STANDARD TREATMENT GUIDELINES

AND

ESSENTIAL MEDICINES LIST

FOR

SOUTH AFRICA

PRIMARY HEALTH CARE LEVEL

2008 EDITION

Copies may be obtained from:

The Directorate: Pharmaceutical Programmes and Planning
Private Bag X828
Pretoria
0001

OR

Department of Health Website: www.doh.gov.za

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

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FOREWORD

"In science the important thing is to modify and change one's ideas as science advances"

Herbert Spencer

It is our pleasure to introduce the fourth edition of the *Standard Treatment Guidelines and Essential Medicines List for Primary Health Care*. In keeping with the goals of the National Drug Policy, the review was done to keep pace with the advances in the field of medicine. Changes in this edition are a reflection of current epidemiology norms and recent developments in medicine.

The challenges facing the health sector are numerous but not insurmountable. The effective and efficient use of medicines will go a long way towards meeting these challenges.

Our goal of evidence based medicine selection has been strengthened in this edition. Affordability, without compromising quality, has been taken into account.

The numerous comments received and involvement from stakeholders is heartening and has contributed enormously to the excellence of this edition. We are indebted to all experts, opinion leaders and users of this book for their contribution.

The Standard Treatment Guidelines and Essential Drugs List is a living document and comments are invited in order to ensure appropriateness and responsiveness to emerging needs.

I would like to congratulate the committee on completing the reviews and to thank them for their continued commitment to the process over the years despite their busy schedules.

It is our sincere hope that the healthcare workers will continue to utilise the *Standard Treatment Guidelines and Essential Medicine List* in their efforts to providing quality care which we ourselves expect to receive.

MS B HOGAN
MINISTER OF HEALTH

INTRODUCTION

Medicines consume a significant portion of the total health care budget. Equitable access to affordable medicines remains a challenge. In accordance with the National Drug Policy, the Standard Treatment Guidelines and Essential Medicines List ensure that cost-effective treatment options are available to citizens of the country, and seeks to build capacity in health care workers at the Primary Health Care Level.

Emerging developments in medicine and scientific advances provided the basis for the review of the Standard Treatment Guidelines and Essential Medicine List. During this process consideration was given to factors such as evidence based therapeutics, prevailing medicine cost and practical experience. Where necessary, expert opinion was solicited.

Consultation with wider stakeholders is an integral part of the review process. I am pleased to note that as a result of the productive feedback of users, this new edition has been completely updated and substantially improved.

Efforts have been made to ensure that Guidelines of priority programmes such as HIV and AIDS, TB, Chronic diseases, IMCI, etc are harmonised with the Standard Treatment Guidelines and Essential Medicine List.

An appeal is being made to all users to follow the recommended guidelines at the back of the book when submitting comments or requesting additions or deletions of medicines from the list. Users are also encouraged to use the Adverse Drug Reaction Report Forms in the book. This will ensure that the quality of service is enhanced and will guide selection of appropriate medicine in future.

I would like to take this opportunity to thank the National Essential Drugs List Committee, the Primary Health Care Level Expert Review Committee, the Chairpersons and all who contributed to the review.

Their dedication and commitment to realising our vision of an accessible, caring and high quality health system is appreciated.

MR TD MSELEKU
DIRECTOR-GENERAL: HEALTH

ACKNOWLEDGEMENTS

We wish to convey our sincere gratitude to all those who participated in the review of this edition. The advice, comments, criticisms and contributions from the various stakeholders including professional societies, expert committees and individuals, has gone a long way toward producing a hugely improved edition of the Standard Treatment Guidelines and Essential Medicines List for Primary Health Care. Without the willingness to participate in this consultative process, this edition would not be have been possible.

In particular, we would like to thank:

» The Chair of the Primary Health Care Level Expert Review Committee, Prof B W van de Wal, for his loyalty, continued commitment and tireless efforts.
» The members of the Committee themselves, for sacrificing their time and for their dedication and willingness to share and learn.
» Prof Pudifin for his technical and editorial support.

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HOW TO USE THIS BOOK

The Primary Health Care Standard Treatment Guidelines and Essential Medicines List should be used by doctors and nurses providing care at clinics, community health centres and gateway clinics at hospitals to provide access to pharmaceuticals to manage common conditions at this level. It is the responsibility of the PTCs to ensure availability of medicines.

All the medicines in this book should also be available at higher levels of care.

Provincial PTCs have the authority to facilitate and control access to additional hospital level EDL medicines at specified PHC facilities.

It is the responsibility of the province to facilitate access of medicines with referral from a higher level to a lower level.

Provincial PTCs have the authority to reasonably adapt the STG/EDL to local conditions and circumstances.

It is important that you become familiar with the contents and layout of the book in order to use the standard treatment guidelines effectively.

Where relevant this book is consistent with the Standard Treatment Guidelines for Hospital Level, Adults and Paediatrics, Integrated Management of Childhood Illness Strategy (IMCI) and other National Programme treatment guidelines.

The ICD-10 number, included with the conditions, refers to an international classification method used when describing certain diseases and conditions. A brief description and diagnostic clinical, radiological and laboratory tests are included to assist the medical officer to make a diagnosis. These guidelines also make provision for referral of patients with more complex and uncommon conditions to facilities with the resources for further investigation and management.

It is important to remember that the recommended treatments provided in this book are guidelines only and are based on the assumption that prescribers are competent to handle patients' health conditions presented at their facilities. Where the professional expertise at certain PHC centres exceeds that of an average clinic, PTCs are encouraged to tailor the availability of medicines at these centres by using their initiative and creative insight. Adopting a more flexible approach means that available staff at each site are better utilised and a more convenient service can be provided for patients.

The treatment guidelines are presented in chapters according to the organ systems of the body. In order to find the relevant sections in the book easily, use the indices at the back of the book. These have been divided into indices of disease conditions

and medicines. Some of the medicines listed are only examples of a therapeutic class. In such cases the Provincial Pharmacy and Therapeutics Committees (PTCs) will decide on their medicine of choice within that therapeutic class.

All suspected adverse medicine reactions must be reported. In this book, only the common adverse effects have been mentioned. Information on the reporting of adverse medicine reactions is provided in the section Guidelines for Adverse Drug Reaction Reporting. The purpose of ADR reporting is to reduce the risks associated with the use of medicines and ultimately improve patient care.

The section on Patient Adherence in Chronic Conditions aims to provide support to health workers to assist patients in achieving their health goals.

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

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

The Essential Drugs Programme
Pharmaceutical Programmes and Planning
Department of Health
Private Bag X828
Pretoria
0001

DOSE CALCULATION

Many of the medicines are presented in the text in the form of tables. Doses are indicated as mg/kg. In addition, doses are also presented in terms of weight bands and according to age.

It is recommended that doses be calculated by weight. If this is not possible choose dose from weight band. Only use the dose according to age as a last resort. In particular, do not use age bands if child looks small for age or malnourished.

The mg/kg/dose dose can be used in 2 ways:

1 To check a dose, here the prescribed dose is divided by the weight and compared to the published mg/kg/dose.

2 Where greater accuracy is needed in establishing a suitable dose the patient's weight is multiplied by the mg/kg/dose and rounded up or down to the most practical dose to administer. When dispensing the dose should be check as per 1.

PRESCRIPTION WRITING

Medicines should be prescribed only when they are necessary for treatments following clear diagnosis. Not all patients or conditions need prescriptions for medicines. In certain conditions simple advice and other general measures may be more suitable.

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

All prescriptions should:

» be written legibly in ink by the prescriber with the full name and address of the patient, and signed with the date on the prescription form.
» specify the age and weight of the patient in the case of children
» have contact details of the prescriber e.g. name and telephone number

In all prescription writing, note the following:

» The name of the medicine or preparation should be written in full using the generic name and
» No abbreviations should be used due to the risk of misinterpretation. Avoid the Greek mu (μ): write mcg as an abbreviation for micrograms
» Avoid unnecessary use of decimal points and only use where decimal points are unavoidable. A zero should be written in front of the decimal point where there is no other figure, e.g. **2 mg** not *2.0 mg* or **0.5 mL** and not *.5 mL*
» Frequency. Avoid Greek and Roman frequency abbreviations that cause considerable confusion – qid, qod, tds, tid, etc. Instead either state the frequency in terms of hours (e.g. 8 hourly) or times per day in numerals (e.g. 3x/d)
» State the treatment regimen in full:
  – medicine name and strength
  – dose or dosage
  – dose frequency
  – duration of treatment

Example
Amoxicillin 250 mg 8 hourly for 5 days

» In the case of “as required”, a minimum dose interval should be specified, e.g. every 4 hours as required
» Most monthly outpatient prescriptions for chronic medication are for 28 days; check that the patient will be able to access a repeat before the 28 days are up.
» After writing a prescription, check that you have stated dose, dose units, route, frequency, and duration for each item. Consider whether the number of items is too great to be practical for the patient, and check that there are no redundant items or potentially important medicine interactions. Ensure that

the prescription is dated and that the patient's name and folder number are on the prescription card. Only then sign the script, and in addition, provide some other way for the pharmacy staff to identify you if there are problems (print your name, use a stamp, or use a prescriber number from your institution's pharmacy.)

THE ESSENTIAL MEDICINES CONCEPT

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

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

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

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

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

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

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

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

It should be noted that the Primary Health Care Essential Medicines List (EML) reflects only the minimum requirements for Primary Health Care level facilities. In keeping with the objectives of the National Drug Policy, provincial and local Pharmacy and Therapeutics Committees should provide additional drugs from the Hospital level EDL based on the services offered and the competency of the staff at each facility.

A GUIDE TO PATIENT ADHERENCE IN CHRONIC CONDITIONS

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

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

Patient Adherence

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

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

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

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

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

Barriers that contribute toward poor adherence

BARRIER	RECOMMENDED SUPPORT
Life style	
» It is often difficult to take multiple medications	» Create a treatment plan with information on how and when to take the medications.
» A busy schedule makes it difficult to remember to take the medication.	» Use reminders such as cues that form part of the daily routine.

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

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

For a patient to consistently adhere to long term pharmacotherapy requires integration of the regimen into his or her daily life style. The successful integration of the regimen is informed by the extent to which the regimen differs from his or her established daily routine. Where the pharmacological proprieties of the medication permits it, the pharmacotherapy dosing regimen should be adapted to the patient's daily routine. For example, a shift worker may need to take a sedating medicine in the morning when working night shifts, and at night, when working day shifts. If the intrusion into life style is too great alternative agents should be considered if they

are available. This would include situations such as a lunchtime dose in a school-going child who remains at school for extramural activity and is unlikely to adhere to a three times a regimen but may very well succeed with a twice daily regimen.

Towards concordance when prescribing

Establish the patient's:

» occupation
» daily routine
» recreational activities;
» past experiences with other medicines
» expectations of therapeutic outcome

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

Note:

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

Education points to consider

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

Note:

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

Notes on prescribing in chronic conditions.

» Don't change doses without good reason.
» Never blame anyone or anything for non-adherence before fully investigating

the cause

» If the clinical outcome is unsatisfactory - investigate adherence (remember side effects may be a problem here).
» Always think about side effects and screen for them from time to time.
» When prescribing a new medicine for an additional health related problem ask yourself whether or not this medicine is being used to manage a side effect.
» Adherence with a once daily dose is best. Twice daily regimens show agreeable adherence. However once the interval is decreased to 3 times a day there is a sharp drop in adherence with poor adherence to 4 times a day regimens.
» Keep the total number of tablets to an absolute minimum as too many may lead to medication dosing errors and may influence adherence

Improving Continuity of Therapy

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

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

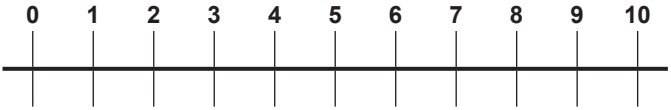
Patient Adherence Record

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

Self-Reporting

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

Visual Analogue Scale (VAS)



Score _____%

Pill Identification Test (PIT)

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

Pill Count

Did the client return the medication containers?	Yes*	No
***If yes,** check that the client only used medication from this container since the date of their last visit. If leftover medication had been used or an emergency prescription obtained, then the calculation will be invalid – skip to adherence assessment.		

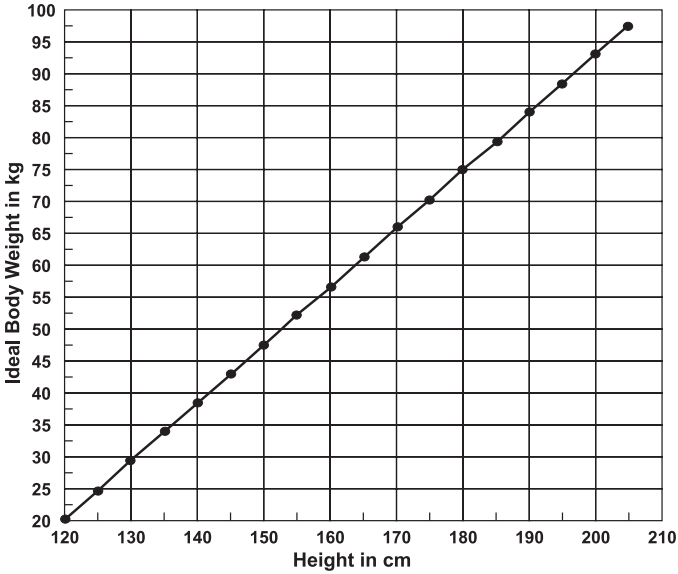
% Adherence = $\frac{\textbf{Dispensed} - \textbf{Returned}}{\textbf{Expected to be taken}}$ **X 100 =** $\frac{\square - \square}{\square}$ **X 100 =** $\square$ **%**

Adherence Assessment

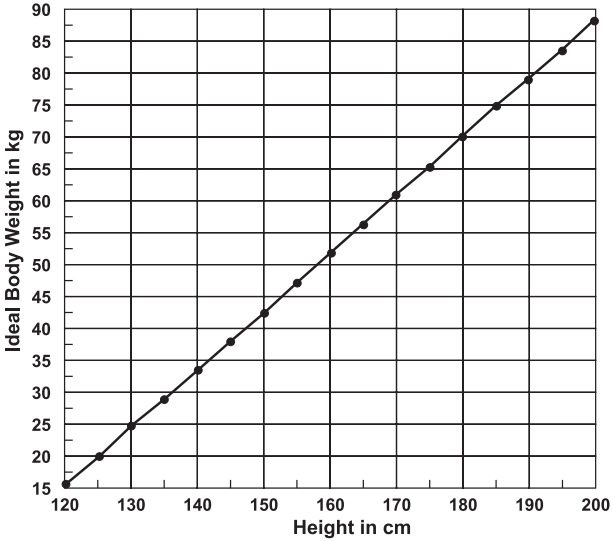
Self-reporting	Answered 'No' to all questions	Answered 'Yes' to 1 question	Answered 'Yes' to 2 or more questions
VAS	> 95%	75–94%	Less than 75%
PIT—*Client knows the…*	Dose, Time, and Instructions	Dose and Time	Dose only or confused
Pill count	> 95%	75–94%	Less than 75%
Overall Adherence	High	Moderate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

IDEAL BODY WEIGHT

Male

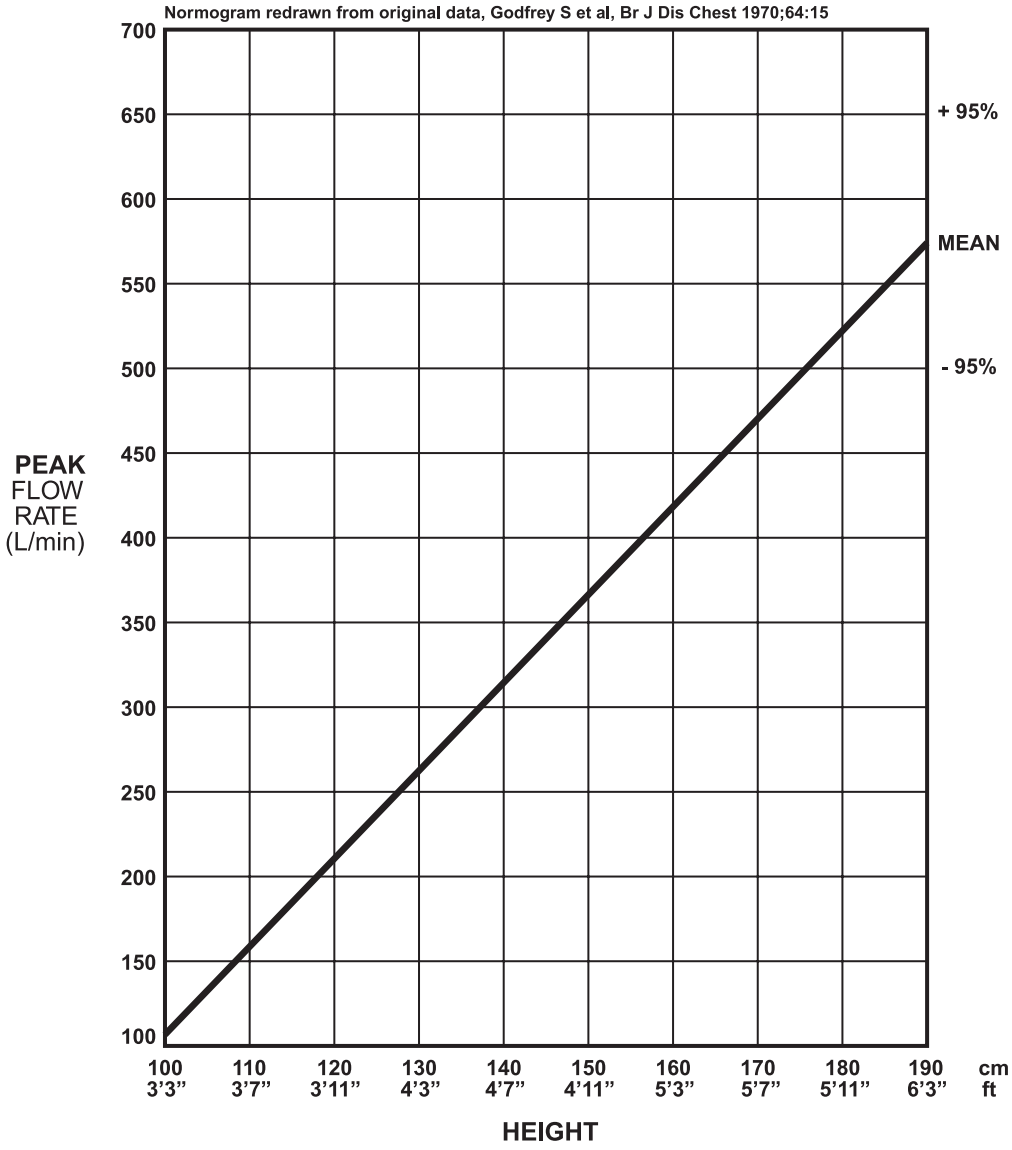


Female

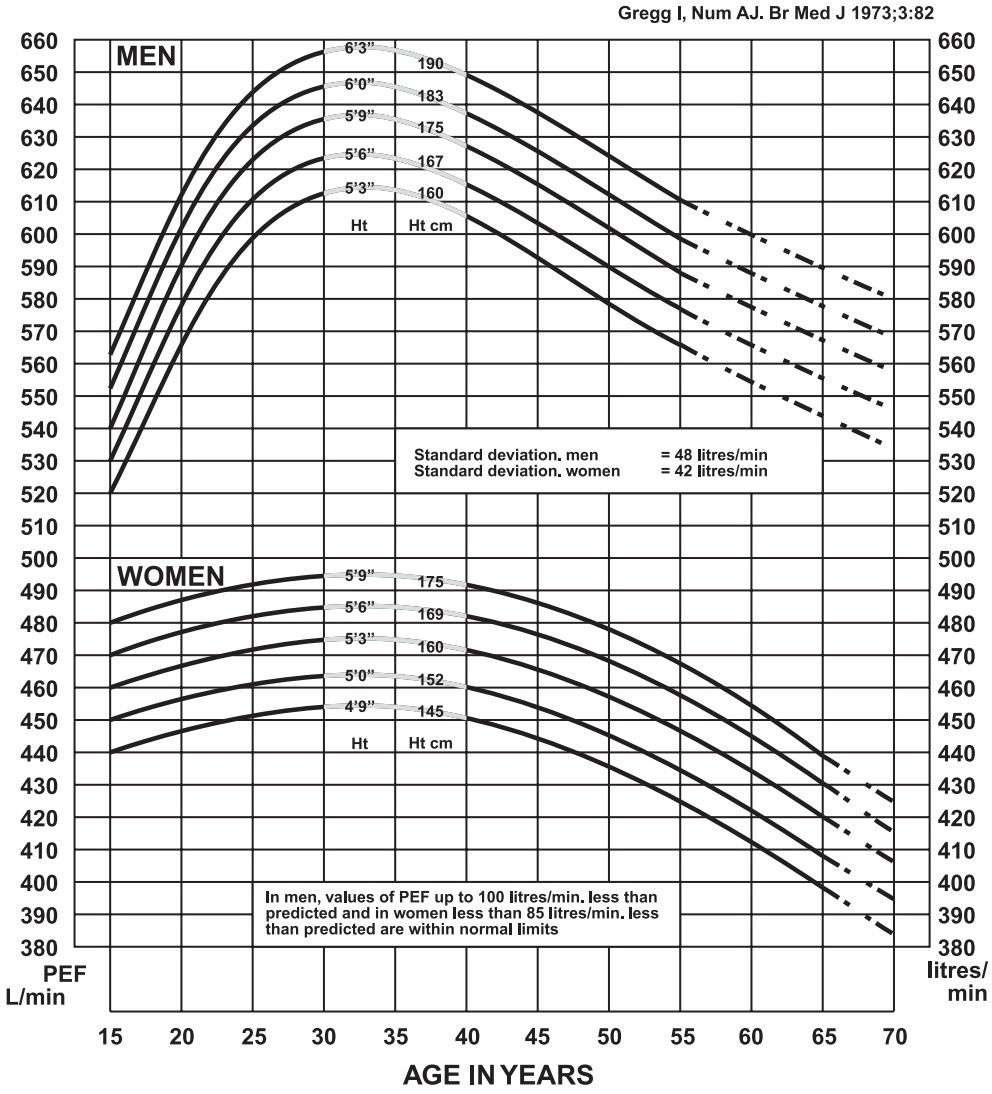


PEAK EXPIRATORY FLOW RATES

Normal peak flow readings for children aged 5 to 18 years



Peak expiratory flow in normal subjects



CALCULATING % PREDICTED PEAK FLOW RATE

- Take the best of 3 of the patient's observed peak flow rate:
  e.g. 200, 180, 190 performed, so take 200
- Find the patient's sex, age and height predicted value from nomogram or sheet:
  e.g. 480 for a woman of age 25 years and height 167cm
- Divide patient's observed peak flow rate over their predicted peak flow rate
  e.g.: 200/480 = 0.42
- Multiply by 100:
  e.g. 0.42X100 = 42%

So, in this example, patient's peak observed flow rate is 42% of predicted

CALCULATING PEAK FLOW VARIABILITY

There are a number of methods for calculating PEF variability.

