urgently to Specialist
	Rituximab	

233. Head Injuries

These are injuries in which the scalp, skull, meninges, brain, or the blood vessels within the brain may be affected separately or together. They are a common cause of death and disability especially in young people. With the advent of increased use of motorbikes as public transport, the incidence has gone up. Head injuries may be open or close, mild, moderate or severe. Symptoms and signs, as well as the treatment modality, will depend on the severity of the injury.

Significant head injury is defined as a Glasgow Coma Scale (GCS) of less than 10. However, take even mild injuries seriously as these may evolve with time. Continuous monitoring of the patient is required as the situation can change quickly.

Corticosteroids have demonstrated no benefits in the treatment of acute head injury and are no longer recommended for routine management. Sedatives must also not be given except in cases of transporting an aggressive patient.

CAUSES

- Road traffic accidents
- Falls, especially from heights
- Blows to the head (fights, including domestic violence, street fights)
- Gunshot wounds
- Stab wounds
- Child abuse

SYMPTOMS

- Headaches
- Drowsiness
- Loss of consciousness
- Vomiting
- Seizures
- Memory loss
- Leakage of clear fluid or bleeding from the ears or nostrils
- Intolerance to light (photophobia)

SIGNS

- Level of consciousness - may vary from fully conscious to deeply unconscious (use the Glasgow Coma Scale whenever possible)
- External signs of injuries - abrasions, contusions, lacerations, darkening around the eyes and the back of the ears
- CSF or blood leakage from the ears/nose
- Pupillary abnormalities - unequal size, pin point or dilated
- Focal neurological deficits - paralysis, loss of speech or vision
- Signs of raised intracranial pressure such as deepening coma, a rising blood pressure, slowing of the pulse rate and irregular respiration
- Other associated injuries
- Alcoholic breath (in cases of intoxication)

INVESTIGATIONS

- FBC
- BUE, Creatinine
- Blood glucose
- X-ray (skull, cervical spine, chest, pelvis)
- Head CT scan (also for children)

TREATMENT**Treatment objectives**

- To prevent further injury to the brain
- To treat associated injuries

Note 23-1

Criteria for admission:

- Loss of consciousness > 5 mins
- Presence of a fracture on skull X-ray
- Presence of focal/lateralizing signs
- Persistent/recurrent headaches, vomiting or seizures
- Open injuries
- CSF otorrhoea or rhinorrhoea
- Especially among Children, and the elderly, or in the
- Absence of a reliable adult to look after patient at home, please admit

Non-pharmacological treatment

- Assess level of consciousness and provide appropriate treatment
- Maintain a clear airway, suck out any secretions and assist ventilation if necessary
- Maintain the blood pressure (if patient hypotensive or hypertensive)
- Prevent hypoglycaemia
- Nurse with head end of bed elevated
- Stabilize the neck with a collar till cervical spine injury has been excluded
- If patient is unconscious, turn 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 (i.e if there is fluid or blood coming from the nostrils, or ears)

Pharmacological treatment

A. For lowering of raised intracranial pressure

Evidence Rating: [B]

- Mannitol 20%, IV, (may be given over 30 to 60 minutes)

Adults

2.5-10 ml/kg (0.5-2g/kg)

Children

2.5-5 ml/kg (0.5-1g/kg)

Or

- Hypertonic saline 3%, IV (particularly for children)

Adults and Children

3-5 ml/kg over 10-20 minutes (max. 250 ml)

B. For mild pain management

Evidence Rating: [A]

- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly as required

Children

6-12 years; 250-500 mg 6-8 hourly as required

1-5 years; 120-250 mg 6-8 hourly as required

3 months-1 year; 60-120 mg 6-8 hourly as required

C. For fracture base of skull

Evidence Rating: [A]

- Cloxacillin, IV,

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

D. For open skull fractures

- Amoxicillin + Clavulanic Acid, IV,

Adults

600 mg 8 hourly

Children

25 mg/kg 6 hourly

And

- Metronidazole, IV,

Adults

500 mg 8 hourly

Children

7.5 mg/kg 8 hourly

And

Evidence Rating: [B]

- Benzylpenicillin, IV,
Adults

1.2-2.4 g 6 hourly

Children

50 mg /kg 6 hourly

E. For aggressive patients requiring sedation

1st Line Treatment

- Haloperidol, IM,
Adults

2-5 mg 4-8 hourly as required (max. 20 mg in 24 hours)

Children

> 12 years; 2-5 mg 4-8 hourly as required
(max. 20 mg in 24 hours)

6-12 years; 1-3 mg 4-8 hourly as required
(max. 150 microgram per kg per day)

< 6 years; not recommended

2nd Line Treatment

- Lorazepam, IV/IM,
Adults

500 microgram-2 mg 6 hourly as needed (max. 10 mg per day)

Children

>2years; 50 microgram 4-8 hourly as needed
(max. 2 mg per dose)

REFERRAL CRITERIA

Refer all patients with significant head injuries immediately to a neurosurgeon.

234. Acute Abdomen

Acute abdomen is sudden onset of severe abdominal pain, which may require surgical intervention. Some medical conditions may present as acute abdominal pain.

CAUSES

- Inflammatory conditions e.g. appendicitis, salpingitis, cholecystitis
- Perforations e.g. typhoid, peptic ulcer, trauma
- Intestinal obstruction e.g. strangulated hernia, adhesions, volvulus
- Haemorrhage e.g. ruptured ectopic pregnancy, ruptured spleen
- Acute pancreatitis
- Colics e.g. ureteric, biliary or intestinal
- Medical conditions e.g. diabetic ketoacidosis, gastro-enteritis, gastritis, malaria, pneumonia, UTI, sickle cell crises, adrenocortical

crises, porphyria, nephrotic syndrome

SYMPTOMS

- Abdominal pain
- Anorexia, nausea and vomiting
- Dyspepsia
- Fever
- Headaches
- Joint pains
- Dizziness
- Vaginal discharge
- Dysuria
- Watery mucoid blood-stained stools

SIGNS

- Dehydration
- Fever
- Hypotension
- Rapid pulse
- Abdominal distension with fluid or gas
- Abdominal surgical scars
- Strangulated hernia (especially femoral hernia)
- Tenderness, rebound tenderness and guarding
- Absent bowel sounds
- Increased bowel sounds
- Tenderness in the recto-vesical or recto-uterine pouch
- Signs of basal pneumonia or myocardial infarction
- Pallor, gnathopathy, frontal bossing in sickle cell disease

ACUTE ABDOMEN

INVESTIGATIONS

- FBC
- Blood film for malaria parasites
- Sickling test
- Chest X-ray
- Plain abdominal X-ray (erect and supine)
- 4-quadrant abdominal tap
- Random blood glucose
- Urine examination
- BUE and Creatinine
- Ultrasound scan of abdomen

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 in suspected surgical cases

Pharmacological treatment**A. For resuscitation**

Evidence Rating: [C]

- IV fluids
- Or**
- Blood transfusion

B. For pain management

- Paracetamol, IV,

Adults

> 50 kg;	1 g 6 hourly as required
< 50 kg;	1 g 8 hourly as required (max. 3 g daily)
<u>Children</u>	
12-18 years (> 50 kg);	1g 8 hourly as required (max. 3 g daily)
12-18 years (< 50 kg);	15 mg/kg 6 hourly as required (max. 750 mg per dose)
2-12 years (< 50 kg);	15 mg/kg 6 hourly as required (max. 75 mg/kg/day)

Or

- Pethidine, IM,

Adults

50-100 mg 4 hourly as required (max. 400 mg/day)

Children

0.5-2 mg/kg repeated 4 hourly as required

Or

- Morphine, IV/IM,

Adults

2-5 mg 4 hourly as required

Children

50-200 microgram/kg 4 hourly as required

C. For infectious conditions, perforations and intestinal obstruction1st Line Treatment

Evidence Rating: [B]

- Gentamicin, IV/IM,

Adults

1-1.5 mg/kg 8 hourly

Children

2.5 mg/kg 8 hourly

Do not give if urine output is less than 30 ml/hour. Avoid in renal impairment.

And

- Metronidazole, IV,

Adults

500 mg 8 hourly

Children

7.5 mg/kg 8 hourly

2nd Line Treatment

Evidence Rating: [B]

- Ceftriaxone, IV,

Adults

1-2 g daily

Children

50 mg/kg daily

Further treatment will depend on the diagnosis.

And

- Metronidazole, IV,

Adults

500 mg 8 hourly

Children

7.5 mg/kg 8 hourly

3rd Line Treatment

Evidence Rating: [B]

- Ciprofloxacin, IV,

Adults

400 mg 8-12 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

1-5 years; 5 mg/kg 12 hourly

< 1 year; not recommended

And

- Metronidazole, IV,

Adults

500 mg 8 hourly

Children

7.5 mg/kg 8 hourly

REFERRAL CRITERIA

Refer all cases to the appropriate specialist depending on the suspected diagnosis.

235. Abdominal Trauma

This may present as a blunt or penetrating injury to the abdomen.

CAUSES

- Road traffic accidents
- Gunshots
- Violence

- Trauma to the abdomen

SYMPTOMS

- Pain
 - Vomiting
 - Distended abdomen

SIGNS

- Distended abdomen
 - Tenderness and rebound tenderness
 - Guarding
 - Tympanic percussion sound
 - Reduced or absent bowel sounds
 - Point of penetration

INVESTIGATIONS

- Plain and erect abdominal X-ray
 - Abdominal CT scan
 - BUE and Creatinine
 - Abdominal ultrasound scan
 - Diagnostic peritoneal lavage
 - Blood grouping and cross matching

TREATMENT

Treatment objectives

- To correct fluid and electrolyte imbalance
 - To decompress bowel
 - To repair damaged viscera
 - To prevent infection
 - To relieve pain

Non-pharmacological treatment

- Insert an NG tube
 - Surgical repair of damaged viscus if necessary

Pharmacological treatment

A. For infection control

1st Line Treatment

Evidence Rating: [A]

- Cefuroxime, IV.

Adults

750 mg 8 hourly for 7-14 days

Children

> 3 months 25 mg/kg body weight 12 hourly for 7-14 days

And

- Metronidazole, IV,

Adults

500 mg 8 hourly for 7-14 days

Children

7.5 mg/kg 8 hourly for 7-14 days

REFERRAL CRITERIA

Refer all cases to a general surgeon.

236. Closed Fractures

This is a break in the continuity of the bony cortex with associated soft tissue injury. As opposed to open fractures (See section on 'Open fractures'), closed fractures do not communicate with an epithelial surface like skin, bowel mucosa, bladder mucosa etc.

Resuscitation and stabilisation of the patient is paramount. Patients should never be sent for imaging unless haemodynamically stable.

CAUSES

- Road traffic accidents
- Domestic violence
- Work place injuries
- Pathological fractures
- Fall from a height
- Assaults

CLOSED FRACTURES

SYMPTOMS

- Pain
- Swelling
- Inability to move the part

SIGNS

- Pain
- Swelling
- Deformity
- Inability to move the part
- Crepitus
- Shock if there has been significant blood loss
- Confusion if there is shock or associated head injury

INVESTIGATIONS

- Haemoglobin
- Blood for grouping and cross matching
- X-rays of suspected part to include joints above and below
- Trauma series X-rays (Cervical spine, Chest and Pelvis) if injury is deemed severe or if patient is confused or unconscious
- CT scan (for fractures involving the following areas):
 - Head
 - Spine
 - Pelvis
 - Fractures around joints

CHAPTER 23: TRAUMA AND INJURIES

- CT angiograms (if significant vascular injury is suspected)
- MRI (to assess spinal cord and soft tissue injuries of the knee)
- Abdominal USG (if intra-abdominal injury is suspected)

TREATMENT**Treatment objectives**

- To resuscitate the patient (save a life first) - ATLS protocol (ABCDE)
- To save the affected limb(s) (save a limb next)
- To restore function of the affected limb(s)

Non-pharmacological treatment

- Splinting
 - P.O.P. backslab
 - Prefabricated splints
 - Customized splint
- Elevation of limb(s)
- Nil per os until a final decision about surgical or non-surgical management has been made
- Manipulation Under Anaesthesia (MUA) if possible

Pharmacological treatment**A. For pain relief**

Evidence Rating: [A]

Morphine, IV/IM,

Adults

2-5 mg 4 hourly as required

Children

50-200 microgram/kg 4 hourly as required

Or

- Pethidine, IV/IM,

Adults

50-100 mg 4 hourly as required (max. 400 mg/day)

Children

0.5-2 mg/kg repeated 4 hourly as required

Or

- Paracetamol, IV,

Adults

> 50 kg; 1 g 6 hourly as required

< 50 kg; 1 g 8 hourly as required (max. 3 g daily)

Children

12-18 years (> 50 kg); 1 g 8 hourly as required (max. 3 g daily)

12-18 years (< 50 kg); 15 mg/kg 6 hourly as required (max. 750 mg per dose)

2-12 years (< 50 kg); 15 mg/kg 6 hourly as required (max. 75 mg/kg per day)

Or

- Diclofenac, IM,

Adults

50-75 mg 8-12 hourly (max. 150 mg daily)

Children

Not recommended

2nd Line Treatment

Evidence Rating: [B]

- Ibuprofen, oral,

Adults

200-800 mg 6-8 hourly as required (max. 2400 mg daily)

Children

10-15 mg/kg 6-8 hourly as required (max. 40 mg/kg daily)

Or

- Naproxen EC, oral,

Adults

250-500 mg 12 hourly as required

Children

Not indicated

Or

- Celecoxib, oral,

Adults

400 mg stat.

Then

200 mg 12-24 hourly as required

Children

Not indicated

Or

- Codeine, oral,

Adults

15-60 mg 4-6 hourly as required

Children

Not recommended

REFERRAL CRITERIA

Refer individuals with the following conditions associated with closed fractures to an orthopaedic surgeon; difficult reduction, fractures with intra articular extension, fractures around growth plates and when there is neuro-vascular compromise.

237. Open Fractures

Open fractures imply communication of the fracture haematoma with an epithelial surface like skin, bowel mucosa, bladder mucosa etc. The main problem here is infection, and therefore, every effort should be made to prevent it. In some cases, the degree of bone loss may warrant amputation. Exclude a neurological deficit especially when the injury is extensive. It is prudent to take a photograph of the affected part(s) for documentation and medico-legal purposes.