The one we use is as follows:

- Subtract the lowest from the highest reading:
  e.g.: 400 – 300 = 100
- Divide by the highest reading:
  e.g.: 100/400 = 0.25
- Multiply by 100:
  e.g.: 0.25X100 = 25%

So, in this example, where a patient has readings of 300 to 400, the variability is 25% and asthma is diagnosed (i.e. ≥ 15%)

DISEASE NOTIFICATION PROCEDURES

The disease reporting system in South Africa is based on government law (Health Act, Act 63 of 1977) and regulations where specific infectious diseases (see list of notifiable medical conditions below) must be reported to the Provincial Health Departments, who then report to the National Department of Health (see flow chart of data below). Disease surveillance comprises mainly four types: Notifiable disease-reporting system, Laboratory-based surveillance, Hospital-based surveillance and Population based surveillance.

Notifiable Disease reporting
A notification serves as the first step in a surveillance cycle, namely for data-capturing or data collection. Notification can be done via the mail, fax or telephone to the local authority concerned. Any person (not necessarily a health worker) can notify a notifiable medical condition (see the Health Act regulations - legal obligations). The list of notifiable medical conditions at the moment determines that 40 different diseases are notifiable (see list below).

Process
Forms involved

GW17/5:	initial diagnosis (complete immediately)
GW17/3:	line list of cases (complete weekly)
GW17/4:	line list of deaths (complete weekly)

The initial diagnosis of a notifiable medical condition are done on a case-based form with the relevant address and fine details on it, to make tracing of the case as easy as possible, since a disease notification demands action (follow-up) at the lowest level (GW17/5 - for cases and deaths).

In South Africa it is required by law that completed weekly disease notification forms are submitted for all notifiable diseases from each local authority or district office to the provincial office. These should be completed and sent by all reporting units e.g.hospitals, health centres, health posts, clinics, private practitioners, private nurses, to the district public health office. The initial diagnosis forms are summarised weekly on separate line list forms for cases (GW17/3) and for deaths (GW17/4).

To ensure complete reporting of all EPI diseases, a zero report should be sent if no cases of a notifiable disease were seen for the reporting period.

Reporting
from reporting units to district office within 9 days
reporting week is Sunday to Saturday

All the reporting units should submit their disease notifications to reach the district no later than 9 days after the end of the reporting week. A reporting week

is normally taken from Sunday to Saturday. Thus, the weekly notifications are normally expected by the following Monday.

All reports received within that period are considered to be **on time**. After that period has passed, any reports received is considered **late**.
Some diseases can be monitored more accurately through the laboratory because of the nonspecificity of the clinical syndrome e.g. most types of food poisoning. For other diseases, laboratory data acts only as a confirmation of the clinical diagnosis.
These include Rabies, Cholera and Crimean Congo Haemorrhagic fever

Hospital-based surveillance
Hospital discharge information as well as mortality data can be used to monitor disease trends and disease burden in a particular area served by the hospital.

Population-based surveillance
A population-based surveillance system collects and analyses medical information in a well-defined population.

Complete reporting is needed when doing surveillance on rarely occurring diseases as well as for the elimination of diseases (e.g. polio eradication in SA by 2000 - surveillance of Acute Flaccid Paralysis).

FLOW CHART

Procedure to follow with notifiable medical conditions

Diagnosis
can be any health worker, not necessarily a Doctor

↓

GW 17/5
immediately

↓

Local authority / Hospital / District
whoever is responsible for disease containment

↓

GW17/3 (cases)
GW 17/4 (deaths)
weekly

↓

Regional office
Health Information Unit
if data entry is done at regional level -
province specific

↓

Computer disks
e-mail
weekly

↓

Provincial office
Health Information Unit
if data entry is done at provincial level -
province specific

↓

computer disks
e-mail
weekly

↓

National Department
Directorate HSR & Epidemiology
Private Bag X828, Pretoria 0001

Notifiable Medical Conditions

Acute flaccid paralysis
Anthrax
Brucellosis
Cholera
Congenital syphilis
Crimean-Congo haemorrhagic fever
Other haemorrhagic fevers of Africa
Diphtheria
Food poisoning
Haemophilus Influenza type B
Lead poisoning
Legionellosis
Leprosy
Malaria
Measles
Meningococcal infection
Paratyphoid fever
Plague
Poisoning agricultural stock remedies
Poliomyelitis
Rabies
Rheumatic fever
Tetanus
Tetanus neonatorum
Trachoma
Tuberculosis primary
Tuberculosis pulmonary
Tuberculosis of other respiratory organs
Tuberculosis of meninges
Tuberculosis of intestines, peritoneum
Tuberculosis of bones and joints
Tuberculosis of genito-urinary system
Tuberculosis of other organs
Tuberculosis miliary
Tuberculosis total
Typhoid fever
Typhus fever (lice-borne)
Typhus fever (ratflea-borne)
Viral hepatitis type A
Viral hepatitis type B
Viral hepatitis non-A non-B
Viral hepatitis unspecified
Viral hepatitis total
Whooping cough
Yellow fever

Chapter 1: Dental and oral conditions

1.1 Abscess and caries, dental

1.1.1 Abscess, dental

K04.7

Description

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

» acute, severe, throbbing pain
» swelling adjacent to the tooth, or on the face
» pain worsened by tapping on affected teeth
» restriction in mouth opening or difficulty in swallowing
» pus collection and drainage either intra-orally or on the face

Drug treatment

Initiate treatment before referral.

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

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup		**Capsule** 250 mg	
		125 mg/ 5 mL	250 mg/ 5 mL		
≥ 11–20 kg	250 mg	10 mL	5 mL	1 capsule	≥ 18 months–7 years
≥ 20 kg and above	500 mg	–	–	2 capsules	≥ 7 years to adult

Penicillin–allergic patients:

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25–35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200mg / 5mL	**Tablets** 200mg	**Tablets** 400mg	
≥9–11 kg	80 mg	2 mL	–	–	≥ 12–18 months
≥11–14 kg	100 mg	2.5 mL	½ tablet	–	≥18 months–3 years
≥14–17.5 kg	120 mg	3 mL	–	–	≥ 3–5 years
≥17.5–25 kg	160 mg	4 mL	–	–	≥ 5–7 years
≥25–35 kg	200 mg	5 mL	1 tablet	½ tablet	≥7–11 years
≥35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥11–15 years
≥55 kg and above	400 mg	–	2 tablets	1 tablet	≥ 15 years and adult

- Paracetamol, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 11–14 kg	120 mg	5 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL		≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	Adults

Referral

» All cases on diagnosis

1.1.2 Caries, dental

K02

To be managed by a dentist.

For local anaesthesia for dental procedures:

- Xylocaine (Dentist only)
- Xylocaine with adrenaline (Dentist only)

1.2 Candidiasis, oral (thrush)

B37.0

Description

An infection of the mouth and sometimes of the pharynx caused by species of the Candida fungus. Presents as painful creamy white patches that can be scratched off the tongue and buccal mucosae.
Often occurs in otherwise healthy babies up to one month of age.
Risk factors for candida include:

» poor oral hygiene
» immunosuppression (severe cases are common)
» prolonged use of broad spectrum antibiotics or corticosteroids (also inhaled)
» certain chronic diseases, e.g. diabetes mellitus
» trauma e.g. poorly fitting dentures

General measures

» Identify underlying diseases (e.g. diabetes or HIV) or medication (such as steroid inhaler or long-term antibiotics)
» Improve oral hygiene
» Cup feeding in preference to bottle feeding
» Ensure proper fitting dentures

Drug treatment

Infants

- Nystatin suspension, oral, 100 000 IU/mL, 1 mL after each feed for 7 days
  or
  Gentian violet, 0.5%, topical aqueous solution, applied to the inside of the mouth three times daily
  - Continue for 48 hours after cure.

Adults

- Antifungal lozenges (troches), e.g. amphotericin B, oral, one lozenge (troche) sucked 6 hourly for 5 days.
  - Treatment may need to be repeated.

Note:
HIV infected patients with oral candidiasis and painful or difficult swallowing have oesophageal involvement and need fluconazole – See section 11.3.3: Candida oesophagitis.

Referral

» No improvement
» Uncertain diagnosis
» Pharyngeal spread

1.3 Gingivitis and peridontitis

K05

1.3.1 Gingivitis, uncomplicated

K05.0

Description

Inflammation of the gum margin causing the gums to separate from the teeth. Pockets form between the gums and the teeth.
Pus and bacteria can collect in these pockets, eventually causing periodontitis, a disease in the tissue that surround and supports the teeth – See section 1.3.2: Peridontitis.

Characteristics of uncomplicated gingivitis:

- » change in the normal gum contour
- » redness
- » watery exudate/bleeding
- » may be recurrent
- » may be painful
- » swollen gums
- » gum recession may occur

Prophylaxis and general measures

Oral hygiene is usually adequate to prevent superficial mouth and gum infection:

- » Oral hygiene after each meal to remove plaque and food debris.
- » Frequent thorough brushing of teeth, at least twice daily.
- » Dental flossing at least once a day.
- » Homemade salt mouthwash may help, e.g. ½ medicine measure of table salt in a glass of lukewarm water. Rinse mouth for one minute twice daily.

Drug treatment

- Paracetamol, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 11–14 kg	120 mg	5 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL		≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	Adults

- Chlorhexidine 0.2%, 15 mL as a mouthwash, 2–4 times daily for 5 days after brushing and flossing

1.3.2 Periodontitis

K05.3

Description

Progressive gingivitis to the point where the underlying bone is eroded and is characterised by loose teeth in their sockets.
It is a cause of tooth loss in adults. See section 1.3.1: Gingivitis, uncomplicated.

General measures

» Advice on improving and maintaining oral hygiene.
» Frequent thorough brushing of teeth (at least twice daily).

Drug treatment

- Chlorhexidine 0.2%, 15 mL as a mouthwash, 2–4 times daily for 5 days after brushing

Referral

» All cases

1.3.3 Necrotising periodontitis

K05.5

Description

An acute very painful infection of the gingival margin characterised by:
» foul smelling breath
» loss of gingiva and supporting bone around teeth
» presence of underlying disease, e.g. HIV
May lead to loss of surrounding lips and cheeks if not adequately treated.

Management

- Relieve pain
- Improve oral hygiene

Drug treatment

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/ 5mL	**Tablets** 200 mg	**Tablets** 400 mg	
≥ 9–11 kg	80 mg	2 mL	–	–	≥ 12–18 months
≥ 11–14 kg	100 mg	2.5 mL	–	–	≥ 18 months–3 years
≥14–17.5 kg	120 mg	3 mL	–	–	≥ 3–5 years
≥17.5–25 kg	160 mg	4 ml	–	–	≥ 5–7 years
≥25–35 kg	200 mg	5 ml	1 tablet	½ tablet	≥7–11 years
≥35–55 kg	300 mg	7.5mL	1½ tablets	–	≥11–15 years
≥55 kg and above	400 mg	–	2 tablets	1 tablet	≥ 15 years and adult

- Chlorhexidine 0.2%, 15 mL as a mouthwash, 2–4 times daily 30 minutes after brushing.
  - o Continue for 5 days

- Paracetamol, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 11–14 kg	120 mg	5 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL		≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

For dental treatment:

» No improvement within 5 days

1.4 Herpes stomatitis

B00.2

Description

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

» Shallow painful ulcers on the lips, gingiva and tongue
» Pain exacerbated on eating
» It is a self-limiting infection with symptoms subsiding within 10 days

General measures

» Homemade salt mouthwash may help, e.g. ½ medicine measure of table salt in a glass of lukewarm water. Rinse mouth for one minute twice daily
» Improve nutrition
» Ensure adequate hydration
» Fluid diet for children
» Avoid acidic drinks, e.g. orange juice or soft drinks as they may cause pain
» Cover lesions on the lips with petroleum jelly

Drug treatment

- Paracetamol, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under six months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9 – 14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14 –17.5 kg	180 mg	7.5 mL		≥ 3–5 years
≥ 17.5 – 35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35 – 55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	Adults

Extensive oral herpes:

- Tetracaine 1 %, oral, topical, applied every 3 to 4 hours.
  - o Apply a thin layer on the affected areas only.

Note:
Children with extensive oral herpes should be treated with aciclovir if this can be started within 72 hours of onset of symptoms.

HIV infected patients with Herpes stomatitis:

- Aciclovir, oral, 8 hourly for 7 days. (Doctor initiated)
  - o Paediatric dose: 250 mg/m^2/dose

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Susp 200 mg/ 5mL	**Tablet** 200 mg	**Tablet** 400 mg	
≥ 3.5–7 kg	80 mg	2 mL	–	–	≥ 1–6 months
≥ 7–11 kg	100 mg	2.5 mL	–	–	≥ 6–18 months
≥ 11–14 kg	120 mg	3 mL	–	–	≥ 18 months–3 years
≥ 14–25 kg	160 mg	4 mL	–		≥ 3–7 years
≥ 25–35 kg	200 mg	5 mL	1 tablet	½ tablet	≥ 7–11 years
≥ 35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥ 11–15 years
≥ 55 kg and above	400 mg	–	2 tablets	1 tablet	≥ 15 years and adults

Referral

» Severe condition with complications
» Dehydrated patients
» No improvement after 1 week of treatment

1.5 Aphthous ulcers

K12.0

Description

Painful ulcers in the oropharynx. Minor ulcers (<1 cm diameter) usually heal within 2 weeks. Major ulcers (>1 cm diameter) are very painful, often very deep and persist.

Drug treatment

Minor aphthous ulcers:

- Choline salicylate/cetalkonium chloride 8.7/0.01% oral gel, applied 6 hourly until healed

Referral

» Major aphthous ulcers for further diagnostic evaluation

Chapter 2: Gastro-intestinal conditions

2.1 Abdominal pain

R10.4

Description

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

The history should include:

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

Examination should emphasise detection of:

» tachycardia
» fever
» jaundice
» abdominal masses, distension, tenderness
» signs of peritonitis (rebound tenderness and guarding)

Drug treatment

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

Urinary tract infection
See chapter 8: Kidney and urological disorders

Dyspepsia
See section 2.2: Dyspepsia, heartburn and indigestion

For pain relief (adults)
Analgesia as appropriate.

Renal and biliary colic, or acute surgical abdomen

- Morphine, IM/IV, 10–15 mg as a single dose and refer
  For IV morphine:
  - Dilute in 10 mL sodium chloride 0.9%
  - Administer slowly over 4–5 minutes

Abdominal pain with cramp-like pains

- Hyoscine butylbromide, oral, 10–20 mg 6–8 hourly for a maximum of 3 days

Cancer pain e.g. pancreatic, gastric cancer

See section 20.3: Chronic cancer pain.

Referral

» Severe pain with no confirmed cause treatable at primary healthcare level
» Signs of acute abdomen
» Associated bloody non-diarrhoeal stools
» Associated abdominal mass

2.2 Dyspepsia, heartburn and indigestion

K30/R12

Description

Dyspepsia, heartburn and indigestion are common conditions, which often present with epigastric discomfort and minimal change in bowel habits.
Intermittent indigestion, heartburn or dyspepsia may be associated with:
» use of NSAIDs, e.g. aspirin, ibuprofen, pain powders
» spicy food, alcohol, carbonated drinks
» smoking
Consider the possibility that dyspeptic symptoms may be due to acute coronary syndrome.

General measures

» Stop smoking.
» Limit alcohol intake.
» Eat small frequent meals.
» Check haemoglobin.
» Check for a drug cause likely to be associated with dyspeptic symptoms.

Drug treatment

Initiate drug therapy only after full assessment.

- Aluminium hydroxide 250 mg/magnesium trisilicate 500 mg, oral, 1–2 tablets to be chewed 1 hour before and 3 hours after meals and at night when needed.
  - Maximum of 16 tablets daily or continuous treatment for 7 days

If there is no response

- Cimetidine, oral, 400 mg at bedtime for 14 days

! CAUTION !

Cimetidine has a high potential for drug interactions when used concomitantly with other drugs.

Referral

» Presence of warning signs:
  – weight loss

  - persistent vomiting
  - dysphagia
  - anaemia
  - haematemesis
  - palpable abdominal mass
- » No response within 7 days of starting cimetidine treatment
- » Recurrence of symptoms:
  - especially in age over 50 years
  - family history of gastric carcinoma
  - previous gastric surgery

2.3 Nausea and vomiting, non-specific

R11

Description

There are many possible causes of nausea and vomiting. Some important causes to **exclude** are:

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

Establish if the vomiting is associated with:

- » abdominal pain
- » diarrhoea
- » headache
- » constipation

General measures

- » Maintain adequate hydration with clear fluids
  See section 2.8: Diarrhoea
- » In children in whom feeds are stopped, this should not be for more than 1 hour and restart feeding in smaller more frequent amounts

Drug treatment

Do not use anti-emetics in children.

Adults

- Metoclopramide, IV/oral, 10 mg 6–8 hourly

Referral

Urgent

- » Severe dehydration
- » Shock
- » Diabetes

» Features of sepsis
» Jaundice
» Infants with projectile vomiting
» Signs of intestinal obstruction, i.e. no stool or flatus passed
» Associated abdominal tenderness with guarding and rigidity
» Vomiting with digested or fresh blood present

2.4 Anal conditions

2.4.1 Anal fissures

K60.2

Description

Painful small cracks just inside the anal margin. It is often seen together with a sentinel pile or external haemorrhoids and may cause spasm of the anal sphincter.

General measures

» Dietary advice to promote soft stools.

Drug treatment

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily
  or
  Lignocaine 2%, cream, topical, applied after each bowel action
- Lactulose, oral, 0.5 mL/kg/dose once daily
  - o If poor response, increase frequency to 12 hourly

Weight kg	**Syrup** 3.3 g/5 mL	**Age** years
≥ 5–9 kg	2.5 mL	≥ 3 months–1 year
≥ 9–17.5 kg	5 mL	≥ 1–5 years
≥ 17.5–25 kg	7.5 mL	≥ 5–7 years
≥ 25–35 kg	10 mL	≥ 7–11 years
≥ 35–55 kg	10 – 20 mL	≥ 11–15 years
≥ 55 kg and above	10 – 20 mL	≥ 15 years and adult

Referral

» Severe pain
» Recurrent episodes
» Poor response to symptomatic treatment

2.4.2 Haemorrhoids

I84.9

Description

Varicose veins of the ano-rectal area, usually accompanied by a history of constipation.

In older patients consider a diagnosis of underlying carcinoma.

General measures

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

Drug treatment

Symptomatic treatment for painful haemorrhoids

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily
  or
  Lignocaine 2%, cream, topical, applied after each bowel action

Constipation
See section 2.7: Constipation

Referral

» For surgical intervention if necessary
  – if the haemorrhoid cannot be reduced
  – if the haemorrhoid is thrombosed
» Children

2.5 Appendicitis

K35.9

Referral

» All patients with suspected appendicitis:
  – right iliac fossa tenderness
  – right iliac fossa rebound pain
  – severe persistent abdominal pain

2.6 Cholera

A00.9
Note: notifiable condition.

Description

Very acute severe watery diarrhoea due to infection with the micro-organism *Vibrio cholerae.*
Clinical features include:
» rice water appearance of stools:
  – no blood in stools
  – no pus in stools
  – no faecal odour
  – possible vomiting
  – rapid severe dehydration

Note:
The prime objective is to prevent and treat dehydration.

General measures

» Rehydrate aggressively with ORS.

Drug treatment

Dehydration

Children

Treat dehydration – See Section 2.8.1: Diarrhoea, acute in children

Adults

Oral treatment

- Oral rehydration solution (ORS)
  or
  Homemade sugar and salt solution (see section 2.8: Diarrhoea)
  The volume of fluid required for oral rehydration depends on the severity of the dehydration.

Oral rehydration is preferable to IV. In stuporose patients administer ORS by nasogastric tube.

IV treatment

- Sodium chloride 0.9%, IV and refer

For the management of severe dehydration during cholera outbreaks, replace sodium chloride 0.9% with:

- Ringer–Lactate, IV and refer

Do not administer ceftriaxone to patients receiving Ringer–Lactate, or who have received Ringer–Lactate intravenously in the previous 48 hours.

Ringer–Lactate should only be available at PHC level during cholera outbreaks.

Cholera epidemics or where cholera is confirmed on culture

Antibiotics may very according to sensitivities in epidemics. Consult the NICD for the latest recommendations. Current recommendations are:

- Doxycycline, oral, as a single dose
  - o Adults (including pregnant women)
  - o Children: 4 mg/kg/dose

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Capsules 50 mg	**Capsules** 100 mg	
≥ 7–14 kg	50 mg	1 capsule	–	≥ 6 months–3 years
≥ 14–25 kg	100 mg	2 capsules	1 capsule	≥ 3–7 years
≥ 25–35 kg	150 mg	3 capsules	–	≥ 7–11 years
≥ 35–55 kg	200 mg	–	2 capsules	≥ 11–15 years
≥ 55 kg and above	300 mg	–	3 capsules	≥ 15 years and adults

  - o Contra–indicated in children less than 8 years. However, in confirmed cases or during epidemics, where the organism is not sensitive to other antibiotics, a single dose may be administered.

Referral

» Severely ill patients
» According to provincial and local policy
» Children under 6 months of age

2.7 Constipation

K59.0

Description

A condition characterised by a change in usual bowel habits and dry, hard stools. There is a decreased frequency of bowel action and patients should be assessed individually.

Constipation may have many causes, including:

» incorrect diet (fibre and fluid)
» pregnancy
» drugs, e.g. opiates and anticholinergics
» hypothyroidism
» lower bowel abnormalities
» chronic use of enemas and laxatives
» behavioural problems in children
» lack of exercise
» old age
» ignoring the urge
» neurogenic
» psychogenic disorders
» cancer of the bowel

! CAUTION !
In adults be especially suspicious of a change in bowel habits, as there is a possibility of cancer of the large bowel.

General measures

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

Drug treatment

Children over 12 months

- Lactulose, oral, 0.5 mL/kg/dose once daily
  - o If poor response, increase frequency to 12 hourly

Weight kg	**Syrup** 3.3 g/5 mL	**Age** years
≥ 5–9 kg	2.5 mL	≥ 3 months–1 year
≥ 9– 17.5 kg	5 mL	≥ 1–5 years
≥ 17.5–25 kg	7.5 mL	≥ 5–7 years
≥ 25–35 kg	10 mL	≥ 7–11 years
≥ 35–55 kg	10–20 mL	≥ 11–15 years
≥ 55 kg and above	10–20 mL	≥ 15 years and adult

Adults

- Sennosides A and B, oral, 7.5 mg, 2 tablets at night.
  - o In resistant cases increase to 4 tablets.

  or

  Lactulose 10–20 mL once or twice daily

! CAUTION !
Prolonged severe constipation may present with overflow “diarrhoea”. Rectal examination should be done in all cases.

Referral

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

2.8 Diarrhoea

A09

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

2.8.1 Diarrhoea, acute in children

Description

A sudden onset of change in consistency and frequency of stools with or without vomiting in children.
It is commonly caused by a virus but may be caused by bacteria or parasites. The cause of these conditions cannot be diagnosed without laboratory investigation.
It may be an epidemic if many patients are infected at the same time.

Special risk situations
Diarrhoea in infants less than 2 weeks, malnourished babies, and babies with other danger signs such as:
» convulsions
» altered level of consciousness
» persistent vomiting
» respiratory distress
» persistent diarrhoea
» hypothermia
» surgical abdomen
Refer these babies urgently for treatment. Before referral, administer:
- Ceftriaxone, IM, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	–	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	–	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adults

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-Lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dosage and route of administration in the referral letter.

Special types of diarrhoea

» Bloody diarrhoea
  – consider dysentery – See section 2.9: Dysentery
» Diarrhoea with high fever or very ill
  – consider typhoid – See section 2.12: Typhoid fever
» Persistent diarrhoea, more than 14 days
  – refer patient
» Diarrhoea in children in the context of an adult epidemic
  – consider cholera – See section 2.6: Cholera

Treatment according to hydration classification

Assess hydration
Identify signs present to classify dehydration as (beginning from the left column):
- severe dehydration – C
- some dehydration – B
- no visible dehydration – A

	C Severe dehydration	B Some dehydration	A No visible dehydration
Signs of classification	2 of the signs below	2 of the signs below but not severe dehydration	None of the signs of dehydration
Level of consciousness	» lethargic or unconscious	» restless or irritable	» well alert
Sunken eyes	» eyes sunken	» eyes sunken	» eyes not sunken
Ability to drink	» drinks poorly **or** not able to drink	» thirsty, drinks eagerly	» drinks normally, not excessive thirst
Skin pinch (Turgor)	» severe decrease in skin turgor » skin pinch returning over 2 seconds or more	» moderate decrease in skin turgor - by slow skin pinch, returning in less than 2 seconds	» skin pinch goes back immediately

	C Severe dehydration	B Some dehydration	A No visible dehydration
Treatment	Give rapidly: • Sodium chloride 0.9%, IV, 20 mL/kg Repeat up to twice if radial pulse is weak or undetectable. Continue with 20 mL/kg every hour for the next 5 hours. **Then**: Refer urgently for continued management continuing with 20 mL/kg every hour for the next 5 hours during urgent referral unless the child is reclassified as B: Some dehydration. » Reassess every 2 hours while awaiting transfer. » If hydration status does not improve, give IV fluids more rapidly. As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give: • ORS, oral, 5 mL/kg/hour If IV administration is not possible, insert a nasogastric tube and while awaiting and during urgent transfer give: • ORS, 20 mL/kg/hour over the next 6 hours via the nasogastric tube If only oral administration is possible, or the condition is not improving, transfer the child urgently giving ORS during transfer. Reassess every **4 hours for classification –** if improves to classification **B: Some dehydration** – treat as such	Give: • ORS, oral, 80 mL/kg over 4 hours, e.g. 5 mL/kg every 15 minutes Give more if the child wants more. Show the caregiver how to give ORS with a cup and spoon using frequent small sips. If child vomits wait 10 minutes and then continue more slowly. Encourage the caregiver to continue feeding the child especially breastfeeding. If after 4 hours there are: • no signs of dehydration – treat as **A: No visible dehydration** • still some dehydration signs – continue as above • signs of severe dehydration – treat as **C: Severe dehydration**	Show the caregiver how to give ORS with a cup and spoon using frequent small sips. Encourage caregiver to give 10 mL/kg after each diarrhoeal stool until diarrhoea stops, i.e. » child age up to 2 years, 50–100 mL » child age 2 years or more, 100–200 mL after each loose stool. Continue at home. Encourage the caregiver to continue feeding the child, especially breastfeeding. Instruct the caregiver how to make ORS/SSS at home and to continue treatment.

Child should return immediately if:

» no improvement
» condition deteriorates
» poor drinking or feeding
» blood in stool
» fever develops
» sunken eyes
» slow skin pinch

In all children who are able to take oral medication

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

Homemade sugar and salt solution may be used if oral rehydration formula is not available and is promoted for home use pending primary health care consultation:

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

Referral

» Severe dehydration with other complications
» Dysentery in children under 12 months of age
» Malnourished children
» Children with general danger signs, e.g. altered level of consciousness, convulsions, inability to feed or drink, intractable vomiting.
» Suspected acute surgical abdomen

2.8.2 Diarrhoea, persistent in children

K52.9

Description

Diarrhoea for 7–14 days.

General measures

» Assess for possible HIV infection, and manage appropriately.
» Prevent dehydration using Homemade sugar and salt solution (See Section 2.8.1: Diarrhoea, acute in children – Plan A)

» Counsel mother regarding feeding.
  – If breastfeeding, give more frequent, longer feeds.
  – If replacement feeding replace milk with breast milk or with fermented milk products such as amasi (maas) or yoghurt, if available.
  – Continue with solids - give small, frequent meals at least 6 times a day.
» Follow-up 5 days. If diarrhoea persists, refer to doctor for investigation.

Drug treatment

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral

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

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

Referral

» Child younger than two months of age
» Signs of dehydration – See Section 2.8.1: Diarrhoea, acute in children
» Malnutrition or weight loss
» Diarrhoea that persists for more than 5 days with treatment, refer to doctor for investigation
» Diarrhoea present for more than 14 days

2.8.3 Diarrhoea, acute, without blood, in adults

K52.9

Description

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

Drug treatment

Treat vigorously.

- Oral rehydration solution (ORS)
  or
  Homemade sugar and salt solution (SSS)

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

Referral

» Suspected acute surgical abdomen
» Diarrhoea with complications

2.8.4 Diarrhoea, chronic, in adults

K52.9

Description

Diarrhoea lasting more than 2 weeks.
The majority of cases may be HIV related. Encourage HIV testing.

A stool sample should be requested for microscopy for ova, cysts and parasites
Note:
Culture and sensitivity should not be requested on the form.

Giardiasis is a common cause of chronic diarrhoea in adults, and may be difficult to diagnose on stools. Therefore empiric treatment for giardiasis is recommended before referring such patients.

Drug treatment

Giardiasis

- Metronidazole, oral, 2 g daily for 3 days

Chronic diarrhoea in HIV/AIDS
See section 11.3.4: Diarrhoea, HIV associated

Referral

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

2.9 Dysentery

A03.0

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

Referral

» No response to treatment

2.9.1 Dysentery, bacillary

A03.0

Description

Acute infection of the bowel usually caused by *Shigella, Salmonella* or *Campylobacter.*

There is sudden onset diarrhoea with:

» blood (not due to haemorrhoids or anal fissure) or mucus in the stools
» convulsions (in children)
» fever
» tenesmus

General measures

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

Drug treatment

Treat hydration vigorously.

Children

Treat dehydration according to Section 2.8.1: Diarrhoea, acute in children

Adults

Oral treatment

- Oral rehydration solution
  or
  Homemade sugar and salt solution

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

The amount of fluid required for oral rehydration depends on the severity of the dehydration.

IV treatment

- Sodium chloride 0.9%, IV

Antibiotic therapy

Indicated for:

» children over 1 year old and adults with blood in the stools
» HIV infected patients

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

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months / years
		Syrup 250 mg/5 mL	**Tablet** 250 mg	**Tablet** 500 mg	
≥ 9–11 kg	150 mg	3 mL	–	–	≥ 12–18 months
≥ 11–14 kg	200 mg	4 mL	–	–	≥ 18 months–3 years
≥ 14–17.5 kg	250 mg	5 mL	1 tablet	–	≥ 3–5 years
≥ 17.5–25 kg	300 mg	6 mL	–	–	≥ 5–7 years
≥ 25–35 kg	375 mg	7.5 mL	–	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	1 tablet	≥ 11 years and adults

Note:

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

Referral

» Malnutrition in children
» Severe illness
» Dehydration in children
» Persistent blood in urine on dipstix or macroscopically
» Acute abdominal signs (severe pain, acute tenderness, persistent or bilious vomiting),
» Bloody mucus passed in absence of diarrhoea.

» Children less than 12 months of age. In these children, before referral give:

- Ceftriaxone, **IM,** 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adults

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-Lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dosage and route of administration in the referral letter.

2.9.2 Dysentery, amoebic

A06.0

Description

A condition characterised by loose stools or rarely diarrhoea, caused by the parasite *Entamoeba histolytica*, with:

» blood
» mucus
» possible constipation, in the alternative
» usually without fever

The presentation is usually subacute.

Drug treatment

For dehydration

» Treat vigorously.

Children
Treat dehydration according to Section 2.8.1: Diarrhoea, acute in children

Adults
Oral treatment
- Oral rehydration solution
  or
  Homemade sugar and salt solution

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

The amount of fluid required for oral rehydration depends on the severity of the dehydration.

IV treatment
- Sodium chloride 0.9%, IV

If case confirmed by identification of organisms on wet stools or if dysentery treated with antibiotics has not improved within 3 days:
- Metronidazole, oral, 8 hourly for 5 days
  - Paediatric dose: 12–17 mg/kg/dose

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5mL	**Tablets** 200mg	**Tablets** 400mg	
≥9–11 kg	160 mg	4 mL	–	–	≥ 12–18 months
≥11–14 kg	200 mg	5 mL	–	–	≥ 18 months–3 years
≥14–17.5 kg	240 mg	6 mL	–	–	≥ 3–5 years
≥17.5–25 kg	300 mg	7.5 mL	1½ tablets	–	≥ 5 – 7 years
≥25–35 kg	400 mg	10 mL	2 tablets	1 tablet	≥7–11 years
≥35–55 kg	600 mg	15 mL	3 tablets	1½ tablets	≥11–15 years
≥55 kg and above	800 mg	–	4 tablets	2 tablets	≥ 15 years and adult

Referral

» Malnutrition in children
» Severe illness
» Dehydration
» Persistent blood in urine on dipstix or macroscopically
» Acute abdominal signs (severe pain, acute tenderness, persistent or bilious

vomiting),
» Bloody mucous passed in absence of diarrhoea.
» No improvement after 3 days treatment
» Children less than 12 months of age. In these children, before referral give:
• Ceftriaxone, **IM,** 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adults

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dosage and route of administration in the referral letter.

2.10 Helminthic infestation

B83

2.10.1 Helminthic infestation, tapeworm

B83.8

Description

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

Infestation may be caused by:

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

Signs and symptoms include:

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

General measures

» Health education on adequate preparation of potentially infected meat.

Drug treatment

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

- Albendazole, oral, daily for three days
  - o Children under 2 years: 200 mg
  - o Children over 2 years and adults: 400 mg

Referral

» Abdominal tenderness or pain
» Abdominal masses
» Vomiting

2.10.2 Helminthic infestation, excluding tapeworm

B82.0

Description

Types of worm infestation and the characteristics are shown in the table below. Check for anaemia and failure to thrive. The infestations are often asymptomatic.

Type of worm	Description	Signs and symptoms
Common Roundworm ***Ascaris lumbricoides***	» Long pink/white worms with sharp ends » Up to 25–30 cm long » Often seen in the stools and vomitus	» Cough » If there is vomiting consider intestinal obstruction
Pinworm ***Enterobius vermicularis***	» White and thread-like » Up to 10 mm long » Often seen in the stools » Self-infection common	» Anal itching – worse at night » Sleeplessness
Hookworm ***Necator americanus***	» Up to 8 mm long	» No symptoms or pain » Anaemia
Threadworm ***Strongyloides stercoralis***	» Very small, up to 4 mm long » Very rare	» No obvious symptoms
Whipworm ***Trichuris trichiura***	» Up to 5 cm long » Anterior half thinner than posterior half	» No symptoms » Abdominal pain » Diarrhoea » Possible anaemia and rectal prolapse » Abdominal discomfort » Weight loss

General measures

» Patient counseling and education.
» Wash hands with soap and water, particularly:
  – after passing a stool
  – before working with food or eating
» Keep fingernails short.
» Wash fruit and vegetables well or cook.
» Keep toilet seats clean.
» Teach children to use toilets and wash hands.
» Do not pollute the soil with sewage or sludge.
» Dispose of faeces properly.

Drug treatment

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

For *Strongyloides stercoralis* refer for specific therapy.

Referral

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

2.11 Irritable bowel syndrome (IBS)

K58
(Synonyms: spastic colon, irritable colon)

Description

Functional bowel disorder: Motility disturbance of the entire GIT resulting in recurrent symptoms of pain, constipation and/or diarrhoea and bloating.

General measures

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

Drug treatment

» Not specifically indicated.
» Based on patients predominant symptoms
» Short-term symptomatic treatment for diarrhoea and/or constipation.

Laxatives only for constipation specific, see Section 2.7: Constipation
Antidiarrhoeals only for diarrhoea specific, see Section 2.8: Diarrhoea

2.12 Typhoid fever

A01.0

Note: notifiable condition.

Description

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

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

Drug treatment

Treat dehydration if present and refer.

Referral

Urgent

» All cases or suspected cases

Chapter 3: Nutritional and blood conditions

3.1 Anaemia

E64.9

Description

A condition characterised by low haemoglobin, clinically recognised by pallor.
It is commonly caused by:

» nutritional deficiency of iron or folate
» chronic systemic diseases
» blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, excessive menstruation

Other causes include:

» infiltration or replacement of the bone marrow
» abnormal haemoglobin or red cells
» haemolysis

Diagnosis

	Hb less than:
» non-pregnant women	11 g/dL
» pregnant women	10 g/dL
» males	12 g/dL
» children 1–5 years	10 g/dL
» children over 5 years	11 g/dL

Children less than 5 years
Anaemia is most often due to iron deficiency – See Section 3.1.1.
Consider blood loss if the anaemia is severe (Hb less than 7 g/dL).

In older children and adults
Request a full blood count.

» If MCV is normal (normocytic):
  – then systemic disease is the likely cause
» If MCV is low (microcytic):
  – then iron deficiency is the likely cause
» If MCV is high (macrocytic):
  – then folate and/or vitamin B_{12} deficiency is the likely cause

Pregnant women
See section 6.2.3: Anaemia in pregnancy.

Referral

» Unknown cause
» Symptoms of anaemia e.g. palpitations and shortness of breath
» Evidence of cardiac failure
» Signs of chronic disease (first investigate for HIV and TB)

» Anaemia associated with enlargement of the liver, spleen or lymph nodes
» Signs and symptoms of acute blood loss or bleeding disorder
» Blood in stool or melaena
» Pregnant women over 34 weeks of gestation and a Hb less than 7 g/dL
» Children with Hb less than 6 g/dL (If Hb cannot be done, severe palmar pallor)
» No improvement despite correct treatment

3.1.1 Anaemia, iron deficiency

D50.9

Description

Iron deficiency is a common cause of anaemia in younger children and women of childbearing age.
In pregnancy and during the post-partum period, folate deficiency and/or combined iron or folate deficiency are common.
Diagnosis suggested on a full blood count. In children this is unnecessary unless referral criteria above are present.

Note:
Iron deficiency in adult males and non-menstruating women is generally due to occult blood loss and all cases should be referred.

General measures

» Identify and treat the cause.
» Exclude other causes – see referral criteria in 3.1 above.
» Lifestyle and dietary adjustment.

Drug treatment

Children

- Iron, oral, 1–2 mg/kg/dose of elemental iron 8 hourly with meals

Weight kg	**Dose** mg of elemental iron	**Use one of the following:**			**Age** Months/ years
		Gluconate syrup 350 mg/ 5 mL (40 mg elemental iron/5 mL)	**Lactate drops** (25 mg elemental iron/ mL)	**Sulphate compound tablets BPC 170 mg** (± 65 mg elemental iron)	
≥ 3.5–5.5 kg	6 mg	0.8 mL	0.3 mL	–	≥ 1–3 months
≥ 5–7 kg	8 mg	1 mL	–	–	≥ 3–6 months
≥ 7–9 kg	16 mg	2 mL	–	–	≥ 6–12 months
≥ 9–25 kg	20 mg	2.5 mL	–	–	≥ 12 months–7 years
≥ 25–35 kg	40 mg	5 mL	–	–	≥ 7–11 years
≥ 35 kg and above	65 mg	–	–	1 tablet	≥ 11 years and above

Follow up Hb after 14 days.

» If Hb is lower than before – refer,

» If same or higher – continue treatment and repeat after another 14 days.

Continue treatment for 3 months after Hb is normal

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

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

Adults

- Ferrous sulphate compound BPC, oral, 170 mg three times daily with food

Follow up at monthly intervals.

The expected response is an increase in Hb of 2 g/dL or more in 4 weeks.

Continue for 3–6 months after Hb is normal to replenish body iron stores

! CAUTION !

Iron is extremely toxic in overdose, particularly in children.

All medication should be stored out of reach of children.

Prophylaxis

Infants from 6 weeks of life:

If < 2.5 kg at birth:

- Ferrous lactate, oral, 0.3 mL daily until 6 months of age

» Pregnant women

See section 6.2.3: Anaemia in pregnancy.

3.1.2 Anaemia, macrocytic or megaloblastic

D53.1

Description

Anaemia with large red blood cells may be due to folate or vitamin B_{12} deficiency.
Folate deficiency is common in pregnant women.
Vitamin B_{12} deficiency occurs mainly in older adults, and can cause neurological damage if not treated.
Special investigations are required to confirm the diagnosis, except in pregnant women – See section 6.2.3: Anaemia in pregnancy.

Investigations

FBC will confirm macrocytic anaemia.