Patients should never be sent for imaging unless haemodynamically stable.

CAUSES

- Road traffic accidents
- Domestic violence
- Assaults
- Work place injuries
- Fall from a height

SYMPTOMS

- Localised pain
- Swelling
- Bleeding
- Exposed bone, muscle and fascia
- Inability to move the part

SIGNS

- Swelling
- Deformity
- Blood
- Laceration over the fracture
- Crepitus
- Shock if there has been significant blood loss
- Confusion or unconsciousness if there is shock or associated head injury

INVESTIGATIONS

- Haemoglobin
- Blood for grouping and cross matching
- X-rays of suspected part to include joints above and below
- Trauma series X-rays (Cervical spine, Chest and Pelvis) if injury is deemed severe or if patient is confused or unconscious
- CT scan (for fractures involving the following areas):
 - Head
 - Spine
 - Pelvis
 - Fractures around joints
- CT angiograms (if significant vascular injury is suspected)
- MRI (to assess spinal cord and soft tissue injuries of the knee)
- Abdominal USG (if intra-abdominal injury is suspected)

TREATMENT

Treatment objectives

- To resuscitate the patient (save a life first) - ATLS protocol (ABCDE)
- To save the affected limb(s) (save a limb next)
- To prevent and eradicate infection
- To restore function of the affected limb(s)

Non-pharmacological treatment

- Remove all foreign bodies
- Cover with sterile dressing
- Splinting of affected limb(s)
- P.O.P. backslab
- Prefabricated splints
- Customized splint
- Elevation of affected limb(s)
- Early range of motion physiotherapy
- Keep nil per os until final decision about management has been made.
- Surgical - under general anaesthesia
 - Irrigation
 - Debridement
 - External fixation or backslab

Pharmacological treatment**A. For treatment of infection**1st Line Treatment

Evidence Rating: [A]

- Cefuroxime, IV,
Adults
750 mg 8 hourly
Children
25 mg/kg body weight 12 hourly
Or
- Clindamycin, IV,
Adults
300-600 mg 6 hourly for 4 weeks or until clinical improvement
Children
3-6 mg/kg 6 hourly for 2-4 weeks

B. If the fracture is in perineal region

- Above antibiotics in section A.

And

- Metronidazole, IV,
Adults
500 mg 8 hourly for 7 days
Children
7.5 mg/kg 8 hourly for 7 days

C. Tetanus prophylaxis

All patients with open fractures must have tetanus prophylaxis.
(See appropriate section).

REFERRAL CRITERIA

Refer complicated fractures e.g. pelvic and intra-articular, and multiple injuries to an orthopaedic surgeon.

238. Dislocations

This refers to the dissociation of articular surfaces. Since there are important neuro-vascular structures around most joints, it is important to assess and document the neuro-vascular status of the limb(s) involved after a dislocation.

CAUSES

- Road traffic accidents
- Domestic violence
- Assaults
- Work place injuries
- Sports injuries
- Falls
- Convulsions

SYMPTOMS

- Pain
- Swelling
- Inability to move the part

SIGNS

- Tenderness
- Swelling
- Inability to move the part

INVESTIGATIONS

- X-ray of affected part(s)
- CT scan or MRI if available
- CT angiogram or Doppler scan (if vascular status assessment is abnormal)

TREATMENT

Treatment objectives

- Save a life first - ATLS (advanced trauma life support)
- Save a limb
- Achieve a congruently reduced joint
- Achieve a stable reduction of the dislocated joint
- Prevent joint stiffness

Non-pharmacological treatment

- Traction
- Splinting of affected part
- Keep nil per os until reduction has been achieved
- Early range of motion physiotherapy

Pharmacological treatment

A. Analgesia for dislocations

Evidence Rating: [A]

- Morphine, IV/IM,
 - Adults
 - 2-5 mg 4 hourly as required
 - Children
 - 50-200 microgram/kg 4 hourly as required
- Pethidine, IV/IM,
 - Adults
 - 50-100 mg 4 hourly as required (max. 400 mg/day)
 - Children
 - 0.5-2 mg/kg repeated 4 hourly as required
- Paracetamol, IV,
 - Adults
 - > 50 kg; 1 g 6 hourly as required
 - < 50 kg; 1 g 8 hourly as required (max. 3g daily)
 - Children
 - 12-18 years (> 50 kg); 1 g 8 hourly as required (max. 3g daily)
 - 12-18 years (< 50 kg); 15 mg/kg 6 hourly as required (max. 750 mg per dose)
 - 2-12 years (< 50 kg); 15 mg/kg 6 hourly as required (max. 75 mg per kg per day)
- Diclofenac, IM,
 - Adults
 - 50-75 mg 8-12 hourly (max. 150 mg daily)
 - Children
 - Not recommended
- Ibuprofen, oral,
 - Adults
 - 200-800 mg 6-8 hourly as required (max. 2400 mg daily)
 - Children
 - 10-15 mg/kg 6-8 hourly as required (max. 40 mg/kg daily)
- Naproxen EC, oral,
 - Adults
 - 250-500 mg 12 hourly as required
 - Children
 - Not indicated
- Celecoxib, oral,

Adults

400 mg stat.

Then

200 mg 12-24 hourly as required

Children

Not indicated

Or

- Codeine, oral,

Adults

15-60 mg 4-6 hourly as required

Children

Not recommended

REFERRAL CRITERIA

Refer all complicated dislocations to an orthopaedic specialist.

239. Acute orthopaedic infections

Acute orthopaedic infections, which often present as emergencies, include acute osteomyelitis, acute septic arthritis, acute pyomyositis, acute-on-chronic osteomyelitis, and acute-on-chronic septic arthritis.

Acute osteomyelitis and septic arthritis can co-exist in the same individual. They are more common in children and in patients with sickle-cell disease. When the diagnosis is made in an adult, it is important to exclude immune-suppression. *Staph. aureus* and epidermidis account for the majority of the above infections. The commonest route of infection is haematogenous and may originate from skin lesions and ENT infections.

It is important to cover empirically with appropriate antibiotics without necessarily waiting for the culture and sensitivity report.

CAUSES

- *Staph. aureus*
- *Staph. epidermidis*
- *Salmonella* (common in sickle-cell disease)
- *Haemophilus influenza*
- *Strept. pyogenes*
- *Strept. faecalis*
- *E. coli*
- Open fractures
- Iatrogenic
 - Implant surgery
 - Joint aspirations
 - Femoral vessel procedures
 - Intra-osseous infusions and transfusions
 - Umbilical vessel catheterization

SYMPTOMS

- Fever
- Pain
- Inability to move affected limb
- Swelling
- Lethargy
- Refusal to feed (children)

SIGNS

- Febrile
- Swelling
- Inability to use the limb

INVESTIGATIONS

- FBC, ESR
- Sickling
- CRP
- Blood culture
- X-ray of affected part
- Ultrasound scan of affected part (may also be used for guided aspiration)
- Gram stain and culture of aspirate
- MRI (if available)
- Radionuclide scans

TREATMENT**Treatment objectives**

- Eradicate infection
- Prevent development of chronicity
- Prevent complications

Non-pharmacological treatment

- Splinting
- Ultrasound guided aspiration
- Incision and drainage

Pharmacological treatment**A. Anti-infective therapy**

1st Line Treatment

Evidence Rating: [B]

- Cloxacillin, IV,
Adults
500 mg 6 hourly for 2-4 weeks
Children
5-12 years; 250 mg 6 hourly for 2-4 weeks
1-5 years; 125 mg 6 hourly for 2-4 weeks
< 1 year; 62.5 mg 6 hourly for 2-4 weeks
- And**

CHAPTER 23: TRAUMA AND INJURIES

- Ciprofloxacin, IV, (to be administered over 60 minutes)
 - Adults
400 mg 8-12 hourly for 14 days
 - Children
10 mg/kg (max. 400 mg) 12 hourly for 14 days

Note 23-2

Monitor BUE and creatinine and perform auditory examinations weekly while on gentamicin

- 2nd Line Treatment
Evidence Rating: [B]
- Clindamycin, IV,
 - Adults
300 mg 6 hourly for 7 days
 - Children
3-6 mg/kg 6 hourly for 7 days
 - Or**
- Amoxicillin + Clavulanic Acid, IV,
 - Adults
1.2 g 12 hourly
Increased to 1.2 g 8 hourly for 7 days in severe infections
 - Children
12-18 years; 600 mg to 1.2 g 12 hourly,
Increased to 1.2 g 8 hourly for 7 days in severe infections
 - 3 months-12 years; 30 mg/kg 12 hourly,
Increased to 30 mg/kg 8 hourly for 7 days in severe infections
 - 7 days-3 months; 30 mg/kg 8 hourly for 7 days
 - Preterm and < 7 days; 30 mg/kg 12 hourly for 7 days

B. For individuals with penicillin sensitivity

- 1st Line Treatment
Evidence Rating: [B]
- Clindamycin, IV,
 - Adults
300 mg 6 hourly for 7 days
 - Children
3-6 mg/kg 6 hourly for 7 days
 - And**
- 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

C. For individuals with sickle cell anaemia

- Evidence Rating: [B]
- Cloxacillin, IV,

Adults

500 mg 6 hourly for 2-4 weeks

Children

5-12 years;	250 mg 6 hourly for 2-4 weeks
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1-5 years;	125 mg 6 hourly for 2-4 weeks
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<1 year;	62.5 mg 6 hourly for 2-4 weeks
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And

- Ciprofloxacin, IV,

Adults

200-400 mg 12 hourly for 2-4 weeks

Children

10 mg/kg 12 hourly for 2-4 weeks

D. Analgesia

1st Line Treatment

- Ibuprofen, oral,

Adults

200-800 mg 6-8 hourly (max. 2400 mg daily)

Children

10-15 mg/kg 6-8 hourly (max. 40 mg/kg daily)

Or

- Diclofenac, oral,

Adults

50 mg 8 hourly or 100 mg 12 hourly

Children

> 12 years;	50 mg 12 hourly
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< 12 years;	not recommended
-------------	-----------------

Or

- Diclofenac, IM,

Adults

50-75 mg 8-12 hourly (max. 150 mg daily)

Children

Not recommended

Or

- Morphine, oral,

Adults

15-30 mg 4-6 hourly as required

Children

200-500 micrograms/kg 4-6 hourly as required

Or

- Morphine, IV/IM,

Adults

2-5 mg 4 hourly as required

Children

50-200 micrograms/kg 4 hourly as required

Or

- Codeine, oral,

Adults

15-60 mg 4-6 hourly as required

Children

Not recommended

E. For control of fever

- Paracetamol, oral,

Adults

500 mg-1g 6-8 hourly

Children

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

Or

- Paracetamol, IV,

Adults

> 50 kg;	1 g 6 hourly as required
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< 50 kg;	1 g 8 hourly as required (max. 3 g daily)
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Children

12-18 years (>50kg);	1 g 8 hourly as required (max. 3g daily)
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12-18 years (<50kg); per dose)	15 mg/kg 6 hourly as required (max. 750 mg per dose)
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2-12 years (<50kg); per kg per day)	15 mg/kg 6 hourly as required (max. 75 mg per kg per day)
--	--

REFERRAL CRITERIA

Refer to an orthopaedic specialist if there is collection of pus and no improvement in 36 hours.

240. Chronic Osteomyelitis and Chronic Septic Arthritis

These are usually from inadequately treated acute episodes, which include acute osteomyelitis, acute septic arthritis, acute-on-chronic osteomyelitis, and acute-on-chronic septic arthritis. Some may arise from the onset as a chronic infection due to mycobacteria or fungi.

The patient is usually not ill-looking unless there is an acute exacerbation.

CAUSES

- Acute bacterial infections of bone and joints
- *Mycobacterium tuberculosis* and fungal infections
- Infected orthopaedic implants
- Iatrogenic

SYMPTOMS

- Chronic discharging sinuses
- Pain
- Deformity

SIGNS

- Swelling
- Tenderness
- Deformity
- Scarring
- Chronic discharging sinuses
- Hyper-pigmentation of the involved part

INVESTIGATIONS

- FBC, ESR
- X-ray
- CT scan

TREATMENT

I Treatment objectives

- Eradicate infection
- Restore function
- Prevent and correct deformities

Non-pharmacological treatment

- Wound dressing
- Splinting
- Surgery
 - Sequestrectomy
 - Implant removal

Pharmacological treatment

A. For acute flare up of infection

1st Line Treatment

Evidence Rating: [B]

- Cloxacillin, IV,

Adults

500 mg 6 hourly for 2-4 weeks

Children

5-12 years;

250 mg 6 hourly for 2-4 weeks

1-5 years;

125 mg 6 hourly for 2-4 weeks

< 1 year;

62.5 mg 6 hourly for 2-4 weeks

And

- Ciprofloxacin, IV, (to be infused over 60 minutes)

Adults

400 mg 8-12 hourly for 14 days

Children

10 mg/kg 12 hourly for 14 days

B. For acute flare up of infection in patients with penicillin sensitivity

1st Line Treatment

Evidence Rating: [B]

- Clindamycin, IV,
 - Adults
300 mg 6 hourly for 7 days
 - Children
3-6 mg/kg 6 hourly for 7 days
 - And**
 - Ciprofloxacin, IV, (to be infused over 60 minutes)
 - Adults
400 mg 8-12 hourly for 14 days
 - Children
10 mg/kg 12 hourly for 14 days
- C. For acute flare up of infection in patients with sickle cell disease**
- 1st Line Treatment
Evidence Rating: [B]
- Cloxacillin, IV,
 - Adults
500 mg 6 hourly for 2-4 weeks
 - Children
 5-12 years; 250 mg 6 hourly for 2-4 weeks
 1-5 years; 125 mg 6 hourly for 2-4 weeks
 < 1 year; 62.5 mg 6 hourly for 2-4 weeks
 - And**
 - Ciprofloxacin, IV, (to be infused over 60 minutes)
 - Adults
400 mg 8-12 hourly for 14 days
 - Children
10 mg/kg 12 hourly for 14 days
- 2nd Line Treatment
Evidence Rating: [B]
- Clindamycin, IV,
 - Adults
300 mg 6 hourly for 4 weeks or until clinical improvement
 - Children
3-6 mg/kg 6 hourly for 2-4 weeks
 - And**
 - Ciprofloxacin, IV, (to be infused over 60 minutes)
 - Adults
400 mg 8-12 hourly for 14 days
 - Children
10 mg/kg 12 hourly for 14 days
 - Or**
 - Amoxicillin + Clavulanic Acid, IV,
 - Adults
1.2 g 12 hourly,
Increased to 1.2 g 8 hourly for 7 days in severe infections
 - Children

12-18 years; 600 mg to 1.2 g 12 hourly,
Increased to 1.2 g 8 hourly for 7 days in severe infections
3 months-12 years; 30 mg/kg 12 hourly,
Increased to 30 mg/kg 8 hourly for 7 days in severe infections
7 days-3 months; 30 mg/kg 8 hourly for 7 days
Preterm and < 7 days; 30 mg/kg 12 hourly for 7 days

And

- Ciprofloxacin, IV, (to be infused over 60 minutes)

Adults

400 mg 8-12 hourly for 14 days

Children

10 mg/kg 12 hourly for 14 days

D. For pain relief

(See section on pain relief in 'Acute Orthopaedic Infections')

REFERRAL CRITERIA

All patients should be referred as soon as possible to an orthopaedic specialist.