» MCV will be elevated
» Hb and/or white cell count and/or platelet count reduced

Serum vitamin B_{12} and red cell folate must be done – low values will confirm the diagnosis.

Note:

The antiretrovirals, stavudine and zidovudine, both cause elevated MCV, and zidovudine often causes anaemia and/or decreased white cell count. It is not necessary to measure folate and B_{12} if the patient is not anaemic.

General measures

» Ensure adequate intake of dietary folate (e.g. liver, eggs, fortified breakfast cereals, lentils, sugar beans and spinach), and vitamin B_{12}, (e.g. liver, fish and eggs).
» Reduce alcohol intake.

Drug treatment

Folic acid deficiency:

- Folic acid, oral, 5 mg daily until Hb is normal.
  - o Check Hb monthly

If folic acid is given to patients with vitamin B_{12} deficiency, this can cause neurological damage unless vitamin B_{12} is also given.

Referral

» All patients with suspected macrocytic anaemia, for investigation and treatment, except in pregnancy and lactating women who should be treated for folate deficiency

» Patients with B_{12} deficiency
» Chronic diarrhoea
» Poor response within a month of treatment

3.2 Childhood malnutrition, including failure to thrive (FTT)

E46

In all children, check for malnutrition and anaemia:
» plot the weight on the Road to Health Chart
» look at the shape of the weight curve:
Is the weight curve rising parallel to the reference lines?
or
is it flattening?
or
is there weight loss?
Look for visible wasting.
Look and feel for oedema of both feet.
Look for palmar pallor, and
Check haemoglobin if anaemia is suspected.

3.2.1 Severe malnutrition

E42

Description

Severe malnutrition is defined as a weight-for-age less than 60% of the expected weight, marasmus, or nutritional oedema of both feet (kwashiorkor). According to IMCI classification, severe malnutrition is defined as very low weight.

Clinical presentation:
» Kwashiokor
  – nutritional oedema associated with skin changes, hepatomegaly and weight usually less than the 3rd percentile for age.
» Marasmus
  – clinical (visible) severe wasting and weight less than 60% of the expected weight for age.
» Marasmic kwashiorkor
  – features of both

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

Exception
Babies who were premature and are growing parallel to or better than the percentiles, would not be classified as severe malnutrition.

Danger signs in children with severe malnutrition:

- » dehydration
- » lethargy
- » hypothermia
- » jaundice
- » shock
- » weeping skin lesions
- » hypoglycaemia
- » refusing feeds

All children with severe malnutrition need stabilisation, followed by urgent referral, as they are at risk of complications or death due to:

- » hypothermia
- » hypoglycaemia
- » infection
- » fluid overload leading to heart failure

Initiate treatment while waiting for transport to hospital.

General measures

Prevent or treat hypoglycaemia

- » Begin feeding **immediately** if the child is stable and able to take oral feeds.
  Feed at 15 mL/kg 3 hourly.
  - – If the child is hypothermic or hypoglycaemic, feed 10 mL/kg 2 hourly.
  - – If oral feeds are refused or not finished, feed via a nasogastric tube

  Use expressed breast milk if mother is breastfeeding or any available breast milk substitute.
- » Check blood glucose with a finger prick glucose stix test on arrival and 3 hourly.
  If blood glucose under 3 mmol/L in asymptomatic child give whichever of the following is most quickly available:
  - – immediate feed, or
  - – dextrose 10% (50 mL) or
  - – sucrose solution (1 rounded teaspoon of sugar in 3 and a half tablespoons of water)
- » Recheck blood sugar in 30 minutes to confirm above 3 mmol/L.
  If hypoglycaemia symptomatic (fits/decreased consciousness) or severe hypoglycaemia (< 1.5 mmol/L) or unresponsive hypoglycaemia give:
  - – dextrose water 10% 5 mL/kg IV (1 part 50% dextrose diluted with 4 parts sterile water) and immediately restart feeds.

Prevent or treat hypothermia:

- » Measure under-arm temperature 3 hourly.
  Keep child warm using mother-child skin-to-skin contact (Kangaroo care), if mother is present.
  Keep the child dry and covered at all times, especially the head and avoid drafts.

If the axillary temperature is below 36ºC, warm urgently (use skin to skin contact with mother and wrap both in blankets, if this is not possible clothe and wrap the child in dry warm clothes and blankets and keep near a heater in a warm area). Monitor temperature 2 hourly until more than 36.5ºC then resume 3 hourly monitoring.

Drug treatment

! CAUTION !
In malnutrition if IV fluids are given for severe dehydration/shock, give Sodium chloride 0.9% 10 mL/kg/ hour and check for volume overload after each bolus – once stable continue with ORS orally or by nasogastric tube.

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

If there are no danger signs – 1st dose while arranging referral to hospital:

- Amoxicillin, oral, 20–30 mg/kg as a single dose

Weight kg	Dose mg	Use one of the following syrups		Age Months/years
		125 mg/ 5 mL	250 mg/ 5 mL	
≥ 2–2.5 kg	62.5 mg	2.5 mL	1.25 mL	34–36 weeks
≥ 2.5–3.5 kg	100 mg	4 mL	2 mL	Birth–1 month
≥ 3.5–5.5 kg	125 mg	5 mL	2.5 mL	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	≥ 6–18 months
≥ 11–17.5 kg	375 mg	15 mL	7.5 mL	≥ 18 months–5 years

If the child has any danger signs:

- Ceftriaxone, IM, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adults

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-Lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dosage and route of administration in the referral letter.

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years
  - o give to neonate at birth if not breast fed
  - o if breast fed, give to mother

Age range	**Dose** units	**Capsule** 50 000 u	**Capsule** 100 000 u	**Capsule** 200 000 u
Mother who will breast feed	200 000	–	2 capsule	1 capsule
Infants 6–11 months old	100 000	2 capsules	1 capsule	–
Children 12 months to 5 yrs	200 000	–	2 capsule	1 capsule

3.2.2 Failure to thrive or not growing well

E45

Description

Children and infants who have either:

» unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health Chart
or
» low weight for age , i.e. under the 3rd percentile weight for age but over the 60% expected weight for age

Note:
Babies who were premature and growing parallel to or better than the percentiles, should not be classified as failure to thrive or not growing well.

Failure to thrive (FTT) may be due to:

» insufficient food intake due to anorexia and illness or poor availability of food
» insufficient uptake of nutrients, e.g. malabsorption
» insufficient use of nutrients for growth due to chronic disease
» an increased demand for nutrients due to illness such as TB

Conduct a feeding and clinical assessment to determine the cause and exclude anaemia.

General measures

» Counselling on nutrition.
» Nutritional supplementation should be supplied unless there is a correctable cause.

Drug treatment

- Multivitamin, oral, daily

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

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

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years
  - give to neonate at birth if not breast fed
  - if breast fed, give to mother

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Mother who will breast feed	200 000	2 capsules	1 capsule
Infants 6–11 months old	100 000	1 capsule	–
Children 12 months to 5 yrs	200 000	2 capsules	1 capsule

Anaemia
See section 3.1: Anaemia

Referral

» No response to treatment
» All children other than those with insufficient food intake
» Severe malnutrition

3.3 Vitamin A deficiency

E50.9

Description

A condition predominantly affecting the skin, mucous membranes and the eyes. It is most common in children of 1 to 5 years.
If associated with measles and diarrhoea there is an increased risk of illness and death.
If not identified and treated early, it can cause blindness.

Clinical features include:
» night blindness or inability to see in the dark
» Bitot's spot or white foamy patches on the eye
» conjunctival xerosis or the conjunctiva becomes dry
» corneal xerosis or the cornea becomes dry
» keratomalacia or wrinkling and cloudiness of cornea
» corneal ulceration or the cornea becomes soft and bulges

General measures

Dietary supplementation with vitamin A rich food including:
» fortified maize meal and/or bread
» carrots, sweet potato, mangoes and pawpaw
» dark green leafy vegetables e.g. morogo/ imifino and spinach
» liver, eggs, full cream milk and fish

Drug treatment

Prophylaxis

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years
  - o give to neonate at birth if not breast fed
  - o if breast fed, give to mother

Age range	Dose units	Capsule 100 000 u	Capsule 200 000 u
Mother who will breast feed	200 000	2 capsules	1 capsule
Infants 6–11 months old	100 000	1 capsule	–
Children 12 months to 5 yrs	200 000	2 capsules	1 capsule

Note:
A high-dose vitamin A capsule can be given to post-partum women up to 8 weeks after delivery if the mother is breastfeeding, or within 6 weeks if she is not breastfeeding.

Treatment
Children 0–5 years with:

- severe under nutrition
- persistent diarrhoea
- any of the clinical signs of vitamin A deficiency
- measles

Older children and adults with:

» any clinical signs of vitamin A deficiency
» measles

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years
  - o give to neonate at birth if not breast fed
  - o if breast fed, give to mother

Age range	Dose units	Capsule 50 000 u	Capsule 100 000 u	Capsule 200 000 u
Newborn – not breast fed	50 000	1 capsule	–	–
Newborn – breast fed	–	–	–	–
Mother who will breast feed	200 000	–	2 capsules	1 capsule
Infants 6–11 months old	100 000	2 capsules	1 capsule	–
Children 12 months to 5 yrs	200 000	–	2 capsules	1 capsule

Administration of a vitamin A capsule

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

Note:

» Children suffering from measles or clinical vitamin A deficiency should receive a repeat dose the following day.
» Children who received a prophylactic dose within the previous month should not receive the treatment dose of vitamin A.
» If a child is scheduled to receive a routine prophylactic dose of vitamin A and has received a treatment dose within the past month, postpone the routine dose for approximately one month.
» Wait at least one month between doses.
» Children receiving routine multivitamin syrup can still receive routine vitamin A supplements.

Referral

» All complicated cases

3.4 Vitamin B deficiencies

E53.9

Description

A condition in which some of the B group vitamins are deficient. This occurs commonly in malnutrition and alcoholism.

General measures

» Lifestyle adjustment
» Discourage alcohol abuse

Drug treatment

- Vitamin B complex, oral, 2 tablets three times daily for 1 week, then one tablet daily for 3 months

3.4.1 Pellagra (nicotinic acid deficiency)

E53.9

Description

Pellagra is a condition associated with nicotinic acid deficiency.
It is usually accompanied by other vitamin deficiencies.

Clinical features include:

» diarrhoea
» dementia
» dermatitis with darkening of sun-exposed skin

General measures

» Lifestyle adjustment.
» Patient counselling.
» Discourage alcohol abuse.

Drug treatment

Children

- Nicotinamide, oral, 100 mg 8 hourly

Adults

- Nicotinamide, oral, 100 mg 8 hourly

Referral

» Failure to respond

3.4.2 Pyridoxine (Vitamin B_6) deficiency

E53.1

Description

Commonly presents assigns of peripheral neuropathy including:
» tingling sensation
» burning pain or numbness of the feet

Pyridoxine deficiency is related to:
» malnutrition
» alcoholism
» isoniazid or combination TB therapy

Drug treatment

Children

- Pyridoxine, oral, 50–200 mg daily for 3 weeks

Adults

- Pyridoxine, oral, 200 mg daily for 3 weeks

Then follow with:

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

Referral

» Failure to respond
» Children

3.4.3 Thiamine deficiency (Wernicke's encephalopathy and beriberi)

E53.9

Description

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

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

General measures

» Lifestyle adjustment.

Drug treatment

Peripheral neuropathy and cardiac failure (wet beriberi):
- Thiamine, oral, 100 mg daily

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

Patients presenting with encephalopathy or eye muscle paralysis
- Thiamine, IM, 100 mg

Followed by:
- Dextrose 5 %, IV

Referral

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

Chapter 4: Cardiovascular conditions

4.1 Prevention of ischaemic heart disease and atherosclerosis

I25.1

Major risk factors for ischaemic cardio- and cerebrovascular disease

» diabetes mellitus
» hypertension
» central obesity: waist circumference ≥ 102 cm (men) and ≥ 88 cm (women)
» smoking
» dyslipidaemia:
  – total cholesterol > 6.5 mmol/L, or
  – LDL > 4 mmol/L, or
  – HDL < 1 mmol/L in men and < 1.2 mmol/L in women
» family history of premature cardiovascular disease in male relatives less than 55 years and in female relatives less than 65 years
» age: men > 55 years, women > 65 years

General measures

Lifestyle modification

All persons with risk factors for ischaemic heart disease should be encouraged to make the following lifestyle changes as appropriate:

» maintain ideal weight, i.e. BMI < 25
» weight reduction in the overweight patient, i.e. BMI > 25
» reduce alcohol intake to no more than 2 standard drinks/day
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with adequate fresh fruit and vegetables
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week
» smoking cessation

Calculation of absolute risk of myocardial infarction over 10 years (in the absence of ischaemic heart disease and monogenetic dyslipidaemia)

To derive the absolute risk as percentage of subjects who will have a myocardial infarction over 10 years: Add the points for each risk category (men – section A; women – section B).

The risk associated with the total points is then derived from section C (for men and women).

Section A: Men

Age (years)	Points
30–34	–1
35–39	0
40–44	1
45–49	2
50–54	3
55–59	4
60–64	5
65–69	6
70–74	7

Total cholesterol	Points
< 4.1 mmol/L	–3
4.2–5.2	0
5.3–6.2	1
6.3–7.2	2
> 7.2	3

HDL cholesterol	Points
< 0.91 mmol/L	2
0.91–1.16	1
1.17–1.29	0
1.3–1.55	0
> 1.55	–2

Blood pressure*	Points
< 120 / < 80	0
120–129 / 80–84	0
130–139 / 85–89	1
140–159 / 90–99	2
≥ 160 / ≥ 100	3

Other	Points
Non-smoker	0
Smoker	2
Not diabetic	0
Diabetic	2

Section B: Women

Age (years)	Points
30–34	–9
35–39	–4
40–44	0
45–49	3
50–54	6
55–59	7
60–64	8
65–69	8
70–74	8

Total cholesterol	Points
< 4.1 mmol/L	–2
4.2–5.2	0
5.3–6.2	1
6.3–7.2	1
> 7.2	3

HDL cholesterol	Points
< 0.91 mmol/L	5
0.91–1.16	2
1.17–1.29	1
1.3–1.55	0
> 1.55	–3

Blood pressure*	Points
< 120 / < 80	–3
120–129 / 80–84	0
130–139 / 85–89	0
140–159 / 90–99	2
≥ 160 / ≥ 100	3

Other	Points
Non-smoker	0
Smoker	2
Not diabetic	0
Diabetic	4

* Use the highest reading of either diastolic or systolic pressure (mmHg).

Section C: Risk (% of cohort defined by the score who will have a myocardial infarction in 10 years)

Total points	–2	–1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Men (%)		2	3	3	4	5	7	8	10	13	16	**20**	**25**	**31**	**37**	**45**	**>53**			
Women (%)	1	2	2	2	3	3	4	4	5	6	7	8	10	11	13	15	18	**20**	**24**	**>27**

The score is gender dependent: for example, 6 points for men and 10 for women both have a 10% risk.

Drug treatment

Indication for Lipid Lowering Drug Therapy

» Established atherosclerotic disease:
  – ischaemic heart disease
  – peripheral vascular disease
  – atherothrombotic stroke

  Note:
  Lipid lowering drugs should be administered in this setting even if the cholesterol is normal.

» Type 2 diabetics

  Note:
  Lipid lowering drugs should be administered in this setting even if the cholesterol is normal.

» A risk of MI of greater than 20% in 10 years (see table above)

  Note:
  Lipid lowering therapy should only be commenced in this group if the dyslipidaemia is not corrected with lifestyle modification

» Such high-risk patients will benefit from lipid lowering (statin) therapy irrespective of their baseline LDL-C levels.

Note:
When lipid-lowering drugs are used, this is ALWAYS in conjunction with ongoing lifestyle modification.

HMGCoA reductase inhibitors (statins) that lower LDL by at least 25%, e.g.:

- Simvastatin, oral, 10 mg daily

Referral

» Random cholesterol >7.5 mmol/L
» Fasting triglycerides >10 mmol/L

4.2 Angina pectoris, unstable

I20.0

Description

Unstable angina is a medical emergency and if untreated can progress to myocardial infarction.

Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:

» angina at rest or minimal effort
» angina occurring for the first time, particularly at rest
» prolonged angina lasting longer than 10 minutes and is not relieved by sublingual nitrates
» the pattern of angina accelerates and gets worse

Diagnosis

» made from good history
» ECG may show ST segment depression or transient ST segment elevation
» a normal ECG does not exclude the diagnosis

Drug treatment

- Oxygen 40% via facemask

- Aspirin soluble, oral, 150 mg immediately.

plus

- Isosorbide dinitrate, sublingual, 5 mg immediately and then repeat once if necessary for pain relief

plus

- Morphine, IV, 5–10 mg
  - Dilute IV morphine to 10 mL with water for injection or sodium chloride 0.9%.

This is a high-risk condition for CVD and is an indication for a statin for patients with proven lesions.

HMGCoA reductase inhibitors, e.g.:

- Simvastatin, oral, 10 mg/day.
  This therapy requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance.
  Random cholesterol should be measured at baseline.
  If < 7.5 mmol/L – initiate therapy.
  If > 7.5 mmol/L – initiate therapy and refer for further assessment.

Therapy should be initiated together with appropriate lifestyle modification and adherence monitoring.

Referral

Urgent

» All patients

4.3 Angina pectoris, stable

I20

Description

Characteristic chest pain due to myocardial ischaemia usually occurring on exercise and relieved by rest.

General measures

» Life style modification.
» Intensive health education.
» Modify reversible risk factors.

Drug treatment

Long-term prophylaxis for thrombosis:

- Aspirin soluble, oral, 150 mg daily

plus

Nitrates, short acting e.g.:

- Isosorbide dinitrate, sublingual, 5 mg
  - o May be repeated if required at 5-minute intervals for 3 or 4 doses.

plus

STEP 1

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

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

STEP 2
add

Long acting calcium channel blocker e.g.:

- Amlodipine, oral, 5 mg daily
  or
  Nifedipine, oral, slow release 30 mg daily

STEP 3
add

- Isosorbide mononitrate, oral, 10–20 mg 12 hourly
  or
  Isosorbide dinitrate, oral, 20–40 mg, 12 hourly
  - o At 8:00 and 14:00 hours for both drugs in order to provide a nitrate free period to prevent tolerance.

- o Modify for night shift workers.

This is a high-risk condition for CVD and is an indication for a statin for patients with proven lesions.
HMGCoA reductase inhibitors, e.g.:

- Simvastatin, oral, 10 mg/day.
  This therapy requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance.

Therapy should be initiated together with appropriate lifestyle modification and adherence monitoring.

Referral

» When diagnosis is in doubt
» Failed medical therapy

4.4 Cardiac arrest, cardio-pulmonary resuscitation (See Chapter 21 – Trauma and emergencies)

I46.9

4.5 Cardiac failure, congestive (CCF)

I50.0

4.5.1 Cardiac failure, congestive (CCF), adults

I50.0

Description

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

Signs and symptoms include:

» dyspnoea (breathlessness)
» tachypnoea (breathing rate more than 18 in men and more than 20 in women)
» inspiratory basal crackles or crepitations on auscultation of the lungs
» fatigue
» ankle swelling with pitting oedema
» raised jugular venous pressure
» tachycardia
» enlarged liver, often tender

General measures

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

Drug treatment

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

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

STEP 1: Diuretic plus ACE inhibitor

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

- Hydrochlorothiazide, oral, 25–50 mg daily
  - Contraindication:
    - gout
    - severely impaired liver function
    - severely impaired renal function

Significant volume overload or abnormal renal function – loop diuretic

- Furosemide, oral, daily. (Doctor initiated)
  - Initial dose: 40 mg
  - Maximum dose: 80 mg
  - Higher dosages may be needed if also renal failure
  - Once failure has improved, consider switching to hydrochlorothiazide
  - Monitor electrolytes and creatinine

Acute pulmonary oedema

- Furosemide, IV

See section 21.15: Pulmonary oedema, acute

Note:

» Reduce diuretic dose when ACE inhibitor is introduced
» Routine use of potassium supplements with diuretics is not recommended. They should only be used short term to correct documented low serum potassium level

All patients with CCF, unless contraindicated or poorly tolerated

ACE inhibitor, e.g.:

- Enalapril up to maximum of 10 mg twice daily
  - Titrate dosages gradually upwards until an optimal dose is achieved
  - Absolute contraindications include: (also see package insert)
    - cardiogenic shock
    - bilateral renal artery stenosis or stenosis of an artery to a single

kidney , aortic valve stenosis and hypertrophic obstructive cardiomyopathy
- pregnancy
- angioedema with previous use of ACE inhibitors or angiotensin receptor blockers

STEP 2: Add spironolactone, only if serum potassium can be monitored

- Spironolactone, oral, 25 mg daily

! CAUTION !
Spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored.
Do not use together with potassium supplements.
Do not use in kidney failure.

STEP 3: Carvedilol (alpha 1 and non-selective beta blocker) unless contra-indicated. (See package insert for full prescribing information)

- Carvedilol, oral
  - Starting dose: 3.125 mg twice daily.
  - Increase at two-weekly intervals by doubling the daily dose until maximum of 25 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Absolute contraindications include: (also see package insert)
    - patients with cardiogenic shock, bradycardia, various forms of heart block
    - severe fluid overload
    - hypotension
    - asthma

Note:
Do not use atenolol for cardiac failure.

STEP 4: Refer

Symptomatic CCF despite above therapy
- Digoxin, oral, 0.125 mg daily
  - Patients in whom plasma levels should be monitored:
    - the elderly
    - patients with poor renal function
    - low body weight

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

Referral

Urgent

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

Referral

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

4.5.2 Cardiac failure, congestive (CCF), children

I50.0

Description

Congestion of the systemic or pulmonary venous systems due to cardiac dysfunction of various different causes and is often mistaken for respiratory infection.
Many conditions including congenital heart disease and acquired cardiac and lung conditions (such as cor-pulmonale due to bronchiectasis in HIV positive children) can cause cardiac failure in children.

Signs and symptoms

Infants

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

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

Children

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

General measures

While arranging transfer:

- Oxygen, using nasal canula at 2–3 L per minute
  or
  Oxygen 40%, using face mask at 2–3 L per minute

» Semi-Fowlers position

Note:

If hypertensive, consider glomerulonephritis in children.

Drug treatment

While arranging transfer:

If CCF is strongly suspected

- Furosemide, IV, 1 mg/kg immediately. Do not put up a drip or run in any IV fluids

Weight kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9– 11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14–17.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

Referral

» All children with suspected congestive cardiac failure

4.6 Myocardial infarction, acute (AMI)

I21.9

Description

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

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

» site – retrosternal or epigastric
» quality – crushing or burning pain or discomfort
» radiation – to the neck and/or down the inner part of the left arm

» duration – at least 20 minutes and often not responding to sublingual nitrates.
» occurs at rest

and may be associated with:

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

Note:
Not all features have to be present.

Emergency treatment before transfer

» Cardio-pulmonary resuscitation if necessary (See section 21.4: Cardiac arrest – cardiopulmonary resuscitation)

- Oxygen, 40%, by facemask

- Aspirin soluble, oral, 150 mg as a single dose as soon as possible

plus

- Isosorbide dinitrate, sublingual, 5 mg, every 5–10 minutes as needed for relief of pain to a maximum of 5 tablets.

plus

- Morphine 15 mg diluted with 14 ml of water for injection or normal saline, slow IV. (Doctor initiated.)
  - Start with 2–3 mg thereafter slowly increase by 1 mg/minute up to 10–15 mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension

plus

Only for confirmed ST-elevation myocardial infarction or new LBBB and if patient presents within 6 hours of onset of pain:

- Streptokinase, IV, 1.5 million IU diluted in 100 mL dextrose 5% or sodium chloride 0.9% and given over 30–60 minutes. (Doctor initiated.)
  - Start as soon as possible after diagnosis is made, preferably within the first 3 hours.
  - **Contraindications**
    - known bleeding disorder
    - stroke within last 6 months or any previous haemorrhagic stroke
    - GIT bleeding within last 3 months or peptic ulcer
    - recent major trauma, surgery or head injury.
    - streptokinase given within past 1 year or known allergy to it.

! CAUTION !
Blood pressure may decrease and pulse rate may increase after administration of streptokinase.
Do not stop streptokinase when there is a drop in blood pressure. However, discontinue streptokinase if patient shows manifestations of impending shock.

Monitor continuously and also during transfer:
» pulse
» blood pressure
» respiration depth and rate (count for a full minute)

Aftercare

This is a high-risk condition for CVD and is an indication for a statin for patients with proven lesions.
HMGCoA reductase inhibitors, e.g.:
- Simvastatin, oral, 10 mg daily.

This therapy requires good initial evaluation, ongoing support for patients and continuous evaluation to ensure compliance.
Random cholesterol should be measured at baseline.
If < 7.5 mmol/L – initiate therapy.
If > 7.5 mmol/L – initiate therapy and refer for further assessment.
Therapy should be initiated together with appropriate lifestyle modification and adherence monitoring.

Referral

Urgent
» All suspected or diagnosed cases

4.7 Hypertension

I10

4.7.1 Hypertension in adults

I10

Description

A condition characterised by a blood pressure (BP) elevated above normal measured on three separate occasions, a minimum of 2 days apart. However, when blood pressure is severely elevated (see table), a minimum of 3 blood pressure readings must betaken at the first visit to confirm hypertension. Ensure that the correct cuff size is used in obese patients.
» Systolic BP equal to or more than 140 mmHg.
and/or
» Diastolic BP equal to or more than 90 mmHg

LEVELS OF HYPERTENSION IN ADULTS

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

» Achieve and maintain the target BP
  – In most cases the target BP should be: systolic below 140 mmHg and diastolic below 90 mmHg.
» Achieve target BP in special cases as:
  – In diabetic patients and patients with cardiac or renal impairment, target BP should be below 130/80 mmHg

General measures

All patients with hypertension require lifestyle modification:
» weight loss if overweight
» regular physical exercise
» stop smoking
» moderate or no alcohol intake
» restrict salt intake
» restrict fat intake
» adequate dietary fibre intake (fruit, vegetable and unrefined carbohydrate)

Drug treatment

Initial drug choices in patients qualifying for treatment is dependent on presence of compelling indications.

Drug treatment choices without compelling indications

Mild hypertension
When there are no risk factors and there is poor response to lifestyle modification measures after 3 months, initiate drug therapy.

Moderate hypertension
Initiate drug therapy as well as lifestyle modification after confirmation of diagnosis.

Presence of risk factors
Drug therapy as well as lifestyle modification, should be initiated after confirmation of diagnosis

Special cases

Pregnancy-induced hypertension:

- Methyldopa, oral, 250–500 mg, 6–8 hourly, only during pregnancy

Hypertension urgency

Systolic BP above 240 mmHg, diastolic BP above 140 mmHg without symptoms of target organ damage:

» initiate treatment at step 3

Stroke

Blood pressure is normally elevated in acute stroke and should only be treated if it persists for more than two days or is severely elevated.
Diastolic BP above 130 mmHg.
Reduce gradually.

Elderly

In patients without co-existing disease, initiate drug treatment only when systolic BP above 160 and diastolic above 90 mmHg.

Note:

Check adherence to medication before escalating therapy.
Monitor patients monthly and adjust therapy if necessary until the BP is stable.
After target BP is achieved, patients may be seen at 3–6 monthly intervals.

! CAUTION !
Lower BP over a few days.
A sudden drop in BP can be dangerous, especially in the elderly.

Stepwise treatment without compelling indications

STEP 1

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

STEP 2

Entry to Step 2	Treatment	Target
» Diastolic BP 90 − 99 mmHg and systolic BP 140 − 159 mmHg without any existing disease **and** » No major risk factors **and** » Failure of lifestyle modification alone to reduce BP after 3 months **or** Mild hypertension with major risk factors or existing disease **or** Moderate hypertension at diagnosis	» Lifestyle modification **and** • Hydrochlorothiazide, oral, 12.5 mg daily	» BP control within 1 month to systolic BP below 140 and diastolic below 90 mmHg

STEP3

Entry to Step 3	Treatment	Target
» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy **or** » Severe hypertension (See table)	» Lifestyle modification **and** • Hydrochlorothiazide, oral, 12.5 mg daily **add** • ACE-inhibitor, e.g.: enalapril, 10 mg daily **or** Long acting calcium channel blocker, e.g.: amlodipine, oral 5 mg daily	» BP control within 1 month to systolic BP below 140 and diastolic below 90 mmHg

STEP 4

Entry to Step 4	Treatment	Target
» Failure of step 3 after 1 month of compliance	» Lifestyle modification **and** • Hydrochlorothiazide, oral, 12.5 mg daily **and** • ACE-inhibitor, e.g.: enalapril, increase to 10−20 mg daily **and** • Long acting calcium channel blocker, e.g.: amlodipine, oral, 5 mg daily	» BP control within 1 month to systolic BP below 140 and diastolic below 90 mmHg with no side-effects

STEP 5

Entry to Step 5	Treatment	Target
» Failure of step 4 after 1 month of compliance	» Lifestyle modification **and** • Hydrochlorothiazide, oral, increase to 25 mg daily **and** • ACE-inhibitor, e.g. enalapril, 20 mg daily **and** • Long acting calcium channel blocker, e.g. amlodipine, oral 10 mg daily **and add:** • Atenolol, oral, 50 mg daily	

If not controlled on step 5 – Refer

Compelling indications for specific drugs	Drug class
Angina	• ß-blocker **or** Long acting calcium channel blocker
Prior myocardial infarct	• ß-blocker **and** • ACE inhibitor
Heart failure	• ACE inhibitor **and** • Carvedilol For volume overload: • Loop diuretic
Left ventricular hypertrophy (confirmed by ECG)	• ACE inhibitor
Stroke: secondary prevention	• Hydrochlorothiazide **and** • ACE inhibitor
Diabetes type 1 and 2 with or without evidence of microalbuminuria or proteinuria	• ACE inhibitor, usually in combination with diuretic
Chronic kidney disease	• ACE inhibitor, usually in combination with diuretic
Isolated systolic hypertension	• Hydrochlorothiazide **or** Long acting calcium channel blocker
Pregnancy	• Methyldopa

Contraindications to individual drugs

Hydrochlorothiazide

» gout
» pregnancy
» severe liver failure
» renal failure

Beta-adrenergic blocking agent e.g. atenolol

Absolute:

» asthma
» chronic obstructive airways disease

Relative:

» heart failure (not carvedilol)
» diabetes mellitus
» peripheral vascular disease
» bradycardia: pulse rate less than 50 per minute

ACE inhibitors
» pregnancy
» bilateral renal artery stenosis
» aortic valve stenosis
» history of angioedema

! CAUTION !
Advise all patients receiving ACEI about the symptoms of angioedema

Calcium channel blockers
» heart failure

Referral

» Young adults (under 30 years)
» BP not controlled by four drugs and where there is no doctor available.
» Pregnancy
» Signs of target organ damage, such as oedema, dyspnoea, proteinuria, angina etc.
» If severe side effects develop

HYPERTENSIVE EMERGENCY

Description

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

Drug treatment

- Amlodipine, oral, 10 mg immediately as a single dose

If pulmonary oedema:
- Furosemide, IV, 40 mg as a single dose

! CAUTION !
A hypertensive emergency needs immediate referral to hospital.

Referral

Urgent
» All patients

4.7.2 Hypertension in children

I10

Description

In children, the diagnosis of hypertension is based on weight or height. Hypertension is defined as systolic and/or diastolic blood pressure ≥ the 95th percentile for gender, age and height percentile on at least three consecutive occasions. See table below.

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

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

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

Diagnosis

95th Percentile of Systolic and Diastolic BP relation to age of child

Age of child	Systolic mmHg	Diastolic mmHg
6 weeks–6 years	115	80
8 years	120	82
9 years	125	84
10 years	130	86
12 years	135	88
14 years	140	90

or

95th Percentile of Systolic and Diastolic BP relation to height of child

Height cm	Systolic mmHg	Diastolic mmHg
100	114	70
110	116	72
120	118	74
130	120	74
140	125	75
150	130	75
160	135 (131)	77
170	140 (133)	80
180	145 (135)	83

(Girls 95th percentile given in brackets).

Referral

» All cases with BP above the 95th percentile

4.8 Pulmonary oedema, acute (See Chapter 21 - Trauma and emergencies)

J81

4.9 Rheumatic fever, acute

I01.9

Note: notifiable condition.

Description

A condition in which the body develops antibodies against its own tissues following a streptococcal throat infection. Effective treatment of streptococcal pharyngitis can markedly reduce the occurrence of this disease. Commonly occurs in children between 3 and 15 years of age.

Clinical signs and symptoms include:

» arthralgia or arthritis that may shift from one joint to another
» carditis including cardiac failure
» heart murmurs
» subcutaneous nodules
» erythema marginatum
» chorea (involuntary movements of limbs or face)
» other complaints indicating a systemic illness e.g. fever

Drug treatment

Eradication of streptococci in throat

- Benzathine benzylpenicillin, IM, single dose
  - Children under 30 kg: 600 000 IU
  - Children over 30 kg and adults: 1.2 MU

or

Adults and children

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

Penicillin–allergic patients**:**

- Erythromycin, oral, 6 hourly before meals for 10 days
  - Children 125 mg
  - Adults 250 mg

Prophylaxis for rheumatic fever

All patients with confirmed rheumatic fever and no rheumatic valvular disease

- Benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks) until the age of 21 years

All patients with confirmed rheumatic fever and rheumatic valvular disease

- Benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks) until the age of 35 years
  - Children under 30 kg: 600 000 IU
  - Children over 30 kg and adults: 1.2 MU

!CAUTION!
IM injections must be avoided if patients are on warfarin

or

Phenoxymethylpenicillin, oral, 12 hourly

- Children 1–6 years 125 mg
- Children > 6 years and adults 250 mg

Penicillin–allergic patients:

- Erythromycin, oral, 12 hourly before meals
  - Children 125 mg
  - Adults 250 mg

Referral

» All patients for diagnosis and management

4.10 Valvular heart disease and congenital structural heart disease

I09.9

Description

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

It may be complicated by:

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

General measures

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

Drug treatment

Prophylaxis antibiotic treatment for infective endocarditis

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

Dental extraction if no anaesthetic is required

- Amoxicillin, oral, 50 mg/kg with a ceiling dose of 2 000 mg, 1 hour before the procedure
  - o Repeat dose 6 hours later

Age	Dose
Less than 5 years	750 mg
5 to 10 years	1 500 mg
10 years and older	2 000mg

If allergic to penicillin:

» **Refer**

If anaesthetic is required:

» **Refer**

Prophylaxis for rheumatic fever

See section 4.9: Rheumatic fever, acute

Referral

» All patients with heart murmurs for assessment
» All patients with heart murmurs not on a chronic management plan
» Development of cardiac signs and symptoms
» Worsening of clinical signs and symptoms of heart disease
» Any newly developing medical condition, e.g. fever
» All patients with valvular heart disease for advice on prophylactic antibiotic treatment prior to any invasive diagnostic or therapeutic procedure

Chapter 5: Skin Conditions

5.1 Dry Skin

L85.3

Description

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

Drug treatment

- Emulsifying ointment (UE), to wash or bath.
- Aqueous cream (UEA), applied to dry areas as a moisturiser and for maintenance treatment.

5.2 Itching (pruritus)

L29.9

Description

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

General measures

» Lukewarm baths.
» Trim fingernails.

Drug treatment

- Calamine lotion, applied when needed.

or

In infants:

- Aqueous cream (UEA), applied when needed.

Severe or refractory pruritus

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL	–	≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥ 35–55 kg	4 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	4 mg	–	1 tablet	≥ 15 years and adults

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

For long term use in adults and school going children, e.g. for chronic pruritus

- Cetirizine, oral, once daily at night

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 1 mg/mL	**Tablet** 10 mg	
≥ 14–25 kg	5 mg	5 mL	–	≥ 3–7 years
≥ 25–55 kg	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	≥ 15 years and adults

! CAUTION !
Do not give an antihistamine to children under 6 months.

Referral

» No improvement after 2 weeks.

5.3 Acne vulgaris

L70.0

Description

A skin condition that is caused by hormones and sebum gland hypertrophy leading to a blocking and/or infection of the follicles with *Propionibacterium acnes*.
Occurs more commonly in adolescence but may also occur in adulthood.
It is distributed on face, chest and back.

It ranges in severity from mild, with a few blackheads, to severe with nodules and cysts.
Severe forms are common in HIV disease and itching may be a feature.

General measures

» Do not squeeze lesions.
» Avoid greasy cosmetics and hair spray.

Drug treatment

Many pustules

- Benzoyl peroxide 5%, gel, apply at night.
- Doxycycline, oral, 100 mg daily for 3 months.

!CAUTION!
As doxycycline impairs the efficacy of oral contraceptives, barrier contraception should be used in addition.

Referral

» No improvement after 3 months
» Development of severe complications e.g. deep pustules
» Severe cases of nodular acne

5.4 Bacterial infections of the skin

5.4.1 Boil, abscess

L02.9

Description

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

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

General measures

» Encourage general hygiene.

» Apply local hot compresses three times daily until the boil/abscess starts draining.
» Drainage of abscess is the treatment of choice. Perform surgical incision only after the lesion is mature.

Drug treatment

Systemic antibiotics are seldom necessary, except if there are:
» swollen lymph nodes in the area
» fever
» extensive surrounding cellulitis

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5 mL	**Capsule** 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5–11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11–25 kg	250 mg	10 mL	1 capsule	≥ 18 months–7 years
≥ 25 kg and above	500 mg	–	2 capsules	≥ 7 years and adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5 mL	**Tablets** 250 mg	
≥ 2.5–3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5	200 mg	8 mL		≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

Referral

» No response to treatment
» Progression of the condition

5.4.2 Impetigo

L01.0

Description

A common skin infection due to streptococci or staphylococci that occurs mainly in children.
Clinical features include:

» purulent sores with crusts or scabs
» pain
» usually starts on the face
» spreading to neck, hands, arms and legs

Note:
Check urine for blood if the sores have been present for more than a week.

General measures

» Prevent infection by keeping breaks in the skin clean.
» Avoid insect bites.
» Trim finger nails.
» Wash and soak sores in soapy water to soften and remove crusts.
» Advise on the importance of washing daily.
» Continue with general measures until the sores are completely healed.

Drug treatment

- Povidone iodine 5%, cream, apply three times daily

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

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Syrup 125mg/ 5mL	**Syrup** 250mg/ 5mL	**Capsule** 250 mg	
≥ 2–2.5 kg	50 mg	2 mL	–	–	34–36 weeks
≥ 2.5–3.5 kg	62.5 mg	2.5 mL	–	–	Birth–1 month
≥ 3.5–5 kg	75 mg	3 mL	–	–	≥ 1–3 months
≥ 5–7 kg	125 mg	5 mL	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	150 mg	6 mL	3 mL	–	≥ 6–12 months
≥ 9–11 kg	187.5 mg	7.5 mL	–	–	≥ 12–18 months
≥ 11–17.5 kg	250 mg	10 mL	5 mL	1 capsule	≥ 18 months–5 years
≥ 17.5–20 kg	375 mg	15 mL	7.5 mL	–	≥ 5–7 years
≥ 20–55 kg	500 mg	–	–	2 capsules	≥ 7–15 years
> 55 kg and above	500 mg	–	–	2 capsules	Adults

If no response:

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/5 mL	Tablets 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5–11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11–25 kg	250 mg	10 mL	–	≥ 18 months–7 years
> 25–55 kg	500 mg	–	2 capsules	≥ 7–15 years
≥ 55 kg and above	500 mg	–	2 capsules	Adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	Dose mg	Use one of the following:		Age Months / years
		Syrup 125 mg/5 mL	Tablets 250 mg	
≥ 2.5–3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5	200 mg	8 mL		≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

In patients with improvement but not complete cure, a further 5-day course of antibiotics should be given.

Referral

» No improvement in 10 days
» Presence of blood on urine test strip for longer than 5 – 7 days
» Clinical features of glomerulonephritis – See Section 8.3.1: Glomerular disease – Nephritic syndrome

5.4.3 Cellulitis

L03.9

Description

A skin infection that is usually caused by streptococci, but also staphylococci and occasionally other organisms.

A diffuse, spreading, acute infection within skin and soft tissues, characterised by:
» oedema
» increased local temperature
» redness
» no suppuration

Occurs commonly on the lower legs, but may occur elsewhere. May follow minor trauma. It is frequently associated with lymphangitis and regional lymph node involvement. There may be significant systemic manifestations of infection:
» fever
» chills
» tachycardia
» hypotension
» delirium/altered mental state

May present as an acute fulminant or chronic condition.

Drug treatment

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days
  - o 10 days for more severe infection

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/5 mL	**Capsules** 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5–11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11–25 kg	250 mg	10 mL	–	≥ 18 months–7 years
≥ 25–55 kg	500 mg	–	2 capsules	≥ 7–15 years
≥ 55 kg and above	500 mg	–	2 capsules	Adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 2.5–3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

Severe cases
Refer for parenteral antibiotics

Referral

» Children when associated with significant pain, swelling or loss of function - refer urgently to exclude osteomyelitis
» Extensive cellulitis
» Necrosis
» Recurrent cellulitis associated with underlying conditions, e.g. lymphoedema
» Cellulitis with systemic manifestations, e.g. confusion, hypotension
» Inadequate response to initial antibiotic treatment
» Poorly controlled diabetic patients

5.5 Fungal infections of the skin

B35

5.5.1 Athlete's foot – tinea pedis

B35.3

Description

A common contagious fungal infection (tinea) of the foot characterised by itching, burning and stinging between the toes spreading to the sole.
Secondary eczema of the hands may be an associated condition.
Vesicles may occur in inflammatory cases.
Reinfection is common.

General measures

» Discourage the use of shared bathing or swimming areas until healed.
» Use own towels and toiletries.
» Keep feet dry:
  – wear open shoes or sandals
  – do not wear socks of synthetic material
  – dry between toes after washing the feet or walking in water
  – wash and dry feet twice daily before applying treatment

Drug treatment

• Imidazole cream, e.g. clotrimazole 2%, applied twice daily for 4 weeks.