241. Cellulitis

CELLULITIS

Cellulitis is an infection of skin, specifically the dermis and subcutaneous tissues usually following a break in the skin such as infected wound or prick by a pin, nail, thorn, insect bite or cracks between the toes from athlete's foot.

It may affect any part of the body, but it affects the legs mostly. Obesity and leg swelling are risk factors. It is important to rule out acute osteomyelitis, necrotizing fasciitis and Deep Vein Thrombosis (DVT).

CAUSES

- *Streptococcus pyogenes* (the commonest cause)
- *Staphylococcus aureus*

SYMPTOMS

- Pain over area affected
- Swelling of the affected parts
- Reddening or darkening of the overlying skin
- Blistering
- Ulcers
- Fever
- Rigors
- Malaise
- Vomiting
- Confusion

SIGNS

- Swelling of affected part

- Blisters
- Localised tenderness and skin colour change
- Localised warmth
- Ulcers including the web spaces
- Enlarged and tender regional lymph nodes
- Underlying pus
- Offensive wound
- Fever

INVESTIGATIONS

- FBC, ESR
- CRP
- Blood culture
- Fasting blood glucose
- Gram stain and culture of discharge
- X-ray of affected part

TREATMENT

Treatment objectives

- To relieve pain
- To control and eradicate the infection
- To treat predisposing conditions
- To prevent complications like ulceration and osteomyelitis

Non-pharmacological treatment

- Rest and elevate the affected part if possible
- Clean and dress any open wounds
- Incision and drainage if pus forms
- Debridement
- Split skin graft (if indicated)

Pharmacological treatment

A. For pain relief

Evidence Rating: [B]

(See section for pain relief in 'Closed fractures' under Trauma and Injuries)

B. Antibiotic therapy for individuals stable enough to be treated as outpatients

1st Line Treatment

Evidence Rating: [C]

- Amoxicillin, oral,
Adults

500 mg-1 g 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

And

- Flucloxacillin, oral,
 - Adults
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

2nd Line Treatment

- Evidence Rating: [C]
- Co-amoxyclav, oral,
 - Adults
625 mg 8-12 hourly for 5-7 days
 - Children
11-18 years; 625 mg 8-12 hourly for 5-7 days
6-10 years; 457 mg 8-12 hourly for 5-7 days
1-5 years; 228 mg 8-12 hourly for 5-7 days
< 1 year; 114 mg 8-12 hourly for 5-7 days

For Individuals with penicillin allergy

Evidence Rating: [C]

- Erythromycin, oral,
 - Adults
250-500 mg 6 hourly for 7 days
 - Children
8-18 years; 250-500 mg 6 hourly for 7 days
2-7 years; 250 mg 6 hourly for 7 days
< 2 years; 125 mg 6 hourly for 7 days

Or

- Clindamycin, oral,
 - Adults
150-300 mg 6-8 hourly for 7 days
 - Children
12-18 years; 150-300 mg 6 hourly for 7 days
1 month-11 years; 3-6 mg/kg 6 hourly for 7 days

C. Antibiotic therapy for patients who require admission**1st Line Treatment**

- Amoxicillin + Clavulanic Acid, IV,
 - Adults
1.2 g 12 hourly,
Increased to 1.2 g 8 hourly in severe infections
 - Children
12-18 years; 600 mg to 1.2 g 12 hourly,
Increased to 1.2 g 8 hourly in severe infections
3 months-12 years; 30 mg/kg 12 hourly,
Increased to 30 mg/kg 8 hourly in severe infections
7 days-3 months; 30 mg/kg 8 hourly

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Preterm and < 7 days; 30 mg/kg 12 hourly

Then

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly

Children

> 12 years; 500/125 mg 12 hourly

4-12 years; 5 ml of 400/57 mg suspension 12 hourly

1-4 years; 5 ml of 200/28 mg suspension 12 hourly

3 months-1 year; 20 mg/kg (of amoxicillin) 12 hourly

< 3 months; 15 mg/kg (of amoxicillin) 12 hourly

And

Evidence Rating: [B]

- Cloxacillin, IV,

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

Then

- 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

2nd Line Treatment

- Amoxicillin + Clavulanic Acid, IV,

Adults

1.2 g 12 hourly,

Increased to 1.2 g 8 hourly in severe infections

Children

12-18 years; 600 mg to 1.2 g 12 hourly,

Increased to 1.2 g 8 hourly in severe infections

3 months-12 years; 30 mg/kg 12 hourly,

Increased to 30 mg/kg 8 hourly in severe infections

7 days-3 months; 30 mg/kg 8 hourly

Preterm and < 7 days; 30 mg/kg 12 hourly

Then

- Amoxicillin + Clavulanic Acid, oral,

Adults

1 g 12 hourly

Children

> 12 years; 500/125 mg 12 hourly

4-12 years; 5 ml of 400/57 mg suspension 12 hourly
 1-4 years; 5 ml of 200/28 mg suspension 12 hourly
 3 months-1 year; 20 mg/kg (of amoxicillin) 12 hourly
 < 3 months; 15 mg/kg (of amoxicillin) 12 hourly

And

- Clindamycin, IV,
Adults
 300 mg 6 hourly or 600 mg 8 hourly
Children
 3-6 mg/kg 6 hourly

Then

- Clindamycin, oral,
Adults
 150-300 mg 6-8 hourly
Children
 12-18 years; 150-300 mg 6 hourly
 1 month-11 years; 3-6 mg/kg 6 hourly

D. For methicillin resistant *Staph. aureus*

Evidence Rating: [B]

- Vancomycin, IV,
Adults
 1 g 12 hourly by slow infusion over 1 hour (max. 2 g daily)
Children
 1 month-12 years; 10 mg/kg per day in divided doses 6-12 hourly (max. 1 g daily)

REFERRAL CRITERIA

- I Refer all cases with treatment failure, complications or ulceration requiring debridement and grafting to a plastic or general surgeon.

242. Necrotizing Fasciitis

It is a rapidly progressive inflammatory infection of the fascia with progressive destruction of the skin and subcutaneous tissue (also known as 'flesh-eating' disease).

It is a life threatening condition and if not properly managed may be fatal. It must be managed as an emergency. It is commoner in the immune-compromised state e.g. diabetes, HIV, malignancies.

CAUSES

- Mixed bacterial infections
 - Strept. spp
 - Staph. spp
 - Clostridium perfringens
 - Bacteroides

SYMPTOMS

- Pain
- Fever
- Swelling
- Discharge

SIGNS

- Fever
- Swelling
- Discharge which may be serosanguinous or purulent
- Skin colour change

INVESTIGATIONS

- FBC, ESR
- CRP
- Blood culture
- Random blood sugar
- HIV screening
- Gram stain and culture of discharge
- X-ray
- BUE and Creatinine

TREATMENT

- Resuscitate (Save life first)
- Eradicate infection
- Treat underlying cause

Non-pharmacological treatment

- Surgery
 - Debridement
 - Grafting and or flap cover

Pharmacological treatment**A. For eradication of infection**

1st Line Treatment

Evidence Rating: [B]

- Clindamycin, IV,

Adults

600 mg 8 hourly for 4 weeks or until clinical improvement

Children

3-6 mg/kg 6 hourly for 2-4 weeks

And

- Amoxicillin + Clavulanic Acid, IV,

Adults

1.2 g 8 hourly for 4 weeks or until clinical improvement

Children

12-18 years; 600 mg-1.2 g 8 hourly for 4 weeks or until clinical improvement

3 months-12 years;

30 mg/kg 8 hourly, for 4 weeks or until clin-

ical improvement
 7 days-3 months; 30 mg/kg 8 hourly for 4 weeks or until clinical improvement
 Preterm and < 7 days; 30 mg/kg 12 hourly for 4 weeks or until clinical improvement

2nd Line Treatment

Evidence Rating: [B]

- **Vancomycin, IV,**
Adults
 1 g 12 hourly by slow infusion over 1 hour (max. 2 g daily)
- Children**
 1 month-12 years; 10 mg/kg per day in divided doses 6-12 hourly (max. 1 g daily)

Note 23-3

- **Dosing Modifications**

Renal impairment: 15 mg/kg initially; further doses are based on renal function, serum drug level, and institutional protocol; dosing intervals range from every 24 to 96 hours, depending on severity of impairment.

- **Dosing Considerations**

General dosing recommendation: 2 g/day IV divided 6-12 hourly; may be increased on basis of body weight or to achieve higher trough values; increased toxicity at dosage > 4 g/day

Peak values 18-26 mg/L; trough values 5-10 mg/L; however, Infectious Diseases Society of America and other guidelines urge troughs 15-20 mg/L

B. For pain relief

Evidence Rating: [B]

(See section for pain relief in 'Closed fractures' under Trauma and Injuries)

REFERRAL CRITERIA

Refer all patients to the plastic, general or orthopaedic surgeons as soon as the patient has been resuscitated.

243. Hand Infections

These are emergencies and require early diagnosis and prompt treatment. Staph. spp are responsible for the majority of cases and it is commoner in manual workers, farmers and fishmongers.

They can be classified as simple or severe infections.

Simple infections	Severe infections
<ul style="list-style-type: none"> Infections of distal phalangeal pulps Felons (also referred to as whitlow or pulp space infection) Paronychia (acute and chronic) Sub-epithelial blisters and abscesses Herpes Septic granulomas Carbuncular infections (from sebum of hair follicles and sweat glands) 	<ul style="list-style-type: none"> Suppurative tenosynovitis Fascial space abscesses Acute osteomyelitis Acute septic arthritis Acute Lymphangitis and allied infections Combinations Complications of acute infections

CAUSES

- Staph. aureus* and epidermidis
- Strept. pyogenes*
- Fungi
- Viruses

SYMPTOMS

- Pain
- Swelling
- Blistering
- Fever
- Skin discoloration
- Loss of function

Note 23-4

In chronic types there may be no pain or fever.

SIGNS

- Fever
- Swelling
- Tenderness
- Discharge
- Stiffness

INVESTIGATIONS

- FBC, ESR
- CRP
- Blood culture
- Random blood sugar
- Gram stain and culture of discharge
- X-ray
- Nail clippings for chronic paronychia

TREATMENT**Treatment objectives**

- Eradicate infection early and aggressively
- Prevent complications such as stiffness of the joints and septicaemia

Non-pharmacological treatment

- Elevation of the affected hand
- Bandaging
- Protective wear
- Physiotherapy
- Surgical drainage of abscesses
- Fasciotomy in compartment syndrome

Pharmacological treatment**A. For treatment of suspected simple *Staph.* infections**1st Line Treatment

Evidence Rating: [B]

- Flucloxacillin, oral,
Adults
250-500 mg 6 hourly for 7-14 days

Children

5-12 years; 250 mg 6 hourly for 7-14 days

1-5 years; 125 mg 6 hourly for 7-14 days

<1 year; 62.5 mg 6 hourly for 7-14 days

2nd Line Treatment

Evidence Rating: [B]

- Clindamycin, oral,
Adults
150-300 mg 6-8 hourly for 7-14 days

Children

12-18 years; 150-300 mg 6 hourly for 7-14 days

1 month-11 years; 3-6 mg/kg 6 hourly for 7-14 days

B. For treatment of suspected severe *Staph.* infections1st Line Treatment

Evidence Rating: [B]

- Cloxacillin, IV,
Adults
500 mg 6 hourly for 7-14 days

Children

5-12 years; 250 mg 6 hourly for 7-14 days

1-5 years; 125 mg 6 hourly for 7-14 days

<1 year; 62.5 mg 6 hourly for 7-14 days

2nd Line Treatment

- Clindamycin, IV/IM,
Adults

300-600 mg 8 hourly for 14 days

Children

12 years-18 years; 150-675 mg 6 hourly for 14 days

1 month-12 years; 3.75-6.25 mg/kg 6 hourly for 14 days

C. For treatment of chronic paronychia

1st Line Treatment

Evidence Rating: [B]

- Itraconazole, oral,
Adults

200 mg daily for 7 days

Children

> 12 years; 200 mg daily for 7 days

1 month-12 years; 3-5 mg/kg daily for 7 days

Caution 23-1.

Use of itraconazole is associated with potentially life-threatening liver-toxicity.

Monitor liver function while on long term therapy.