Referral

» Severe infection
» Involvement of the nails
» No improvement after 4 weeks

5.5.2 Candidiasis, skin

B37.2

Vaginal candidiasis: See section 12.2: Vaginal discharge syndrome

Description

A skin infection caused by *C. albicans*.
Most common sites for infection are skin folds such as:
» under the breasts
» perineum
» axilla
» nail folds
» groin

The skin lesions or sores:
» appear moist (weeping)
» may have peripheral white pustules and scales
» have clear edges
» are red raw-looking patches

Note:
Infection often occurs in immunocompromised patients.
Suspect HIV if the infection is severe or chronic.
Exclude diabetes.

Drug treatment

- Imidazole cream, e.g. clotrimazole 2% cream, applied three times daily for 14 days

Referral

» No response to topical treatment

5.5.3 Ringworm and other tineas

B35.9

Description

A highly contagious fungal infection of the skin that can be found anywhere on the body.
Clinical features include:
» itchy ringlike patches
» raised borders
» patches slowly grow bigger
As the patch extends a clear area develops in the center which may become

hyperpigmented in dark skin.
Extensive disease is common in HIV.

General measures

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

Drug treatment

Treat any secondary skin infection with antibiotics – See section 5.4.2: Impetigo

- Imidazole, e.g. clotrimazole 2% cream, topical, applied 3 times daily.
  - Continue using cream for at least 2 weeks after lesions have cleared.

For scalp infections (Doctor initiated):

- Fluconazole, oral, 5–8 mg/kg for 28 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/ years
		Capsule 50 mg	**Capsule** 200 mg	
≥ 7–11 kg	50 mg	1 capsule	–	≥ 6–18 months
≥ 11–25 kg	100 mg	2 capsules	–	≥ 18 months–7 years
≥ 25–55 kg	150 mg	3 capsules	–	≥ 7–15 years
≥ 55 kg and above	200 mg	–	1 capsule	≥ 15 years and adults

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

Tinea versicolor
Oral antifungal therapy is not indicated.

- Selenium sulphide shampoo
  - Apply daily to body for 3 days.
  - Leave on for 30 minutes then wash off.

Referral

» Infection is widespread
» No response to treatment for scalp lesions

5.6 Parasitic infections of the skin

5.6.1 Lice (pediculosis)

B85.2

Description

An infestation of the hairy parts of the body with lice.
Head lice are common in children. The eggs (nits) appear as fixed white specks on the hair.
Body lice live in the seams of clothing and only come to the skin to feed.

Clinical features include:
» itching
» bite marks
» presence of secondary eczema and secondary infection

Note:
Body lice may carry typhus fever.

General measures

Head lice
» Wash hair.
» Use a fine comb to comb out the nits after washing hair.
» Shave the head. This may not be necessary if permethrin rinse is used.
» Prevent spread by treating other contacts.
» Remove nits manually from eyelashes.

Body lice
» Do not shave the pubic area.
» Prevent spread by treating other contacts.
» Regularly wash bed linen and underclothes in hot water and expose to sunlight.

Drug treatment

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

Head lice
- Permethrin 1% cream rinse, applied after washing hair with shampoo.
  - o Rinse off after 10 minutes.

  Note:
  - o **Do not** apply to broken skin or sores.
  - o **Avoid** contact with eyes.

Body lice

Adults and adolescent children:

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

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

Antibiotic treatment for secondary infection
See section 5.4.2: Impetigo

Referral

» Lice infestation of eyelashes in children to exclude inappropriate sexual contact (suspected sexual abuse)

5.6.2 Scabies

B86

Description

An infestation with the parasite *Sarcoptes scabei.* Most commonly occurs in the skin folds.
The infestation spreads easily and usually affects more than one person in the household.

Clinical features include:

» intense itching, which is more severe at night
» the presentation of small burrows between fingers, toes, elbow areas and skin folds where the parasite has burrowed under the skin
» secondary infection which may occur due to scratching with dirty nails

General measures

All close contacts must be treated simultaneously even if they are not itchy – see drug treatment below.

» Cut finger nails and keep them clean.
» Wash all linen and underclothes in hot water.
» Expose all bedding to direct sunlight.
» Put on clean, washed clothes after drug treatment.

Drug treatment

Adults and children over 6 years:

- Benzyl benzoate 25% lotion, applied undiluted to the whole body from the neck to the feet on two consecutive days.
  - Leave on overnight and wash off the next day.

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

If benzyl benzoate is unsuccessful:

- Sulphur 5% ointment, applied daily for 3 days

Children under 6 years:

- Sulphur 5% ointment, applied daily for 3 days

  Note:
  - Itching may continue for 2–3 weeks after treatment.
  - Do not continue if rash or swelling develops
  - Avoid contact with eyes and broken skin or sores

Treatment may need to be repeated after one week.

Antibiotic treatment for secondary infection
See section 5.4.2: Impetigo

5.7 Eczema

5.7.1 Eczema, atopic

L20.9/B00.0

Description

An itchy red rash or dry rough skin linked to allergy.
In babies it appears at approximately 3 months.
A family history of asthma, hay fever or atopic dermatitis is common.
Clinical features:

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

Eczema is usually a chronic condition and requires long term care.
Sufferers of atopic eczema are particularly susceptible to herpes simplex infection

and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).

General measures

» Avoid wearing clothes made from wool.
» Avoid overheating by blankets at night.
» Cut nails short.
» Avoid scratching.
» Avoid perfumed soap.

Drug treatment

STEP 1

- Emulsifying ointment (UE), to wash or bath
- Aqueous cream (UEA), applied to dry areas as a moisturiser

STEP 2

If no response within seven days or more severe eczema:

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

If there is a response:
Reduce the use of the hydrocortisone cream over a few days and maintain treatment with:

- Aqueous cream (UEA)
  or
  Emulsifying ointment (UE)

STEP 3

If no response within seven days or more severe eczema:

- Potent topical corticosteroids, e.g. betamethasone 0.1% ointment applied twice daily for 7 days (Doctor initiated)
  - **Do not** apply to face, neck and flexures

If there is a response:
Reduce the use of the hydrocortisone cream over a few days and maintain treatment with:

- Aqueous cream (UEA)
  or
  Emulsifying ointment (UE)

For itching not controlled with topical treatment:

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 2 mg/5 mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL		≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL		≥ 7–11 years
≥ 35–55 kg	4 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	4 mg	–	1 tablet	≥ 15 years and adults

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

For long term use in adults and school going children:

- Cetirizine, oral, once daily at night

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 1 mg/ L	**Tablet** 10 mg	
≥ 14–25 kg	5 mg	5 mL	–	≥ 3–7 years
≥ 25– 55 kg	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	Adults

For eczema herpeticum:

- Aciclovir, oral, 8 hourly for 10 days
  - o Paediatric dose: 250 mg/m^2/dose

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5 mL	**Tablet** 200 mg	**Tablet** 400 mg	
≥ 3.5–7 kg	80 mg	2 mL	–	–	≥ 1–6 months
≥ 7–11 kg	100 mg	2.5 mL	–	–	≥ 6–18 months
≥ 11–14 kg	120 mg	3 mL	–	–	≥ 18 months–3 years
≥ 14–25 kg	160 mg	4 mL	–	–	≥ 3–7 years
≥ 25–35 kg	200 mg	5 mL	1 tablet	½ tablet	≥ 7–11 years
≥ 35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥ 11–15 years
≥ 55 kg and above	400 mg	–	2 tablets	1 tablet	≥ 15 years and adults

Referral

» No improvement in 2 weeks
» Infants requiring more than 1% hydrocortisone

5.7.2 Eczema, acute, moist or weeping

L21.9

Description

A form of eczema with microscopic or large vesicles, associated with oozing and eventual crusting and scaling.

General measures

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

Drug treatment

Antibiotic treatment for staphylococcal secondary infection:

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5mL	**Capsule** 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5–11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11–25 kg	250 mg	10 mL	–	≥ 18 months–7 years
> 25–55 kg	500 mg	–	2 capsules	≥ 7–15 years
≥ 55 kg and above	500 mg	–	2 capsules	Adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5mL	**Capsule** 250 mg	
≥ 2.5–3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5	200 mg	8 mL		≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

For itching:

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 2 mg/5 mL	**Tablet** 4 mg	
> 9–11 kg	1 mg	2.5 mL	–	> 12–18 months
> 11–14 kg	1.2 mg	3 mL	–	> 18 months–3 years
> 14–17.5 kg	1.5 mg	4 mL	–	> 3–5 years
> 17.5–25 kg	2 mg	5 mL	–	> 5–7 years
> 25–35 kg	3 mg	7.5 mL	–	> 7–11 years
35 kg and above	4 mg	–	1 tablet	> 11 years and adults

Topical steroids should only be considered after the infection has cleared.

Referral

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

5.7.3 Dermatitis, seborrhoeic

L21.9

Description

In its simplest form it is dandruff, which tends to be rather oily. Pruritus may or may not be present. The scalp, ears and skin folds are commonly affected. It may become very extensive, particularly in infants and HIV infected patients.

General measures

» Cut nails short.
» Avoid scratching.
» Avoid perfumed soap.

Drug treatment

- Hydrocortisone 1% cream, applied 2–3 times daily until improved.
  - Then apply once or twice weekly for maintenance as needed.

For severe eczema:

- Betamethasone 0.1% ointment, applied twice daily for 5–7 days. (Doctor initiated)
  - **Do not** apply to face and skin folds.

For scalp itching, scaling and dandruff:

- Selenium sulphide 2% suspension
  - o Apply weekly by lathering on the scalp
  - o Rinse off after 10 minutes

Note:
Consider the possibility of HIV infection in patients with diffuse seborrhoeic eczema.

5.8 Nappy rash

L22

Description

A diffuse reddish eruption usually caused by irritation from:

» persistent moisture and irregular cleaning and drying or nappy in area,
» diarrhoeal stools, and
» underlying skin conditions in some cases, or
» improper rinsing of nappies to remove soap.

General measures

» Change nappies regularly.
» Do not use waterproof pants to cover nappy.
» Expose nappy area to air if possible especially with severe nappy dermatitis.
» Educate caregiver and give advice on:
  – washing, rinsing and drying of the nappy area when soiled
  – regular nappy changes
  – proper washing and rinsing of nappies

Drug treatment

- Zinc and castor oil ointment , applied after each nappy change

If no improvement within 3 days, suspect candida:

- Clotrimazole 2% cream followed by zinc and castor oil ointment applied after each nappy change

Referral

» No improvement after 3 days of clotrimazole treatment

5.9 Sandworm

B76.0

Description

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

Drug treatment

- Albendazole, oral, daily for three days
  - o Children under 2 years: 200 mg
  - o Children over 2 years and adults: 400 mg

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 2 mg/5 mL	**Tablet** 4 mg	
> 9–11 kg	1 mg	2.5 mL	–	> 12–18 months
> 11–14 kg	1.2 mg	3 mL	–	> 18 months–3 years
> 14–17.5 kg	1.5 mg	4 mL	–	> 3–5 years
> 17.5–25 kg	2 mg	5 mL	–	> 5–7 years
> 25–35 kg	3 mg	7.5 mL	–	> 7–11 years
35 kg and above	4 mg	–	1 tablet	> 11 years and adults

5.10 Urticaria

L50.9

Description

Urticaria is a skin disorder characterised by itchy wheals (hives). There are many causes, including allergic, toxic or physical.
Allergic urticaria may be caused by drugs, plant pollen, insect bites or foodstuffs, e.g. fish, eggs, fruit, milk and meat.

Note:
Aspirin is a common cause and is found in many medicines.

General measures

» Take detailed history to detect trigger factors.
» Lifestyle adjustment.

Drug treatment

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	Dose mg	Use one of the following:		Age Months/years
		Syrup 2 mg/5 mL	Tablet 4 mg	
> 9–11 kg	1 mg	2.5 mL	–	> 12–18 months
> 11–14 kg	1.2 mg	3 mL	–	> 18 months–3 years
> 14–17.5 kg	1.5 mg	4 mL	–	> 3–5 years
> 17.5–25 kg	2 mg	5 mL	–	> 5–7 years
> 25–35 kg	3 mg	7.5 mL	–	> 7–11 years
35 kg and above	4 mg	–	1 tablet	> 11 years and adults

- Calamine lotion, applied on the skin

Referral

» No improvement or response after 24 hours
» Progressive illness

5.11 Pityriasis rosea

L42

Description

A common disease of unknown cause, probably due to a viral infection as it occurs in minor epidemics. It is most common in young adults but any age may be affected. The rash involves the trunk, neck and mainly proximal parts of the limbs.
Presents as pink papules, and macules which are oval and slightly scaly at the margins. The eruption is usually preceded by a few days by one larger, oval, slightly scaly area (“herald patch”), commonly found in the scapular area or abdomen. The macules on the thorax characteristically lie parallel to the long axis of the ribs (“Christmas tree” distribution). The itch is usually mild and there few or no constitutional symptoms. It is self-limiting within about 6–8 weeks.

General measures

» Explain about the benign but protracted nature of the condition.

Drug treatment

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	Dose mg	Use one of the following:		Age Months/years
		Syrup 2 mg/5 mL	Tablet 4 mg	
> 9–11 kg	1 mg	2.5 mL	–	> 12–18 months
> 11–14 kg	1.2 mg	3 mL	–	> 18 months–3 years
> 14–17.5 kg	1.5 mg	4 mL	–	> 3–5 years
> 17.5–25 kg	2 mg	5 mL	–	> 5–7 years
> 25–35 kg	3 mg	7.5 mL	–	> 7–11 years
35 kg and above	4 mg	–	1 tablet	> 11 years and adults

- Aqueous cream, applied 3 times daily.

5.12 Molluscum contagiosum

B08.1

Description

Infectious disease caused by a poxvirus.
Presents with a dome-shaped papules with a central depression (umbilication). Their number varies from occasional lesions to large crops of lesions particularly in those co-infected with HIV. Papules are commonly seen on the face in children but may be found at any dermal site except on the palms and soles. They may also occur on the genitalia as an STI.

General measures

In genital molluscum contagiosum:

» Counsel on risk reduction for transmission of STI and STI.
» Provide and promote use of condoms.
» Notify partner to be examined and treated.

In non- genital molluscum contagiosum:

» Allow to heal spontaneously if the lesions are few in number

Drug treatment

- Tincture of iodine BP, applied to the core of individual lesions using an applicator.

Referral

» Extensive lesions for cryotherapy with liquid nitrogen

5.13 Herpes simplex

B00.0

Description

Infection caused by herpes simplex virus type 1.
The primary infection usually presents as a gingivostomatitis but may occur at other sites, e.g. the face. It is characterised by grouped crusted vesicles surrounded by erythema. The secondary infection usually presents with cold sores on the lips or nose often in association with upper or lower respiratory tract infection.
Sufferers of atopic eczema are particularly susceptible to the virus and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).
Mucocutaneous ulceration for more than 1 month (AIDS–defining illness). Ulcers occur commonly in the mouth genital or perianal regions See Section 11.3.9: Herpes simplex ulcers, chronic

General measures

» Keep the skin lesions clean and dry

Drug treatment

Extensive herpes or eczema herpeticum:

- Aciclovir, oral, 8 hourly for 10 days
  - o Paediatric dose: 250 mg/m^2/dose

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5 mL	**Tablet** 200 mg	**Tablet** 400 mg	
≥ 3.5–7 kg	80 mg	2 mL	–	–	≥ 1–6 months
≥ 7–11 kg	100 mg	2.5 mL	–	–	≥ 6–18 months
≥ 11–14 kg	120 mg	3 mL	–	–	≥ 18 months–3 years
≥ 14–25 kg	160 mg	4 mL	–	–	≥ 3–7 years
≥ 25–35 kg	200 mg	5 mL	1 tablets	½ tablet	≥ 7–11 years
≥ 35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥ 11–15 years
≥ 55 kg and above	400 mg	–	2 tablets	1 tablet	≥ 15 years and adults

5.14 Herpes zoster (See Section 11.3.10)

5.15 Warts

B07

Description

A common, infectious, self-limiting condition of the skin or mucous membrane caused by papilloma virus.

5.15.1 Common Warts

Seen most often on the hands and fingers.
Raised nodular type with a rough 'warty' surface.

General measures

» May be left alone to wait for improvement

Drug treatment

- Podophyllum resin 20% and salicylic acid 25% ointment, applied under plaster nightly.
  - o Protect surrounding skin with petroleum jelly.
  - o Repeat until the wart falls off.

Referral

» Extensive warts

5.15.2 Plane Warts

Very small warts which are just slightly raised.
These present as smooth, flat, skin-coloured or slightly pigmented surface and occurs particularly on the face, backs of the hands and knees.

Referral

» Extensive cases involving the face

5.15.3 Plantar Warts

Appear commonly on the pressure-bearing areas of the soles and can be painful

and interfere with walking.
Because pressure forces them deep into the dermis they are flat, almost circular lesions, with a rough surface and are often thick and hard due to increased keratin formation.

Drug treatment

- Podophyllum resin 20% and salicylic acid 25% ointment, applied under plaster nightly.
  - o Protect surrounding skin with petroleum jelly.
  - o Repeat until the wart falls off.

Referral

» No response to treatment
» Diabetic patients

5.15.4 Filiform Warts

Pedunculated warts found on the face, neck and occasionally on mucous membrane of the mouth.
In the anogenital area they are known as condylomata accuminata.
See Section 12.11: Genital warts (GW): *condylomata accuminata*

Referral

» Extensive involvement

5.15.5 Genital Warts: Condylomata Accuminata
A63.0

See section 12.11: Genital warts (GW): *condylomata accuminata*

Chapter 6: Obstetrics and gynaecology

Obstetrics

6.1 Bleeding in pregnancy

6.1.1 Miscarriage

O03

Description

Bleeding from the genital tract prior to 24 weeks gestation, as determined either from last menstrual period (LMP) or ultrasound, which may or may not be associated with lower abdominal pain (LAP), and is classified as follows:

» Threatened miscarriage:
  – mild vaginal bleeding, usually no associated LAP
  – cervix closed on digital examination
» Inevitable miscarriage:
  – moderate vaginal bleeding associated LAP
  – cervical dilatation may be present
» Incomplete miscarriage:
  – vaginal bleeding with clots
  – passage of products of conception
» Complete miscarriage:
  – complete passage of all products of conception
  – usually still requires referral for confirmation
» Septic miscarriage:
  – any miscarriage with history of interference, pyrexia, tachycardia and/or offensive products of conception

(For perinatal mortality reporting, a stillbirth is considered a fetus > 1 000 g or > 28 weeks gestation.)

General measures

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.
» Counselling and support.

Drug treatment

- Oxytocin 20 units, IV, diluted in 1 000 mL sodium chloride 0.9% and infused at 125 mL/hour in all cases, **except where threatened miscarriage** is suspected.

If septic miscarriage is suspected, before referral

- Ceftriaxone, IV, 1 g

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.

and

- Metronidazole, oral, 400 mg

In Rh-negative, non sensitised, women

- Anti-D immunoglobulin, IM, 100 mcg preferably within 72 hours but may be given up to 7 days following management of miscarriage.

Referral

Urgent

» All patients

6.1.2 Antepartum Haemorrhage

O46.9

Description

Vaginal bleeding in pregnancy after 24 weeks of gestation as determined either from LMP or ultrasound.
Important causes include the following:

» abruptio placentae,
» placenta praevia and
» uterine rupture (particularly when misoprostol was used).

Drug treatment

- Sodium chloride 0.9%, IV

» Treat for shock if necessary.
» Avoid vaginal examination.

Referral

Urgent

» All patients

! CAUTION !
Avoid using prostaglandins, e.g. misoprostol together with oxytocin when the uterus is greater than 20 weeks size.

6.2 Antenatal care

6.2.1 Care of HIV positive pregnant woman

Description

HIV is currently the commonest cause of maternal deaths in South Africa. Transmission of HIV from mother to infant may occur during pregnancy, delivery, and/or breast-feeding.
Without intervention, 25–40% of infants born to HIV positive women may become infected. With appropriate interventions, maternal mortality as well as perinatal transmission of HIV can be substantially reduced.

General measures

At first antenatal visit

» Offer counselling and voluntary HIV testing to all pregnant women, preferably at 1st visit.
  – If she is HIV positive, a CD4 count must be done at once.
  – The CD4 result must be obtained within 1 week.
» Assist HIV positive pregnant women with access to TOP services, when requested, i.e. unplanned, unwanted pregnancy less than 20 weeks.
» Identify HIV positive pregnant women who are eligible for life-long ART.
  – Refer to appropriate ARV unit.
» HIV positive pregnant women not yet eligible for ART should be counselled about the benefits of PMTCT.

Drug treatment

Mother

Refer all HIV positive pregnant women with indications for long term ART to ARV unit regardless of gestational age. These women should be fast tracked for access to ART.

HIV positive pregnant women without indication for ART

- Zidovudine, oral, 300 mg 12 hourly from 28 weeks of pregnancy until delivery.
  - Zidovudine is still of benefit even if started after 28 weeks of pregnancy.

plus

- Nevirapine, oral, 200 mg single dose as early as possible in labour, or 4 hours prior to elective Caesarean section.

» Check baseline Hb prior to starting zidovudine therapy.
  – If below 8 g/dL do not commence zidovudine and refer patient.
» Monitor Hb every 4 weeks while on therapy.
  – If Hb drops below 8 g/dL, refer patient.

Newborn

- Nevirapine, oral, 2 mg/kg single dose within 48 hours of birth.

plus

- Zidovudine, oral, 4 mg/kg/dose 12 hourly for the first week of life.
  - If the mother received less than 4 weeks of zidovudine antenatally, give zidovudine to newborn for 4 weeks.

This regimen is applicable to all HIV-exposed newborns, regardless of which prophylaxis or treatment the mother received antenatally.

6.2.2 Hypertensive disorders of pregnancy

O13/O14

Description

Hypertension in pregnancy, pre-eclampsia and eclampsia may have very serious and fatal consequences for both the mother and the baby.
Hypertension at 20 weeks of gestation or more (gestational hypertension) characterised by:

» BP equal or above 140/90 mmHg measured on two occasions 4 hours apart

OR

» diastolic BP above 110 mmHg measured on one occasion

Hypertensive disorders of pregnancy can be classified as:

» Chronic hypertension:
  – hypertension without proteinuria diagnosed before pregnancy or before 20 weeks of pregnancy.
» Chronic kidney disease:
  – proteinuria with/without hypertension prior to 20 weeks
» Gestational hypertension:
  – hypertension without proteinuria, detected after 20 weeks of pregnancy.
» Pre-eclampsia:
  – Hypertension with proteinuria after 20 weeks of pregnancy.
» Eclampsia:
  – generalised tonic-clonic seizures in women with pre-eclampsia.

LEVELS OF SEVERITY

Level of hypertension	BP Level mmHg			Proteinuria
	Systolic		Diastolic	
mild	140–159	or	90–109	+
severe	above 160	and	above 110	+++

PREVENTION

All antenatal patients to reduce the risk of pre-eclampsia:

- Calcium, oral, 1 g of elementel calcium daily

MILD HYPERTENSION

General measures

» May be managed without admission before 38 weeks of gestation.
» Review the following on a weekly basis:
  – BP
  – weight
  – urine analysis
  – height of fundus
  – fetal heart rate and movements
» Advise bed rest.
» Educate on signs requiring follow-up.
» Admit to hospital if proteinuria is present.
» Admit at 38 weeks for delivery.

Drug treatment

- Methyldopa, oral, 250 mg 8 hourly.
  o Maximum dose: 750 mg 8 hourly.

PREGNANCY IN PATIENTS WITH HYPERTENSION

» Stop ACE Inhibitors when pregnancy is planned or as soon as pregnancy is diagnosed.

Drug treatment

- Methyldopa, oral, 250mg 8 hourly.
  o Maximum dose: 750mg 8 hourly

  or

  Nifedipine, slow release, oral, 30 mg daily.

SEVERE HYPERTENSION

Drug treatment

» Aim to reduce diastolic BP to ± 100 mmHg.

Preload with:

- Sodium chloride 0.9%, IV, 300 mL unless in cardiac failure.

plus

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  o May be repeated in 30 minutes if diastolic BP remains above 110 mmHg

ECLAMPSIA

General measures

» Ensure safe airway.
» Turn woman onto left lateral position.
» Administer oxygen.
» Stabilise prior to urgent referral.
» Insert a Foley's catheter.

Drug treatment

- Magnesium sulphate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

and

- Magnesium sulphate, IM, 10 g given as 5 g in each buttock
  - Then IM, 5 g every 4 hours in alternate buttocks

If infusion pump is available, administration of a continuous infusion is preferred:

- Magnesium sulphate, IV, at 1 g/hour as a continuous infusion.
  - 10 g in 200 mL sodium chloride at over 20 mL/hour

Stop magnesium sulphate if:

- urine output is less than 100 mL in 4 hours, or
- respiratory rate is less than 16 breaths per minute, or
- if patellar reflexes are absent

If magnesium toxicity suspected (decreased tendon reflexes)

- Calcium gluconate 10%, IV, 10 mL administered over 2–3 minutes as antidote.

Referral

Urgent

» Severe pre-eclampsia and eclampsia
  – stabilise the patient
  – initiate magnesium sulphate loading dose and infusion before referral
  – monitor vital signs while awaiting transport
» Poor control in mild gestational hypertension
» Hypertension with proteinuria

6.2.3 Anaemia in pregnancy

O99.0

Description

Anaemia in pregnancy is pallor plus a haemoglobin (Hb) of less than 11 g/dL, mostly due to either iron deficiency, folic acid deficiency or a combination of both. Women with iron deficiency often have ‘pica’, e.g. eating substances such as soil, charcoal, ice, etc.

General measures

» Reduce intake of tea.
» Do not drink tea within 2 hours of taking iron tablets.

Drug treatment

Prevention:
All antenatal patients, routine iron and folic acid supplementation.

Single pregnancy:
- Ferrous sulphate compound BPC, oral, 170 mg once daily with food

and
- Folic acid, oral, 5 mg daily

Twin or multiple pregnancy:
- Ferrous sulphate compound BPC, oral, 170 mg 12 hourly with food.

and
- Folic acid, oral, 5 mg daily.

Established anaemia with Hb less than 10 g/dL:
- Ferrous sulphate compound BPC, oral, 170 mg 8 hourly with food.
  - o Continue for three months after the Hb normalises in order to replenish body iron stores.

and
- Folic acid, oral, 5 mg daily.

Referral

» Hb less than 7 g/dL at any stage
» Hb less than 10 g/dL and patients over 34 weeks of gestation
» Non-responding Hb
» A rise in the Hb of less than 1.5 g/dL over 2 weeks in early pregnancy
» Any low Hb with an obstetric complication
» Signs or symptoms of acute or chronic blood loss
» Pallor (anaemia) plus signs of chronic disease, e.g. suspicion of TB, or the presence of hepatosplenomegaly
» Evidence of cardiac failure
» Anaemia of sudden onset

6.2.4 Syphilis in pregnancy

O98.1

Description

A sexually transmitted infection with many manifestations that may be asymptomatic in pregnant women. It is caused by the spirochaete, *T pallidum*. Vertical transmission to the fetus occurs in up to 40% of cases in untreated mothers. Untreated maternal syphilis may lead to miscarriage, stillbirth, non-immune hydrops fetalis, or congenital syphilis in the newborn.
Diagnosis is made by positive serology (VDRL, RPR) confirmed with positive TPHA or FTA.

All pregnant women should have a RPR test at the first visit.

General measures

» Encourage partner notification and treatment.
» Provide counselling and promote HIV testing.
» Educate on treatment adherence.
» Promote condom use.

Drug treatment

Pregnant woman

- Benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 weeks
  - Follow up at 3 months after the last injection to confirm a fourfold (i.e. 2 dilution) reduction in VDRL/RPR titres

Penicillin allergy:

- Erythromycin, oral, 500 mg 6 hourly for 28 days.

Mother, once she has stopped breast-feeding:

- Doxycycline, oral, 100 mg 12 hourly for 28 days.

Note:
Erythromycin does not reliably cure syphilis in the woman. The mother must be followed up with repeated RPR after 3 months to confirm a four fold reduction in VDRL/RPR titres.

Newborn baby

Asymptomatic, well baby

- Benzathine benzylpenicillin (depot formulation), IM, 50 000 units/kg as a single dose into the lateral thigh

Symptomatic baby

- Procaine penicillin (depot formulation), IM, 50 000 units/kg daily for 10–14 days
  - **Not for IV use**

  or

  Benzylpenicillin (Penicillin G), IV, 50 000 units/kg, 12 hourly for 10–14 days

! CAUTION !
Procaine penicillin and benzathine benzylpenicillin (depot formulation) should not be given intravenously.

6.3 Preterm labour (PTL) and preterm prelabour rupture of membranes (PPROM)

O60

6.3.1 Preterm labour (PTL)

Description

Regular painful contractions, three per 10 minutes, occurring before 37 weeks of gestation. Labour prior to 34 weeks is of clinical importance due to adverse neonatal outcomes.

General measures

Less than 26 weeks:

» refer without drugs to inhibit uterine contractions (tocolysis).

26 – 33+ weeks of gestation:

» refer with initial tocolysis and corticosteroids.

≥ 34 weeks gestation:

» allow labour to continue.

Drug treatment

26 – 33+ weeks gestation

- Betamethasone, IM, 12 mg two doses 24 hours apart.

Tocolysis:
Preload with:

- Sodium chloride 0.9%, IV, 300 mL

then

- Nifedipine, oral, 20 mg as a single dose
  - Follow with 10 mg after 30 minutes,
  - Then 10 mg every 4 hours until patient is transferred
  - Maximum duration: 24 hours

Referral

» All cases prior to 34 weeks

6.3.2 Preterm prelabour rupture of membranes (PPROM)

Description

Rupture of the membranes prior to 37 weeks of gestation. PPROM prior to 34

weeks is of clinical importance due to adverse neonatal outcomes.
Confirmed with a sterile speculum examination demonstrating leakage of amniotic fluid. If there is clinical uncertainty, test for pH – liquor is alkaline.
Avoid digital vaginal examination.

Drug treatment

26 – 33+ weeks gestation

- Betamethasone, IM, 12 mg two doses 24 hours apart.

Referral

» All cases

6.4 Intrapartum care

O80.9

For the comprehensive management of women in labour, refer to the National Maternity Care Guidelines.

Description

Labour is divided into 4 stages:

» **First stage**
  – onset of regular uterine contractions at term to full dilatation of cervix
» **Second stage**
  – full dilatation to delivery of the baby
» **Third stage**
  – delivery of the baby to delivery of the placenta
» **Fourth stage**
  – 1 hour post delivery

General measures

» Encourage companion support.
» Ensure that the mother is adequately hydrated.
» Monitor progress of labour on partogram.

Drug treatment

First stage with cervical dilatation of less than 10 cm:

Analgesia:

- Pethidine, IM, 100 mg 4 hourly
  or
  Morphine, IM, 10–15 mg, 4 hourly (Doctor initiated)
  or

Especially in advanced first stage of labour

Nitrous oxide 50% mixed with oxygen 50%, given by mask

and

For nausea and sedation, if needed:

- Promethazine, IM, 25 mg 4 hourly

Second stage

If episiotomy is needed, local anaesthetic:

- Lignocaine 1%.
  - Do not exceed 20 mL

Fetal distress during labour:

- Salbutamol 1 mg/mL, IV, 100–250 mcg administered slowly over 2 minutes and refer.
  Reconstitute the tocolytic as follows:
  - Salbutamol 1 ml added to 200 mL sodium chloride 0.9% to make a 5 mcg/mL solution.
  - Draw up 20 mL (100 mcg) in syringe. Monitor pulse.
  - Inject 20 mL (100 mcg) over at least 1 minute. Monitor pulse.
  - If pulse is not more than 120/minute, inject another 20 mL over at least 1 minute. Monitor pulse.
  - Maximum dose 250 mcg (50 mL) over at least 2 minutes.
  - Do not administer if mother has cardiac disease.

Place the mother in the left lateral position.

Inadequate or inco-ordinate uterine contractions:

Use only for primigravida and titrate to individual needs. Contraction frequency should never exceed 5 in 10 minutes.

- Oxytocin, IV, diluted with 1 000 mL sodium chloride 0.9%.
  - Infuse at a rate of 6 mL/hour (1 milliunit /minute)

Time after starting minutes	**Oxytocin dose** milliunits/minute	Dilute 10 units in 1 000 mL sodium chloride 0.9% (mL/hour)
0	1	6
30	2	12
60	4	24
90	6	36
120	8	48
150	10	60
180	12	72

Precautions

» Use oxytocin for augmentation only, not for induction of labour.
» Do not administer oxytocin when the action line on the partogram has been crossed – refer to hospital.

Prevention of post-partum haemorrhage after delivery of the baby:
» Check for twin
- Oxytocin, IM, 10 units

Post-partum haemorrhage:
» Rub up the uterus to expel clots from vagina.
» Empty the bladder.
- Oxytocin, IV, 20 units in 1 000 mL Ringers-Lactate infused rapidly

As fluid replacement:
- Sodium chloride 0.9%, IV

If no response:
- Ergometrine, IM, 0.5 mg. (Doctor initiated)
  - o Avoid ergometrine in hypertensive women unless haemorrhage is life threatening.
  - o Repeat after 10–15 minutes if no response to first dose, while arranging referral.

If referral is delayed and if no response within 10–15 minutes after second dose of ergometrine:
- Misoprostol, sublingual, 400 mcg as a single dose. (Doctor initiated)

Rh negative mother
Administer to Rh-negative mother if baby is Rh-positive or baby's Rh group is not known
- Anti-D immunoglobulin, IM, 100 mcg, preferably within 72 hours but can be given up to 7 days after delivery.

Baby
See section 6.5: Care of the neonate

Observe mother and neonate closely for 1–2 hours before transfer to the postnatal ward.

Note for HIV positive patients:
» Do not rupture the membranes unless it is essential.
» Provide PMTCT – **See section 6.2.1: Care of HIV positive pregnant woman**
» Avoid unnecessary episiotomy and other invasive procedures, to reduce the mother to child transmission of HIV.

Referral

» Prolonged labour according to charting on partogram
» Post-partum haemorrhage
» Incomplete delivery of the placenta

» Other complications of mother or baby

6.5 Care of the neonate

Drug treatment

Neonatal conjunctivitis prophylaxis:

- Chloramphenicol ophthalmic ointment 1%, applied routinely to each eye after birth.

Bleeding prophylaxis:

To prevent hypoprothrombinaemia

- Vitamin K, IM, 1 mg immediately after birth routinely

Neonate not breathing well:

After mother received morphine/pethidine up to 4 hours before birth:

- Naloxone, IM, 0.1 mg/kg

Routine immunisation EPI:

- BCG vaccination, intradermal, once neonate is stable.
- Polio vaccine, oral, once neonate is stable

No baby must be sent home without immunisation.

6.5.1 Sick neonate and neonatal emergencies

Description

Newborn infants can become ill very rapidly and signs of disease are often not readily appreciated unless specifically looked for. All of these conditions in newborns should be referred urgently.

The most common serious conditions are:

» septicaemia or infections
» respiratory conditions
» congenital abnormalities
» late effects of asphyxia

Possible serious bacterial infection or other severe abnormalities must be suspected when any of the following are found:

» convulsions
» fast breathing (more than 60 breaths per minute)
» severe chest indrawing
» nasal flaring or grunting respiration
» bulging fontanelle
» umbilical redness extending to the skin and draining pus
» low or high temperature

» many or severe skin pustules
» swollen eyes with pus draining from eye
» lethargic or unconscious or less than normal movements
» shallow or slow breathing
» poor feeding
» diarrhoea (obvious)
» vomiting everything or bile-stained vomitus
» abdominal distension or passing blood per rectum
» pallor
» jaundice within the first 24 hours of life

General measures

Keep the neonate warm, the axillary temperature should be 36.5–37°C.

» This is best done by "Kangaroo Care" where the neonate is kept naked against the mother's skin between her breasts inside her clothing.
» Alternatively, use an incubator or heated cloths. Monitor temperature of baby once the temperature is normal.

Drug treatment

If baby's tongue and lips are blue:

- Oxygen, using nasal catheter at 2 L/minute

If infection is suspected and jaundice has been excluded:

- Ceftriaxone, IM, 50 mg/kg into the lateral thigh

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate dose and route of administration in referral letter.

Monitor blood glucose and exclude hypoglycaemia. If less than 2.6 mmol/L and baby able to suckle or take orally:

» Breastfeed

or

- Dextrose 10%, oral

If unable to take orally consider nasogastric tube feeding or IV infusion.

Referral

Urgent

» All newborns with jaundice on the first day or life or with pallor or with poor feeding
» All other newborns with increasing, deep or persistent (more than 10 days) jaundice should be referred as soon as possible
» All cases

If possible, always send mother with the child as well as any clinical notes.

6.5.2 Neonatal resuscitation

Be prepared!
Be at the delivery!
Check the equipment and emergency medicines!

Ask 3 questions to evaluate the infant:

1. Is the baby breathing adequately and not just gasping?
2. Is the baby's heart rate (HR) above 100 beats per minute?
3. Is the baby centrally pink, i.e. no central cyanosis.

» If the answer to all three questions is "yes", the baby does not need resuscitation.
» If the answer to any of the questions is "no", the baby needs resuscitation.

Assess the infant using the above 3 questions every 30 seconds during resuscitation.

» If the baby is improved, then the intervention e.g. ventilation can be stopped and the response observed.
» If the baby is not responding or getting worse – check that each step is being applied effectively. If so, continue to apply the intervention, whilst also adding the next step/intervention (see algorithm).

If the newborn response to resuscitation is inadequate once the ventilation and circulation are adequately supported the following steps should be carried out:

<u>If the mother is known or suspected to have had narcotic pain relief:</u>

- Naloxone, IV, 0.1 mg/kg

Check the blood glucose of the child.
<u>If hypoglycaemia is present:</u>

- Dextrose 10%, IV, 2.5–5 mL/kg

If no adequate response has occurred by this stage a person skilled in neonatal resuscitation should be consulted and the child transferred with ongoing resuscitation to a higher level of care.

Newborns requiring minimal resuscitation with prompt and complete response may be watched with their mothers. Newborns who, after resuscitation, are not completely normal should be referred to a higher level for care using transport with necessary support, e.g. oxygen, temperature control.

Consider discontinuation of resuscitation if the unsatisfactory response to resuscitation persists for > 20 minutes and underlying treatable conditions e.g. hypoglycaemia, pneumothorax, have been excluded; **or** > 10 minutes of unresponsive cardiac arrest (asystole); **or** > 20 minutes of unsustainable respiration.

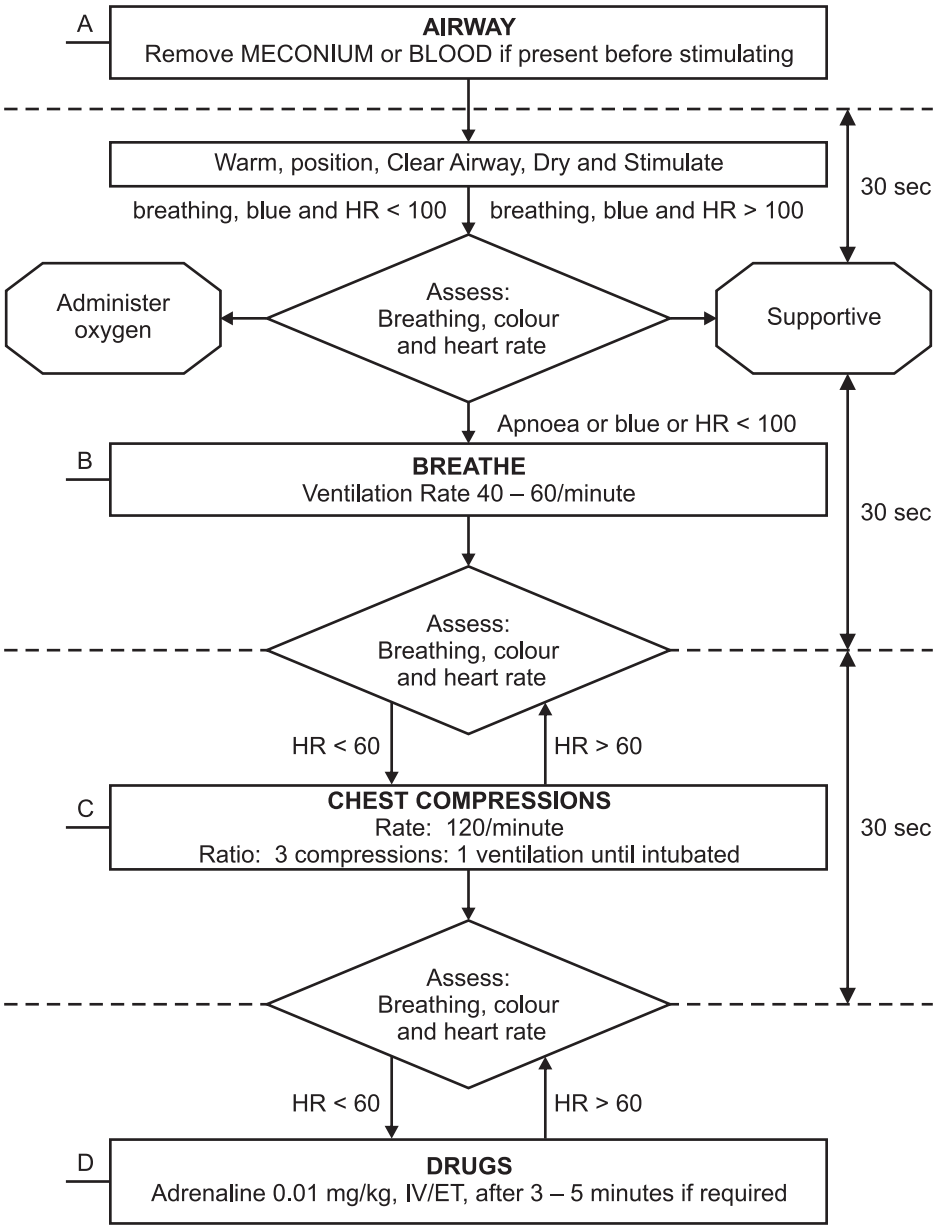
An unsatisfactory response to resuscitation includes:

» a sustained slow heart rate, usually less than 60/minute or a progressive decrease in heart rate
» episodes of cardiac arrest, with a progressively weaker response to chest compressions, positive pressure ventilation and medicines
» a decreasing blood pressure, increasing acidosis, severe hypotonia with central cyanosis or intense pallor
» apnoea or only abnormal and, irregular respiratory efforts (brain stem gasping)

Drugs used during Neonatal Resuscitation

Drug and dose	Indications	Effect
• Adrenaline o IV, 0.01 mg/kg/dose (0.1 mL/kg of a 1:10 000 dilution) o *ET, 0.03 mg/kg/dose (0.3 mL/kg of a 1:10 000 dilution)	» asystole » heart rate <60/ minute	» ↑Heart rate » ↑Myocardial contractility » ↑Arterial pressure
• Naloxone o ET*/IV/SC/IM, 0.1 mg/kg	» maternal administration of opiates with apnoeic infant	» Corrects apnoea and/or hypoventilation
• Dextrose o IV, 2 mL/kg of 10% dextrose water (10% solution: draw up 4 ml of 50% dextrose water into a 20 ml syringe then draw up 16 mL water for injection – mix by agitating the syringe)	» hypoglycaemia	» Corrects hypoglycaemia

*ET = Endotracheal tube


A
AIRWAY
Remove MECONIUM or BLOOD if present before stimulating
Warm, position, Clear Airway, Dry and Stimulate
30 sec
breathing, blue and HR < 100
breathing, blue and HR > 100
Administer oxygen
Assess: Breathing, colour and heart rate
Supportive
Apnoea or blue or HR < 100
B
BREATHE
Ventilation Rate 40 – 60/minute
30 sec
Assess: Breathing, colour and heart rate
HR < 60
HR > 60
C
CHEST COMPRESSIONS
Rate: 120/minute
Ratio: 3 compressions: 1 ventilation until intubated
30 sec
Assess: Breathing, colour and heart rate
HR < 60
HR > 60
D
DRUGS
Adrenaline 0.01 mg/kg, IV/ET, after 3 – 5 minutes if required

6.6 Post partum care

Z39.2

6.6.1 Feeding options for HIV positive mother

Feeding during the first 6 months:

» Feeding choices need to be individualised based on patients' circumstances.
» The feeding options for the first 6-months of life are exclusive breastfeeding or exclusive formula feeding. Breast feeding should be continued (ideally until 2 years of age) in infants who are known to be HIV infected (positive PCR test).
» HIV may be transmitted via breast milk of HIV infected mothers.
» For each mother, the Acceptability, Feasibility, Affordability, Safety and Sustainability criteria (AFASS) should be assessed and discussed, and the mother should be assisted to make the feeding choice that would be most appropriate for her individual situation.