And

- Miconazole tincture, topical,
Adults and Children > 2 years
Apply 12 hourly to affected area

2nd Line Treatment

Evidence Rating: [B]

- Fluconazole, oral,
Adult

150-300 mg weekly

Children

12-18 years; 50-100 mg weekly

14 days-12 years; 3-6 mg/kg weekly

Or

- Clotrimazole, topical,
Adults and Children
Apply 8-12 hourly to affected area

Or

- Nystatin cream, topical,
Adults and Children
Apply 8-12 hourly to affected area

Or

- Econazole cream, topical,
Adults and Children
Apply 8-12 hourly to affected area

Or

- Ciclopirox cream, topical,
Adults
Apply 8-12 hourly to affected area

Or

- Ciclopirox cream, topical,
Children

> 10 years;

apply 8-12 hourly to affected area

< 10 years; not recommended

3rd Line Treatment

Evidence Rating: [C]

- Griseofulvin, oral,
Adults
500 mg daily (double in severe infection) for 4 weeks
Children
12-18 years; 500 mg once daily or in two divided doses
(may be doubled in severe infections) for 4 weeks
1 month-12 years; 10 mg/kg (max. 500 mg) once daily or in
two divided doses for 4 weeks
And
- Miconazole tincture, topical,
Adults and Children
Apply 12 hourly to affected area

D. For treatment of septic granuloma

1st Line Treatment

- Copper sulphate stone (blue stone), topical,
Adults and Children
Apply to the affected site 12 hourly
Or
- Evidence Rating: [B]
- Hydrocortisone cream, 0.5-2.5%, topical,
Adults (0.5-2.5%)
Apply 8-12 hourly to affected area(s)
Children (0.5-1%)
Apply 8-12 hourly to affected area(s)

Or

- Clobetasol propionate cream (0.05%), topical,
Adults
Apply 8-12 hourly to affected area(s)
Children
> 12 years; apply 8-12 hourly to affected area(s)
< 12 years; not recommended
Or
- Betamethasone dipropionate cream (0.05%), topical,
Adults and Children < 12 years
Apply 12 hourly to affected area(s)

REFERRAL CRITERIA

Refer to appropriate specialists if patient does not improve.

244. Tuberculosis in orthopaedics

Tuberculosis can affect all bones and joints. The spine is affected in 50% of all cases. It affects all ages but commoner in the extremes of age. May co-exist with pulmonary TB in some cases and also in HIV positive patients.

There may be a positive history of contact with a TB infected patient.

CAUSES

- *Mycobacterium tuberculosis*
- *Mycobacterium africanum*
- *Mycobacterium bovis*

SYMPTOMS

- Pain especially at night
- Swelling
- Deformity
- Night sweats
- Low grade fever
- Chronic cough
- Weight loss

SIGNS

- Swelling
- Tenderness
- Deformities
- Discharging sinuses
- Cold abscesses
- Muscle wasting

INVESTIGATIONS

- Chest X-Ray to rule out pulmonary TB
- X-ray of the suspected part
- Sputum/gastric washings for AFBs
- FBC, ESR
- MRI of suspected parts (if available)
- Bone and soft tissue biopsy for culture and histology
- Mantoux test

TREATMENT

Treatment objectives

- Eradicate infection
- Prevent and correct deformity
- Prevent stiffness

Non-pharmacological treatment

- Physiotherapy
- Splints/corsets/body jackets

- Draining of abscesses
- Debridement
- Arthrodesis

Pharmacological treatment

A. For bone and joint tuberculosis

(See section on 'Tuberculosis')

B. For pain relief

Evidence Rating: [B]

(See section for pain relief in 'Closed fractures' under Trauma and Injuries)

REFERRAL CRITERIA

Refer to appropriate specialist as soon as diagnosis is made.

245. Rickets and Osteomalacia

RICKETS AND OSTEOMALACIA | Rickets is caused by failure of osteoid to calcify in a growing person resulting in softening and weakening of bones, due to extreme or prolonged vitamin-D deficiency.

Osteomalacia is essentially its equivalent in the skeletally mature.

CAUSES

- Vitamin-D deficiency due to:
 - Reduced intake (nutritional is the commonest)
 - Malabsorption
 - Reduced sunlight
- Vitamin-D resistance
- Vitamin-D dependence

SYMPTOMS

- Usually none
- Pain in the wrists

SIGNS

- Malnourished with discoloured hair
- Deformities
- Small for age
- Swelling of wrists
- Rachitic rosary

INVESTIGATIONS

- Serum vitamin-D level
- Serum calcium
- Serum and urine phosphate levels
- X-ray of deformed bones

TREATMENT

Treatment objectives

- Correct metabolic derangement
- Prevent and treat deformities

Non-pharmacological treatment

- Nutritional support and advice
- Surgical correction

Pharmacological treatment

A. For rickets

1st Line Treatment

Evidence Rating: [A]

- Vitamin-D, oral,
Adults and Children
125-250 microgram (5 000-10 000 Units) daily for 2-3 months until healing is well established
- **B. For rickets in patients with malabsorption**
- Vitamin-D, IM,
Adults and Children
12-18 years; 10 000-40 000 Units daily
1-12 years; 10 000-25 000 Units daily
Or
- Vitamin-D, oral,
Adults and Children
10 000-300 000 Units daily based on severity of condition

And

- Calcium, oral,
Adults and Children
1000-1500 mg daily

C. For patients with osteomalacia

1st Line Treatment

- Vitamin-D, oral,
Adults
2 000-5 000 Units daily for 2-3 months until healing is well established
- **Or**
- Vitamin-D, IM,
Adults
10 000 Units daily for 2-3 months until healing is well established

REFERRAL CRITERIA

Refer to a paediatrician and orthopaedic surgeon once diagnosis is made.

246. Scurvy

Scurvy is a multi-system disease, which may present with bony deformities and soft tissue scarring. It is caused by dietary deficiency of Vitamin-C (ascorbic acid). It is rare globally but seen in the low-middle income countries. Presentation may be dramatic, but once the diagnosis is made, the treatment is effective and rewarding.

CAUSES

- Vitamin-C deficiency

SYMPTOMS

- Pain and swelling of long bones

SIGNS

- Tenderness of the legs
- Bleeding gums
- Swelling of long bones

INVESTIGATIONS

- X-ray
- Vitamin-C assay

TREATMENT

Treatment objectives

- Correct deficient states
- Correct deformity

| Non-pharmacological treatment

- Fruits rich in Vitamin-C e.g. oranges
- Surgery to correct deformities

Pharmacological treatment

A. For scurvy

1st Line Treatment

Evidence Rating: [C]

- Vitamin-C, oral,
Adults

500 mg 12-24 hourly (max. 1 g daily)

Children

12-18 years; 500 mg 12-24 hourly (max. 1 g daily)

4-12 years; 250 mg 12-24 hourly (max. 500 mg daily)

1 month-4 years; 125 mg daily 12-24 hourly (max. 250 mg daily)

REFERRAL CRITERIA

Refer all cases to paediatrician and orthopaedic specialist.

247. Osteoporosis

Osteoporosis is a systemic skeletal disease characterized by low bone mass and small areas of deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. Risk of fractures is higher in elderly individuals with poor walking balance and vision.

Some risk factors include parental hip fractures, advanced age - especially women after menopause, smoking, alcohol abuse, immobilization, inadequate intake of vitamin-D and calcium, prolonged steroid use, hyperthyroidism, hyperparathyroidism, type-I diabetes mellitus, rheumatoid arthritis, malabsorption syndromes, and low femoral neck Bone Mineral Density (BMD).

CAUSE

- Imbalance between new bone formation and old bone breakdown
 - Bone mineral loss
 - Low bone density

SYMPTOMS

- Back pain
- Inability to walk after a very trivial fall

SIGNS

- Deformed limbs
- Fractures
- Stooping stance

INVESTIGATIONS

- X-rays of wrists/hips
- Bone Mineral Density (BMD) scan
- Quantitative CT scan

TREATMENT

Treatment objectives

- Management of underlying risk factors
- Prevention of fractures
- Early treatment of fractures

Non-pharmacological treatment

- Dietary (adequate intake of calcium and vitamin-D containing foods)
- Therapeutic Lifestyle Changes (refer to risk factors in the preamble above)

Pharmacological treatment

A. For low fracture risk

1st Line Treatment

Evidence Rating: [A]

- Calcium with Vitamin-D, oral,
Adults

1000-1300 mg daily of Calcium and 200-800 IU vitamin-D daily

B. For moderate fracture risk

Evidence Rating: [A]

- Calcium with Vitamin-D, oral,
Adults

1000-1500 mg daily of Calcium and 200-800 IU vitamin-D daily

C. For high fracture risk

Note 23-5

For any of the therapies below, consult a specialist

- Hormone replacement therapy (HRT)
- Estrogen therapy (ET)
- Bisphosphonates
- Calcitonin
- Selective estrogen receptor modulators (SERMs)
- Denosumab
- Strontium
- Teriparatide

REFERRAL CRITERIA

Refer all cases to a physician or orthopaedic specialist.

248. Sickle-cell Vaso-occlusive Crisis

This is a painful complication of sickle-cell disease, induced by obstruction of small blood vessels by crystallized sickle cells leading to ischaemic injury to several organs, including bone. The bone pain is usually difficult to distinguish from acute osteomyelitis.

CAUSES

- Pyogenic infection
- Malaria
- Dehydration
- Severe anaemia
- Stress and anxiety

SYMPTOMS

- Bone pain
- Fever
- Sickle-cell anaemia

SIGNS

- Bone tenderness
- Fever

INVESTIGATIONS

- FBC, ESR
- CRP
- Sickling and Hb Electrophoresis (if not previously known)
- Blood film or Rapid Diagnostic Test (RDT) for malaria parasites
- Urinalysis and culture
- BUE and Creatinine
- Blood culture and sensitivity

TREATMENT**Treatment objectives**

(See section on 'Sickle Cell Disease')

Non-pharmacological treatment

Encourage adequate fluid intake

(See section on 'Sickle Cell Disease')

Pharmacological treatment**A. Treatment of underlying Malaria**

(See section on 'Malaria')

B. For treatment of other infections

(See appropriate section)

C. For rehydration

(See section for pharmacological treatment in 'Sickle Cell Disease')

D. For analgesia

(See section for pharmacological treatment in 'Sickle Cell Disease')

REFERRAL CRITERIA

Refer all patients with complications to a paediatrician, physician specialist or haematologist.

249. Avascular Necrosis

This is bone death caused by reduced blood supply.

CAUSES

- Non-traumatic
 - Sickle-cell anaemia
 - Infection – septic arthritis
 - Slipped capital femoral epiphyses / slipped upper femoral epiphyses
 - HIV
 - Prolonged steroid use
 - Alcohol abuse
 - Vasculitis
 - Idiopathic

- Developmental dysplasia of hip
- Traumatic
 - Displaced femoral neck fractures
 - Dislocations of joints

SYMPTOMS

- Pain in the affected joint
- Limping

SIGNS

- Limping
- Tenderness on joint movement
- Deformity
- Leg length discrepancy

INVESTIGATIONS

- X-ray
- MRI

TREATMENT

Treatment objectives

- Treat underlying cause
- Prevent progression
- Encourage recovery
- Pain relief

Non-pharmacological treatment

- Physiotherapy
- Walking aid when lower limb is involved
- Surgery
 - Core decompression
 - Osteotomies

Pharmacological treatment

A. For pain relief

1st Line Treatment

Evidence Rating: [A]

- Naproxen EC, oral,
Adults

250-500mg 12 hourly as required

Children

Not indicated

Or

- Celecoxib, oral,
Adults

400 mg stat.

Then

200 mg 12-24 hourly as required

Children

- Not indicated
- Or**
- Diclofenac, oral,

<u>Adults</u>	50 mg 8 hourly or 100 mg 12 hourly
<u>Children</u>	> 12 years; 50 mg 12 hourly < 12 years; not recommended
 - Ibuprofen, oral,

<u>Adults</u>	200-800 mg 6-8 hourly as required (max. 2.4 g daily)
<u>Children</u>	10-15 mg/kg 6-8 hourly as required (max. 40 mg per kg daily)
- B. For prevention of bone collapse**
- Pamidronate, consult specialist
Alendronate, consult specialist

REFERRAL CRITERIA

Refer once the diagnosis is made to orthopaedic specialist.

250. Osteogenesis Imperfecta

This is also known as brittle bone disease. It is a genetic disorder characterised by low bone mass, skeletal fragility and recurrent fractures.

CAUSES

- Gene mutation leading to defective collagen formation

SYMPTOMS

- Incessant crying

SIGNS

- Bluish sclera
- Dentinogenesis imperfecta (blueish-grey or yellowish-brown colouration of teeth)
- Multiple fractures with callus formation
- Bone deformities

INVESTIGATIONS

- X-ray – Baby-gram (multiple fractures at different stages)

TREATMENT

Treatment objectives

- Make child comfortable
- Prevent recurrent fractures
- Prevent deformities

Non-pharmacological treatment

- Counsel parents
- Splints
- Baby handling techniques
- Surgical prevention and correction of deformities

Pharmacological treatment

A. For prevention of fractures

1st Line Treatment

Evidence Rating: [B]

- Alendronate, IV,
Children
Consult specialist

B. For pain relief

- Paracetamol, oral or rectal,
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

REFERRAL CRITERIA

- | Refer as soon as diagnosis is made to a paediatrician and orthopaedic specialist.

BURNS

251. Burns

A burn is basically destruction of the skin. In certain situations deeper tissues such as subcutaneous tissue, muscle and bone may be involved. The burn may be superficial or deep depending on the extent of the injury. This condition, which can have devastating effects on affected people, can be prevented most of the time. It affects young and fit people in most cases and they must be managed properly so that they can return to their normal life.

CAUSES

- Dry heat (fire)
- Wet heat (scalds) from hot liquids, steam, soups etc.
- Electrical (low or high voltage)
- Chemical (acids and alkalis)

SYMPTOMS

- Pain (very severe in superficial type and less in deeper burns)
- Swelling
- Difficulty in breathing
- Blisters

SIGNS

- Shock
- Inhalational injury (burnt nasal hairs, soot in the throat, hoarseness of the voice and black particles in sputum)
- Swelling
- Blister formation
- Charring of tissue (deep burns)
- ECG changes (electrical burns)

INVESTIGATIONS

- FBC and sickling
- BUE and Creatinine
- Wound swab
- Blood gases
- Chest X-ray

TREATMENT**Treatment objectives**

- Prevent further injury from burns
- Relieve pain
- Replace lost fluid
- Prevent infection of burn wound
- Aid healing of the burn wound
- Avoid complications

Non-pharmacological treatment

- Remove clothing from affected part
- Put affected part under running water if available till pain goes away or it is reduced
- If chemical is in powder form brush it off the affected part and put under running water
- Secure airway
- Leave intact blisters alone
- Do not apply any creams or ointment
- Affected limbs should be elevated
- Good nutrition
- Psychological therapy
- Physiotherapy
- Reassure patient

Pharmacological treatment

- A. For burns with Total Body Surface Area (TBSA) of less than 10% in children and 15% in adults

Note 23-6

- Update tetanus prophylaxis
- (See section on 'Tetanus prophylaxis')

- Liberal oral fluids
 - Dress burns with Silver Sulphadiazine
 - Oral Analgesia
 - 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
 - Naproxen EC, oral,
Adults
250-500 mg 12 hourly as required
Children
Not indicated
Or
 - Celecoxib, oral,
Adults
400 mg stat.
- Then**
- | 200 mg 12-24 hourly as required
Children
Not indicated
Or
- | ● Diclofenac, oral,
Adults
50 mg 8 hourly or 100 mg 12 hourly
Children
> 12 years; 50 mg 12 hourly
< 12 years; not recommended
Or
- Ibuprofen, oral,
Adults
200-800 mg 6-8 hourly as required (max. 2.4 g daily)
Children
10-15 mg/kg 6-8 hourly as required (max. 40 mg per kg daily)
- And**
- Flucloxacillin, oral,
Adults
500 mg 6 hourly for 2 weeks
Children
5-12 years; 250 mg 6 hourly for 2 weeks
1-5 years; 125 mg 6 hourly for 2 weeks
< 1 year; 62.5 mg 6 hourly for 2 weeks

- B. If the Patient has burns (TBSA) of more than 10% in children and 15% in adults**

Note 23-7

- Admit
- Update tetanus prophylaxis
- (See section on 'Tetanus prophylaxis')
- Resuscitate by calculating IV fluids requirement using Parkland's formula (4 x TBSA x Weight of Patient) given in the form of crystalloids
- In adults give half of calculated total fluid in first 8 hours from the time of injury and the other half in 16 hours as Ringers lactate
- In children add daily fluid requirement to the calculated fluid for resuscitation and administer as above as Ringers lactate and 4.3% dextrose in ½ saline
- Dress burns with silver sulphadiazine
- Opioid Analgesia

- Morphine, IV,
Adults
2.5-5 mg 4 hourly
Children
0.1 mg/kg (max. 5 mg) 4 hourly
Or
- Pethidine, IV,
Adults
25-50 mg 4 hourly. Lower dose in the elderly.
Children
1 mg/kg (max. 50 mg) 4 hourly

- **And**
- Cloxacillin, IV,
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

B. If the Patient has burns (TBSA) of more than 10% in children and 15% in adults – and allergic to penicillins

- Clindamycin, IV, (if patient is allergic to penicillin)
Adults
300-600 mg 6 hourly for 7 days
Children
3-6 mg/kg 6 hourly for 7 days
And
- Metronidazole, IV,
Adults
500 mg 8 hourly for 7 days

Children

7.5 mg/kg 8 hourly for 7 days

- C. If the Patient has burns (TBSA) of more than 20% in children and 30% in adults (considered as severe burns)**

Note 23-8

- Admit
- Update tetanus prophylaxis
- (See section on 'Tetanus prophylaxis')
- Resuscitate by calculating IV fluids requirement using Parkland's formula ($4 \times$ TBSA \times Weight of Patient) given in the form of crystalloids
- In adults give half of calculated total fluid in first 8 hours from the time of injury and the other half in 16 hours as Ringers lactate
- In children add daily fluid requirement to the calculated fluid for resuscitation and administer as above as Ringers lactate and 4.3% dextrose in 1/5 saline
- Dress burns with silver sulphadiazine

- Cefuroxime, IV,
Adults
750 mg-1.5 g 8 hourly for 7 days
- | Children
25 mg/kg 8 hourly for 7 days
And
- Metronidazole, IV,
Adults
500 mg 8 hourly for 7 days
Children
7.5 mg/kg 6 hourly for 7 days

And

- Omeprazole, IV,
Adults
40 mg 12 hourly
Or
- Esomeprazole, IV,
Adults
40 mg daily

- For DVT prophylaxis**
- Enoxaparin, SC,
Adults
40 mg daily
Children
2 months-18 years; 1 mg/kg 12 hourly
1-2 months; 1.5 mg/kg 12 hourly
Neonates; 1.5-2 mg/kg 12 hourly

Or

- Dalteparin, SC,
Adults
5000 units daily
Children
12-18 years; 2500-5000 units daily
1 month-12 years; 100 units/kg 12 hourly
Neonates; 100 units/kg 12 hourly

D. If a burn is clinically infected**Note 23-9**

- Admit
- Update tetanus prophylaxis
- (See section on 'Tetanus prophylaxis')
- Take wound swabs and blood for culture and sensitivity testing
- Give IV Fluids
- Give IV Analgesics
- Start IV Antibiotics

1st Line Treatment

- 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

Or

- Ceftazidime, IV,
Adults
1-2 g 8 hourly
Children
1 month-18 years; 25 mg/kg 8 hourly
Neonates
21-28 days; 25 mg/kg 8 hourly
7-21 days; 25 mg/kg 12 hourly
< 7 days; 25 mg/kg daily

And

- Metronidazole, IV, (doses as indicated in section B. above)
And
- Cloxacillin, IV, (doses as indicated in section B. above)

2nd Line Treatment

- Meropenem, IV,
Adults
0.5-1 g 8 hourly
Children
12-18 years; 0.5-1 g 8 hourly

1 month-12 years (> 50 kg); 0.5-1 g 8 hourly

1 month-12 years (< 50 kg); 10-20 mg/kg 8 hourly

Neonate

> 7 days; 20 mg/kg 8 hourly

< 7 days; 20 mg/kg 12 hourly

Or

- Amikacin, slow IV over 3-5 minutes, (monitor serum Amikacin levels)

Adults

7.5 mg/kg 12 hourly (max. 1.5 g daily and 15 g per course)

Children

- 12-18 years; 7.5 mg/kg every 12 hours (max. 500 mg 8 hourly, and 15 g per course)

REFERRAL CRITERIA

Refer all cases of burns with the following characteristics to a specialist.

Partial-thickness burns more than 10% of TBSA

Deep burns of any percentage.

Burns involving face, hands, feet, genitalia, perineum, or major joints

Chemical burns

Electrical burns

- I Any burn with concomitant trauma in which burn poses greatest risk to patient

WOUNDS
Inhalation injury

Infected burns

Burns with pre-existing diabetes, renal failure etc.

252. Wounds

A wound is a break in the continuity of tissues in the body. It may involve overlying epithelium like skin. Wounds are usually caused by injury. Tissues affected include subcutaneous tissue, muscles and even bones. It may be small or large and may be deep or superficial. It may bleed, may be contaminated with dirt and other foreign matter and become infected.

CAUSES

- Mechanical agents e.g. cut from cutlass or knife, gunshot, accidents, contusion from blunt injury. Wounds may follow snake or insect bites, animal or human bites
- Chemical agents e.g. strong acids or alkalis, other corrosive chemicals
- Thermal injury resulting in burns

SYMPTOMS

- Local pain
- Bleeding
- Discharge of pus if infected

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

- Haemoglobin level if patient has bled
- Group and cross-match blood if indicated
- X-ray of injured part may be required to rule out osteomyelitis and bone fractures
- 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.
- If a bleeding vessel can be identified, it should be ligated. (the use of tourniquet to stop bleeding is discouraged)
- Bleeding from a tooth socket - put a small piece of sterile gauze in the socket and ask the patient to bite on it.

Box 23-1: 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 6 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

Pharmacological treatment

1st Line Treatment

Evidence Rating: [C]

- Tetanus prophylaxis for all potentially contaminated wounds, followed by booster doses of tetanus toxoid as appropriate (See section on 'Immunisation')

And

- Paracetamol, oral,

Adults

500 mg-1 g 6-8 hourly

Children

6-12 years; 250-500mg 6-8 hourly

1-5 years; 120-250 mg 6-8 hourly

3 month-1 year; 60-120 mg 6-8 hourly

And

- IV fluids and blood transfusion as required.

And

- 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

|

REFERRAL CRITERIA

Complicated wounds (e.g. wounds associated with fractures, division of tendons, blood vessels and nerves).

BITES AND STINGS

253. 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

- Full blood count
- Renal function test
- 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)
- 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

1st Line Treatment

Evidence Rating: [B]

A. Indication for anti-venom treatment

| Presence of symptoms and signs of local and systemic effects of envenomation.

- Anti-snake serum (ASS) - polyvalent
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

Note 23-10

Never inject anti-venom into toe/finger

Monitor patient and correct:

- Hypovolaemic shock - crystalloids/colloids/blood
- Defects of haemostasis - clotting factors/fresh frozen Plasma/platelets
- Respiratory distress - oxygen /intubate/ventilate
- Anti-tetanus therapy,
- Tetanol, IM, 0.5 ml stat.

And

- Diazepam, oral, 5-10 mg stat.

B. For 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 stat.

Children

> 2 years; 200 micrograms/kg

< 2 years; 100-200 micrograms/kg

C. Prevention of secondary infection

- Amoxicillin (Amoxycillin), oral,

Adults

500mg 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 N

Note 23-11

Corticosteroids are of little or no value during poisoning except in treating anaphylactic crisis. Avoid venopuncture in sites of generalized bleeding.

REFERRAL CRITERIA

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 anti-venom (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 at the site of bite

- Localized swelling
- Vomiting
- Abdominal pain

SIGNS

- Excessive salivation
- Sweating
- Rapid respiration
- Single-puncture wound

TREATMENT

Treatment objectives

- To relieve pain
- To maintain hydration
- To reassure patient

Non-pharmacological treatment

- Detain for observation.
- Put ice compresses on the area.
- Give the patient plenty of fluids to drink

Pharmacological treatment

1st Line Treatment

Evidence Rating: [C]

- Paracetamol, Aspirin, Ibuprofen or Diclofenac, oral,
And
- 1% Lidocaine (Lignocaine), 2-5 ml for local infiltration to relieve pain

BEE AND WASP STINGS

Majority of bee and wasp stings only produce localized pain. 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.

SYMPOTMS

- Localized pain at the site of sting

SIGNS

- Swelling at site
- Urticaria
- Hypotension
- Difficulty in breathing
- Bronchospasm

TREATMENT

Treatment objectives

- To relieve pain
- To manage anaphylaxis if necessary

Non-pharmacological treatment

- Detain for observation
- Put ice compresses on the area
- 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**1st Line 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

For shock

- IV fluids

For pain

- 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

REFERRAL CRITERIA

Refer all 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

Pharmacological treatment

1st Line 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

And

- 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

And

- Paracetamol, oral,
Adults

500mg-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

Note 23-12

As a general rule, do not suture wounds from human bite.

REFERRAL CRITERIA

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.

SYMPOTMS

- 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
- To treat any secondary infection

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

1st Line 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

And

- 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 immunised) tetanus immunisation (See section on 'Tetanus Immunisation')

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 Immunisation 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
	unconfirmed sign in animal	initiate vaccination stop if animal is normal on day 5	give according to guidelines
Strong suspicion of rabies	Rabies confirmed	continue vaccination regime	give according to guidelines
Rabies		immediate vaccination	give according to guidelines

Rabies Immunisation post exposure

Patients 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 (10 IU/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

Note 23-13

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 anti-rabies 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, IM, 1 ml on each of days 0, 7 and 28 Booster doses should be given every 2-3 years

REFERRAL CRITERIA

Refer to a tertiary centre when symptoms of rabies set in.

I
SHOCK
I**254. Shock**

Shock is a clinical state of cellular dysfunction as a result of decreased circulating blood volume 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. haemorrhage, vomiting, diarrhoea, acute intestinal obstruction
- Cardiogenic e.g. myocardial infarction, Massive pulmonary embolus
- Obstructive e.g. Pericardial tamponade, tension pneumothorax
- Severe sepsis

SYMPOTMS

- Thirst
- Feeling faint
- Palpitations
- Sweating
- Restlessness

- Clouding of consciousness, confusion

SIGNS

- Altered sensorium
- Pallor
- Cold extremities
- Collapsed peripheral veins
- Tachycardia, pulse > 90 bpm
- Hypotension, Systolic BP < 90 mmHg

INVESTIGATIONS

- Septic screen if sepsis is suspected
- CXR, ECG and Echocardiogram if cardiogenic shock suspected
- Supportive tests like FBC, BUE, Creatinine and LFT is done to detect any derangement and correct them

TREATMENT

Treatment objectives

- To reverse shock
- To secure airway, breathing and circulation
- To prevent complications and multiple organ failure
- To prevent death

| Non-pharmacological treatment

- Raise foot end of bed

| Pharmacological treatment

| Evidence Rating: [C]

A. Hypovolaemic shock

Insert the largest bore cannula (size 14 or 16) 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
- In haemorrhagic states cross-matched blood is preferred but in the meantime resuscitate with crystalloids e.g. normal saline.
- Ringers lactate, IV,

Adults

70 ml/kg body weight

Children

(See section on 'Management of severe dehydration')

- Normal saline should be given quickly and slowed only when BP rises and urine flow is adequate.
Adults and older children
0.5-1 ml/kg per hour of urine
Smaller children
1 ml/kg per hour of urine
- Catheterise the bladder to monitor the urine output.
- 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 - Immune depression

REFERRAL CRITERIA

Refer all patients to the appropriate physician specialist.

255. 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 allergen. Persons who are aware of the risk of anaphylaxis are to be informed of avoidance measures, and may be taught the use of an epinephrine (adrenaline) pen.

CAUSES

- Bee or other insect stings
- Drugs e.g. penicillins, sulphonamides
- Vaccines
- Antisera e.g. snake serum, anti-tetanus serum
- Intravenous contrast media
- Foods like seafood, groundnuts, fruit etc.

SYMPTOMS

- Severe itching
- Urticular rash
- Facial and peri-oral swelling
- Difficulty in breathing
- Wheeze
- Collapse
- Syncope

SIGNS

- Angio-oedema
- Difficulty in breathing
- Bronchospasm with wheeze
- Tachycardia
- Hypotension
- Cold clammy extremities
- Facial oedema
- Urticaria
- Cyanosis

INVESTIGATIONS

- FBC (eosinophilia)
- Skin prick test for specific allergens
- Serum specific IgE

TREATMENT**Treatment objectives**

- Secure airways, breathing and circulation
- Reverse symptoms
- Remove the offending cause if possible
- Rapidly intervene and correct abnormal vital signs

Non-pharmacological treatment

- Avoid the allergen
- Resuscitation

Pharmacological treatment**A. Acute Anaphylactic Reaction**

1st Line Treatment

Evidence Rating: [B]

- Oxygen

By nasal prongs	2-6 L/min
Or	
Face mask	4-8 L/min
Or	
Non-rebreather mask,	10-15 L/min

And

- Adrenaline (Epinephrine), IM,
Adults
 0.3-0.5 ml of 1:1000 solution (i.e. 300-500 micrograms) repeated if necessary every 10 minutes and while monitoring blood pressure and pulse
Children
 0.3 ml of 1:1000 solution (i.e. 300 micrograms)
 Repeat as for adults.

And

- Hydrocortisone, IV,
Adults
 100-200 mg 6-8 hourly, to control any late allergic reaction that may occur
Children
 All ages; 2 mg/kg 6 hourly for 4 doses, not to exceed 250 mg/day

Then

- Prednisolone, oral,
Adults

40 mg daily for 14 days and taper off

Children

2 mg/kg daily for 14 days and taper off

And

- Promethazine hydrochloride, IM,

Adults

25 mg repeat after 2 hours if necessary,

Then 12 hourly for 24 hours

Children

2 years-12 years; 6.25-12.5 mg 8-12 hourly for 24 hours

< 2 years; not recommended

Or

- Chlorpheniramine, IM,

Adults

5-10 mg 6 hourly (max. of 40 mg daily)

Children

6-12 years; 5mg up to a max. of 4 doses in 24 hours

6 months-6 years; 2.5 mg,

< 6 month; 250 microgram/kg (max. 1.5 mg)

B. Acute Anaphylactic Reaction with severe airway obstruction

And

- Salbutamol, nebulised,

Adults

5 mg 4-6 hourly until resolved

Children

2.5 mg 4-6 hourly until resolved

Or

- Aminophylline, IV,

Adults

250 mg over 20 minutes, then continuous infusion by perfusor at 0.5 mg/kg/hour for 24 hours if necessary

Children

3-5 mg/kg over 20 minutes as a slow bolus injection or by infusion in 500 ml Sodium Chloride 0.9%, IV, 4-6 hourly for 24 hours

C. Acute Anaphylactic Reaction with severe hypotension

And

- Normal saline, 0.9%, IV, 1 L- 4 L, rate determined by clinical assessment

REFERRAL CRITERIA

Refer to district or regional hospital if symptoms of anaphylaxis persist after stabilizing the patient and giving initial treatment.

Chapter

25

ANTIBIOTIC PROPHYLAXIS IN SURGERY

256. Antibiotic Prophylaxis in Surgery

Antibiotic prophylaxis refers to the administration of antibiotics in patients to reduce the risk of perioperative sepsis. The main cause of morbidity and mortality in surgery is infectious complications.

Antibiotic prophylaxis is indicated in cases where sepsis is expected and could have disastrous local or generalised effects.

For prophylaxis to be effective, antibiotics must be given before contamination takes place or at the earliest possible time before infection is established. For surgery, therefore, it must be given IV about the time of induction of anaesthesia, so that tissues are saturated with the antibiotic before contamination occurs.

CAUSES

- *Staphylococcus aureus*
- *Streptococcus* spp.
- Enterobacteriaceae (GI)
- Anaerobes (GI)
- Coagulase negative staphylococci (especially cardiac surgery, and implantation surgery), etc.

OBJECTIVES

- Prevent infections
- Prevent complications

INDICATIONS

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

- Implant surgery where prosthesis and device implants are used
- Cardiovascular surgery
- Caesarean section

Possible Indications

- Thoracic surgery
- Neurosurgery
- Surgery on the genito-urinary tract
- Trauma surgery

CHOICE OF ANTIBIOTICS

The antibiotic chosen must:

- Have antibacterial activity against the anticipated pathogens
- Not easily induce antimicrobial resistance
- Have a high concentration at the site of infection
- Be safely metabolised and excreted
- Have few toxic or adverse reactions
- Be affordable

Table 25-1: Choice of Antibiotics for prophylaxis

SURGICAL PROCEDURE	REGIMEN
Appendectomy/ Uncomplicated appendicitis	<p>Ampicillin, IV, <u>Adults</u> 1g <u>Children</u> 6-12 years; 500 mg < 5 years; 250 mg</p> <p>And 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</p>
Resection of the colon or rectum or obstructed bowel	<p>Gentamicin[§], IV, 5 mg/kg And Metronidazole[§], IV, <u>Adults</u> 500 mg <u>Children</u> 7.5 mg/kg Or</p>

CHAPTER 25: ANTIBIOTIC PROPHYLAXIS IN SURGERY

SURGICAL PROCEDURE	REGIMEN
	<p>Metronidazole, IV, (doses same as above)</p> <p>And</p> <p>Cefuroxime^s, IV,</p> <p><u>Adults</u></p> <p>1.5 g</p> <p><u>Children</u></p> <p>60 mg/kg as a single dose.</p> <p>Or</p> <p>Ciprofloxacin, IV, (to be administered over 60 minutes)</p> <p><u>Adults</u></p> <p>400 mg 8-12 hourly</p> <p><u>Children</u></p> <p>10 mg/kg 12 hourly (max. 400 mg)</p> <p>And</p> <p>Metronidazole, IV,</p> <p><u>Adults</u></p> <p>500 mg stat.</p> <p><u>Children</u></p> <p>7.5 mg/kg stat.</p>
Biliary tract surgery	<p>Single dose of Gentamicin, IV, (same as above)</p> <p>And</p> <p>Cefuroxime, IV, (same as above)</p>
Hysterectomy	<p>Single dose of Metronidazole, IV,</p> <p>500 mg</p>
Dental procedures for patients with heart valve prostheses, rheumatic heart disease, septal defect and patent ductus arteriosus	<p>Under Local Anaesthesia:</p> <p>Amoxicillin(Amoxyccillin), oral,</p> <p><u>Adults</u></p> <p>3 g one hour before procedure</p> <p><u>Children</u></p> <p>6-12 years; 1.5 g</p> <p>5 years; 750 mg</p> <p>Patients with Penicillin allergy or who have received more than one dose Penicillin in the previous month;</p> <p>Clindamycin, oral,</p> <p><u>Adults</u></p> <p>600 mg</p> <p><u>Children</u></p> <p>5-10 years; 300 mg</p> <p>< 5 years; 150 mg</p> <p>Patients who have had previous Endocarditis</p> <p><u>Adults</u></p> <p>Ampicillin, IV, 1g</p> <p>And</p> <p>Gentamicin, IV,</p> <p>120 mg at induction</p> <p>Then</p> <p>Amoxicillin, oral,</p> <p>500 mg 6 hours later.</p>

SURGICAL PROCEDURE	REGIMEN
	<p><u>Children</u> Ampicillin, IV, 6-12 years; 500 mg < 5 years; 250 mg <u>And</u> Gentamicin, IV, 2 mg/kg Then (6 hours later) Amoxicillin, oral, 6-12 years; 250 mg < 5 years; 125 mg</p> <p>Under General Anaesthesia: Amoxicillin + Clavulanic Acid, IV,</p> <p><u>Adults</u> 1.2 g at induction Then Amoxicillin, oral, 500 mg 6 hours later.</p> <p><u>Children</u> 5-10 years; $\frac{1}{2}$ of adult dose < 5 years; $\frac{1}{4}$ of adult dose If patient has a prosthetic valve or previously had endocarditis, Ampicillin, IV and Gentamicin, IV. Patients who are allergic to penicillin or who have had more than a single dose of Penicillin In previous month: Clindamycin, IV,</p> <p><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</p> <p><u>Children</u> 6 mg/kg stat. 3 mg/kg 6 hours later</p>

Chapter

MANAGEMENT OF ACUTE PAIN

26

257. Management of Acute Pain

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Many factors influence the feeling and emotion of pain and these factors vary from person to person. Pain is what the patient says it is.

Acute pain (as opposed to chronic pain) is defined as lasting for less than three months and is due to noxious stimuli from identifiable causes such as trauma, surgery, or acute illness.

Management of acute pain must be individualized to each patient and should include analgesia as well as treatment of the underlying condition. Special attention must be given, and precautions taken in providing pain relief in children, the elderly, pregnant women, as well as those with concurrent hepatic or renal disease, and those who are opiate tolerant or have a history of substance abuse.

CAUSES

- Traumatic musculoskeletal injury
- Surgery
- Burns
- Labour and delivery
- Headache
- Sickle-cell crisis
- Myocardial infarction
- Acute abdomen e.g. acute pancreatitis
- Joint inflammation
- Others

SYMPTOMS

- Depend on the underlying cause

SIGNS

- Depend on the underlying cause

INVESTIGATIONS

- Depend on the underlying cause

TREATMENT

Treatment objectives

- Resuscitate the patient if necessary
- Relieve pain
- Treat any underlying disorder

Non-pharmacological treatment

- Place affected part in most comfortable position where appropriate
- Elevation of affected part where indicated
- Splinting when indicated
- Cold or warm compresses where indicated
- Reassurance

Pharmacological treatment

- Paracetamol
- Non-Steroidal Anti-Inflammatory Drugs (NSAIDS)
- Opioids
- Nerve blocks with local anaesthetics
- Multimodal treatment

A. Paracetamol (Acetaminophen)

Adults

Oral:

0.5-1 g 6 hourly (max. 4 g/24 hours)

For adults body weight < 60 kg, dose is 15 mg/kg 6 hourly (max. 60 mg/kg/24 hours)

Rectal:

1 g 6 hourly (max. 4 g/24 hours)

For adults body weight < 60kg, dose is 15 mg/kg 6 hourly (max. 60 mg/kg/24 hours)

IV (Intravenous):

Should be given slowly over 15 minutes

1 g 6 hourly (max. 4 g/24 hours)

For adults body weight < 60 kg, dose is 15 mg/kg 6 hourly (max. 60 mg/kg/day)

Paediatric doses

Oral:

Children: 15 mg/kg 6 hourly (max. 60 mg/kg/24 hours)

Neonates: 10-15 mg/kg 8-12 hourly (max. 30 mg/kg/24 hours)

Rectal:

Same as oral dose above but a loading dose is given (First dose only)

Loading dose for children and Full term neonates is 30 mg/kg.

IV (Intravenous):

Should be given slowly over 15 minutes

Children body weight > 10 kg weight:

15 mg/kg 6 hourly (max. 60 mg/kg/24 hours)

Children body weight < 10 kg and above the age of 2 months:
7.5 mg/kg 6 hourly (max. 30 mg/kg/24 hours)

B. Non-Steroidal Anti-Inflammatory Drugs (NSAIDS)

Note 26-1

NSAIDs should be used with caution. Before starting any patient on NSAIDs, one must make sure the patient is not likely be affected by the adverse effects of the NSAIDs.

Some of the adverse effects of NSAIDS are:-

- Exacerbates peptic ulcer disease
- Causes platelet dysfunction
- Affects renal function – decreases renal blood flow
- Triggers bronchospasm in some asthmatic patients
- Causes fluid retention

Thus NSAIDS should **not** be given to several groups of patients, including the following:-

- Patients with peptic ulcer disease
- Patients with coagulation or bleeding problems
- Patients who are at risk of postoperative bleeding eg tonsillectomies
- Patients with impaired renal function or patients who are at risk of going into renal failure (eg septic patients)
- Patients with heart failure.
- Pregnant women, particularly in the third trimester, as it causes early closure of the patent ductus arteriosus
- Should be used with increased caution in elderly patients.

There have been concerns about the cardiovascular safety of the COX-2 selective inhibitor group of NSAIDS. The recommendations are that this group of drugs should not be given to patients with ischaemic heart disease or cerebrovascular disease.

Adult

- Diclofenac, oral, 25-50 mg 8 hourly or 75 mg 12 hourly

Or

Rectal, 50 mg 12 hourly or 100 mg 18 hourly

Or

IM, 25-50 mg 8 hourly or 75 mg 12 hourly (max. 150 mg/day)

- Ibuprofen, oral,

Adult

400 mg 6-8 hourly

Children

20-30 mg/kg daily in 3 divided doses (max. 1.2 g per day)

C. Opioids

These are used for severe pain.

- Tramadol

Adults

Oral, 50-100 mg 4-6 hourly (max. 400 mg daily)

- Pethidine, IM,
Adults
25-50 mg (approx. 1 mg/kg) 4 hourly. Lower dose in the elderly
Children
1 mg/kg (max. 50 mg) 4 hourly
- Pethidine, IV,
Adults
25 mg repeated if necessary with caution
- Morphine, IV,
Adult
1-2 mg boluses repeated if necessary with caution
- Morphine, IM,
Adults
5-10 mg 4 hourly
Children
0.1 mg/kg (max. 5 mg) 4 hourly

D. Nerve blocks with local anaesthetic agents

- Lidocaine
- Bupivacaine

E. Multimodal Treatment

Note 26-2

Different groups of drugs can be used together to treat pain. This increases the effectiveness of pain relief as there is a limit to the dosage of each drug that can be given. This limits its effectiveness when used alone.

- Paracetamol And Opioid
Or
- Paracetamol And NSAID
Or
- Paracetamol And NSAID And Opioid

REFERRAL CRITERIA

If underlying condition does not improve or pain relief is not achieved with recommended doses.

Chapter

COMMON MALIGNANCIES

27

258. Breast Cancer

Breast cancer is the commonest cancer affecting women. Early detection of this cancer is possible through monthly breast self-examination and is recommended for women of child-bearing age.

Periodic screening through clinical breast examination is required for women below 40 years (1 in every 3 years) and yearly for women above 40 years. Mammography is recommended every 2 years for women 40 years and above.

Five treatment modalities are available, but each patient's treatment is personalized and depends on the biological characteristics of the tumour, stage of disease and other patient factors. Two percent of breast cancers in Ghana occur in males.

Box 27-1: Risk factors

- Female sex
- Age
- Genetic disposition (Family history of breast cancer)
- Previous personal history of breast cancer
- Prolonged exposure to oestrogen
- Early menarche
- Late menopause
- Nulliparity
- Oestrogen therapy (contraceptives, HRT)
- High fat intake, Alcohol and tobacco

CAUSES

- Unknown

SYMPTOMS

- Lump in the breast
- Change in size or shape of breast
- Swelling in axilla
- Swelling of upper limb
- Peau d'orange
- Skin nodules
- Ulceration

- Nipple discharge
- Nipple retraction
- Eczema/ulceration of nipple or areola

SIGNS

- Breast lump
- Peau d'orange
- Skin tethering, nodules or ulceration
- Nipple retraction
- Bloody nipple discharge
- Palpable axillary nodes

Box 27-2: Symptoms and signs of metastatic disease

- Bone pain
- Pathological fractures
- Back pain
- Paraplegia
- Cough – from Lung metastases
- Breathlessness from pleural effusion
- Headache, vomiting altered consciousness, localizing signs – from Brain metastasis

INVESTIGATIONS

- Mammography
- Ultrasonography of the breast
- Fine needle aspiration for cytology
- Core biopsy

BREAST CANCER

TREATMENT

Treatment objectives

- Achieve a cure
- Prevent local and distant metastasis
- Prolong survival in metastatic disease
- Relieve pain and suffering

Non-pharmacological treatment

- Psychological support and counselling
- Palliative care
- Surgery
- Radiotherapy

Pharmacological treatment

- Chemotherapy
- Hormonal therapy
- Immunotherapy

REFERRAL CRITERIA

All cases of suspected breast cancer must be referred for specialist attention.

Chapter

GENERAL MANAGEMENT OF POISONING

28

259. General Management of Poisoning

Poisoning represents the harmful effects of toxic amounts of any substance on the body. In many cases, only mild symptoms and signs will develop. However, suspected poisoning should always be considered a medical emergency since the situation may rapidly evolve to become critical.

Many deaths due to poisoning can be prevented with early initiation of good supportive care and general treatment measures. Symptoms and signs of poisoning depend on the specific exposure, and may be local, systemic, or both. Effects may occur immediately, or several hours or days later.

The severity depends on many factors, including the **type** of substance, the **route** of exposure (ingestion, inhalation, injection, dermal application, etc.), the **dose** and **duration** of exposure, and **patient or environmental factors**.

Obtaining the original container or a sample of the substance is often most helpful, along with a thorough history and physical examination and laboratory analysis to look for characteristic features of poisoning with specific agents.

Judicious use of antidotes for poisoning with specific substances may be added to general treatment measures based on these findings.

A Poison Control Centre exists in Ghana to support health professionals in developing rational and timely strategies for diagnosis and treatment of poisoning.

CAUSES

- Household chemicals
- Pesticides
- Medications
- Toxic plants
- Venomous bites and stings
- Toxic alcohols
- Industrial chemicals

SYMPTOMS

- Nausea, vomiting
- Diarrhoea
- Abdominal pain
- Difficulty in breathing
- Palpitations
- Skin rash
- Headache
- Confusion
- Lethargy, weakness

SIGNS

- Abnormal vital signs (pulse, temperature, respiratory rate)
- Small pupils (miosis)
- Large pupils (mydriasis)
- Excessive sweating
- Hypersalivation
- Frequent urination
- Diarrhoea
- Wheezing
- Flushed dry skin
- Dehydration
- Shock
- Low urine output (oliguria, anuria) or retention
- Abdominal tenderness
- Jaundice
- Altered mentation
- Tremors
- Seizure
- Coma

INVESTIGATIONS

- Blood glucose (random)
- FBC
- BUE and Creatinine
- Urinalysis
- ECG
- Liver function tests
- Clotting time
- Coagulation profile

Note 28-1

Investigations should be individualised to the exposure. The Poisons Control Centre and/or clinical pharmacologist may advise in specific cases.

TREATMENT

Treatment objectives

- Provide resuscitation
- Provide good supportive care
- Prevent or limit absorption
- Enhance elimination
- Prevent or manage organ damage
- Prevent recurrence

Non-pharmacological treatment

- Airway protection
- Decontamination
- Detain patient for close monitoring
- Resuscitation when necessary
- Gastric lavage if indicated
- Education and counselling

Pharmacological treatment

A. Gastrointestinal decontamination, acute poison ingestion or oral overdose

1st Line Treatment

Evidence Rating: [C]

- Activated charcoal powder, oral,
Adults and Children

50 g initially (1 g/kg, max. 100 g) given as 50 g/500 ml slurry in water

Then

20-50 g every 2-6 hours as required

Note 28-2

Precautions:

routine use not recommended, most effective within 2-4 hours of ingestion;

Contraindications:

- Any aspiration risk (e.g. kerosene, coma)
- Patients at risk of gastrointestinal haemorrhage, perforation or obstruction (e.g. ingestion of caustics)

(See table below on antidotes for specific poisons)

Table 28-1: Presentation of common Poisons and their Antidotes

Class	Toxic syndrome	Antidote(s)	Evidence Rating
Opioids	Small pupils, lethargy/coma, reduced bowel sounds, respiratory depression	Naloxone for respiratory depression	A
Benzodiazepines	Lethargy/coma, respiratory depression	Flumazenil for respiratory depression	C

Class	Toxic syndrome	Antidote(s)	Evidence Rating
Organophosphate/ Carbamate Pesticides (Cholinergic agents)	Excessive salivation, tears, nausea, vomiting, diarrhoea, urination, bradycardia, wheezing, agitation or coma, seizure, hypotension, muscle weakness +/- fasciculation	Atropine for bradycardia, excessive salivation, or wheezing Diazepam for agitation, seizure	A A
Organochlorine/ Chlorinated Hydrocarbon Pesticides (e.g. DDT, lindane, heptachlor, endosulfan, etc)	Usually abrupt onset: nausea, vomiting, diarrhoea, dizziness, headache, paresthesia, agitation, hallucination, seizure, coma, tremor, cough, hypotension, cardiac dysrhythmia, rash, renal +/- hepatic failure	Diazepam for agitation, seizure Cholestyramine N-acetylcysteine if hepatomegaly Avoid startling the patient or giving adrenaline, salbutamol, other stimulant medications	A C C
Pyrethrin and Pyrethroid Insecticides	Burning or tingling in the mouth, paresthesias, tremors, seizure, coma, gastrointestinal upset, tachycardia, hypotension, diaphoresis, excess salivation, hyper-reflexia	Diazepam for agitation, seizure Symptomatic care	A
Warfarin-based Anticoagulants (e.g. many rat poisons)	Bruising, bleeding from gums, any other bleeding, headache, flanks or abdominal pain, pallor, shock, blue-green vomitus	Phytomenadione if elevated INR Fresh Frozen Plasma +/- whole blood transfusion if severe bleeding	B
Bleach, soaps, detergents, and corrosives (acids & alkalis)	Nausea, vomiting, oral ulcers, mouth/throat/ abdominal pain, gastrointestinal bleeding, shock, breathlessness, tachycardia	Keep NPO until pain relieved Proton pump inhibitor +/- H2-blocker (e.g. Ranitidine) Anti-emetic for nausea, vomiting Avoid: forced emesis, activated charcoal, gastric lavage	C

CHAPTER 28: GENERAL MANAGEMENT OF POISONING

Class	Toxic syndrome	Antidote(s)	Evidence Rating
Paracetamol	Nausea, vomiting, abdominal pain +/- tenderness, hepatic failure, coagulopathy, shock May be asymptomatic	N-acetylcysteine Anti-emetics Proton pump inhibitors	B B
Iron	Nausea, vomiting, diarrhoea, abdominal pain +/- tenderness, bloody emesis or stools, shock, hepatic failure	Desferrioxamine Anti-emetics Proton pump inhibitors	A
Paraquat (herbicide)	Mouth and/or throat pain +/- ulcers, breathlessness, hypoxia, wheezing, abdominal pain, renal failure, hepatic failure	No antidotes; give symptomatic and supportive care Dialysis may be indicated Avoid: supplemental oxygen unless patient is hypoxic or in moderate/severe respiratory distress	
Toxic alcohols (methanol, ethylene glycol)	Lethargy, coma, shock, impaired vision (methanol), renal failure (ethylene glycol)	Ethanol or Fomepizole Dialysis may be indicated	B
Cyanide	Headache, confusion, nausea, vomiting, breathlessness, seizure, coma, shock	Hydroxocobalamin or Sodium Thiosulfate	B

REFERRAL CRITERIA

Refer patients for specialist management if they do not improve with general supportive care or if they require specific antidotes.

260. Medicines Use in the Elderly

Prescribing for older patients presents unique challenges. Many medications need to be used with special caution because of age-related changes in the absorption, distribution, metabolism, and excretion of the drug as well as the physiologic effects of the drug. In particular, physiologic changes in body composition, renal and hepatic functions play vital roles in determining changes in drug levels and the risk of adverse drug events in the elderly.

There is also the issue of multi-morbidity in the elderly, which leads to the prescribing of multiple medications. The more medications prescribed for an elderly person, the higher the risk of adverse effects and other drug interactions.

The 'Beers criteria' (The American Geriatrics Society 2012 Beers Criteria Update Expert Panel) gives a list of medications considered inappropriate for older patients; either because of ineffectiveness or high risk for adverse events.

CAUSES OF ADVERSE DRUG EVENTS

- Polypharmacy
- Use of inappropriate medications
- Underutilization of appropriate medication
- Transitions in care settings

MANAGEMENT

Treatment objectives

- Prevent Adverse Drug Events (ADE)

Preventive measures

- Education on drug use for the elderly and their families or caregivers
- Proper drug history taking by the healthcare provider
- Quality measures of drug prescribing
 - Avoidance of inappropriate medications
 - Appropriate use of indicated medications
 - Monitoring for side effects and drug levels

CHAPTER 29: MEDICINES USE IN THE ELDERLY

- Avoidance of drug-drug and drug-food interactions
- Involvement of the patient/family and integration of patient values
- Maintenance of an accurate list of all medications that a patient is currently using
- Periodic ‘polythene bag check-ups’; i.e. instruct patients to bring all pill bottles and containers on each medical visit (including empty packets and containers); these should be checked against the medication list
- Patients should be made aware of potential drug confusions i.e. sound-alike names, look-alike pills, and combination medications
- Inform patients of both generic and brand names, including spelling, as well as the reasons for taking their medications
- Medicine organisers prepared by the pharmacist, can also be helpful in ensuring that patients take their medications correctly

Box 29-1: Medication Question Checklist

1. Is there a clear indication for this medication?
2. Is it working?
3. Are there side effects?
4. Is the patient taking the medication routinely?
5. Does the medication need lab monitoring?
6. Is it still needed?

Box 29-2: Principles of Rational Drug Prescribing for Elderly Patients

1. Periodically update and review the medication list
2. Work with the community pharmacist
3. Educate the patient about the medication
4. Consider an adverse drug event (ADE) as a cause of any new patient symptom
5. Simplify the medication regimen
6. Start one medication at a time, at lowest possible dose

Chapter

LOCAL ANAESTHETIC AGENTS

30

261. Local Anaesthetic Agents

Local anaesthetic (LA) agents are drugs that reversibly block nerve transmission. They are used to provide anaesthesia to specific areas of the body and can also be used for analgesia.

Local anaesthetics also affect transmission in motor nerves; hence, motor weakness may occur following a local anaesthetic, depending on the site of application.

Adrenaline is added to local anaesthetics to delay absorption and thus prolong their action. The usual concentration of adrenaline added to a local anaesthetic is 1:200,000.

Local anaesthetics with adrenaline should never be used where the blood supply is by end arteries e.g. should not be used for digital nerve blocks. They are also contraindicated in intravenous regional anaesthesia (IVRA).

Commonly used LAs in our sub-region are lignocaine and bupivacaine.

A. Lidocaine (Lignocaine)

- Advantage - rapid onset of action
- Duration - about 1 hour
- Maximum dose of plain lidocaine - 3 mg/kg (approx. 200 mg in adult)
- Maximum dose of lidocaine with adrenaline - 7 mg/kg
- Lidocaine is not recommended for spinal anaesthesia

B. Bupivacaine

- Advantage - long acting
- Disadvantages - cardiotoxic, slow onset of action
- Maximum dose is 2 mg/kg (for both plain and with adrenaline added)

Note 30-1

Bupivacaine should be used with caution. Apart from general resuscitative measures, intralipid 20% is effective for the treatment of cardiotoxicity.

C. Ropivacaine

- Advantage - long acting, less cardiotoxic
- Maximum dose is 3 mg/kg

Uses of local anaesthetic agents

- Topical
- Local infiltration
- Nerve blocks
- Intravenous regional anaesthesia
- Spinal anaesthesia (subarachnoid block)
- Epidural anaesthesia/analgesia
- Nebulisation for anaesthetizing upper airway
- Intravenous preparation of lignocaine used as an antiarrhythmic

Prevention of local anaesthetic toxicity

- Always aspirate before injecting, to prevent inadvertent intravascular injection
- Do not inject large volumes at a time
- Caution when injecting into areas of high vascularity

Symptoms and signs of local anaesthesia toxicity

- Peri-oral tingling, tinnitus, light headedness
- Visual disturbances, slurred speech
- Altered consciousness, seizures, loss of consciousness, respiratory arrest
- Hypotension, cardiac arrhythmias, cardiac arrest

Treatment of local anaesthetic toxicity

- Stop injection of LA
- Start ABC (Airway, Breathing, Circulation) of resuscitation
- Give 100% oxygen. If necessary intubate patient
- Give Midazolam (3-5 mg) or diazepam (5-10 mg) to treat seizures. If seizures persist, an anaesthetist can give thiopentone 1-2 mg/kg or more midazolam and paralyse, intubate and ventilate patient
- Treat cardiovascular instability with IV fluids, inotropes, and when bupivacaine or ropivacaine has been used, give Intralipid 20% using regime below
- If cardiac arrest occurs, start CPR and call for help

Use of 20% intralipid in treatment of local anaesthetic toxicity (following bupivacaine or ropivacaine)

In addition to other resuscitative measures outlined above:

- Give an intravenous bolus of Intralipid 20%, 1.5 ml/kg fast (approx. 100 ml for a 70kg patient)
- Start an infusion of 20% Intralipid at 0.25 ml/kg/min (approx. 400 ml over 20 mins for a 70 kg patient)
- Repeat initial bolus twice at 5 minute intervals, if adequate circulation has not been restored
- Maximum dose of 12 ml/kg of Intralipid 20% should not be exceeded

STRUCTURED APPROACH TO THE SERIOUSLY ILL CHILD

262. Structured Approach to the Seriously Ill Child

A seriously ill child is one whose vitals are compromised. A structured approach in determining the cause and subsequent successful management of the child is necessary. Rapid assessment and urgent intervention are the major requirements in the approach.

Triaging soon after their arrival in hospital for emergency signs like severe respiratory distress or coma and priority signs like high temperature, restlessness or severe pain is important.

Presentations of serious illness may be classified under the following problem areas; airway/breathing, cardiac, shock and neurological disability.

The structured approach includes:

- Primary assessment
- Resuscitation
- Secondary assessment
- Emergency treatment
- Definitive care

AIRWAY/BREATHING PROBLEMS

CAUSES

- Severe Pneumonia
- Bronchiolitis
- Upper airway obstruction or stridor
- Others

SIGNS AND SYMPTOMS

- Depends on condition

APPROACH

- Primary assessment
 - Can child speak? Indicates airway patency
 - Can infant cry? Indicates airway patency
- Adequacy of breathing assessed by recession, respiratory rate, grunting, inspiratory or expiratory noises, flaring of the alae nasi

CHAPTER 31: STRUCTURED APPROACH TO THE SERIOUSLY ILL CHILD

- Effectiveness of breathing is assessed by breath sounds, chest expansion and abdominal excursion
- Final effects of inadequate respiration are determined from the heart rate, skin colour and mental status
- Pulse oximetry desirable. A saturation of less than 90% while breathing air or less than 95% while breathing oxygen is very low
- High flow oxygen should be given to all children with respiratory difficulty or hypoxia. In a child with inadequate ventilation, bag valve mask oxygenation or intubation may be required

INVESTIGATIONS

- Chest X-ray
- Arterial blood gas
- Peak flow (if asthma a possibility)

MANAGEMENT

If a chin lift or jaw thrust can secure airway then do so, otherwise consider intubation

RESPIRATORY; if bubbly noises heard, airway full of secretions, suction required

Harsh stridor with barking cough and severe respiratory distress, more likely to be upper airway obstruction, nebulise with adrenaline (5ml of 1:1000 in oxygen)

If symptoms had a sudden onset and there is history of inhalation, consider laryngeal foreign body. Call an ENT surgeon immediately

Children with a history of asthma and respiratory distress require nebulized salbutamol 2.5 mg or 5 mg if 7 years plus and oxygen

CIRCULATION/CARDIOVASCULAR

When normal capillary refill time is more than 2 seconds, then there is no problem with cardiac output. Cardiac arrest predominantly occurs secondary to hypoxia or hypovolaemia. Primary myocardial disease is rare.

CAUSES

- Heart failure
- Arrhythmias (heart rhythm abnormalities)

APPROACH

- Primary assessment, with regard to circulation;
- Heart rate
- Pulse volume
- Capillary refill
- Blood pressure
- Look for tachycardia, bradycardia, abnormal pulse volume, hypotension or hypertension, hepatomegaly, murmurs and peripheral oedema
- Check the effects of circulatory inadequacy on other organs by

- checking the respiratory rate
- skin appearance and temperature
- mental status and urinary output

INVESTIGATIONS

- Urea electrolytes
- Chest X-ray
- ECG
- Full blood count
- Blood culture

MANAGEMENT

- Address airways and breathing before commencing external cardiac massage
- If cardiac output is not responding to CPR, reconsider the adequacy of airway and breathing support

SHOCK (INADEQUATE CIRCULATION)

CAUSES

- Severe gastroenteritis
- Diarrhoea
- Cardiac disease

MANAGEMENT

Resuscitation – every child in shock should have oxygen at a high flow rate. Venous or intraosseous access should be obtained and an infusion of normal saline at 20 ml/kg given

In drowsiness with sighing respirations check blood sugar and acid base balance. Treat diabetic ketoacidosis with IV normal saline and insulin

In an unconscious child with pinpoint pupils consider opiate poisoning. Try naloxone.

Gastrointestinal: Usually presents with shock from fluid loss.

I Symptoms include vomiting, abdominal pain or bloody stools; signs may include abdominal tenderness or a mass. Consider surgical intervention

Give boluses of fluid to shocked children if first one not effective.

Consider IV antibiotics in shocked children with no obvious fluid loss

NEUROLOGICAL DISABILITY

CAUSES

- Status epilepticus (continuous seizures without regaining consciousness)
- Meningitis
- Encephalitis
- Strokes in Sickle Cell Disease
- Cerebral malaria

SIGNS

- Altered conscious level
- Convulsions
- Altered pupil size and reactivity
- Abnormal posture
- Meningism
- Papilloedema
- Hypertension

INVESTIGATION

- Urea and electrolyte
- Blood sugar
- Blood culture

MANAGEMENT

- If low blood sugar, give 5 ml/kg of 10% dextrose by rapid infusion
- Prolonged fits – give rectal diazepam. If convulsions persist begin status epilepticus protocol using phenobarbitone, phenytoin and midazolam IV in that order.
- If evidence of raised intracranial pressure. Give Mannitol.
- In a child with depressed conscious level and convulsions consider meningitis. Give cefotaxime/Aciclovir.

SYSTEMIC CAUSES

CAUSES

- Poisoning (ingestion of kerosene, corrosives, pesticides, paracetamol)
- Hypoglycaemia (think of severe malaria)
- Diabetic ketoacidosis
- Angio-oedema

SYMPTOMS

- Rash, urticarial rash
- Fever
- Abdominal pain
- Vomiting
- Excessive thirst or excessive drinking

SIGNS

- Severe dehydration
- Deep and rapid respiration
- Smell of ketones in breath
- Pin-point pupils, large pupils
- Tachypnoea
- Sighing respirations
- Hypothermia
- Hyperthermia

TREATMENT**Treatment objectives**

- Depends on the cause

Note 31-1

If diagnostic clues point to poisoning then emergency treatment and emergency treatment of specific poisons becomes paramount. If history and signs point to diabetic ketoacidosis, then normal saline is the initial fluid to start together with insulin.

Non-pharmacological treatment

- Reassure or console the child
- Team work

Pharmacological treatment**A. Oxygen therapy**

1st Line Treatment

- Seriously ill children may need supplemental oxygen.

B. Convulsing child

Evidence Rating: [A]

- Lorazepam or diazepam, phenobarbitone, or phenytoin or midazolam in that order

C. Suspected meningitis

Evidence Rating: [A]

- Cefotaxime

D. Suspected Croup

Evidence Rating: [A]

- Nebulised adrenaline

And

- Dexamethasone

Or

- Prednisolone

E. Suspected Asthma

Evidence Rating: [A]

- Salbutamol
- Ipratropium bromide
- Hydrocortisone
- Prednisolone
- Aminophylline

REFERRAL CRITERIA

Refer the seriously ill child to the appropriate specialist.

**GHANA NATIONAL DRUGS PROGRAMME
MINISTRY OF HEALTH**

FEEDBACK ON STANDARD TREATMENT GUIDELINES (STG)

PERSONAL DETAILS			
1. Full Name			
2. Phone	1]		
	2]		
3. Email			
ORGANISATION DETAILS			
4. Organisation Name			
FEEDBACK			
5. Heading/STG Topic or Disease Condition			
6. Comments or Feedback			
7. Priority	High [<input type="checkbox"/>]	Moderate [<input type="checkbox"/>]	Low [<input type="checkbox"/>]
8. Date of submission	Day [<input type="checkbox"/>]	Month[<input type="checkbox"/>]	Year[<input type="checkbox"/>]
NOTES			
<p>The completed form can be sent to: The Programme Manager Ghana National Drugs Programme Ministry of Health P. O. Box MB 582 Accra, Ghana</p>			
<p>It can be also sent via email to: gndp@ghndp.org This form can also be filled online or uploaded at: www.ghndp.org/stgemail/feedback Note: You may choose to submit feedback either online or via mail.</p>			
Standard Treatment Guidelines Feedback form v1			

**GHANA NATIONAL DRUGS PROGRAMME
MINISTRY OF HEALTH**

FEEDBACK ON ESSENTIAL MEDICINES LIST (EML)

PERSONAL DETAILS

1. Full Name	
2. Phone	1]
	2]
3. Email	

ORGANISATION DETAILS

4. Organisation Name

FEEDBACK

5. Heading/Title/ Medicine	
6. Comments or Feedback	

7. Priority	High []	Moderate []	Low []
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8. Date of submission	Day []	Month[]	Year[]
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NOTES

The completed form can be sent to:
The Programme Manager
Ghana National Drugs Programme
Ministry of Health
P. O. Box MB 582
Accra, Ghana

It can be also sent via email to: gndp@ghndp.org

This form can also be filled online or uploaded at: www.ghndp.org/stgeml/feedback

Note: You may choose to submit feedback either online or via mail.

FORMS

REPORTING FORM FOR ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFI)
MOH-Ghana Health Service/Food & Drugs Authority

SMC/SMD/GEN- 10/1.0

Reporting: Sub-District:				District:				Region			
AEFI Reporting ID Number Region Code District Code Year Serial Number <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				Vaccination Card/Booklet <input type="checkbox"/> Yes <input type="checkbox"/> No If no, state other source of information:							
A. PATIENT DETAILS											
*Name : Sex: <input type="checkbox"/> M <input type="checkbox"/> F Mother's Name (if child): Contact Phone No: Vaccination centre: Community:				*Date of birth (DD/MM/YYYY): ____ / ____ / ____ OR Age at onset: <input type="checkbox"/> Years <input type="checkbox"/> Months <input type="checkbox"/> Days OR Age Group: <input type="checkbox"/> < 1 Year <input type="checkbox"/> 1 to 5 Years <input type="checkbox"/> > 5 Years *Address (landmarks and other contact information):							
*B. DESCRIPTION OF AEFI											
<input type="checkbox"/> Severe local reaction <input type="checkbox"/> >3 days <input type="checkbox"/> beyond nearest joint <input type="checkbox"/> Seizures <input type="checkbox"/> febrile <input type="checkbox"/> afebrile <input type="checkbox"/> Abscess <input type="checkbox"/> Sepsis <input type="checkbox"/> Encephalopathy <input type="checkbox"/> Toxic shock syndrome <input type="checkbox"/> Thrombocytopenia <input type="checkbox"/> Anaphylaxis <input type="checkbox"/> Fever≥38°C <input type="checkbox"/> Other (specify)				Date AEFI started (DD/MM/YYYY): ____ / ____ / ____ Time AEFI started <input type="checkbox"/> Hr <input type="checkbox"/> Min Signs and symptoms- please give a summary of the case, including any prior disease(s)/condition and patient's medicines before vaccination) Indicate treatment given for the AEFI:							
*C. OUTCOME OF AEFI											
*Serious: <input type="checkbox"/> Yes <input type="checkbox"/> No; → If Yes <input type="checkbox"/> Death <input type="checkbox"/> Life threatening <input type="checkbox"/> Disability <input type="checkbox"/> Hospitalization <input type="checkbox"/> Congenital anomaly <input type="checkbox"/> Other important medical event (Specify _____)											
*Outcome: <input type="checkbox"/> Recovering <input type="checkbox"/> Recovered <input type="checkbox"/> Recovered with sequelae <input type="checkbox"/> Not Recovered <input type="checkbox"/> Unknown <input type="checkbox"/> Died If died, date of death (DD/MM/YYYY): ____ / ____ / ____ Autopsy done: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown											
D. DETAILS OF ALL VACCINE(S) ADMINISTERED											
*Name <input type="text"/> <input type="text"/>	*Date and time of Vaccination <input type="text"/> Date <input type="text"/> Time		*Route (if injection indicate L/R site) <input type="text"/>	*Lot / Batch No. <input type="text"/>	Manufacturer <input type="text"/>	Expiry Date <input type="text"/>	Manufacturer <input type="text"/>	*Lot / Batch No. <input type="text"/>	Expiry Date <input type="text"/>	Date and time of reconstitution <input type="text"/> Date <input type="text"/> Time	
E. REPORTER DETAILS											
*Name: <input type="text"/> Name of Institution: <input type="text"/>				Profession/Designation: <input type="text"/> Today's Date: <input type="text"/> / <input type="text"/> /				Tel No.: <input type="text"/> Signature: <input type="text"/>			
For District Level Office											
Date Report Received: <input type="text"/> / <input type="text"/> / Investigation needed: <input type="checkbox"/> Yes <input type="checkbox"/> No				Checked by: <input type="text"/> If yes, date started: <input type="text"/> / <input type="text"/>				Designation: <input type="text"/>			
For National/Central Level Office											
Date Report Received: <input type="text"/> / <input type="text"/> / Comments (include results of Causality Assessment): <input type="text"/>								Checked by: <input type="text"/> Designation: <input type="text"/>			

All serious AEFIs & AEFI clusters (two or more cases of the same adverse event related in time, place or vaccine administered) should be investigated.

*Mandatory fields

ADVERSE REACTION REPORTING FORM

(Please complete all sections as much as possible)

(A) PATIENT DETAILS

Age/Date of Birth (dd/mm/yyyy): / / Wt (kg):
 Gender: M () F () If female, Pregnant Yes () No () Age of pregnancy.....
 Name/Folder Number Telephone No:.....
 Hospital/Treatment Centre.....

(B) DETAILS OF ADVERSE REACTION AND ANY TREATMENT GIVEN (Attach a separate sheet and all relevant laboratory tests/data when necessary)

Date reaction started (dd/mm/yyyy): / / Date reaction stopped (dd/mm/yyyy): / /

(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.....

SERIOUSNESS: Death () Life threatening () Disability () (specify)..... Hospitalization ()

Others (specify).....

(D) SUSPECTED PRODUCT(S) (Attach sample or product label if available)

Brand name	Generic name	Batch Number	Expiry date	Manufacturer
Reasons for use (Indication):		Dosage Regimen:	No. of days given:	Route of Administration:
Date started: (dd/mm/yyyy) / /		Date stopped: (dd/mm/yyyy) / /		
Did the adverse reaction subside when the drug was stopped (de-challenge)? Yes () No ()				

Was the product prescribed? Yes No Source of Drug:

Was product re-used after detection of adverse reaction (re-challenge)? Yes () No ()

Did adverse reaction re-appear upon re-use? Yes () No ()

(E) CONCOMITANT DRUGS: INCLUDING COMPLEMENTARY MEDICINES, CONSUMED AT THE SAME TIME AND/OR 3 MONTHS BEFORE

(Attach a separate sheet when necessary)

Name of Drug	Daily dose	Date started	Date stopped/ Ongoing	Reason(s) for use

(F) REPORTER DETAILS

Name of Reporter: Profession:

Institution's Address:

Signature: Tel: E-mail:

Date (dd/mm/yyyy) : / /

Confidentiality: Identities of the reporter and the patient will remain strictly confidential

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