Mixed feeding carries the highest risk of HIV transmission and should be discouraged.

6.6.2 Cracked nipples during breastfeeding

O92.1

Description

The areola and nipple are protected by the secretion of a lubricant from Montgomery's glands. Cracked nipples may lead to infection and mastitis.

Causes of cracked nipples include:

» poor attachment
» removing the baby from the breast before suction is broken

The four signs of good attachment are:

» chin touching breast (or very close)
» mouth wide open
» lower lip turned outward
» more areola visible above than below the mouth

General measures

» Apply expressed breast milk to the nipples between feeds.
» If too painful, express the milk and nurse the baby on the other breast until improvement.
» Keep areola clean.

Referral

» No improvement after 3 days

Gynaecology

6.7 Pregnancy, ectopic

O00.9

Description

Pregnancy outside the uterus, usually presenting with the combination of:

» missed menstruation
» sudden lower abdominal pain
» dizziness
» shock
» anaemia
» urine pregnancy test usually positive
» shoulder tip pain

Note:
Consider ectopic pregnancy in any young woman who complains of lower abdominal pain.

Referral

» All suspected cases of ectopic pregnancy
» Treat shock if indicated

6.8 Bleeding, vaginal

N93.9

Note:
Women should receive regular screening for cervical cancer after the age of 30 years.

6.8.1 Abnormal vaginal bleeding during fertile years

N92.0/N92.1

Description

Increased vaginal blood flow either in volume, duration and/or frequency, including menorrhagia or dysfunctional uterine bleeding.

General measures

» Assess current contraceptives used.
» Exclude pregnancy complication or organic disease e.g. fibroids.

Drug treatment

- Combined oral contraceptive pill (levonorgestrel and ethinyl oestradiol) for 3–6 months
- Ibuprofen, oral, 200–400 mg 8 hourly with or after food as needed for 2–3 days
  Ibuprofen may reduce blood loss in menorrhagia associated with:
  - o intrauterine contraceptive device (IUCD)
  - o chronic salpingitis (See chapter 12: Sexually transmitted infections)

If blood loss has been severe or there are signs of anaemia:

- Ferrous sulphate compound BPC, oral, 170 mg three times daily after food.
  - o Continue ferrous sulphate for 3 months until haemoglobin has noramlsed.

Referral

» No improvement
» Girls less than 12 years with vaginal bleeding before the development of their secondary sexual characteristics
» For investigation of other causes such as:
  – sexual abuse
  – foreign bodies
  – tumours of the genital tract
» Severe anaemia

6.8.2 Bleeding, post-menopausal

N95.0

Description

Vaginal bleeding following the cessation of menstruation for 1 year.

Note:
If bleeding profuse stabilise before referral.

Referral

» All cases, to exclude underlying malignancy and other pathology

6.9 Dysmenorrhoea

N94.6

Description

Pain associated with menstrual cycles. In primary dysmenorrhoea there is no known cause. Secondary dysmenorrhoea has an organic cause.

General measures

» Advise and reassure women with primary dysmenorrhoea about the nature of the condition.
» Encourage patient to carry on with normal everyday activities.

Drug treatment

- Ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days

Treat for pelvic infection when present.

Referral

» Poor response to treatment
» If an organic cause is suspected, e.g. fibroids

6.10 Hormone replacement therapy

Indications:

» Menopausal symptoms, e.g. hot flushes
» Urogenital atrophy
» Osteoporosis prevention and treatment
» Oophorectomy in pre-menopausal woman

For menopausal women, treatment should not be longer than 5 years.
A risk benefit assessment should be individualised in all patients.

Contra-indications:

» endometrial cancer
» breast cancer
» previous deep vein thrombosis
» porphyria
» undiagnosed vaginal bleeding
» recent myocardial infarction
» liver disease
» uncontrolled hypertension

Drug treatment (Doctor initiated)

Women with intact uterus per cycle:

- Oestradiol, oral, 0.5–1 mg daily.
  or
  Conjugated oestrogens, oral, 0.3 mg–0.625 mg daily.

and

- Medroxyprogesterone, oral 5 mg

Women with no uterus (post-hysterectomy):

- Oestradiol, oral, 0.5–1 mg daily
  or
  Conjugated oestrogens, oral, 0.3 mg–0.625 mg daily

Referral

» Annually, for re-evaluation

6.11 Ulcers, vaginal
(See Chapter 12: Sexually transmitted in infections)

6.12 Vaginal discharge/lower abdominal pain in women
(See Chapter 12: Sexually transmitted in infections)

A54.9

Chapter 7: Family planning

The appropriate choice of family planning method should be decided on by the woman in consultation with the health care professional taking into consideration safety, efficacy, acceptability and access. A complete medical and sexual history must be obtained and an appropriate physical examination performed to identify potential risks to the individual's health.
Exclude pregnancy before commencing contraception.

7.1 Contraception, hormonal

! CAUTION !
Hormonal contraception does not prevent sexually transmitted infections, including HIV. Additional use of condoms is recommended if there is a risk of exposure to infection.

7.1.1 Contraceptives, injectable

Z30.8

Injectable contraceptives are recommended:
» for women who prefer injectable contraception, or
» in whom oestrogen containing contraceptives are contraindicated or adherence is likely to be a problem, e.g.:
  – mental retardation
  – cardiac or renal disease
  – women with epilepsy, on anti-TB drugs

Injectable contraceptives are not suitable if pregnancy planned within a year.

- Medroxyprogesterone acetate (long-acting), IM, 150 mg, 12 weekly
  or
  Norethisterone enanthate, IM, 200 mg, 8 weekly

Note:
It is not necessary to shorten the dosage interval for women taking concomitant enzyme-inducing drugs, e.g. rifampicin, antiretrovirals and anticonvulsants.

7.1.2 Contraceptives, oral

Z30.8

Oral contraceptives are recommended for highly motivated, women where good, reliable adherence is more likely.

Monophasic: progestogen only tablets

Indicated for breastfeeding patients not willing to use injectable contraceptives.

- Levonorgestrel, oral, 0.03 mg daily

Contraindications include:

» abnormal uterine bleeding of unknown cause
» myocardial infarction or stroke
» liver disease
» cancer of the breast or genital tract
» known or suspected pregnancy

Monophasic: combination of progestogen and oestrogen in each tablet

Formula 1:

- Levonorgestrel/ethinyl oestradiol 0.15/0.03 mg, oral

Formula 2:

- Norgestrel/ethinyl oestradiol 0.5/0.05 mg, oral

Triphasic preparations: combination of progestogen and oestrogen

- Levonorgestrel/ethinyl oestradiol, oral
  - o 6 tablets levonorgestrel 0.05 mg and ethinyl oestradiol 0.03 mg
  - o 5 tablets levonorgestrel 0.075 mg and ethinyl oestradiol 0.04 mg
  - o 10 tablets levonorgestrel 0.125 mg and ethinyl oestradiol 0.03 mg
  - o 7 tablets placebo

Combination preparations are contraindicated in certain conditions. Consult the package insert or pharmacist in this regard. Examples of contraindications include:

» heart disease
» liver disease
» thromboembolism
» certain cancers

7.2 Contraception, intrauterine device (IUCD)

Z30.1

A medical examination must be done prior to insertion of an IUCD to exclude a contraindication.
HIV infection is not a contraindication to the use of an IUCD and may be indicated in patients on ARVs.

- 380 mm² copper – standard type

Use according to manufacturers instructions.

!CAUTION!
IUCDs do not prevent sexually transmitted infections, including HIV. Additional use of condoms is recommended if at risk of exposure to infection.

7.3 Contraception, barrier methods

Z30.9

Barrier methods are the optimum means to prevent STI and HIV transmission. Barrier methods are recommended in all individuals not in a long term monogamous relationship or where either of the partners are known to have a STI, including HIV.

- Condoms, male and female

7.4 Contraception and HIV and AIDS

The selection of contraception should always be done in consultation with the HIV practitioner as there may be drug interactions leading to reduced efficacy and other risks.

7.5 Contraception, missed pills

Missing active pills and extending hormone free interval leads to decreased contraceptive efficacy.

Scenario	Action
One active pill forgotten	Take pill as soon as remembered and take next one at usual time
Two active pills forgotten	Take last missed pill as soon as remembered and next one at usual time. Use condoms or abstinence for the following 7days.
Two or more pills forgotten in the last 7 active pills of the pack	Omit the inactive tablets and immediately start the first active pill of the next pack.
Two or more pills forgotten during the first 7 active pills of the pack and sexual intercourse has occurred	Give emergency contraception, restart active pills 12 hrs later and advise additional precautions for the following 7 days

7.6 Contraception, emergency

Z30.9

! CAUTION !
Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not more than 5 days later.

- Levonorgestrel 0.75 mg, oral, 2 tablets as a single dose as soon as possible after unprotected intercourse.

Or if unavailable:

- Norgestrel/ethinyl oestradiol 0.5/0.05 mg, oral, 2 tablets as soon as possible after unprotected intercourse, followed by 2 tablets 12 hours later.

Chapter 8: Kidney and urological disorders

Kidney section

8.1 Chronic kidney disease (CKD)

N18.9

Description

Structural or functional kidney damage present for > 3 months, with or without a decreased glomerular filtration rate (GFR).

Markers of kidney damage include:
» abnormalities in urine e.g. proteinuria or haematuria,
» abnormalities in blood e.g. uraemia,
» abnormalities in imaging tests e.g. small kidneys on ultrasound,
» abnormalities on pathological specimens e.g. glomerular disease on renal biopsy.

The creatinine clearance (CrCl) approximates GFR and may be estimated by the following formula:

Adults

Males:

$$\text{eGFR (mL/minute)} = \frac{(140 - \text{age}) \times \text{weight (kg)}}{\text{serum Cr (micromol/L)}}$$

Females:
Multiply estimated CrCl by 0.85

Children

$$\text{eGFR (mL/minute)} = \frac{K^* \times \text{height (cm)}}{\text{serum Cr (micromol/L)}}$$

Where *K is:

infants 0–18 months =	40
girls 2–16 years =	49
boys 2–13 years =	49
boys 13–16 years =	60

Common causes of chronic kidney disease include:
» hypertension
» diabetes mellitus
» glomerular diseases

Chronic kidney disease can be entirely asymptomatic BUT early detection and management can improve the outcome of this condition.

Treatment and prevention strategies according to stages

Estimation of the degree of kidney damage and staging is important to guide management and further prevent adverse outcomes of chronic kidney disease.

Note:
Adults with early CKD i.e. stages 0–3 can all be managed at primary care level **once** the cause and plan for care has been established.
All children should be referred for investigation and initial management.

Staging of kidney disease is essential for adequate management of CKD

CKD Stage. Glomerular filtration rate (mL/minute/1.73m^2)	**Description**	**Action** Includes actions from preceding stages
Stage 0 or GFR > 90	At increased risk for CKD, e.g.: » diabetes mellitus » hypertension » glomerular disease » and HIV	» Screening for advanced CKD and CVD disease » CKD risk reduction i.e. treat hypertension, diabetes and HIV
Stage 1 or GFR > 90	Kidney damage with normal GFR	» Diagnose and treat comorbid conditions See for Stage 0
Stage 2 or GFR 60–89	Kidney damage with mild ↓ GFR	» Refer to determine cause and develop care plan. » While on the care plan, monitor the GFR in these patients and make sure kidney function is not worsening rapidly and watch for stage 3
Stage 3 or GFR 30–59	Moderate ↓ GFR	Refer
Stage 4 or GFR 15–29	Severe ↓ GFR	Refer
Stage 5 or GFR < 15	Kidney failure requiring renal replacement therapy End stage renal disease	Refer

GFR should be done yearly in all patients at increased risk.

General measures

» Reduce salt intake.
» Low protein diet is indicated in the presence of CKD stage 4 and 5.
» Reduce cardiovascular disease risk factors – See section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Drug treatment

» Treat underlying conditions.
» Decrease significant proteinuria, if present.
  – Significant proteinuria = spot urine protein creatinine ratio of > 0.1 g/mmol or ACR (albumin-creatinine ratio) > 100 g/mol, confirm as positive if raised on at least 2 of 3 occasions, in the absence of infection, cardiac failure and menstruation.

See section 9.7.2: Diabetic nephropathy

Proteinuria

» In established chronic kidney disease, decrease proteinuria, irrespective of presence or absence of systemic hypertension.
» Monitor renal function and potassium especially with impaired renal function.
» If volume depleted, first rehydrate before commencing ACE-inhibitor.
» ACE-inhibitor are contraindicated in:
  – hyperkalaemia
  – known allergy to ACE-inhibitor
» Begin with low dosage of ACE-inhibitor and titrate up ensuring blood pressure remains in normal range and no side effects are present, up to the maximum dose or until the proteinuria disappears – whichever comes first.

Adults

- ACE inhibitor, e.g. enalapril, oral, 10–20 mg 12 hourly.

If ACE inhibitor cannot be used, refer.

Hyperlipidaemia

If hyperlipidaemia is a co-existent risk factor manage according to section 4.1: Prevention of ischaemic heart disease and atherosclerosis

Diabetes mellitus

» In diabetics, optimise control according to section 9.6: Diabetes mellitus type 2, in adults
» Avoid oral hypoglycaemics if GFR is < 60 because of the risk of lactic acidosis with metformin and prolonged hypoglycaemia with long acting sulphonylureas.

Hypertension

Treat if present.

See Section 4.7: Hypertension

Fluid overload

Treat fluid overload if present and refer.

Adults

- Furosemide, slow IV or oral, 12 hourly.
  - Adults: 40–80 mg
  - If poor response, repeat after 1 hour.
  - Do not give IV fluids – use heparin lock or similar IV access.

Children

- Furosemide, IV, 1 mg/kg immediately.
  - Do not put up a drip or run in any IV fluids

Weight kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9– 11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14–17.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

Note:

Exclude heart failure in patients with persistent pedal oedema.

Referral

» All cases of suspected chronic kidney disease stages 3–5 for assessment and planning
» All children
» All cases of CKD with:
  – haematuria,
  – proteinuria
  – raised blood urea or creatinine initially for assessment and planning
» Uncontrolled hypertension/fluid overload
» CKD associated with hyperlipidaemia
» No resolution of proteinuria with ACE-I therapy

Patients who might qualify for dialysis and transplantation or who have complications should be referred early to ensure improved outcome and survival on dialysis, i.e. as soon as GFR drops below 30 mL/min/1.73 m^2, or as soon as diagnosis is made/suspected.

8.2 Acute renal failure (ARF)

N17.9

Description

This is (usually) reversible kidney failure, most commonly as a result of:

» dehydration and fluid loss
» drugs/toxins,
» urinary tract obstruction, and
» acute glomerulonephritis in older children

It is often recognised by:

» fluid overload
» decreased or no urine output
» blood result abnormalities of urea, creatinine or electrolytes.
» convulsions in children

General measures

» Give oxygen, and nurse in semi-Fowlers' position if patient has respiratory distress.
Early referral is essential.
» If fluid overloaded:
  – stop all fluids oral and give no IV fluids
  – stop intake of all salt and potassium containing foods and fluids
» If not overloaded, dehydrated nor shocked:
  – no IV fluids
  – restrict oral fluid intake to 10 mL/kg/day daily plus visible fluid losses
  – arrange referral in the meantime
» If dehydrated or shocked:
  – treat immediately as in shock section.

Drug treatment

Children

Under 6 years of age:	> 120 mmHg systolic BP or 90 mmHg diastolic BP
6–15 years:	> 130 mmHg systolic BP or 95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - o Withdraw contents of 5 mg capsule with a 1 mL syringe:

10 to 25 kg:	2.5 mg
25 to 50 kg	5 mg
over 50 kg:	10 mg

If there is respiratory distress (rapid respiration, chest indrawing):

- Furosemide, IV, 1 mg/kg immediately.
  - o Do not put up a drip or run in any IV fluids

Weight kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9–11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14–17.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

Adults

If diastolic blood pressure is greater than 100 mmHg or systolic blood pressure is above 150 mmHg:

- Amlodipine, oral, 5 mg as a single dose.

If there is respiratory distress (rapid respiration, orthopnoea):

- Furosemide, as an IV bolus, 80 mg.
  - o Do not put up a drip **and do not** give a fluid infusion.

Referral

» All cases

Where adequate laboratory and clinical resources exists, management according to the hospital level guidelines may be instituted

8.3 Glomerular Diseases (GN)

N00–N08

Description

Glomerular disease may be a result of a primary condition of the kidney, or may be secondary to a systemic disorder. Can present with any, or a combination of the following:

» proteinuria
» reduced GFR (and its effects)
» haematuria
» hypertension and oedema.

Approach to care is outlined under the syndromes which follow.

Referral

» Unexplained haematuria on two to three consecutive visits
» Proteinuria > 1 g/24 hours or PCR > 0.1 g/mmol or ACR > 100 g/mol
» Nephritic syndrome
» Nephrotic syndrome
» Chronic Kidney Disease

Note:
Where facilities are available investigation should be done e.g. urine and electrolytes calculate the GFR or PCR

8.3.1 Glomerular disease - Nephritic syndrome

N01/N03

Description

Presents with a varied combination of:
» painless macroscopic turbid, bloody or brownish urine
» peripheral and facial oedema
» pulmonary oedema (circulatory overload)
» hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions
» little or no urine excretion

In children this is most commonly due to acute post streptococcal glomerulonephritis, but not exclusively so.

General measures

» Give oxygen, and nurse in semi-Fowlers position if patient has respiratory distress.
» Early referral essential especially if patient has had a hypertensive episode or fluid overload.
» If fluid overloaded:
  – stop all fluids oral and give no IV fluids
  – stop intake of all salt and potassium containing foods and fluids
» If not overloaded, dehydrated nor shocked:
  – no IV fluids
  – restrict oral fluid intake to 10 mL/kg/day daily plus visible fluid losses
  – arrange referral in the meantime
» If dehydrated or shocked:
  – treat immediately as in shock section.

Drug treatment

Children

Fluid overload (rapid respiration, chest indrawing)

- Furosemide, IV, 1 mg/kg immediately.
  - o Do not put up a drip or run in any IV fluids

Weight kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9–11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14–17.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

If hypertension

Under 6 years of age: > 120 mmHg systolic BP or 90 mmHg diastolic BP
6–15 years: > 130 mmHg systolic BP or 95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - o Withdraw contents of 5 mg capsule with a 1 mL syringe:
    - 10 to 25 kg: 2.5 mg
    - 25 to 50 kg: 5 mg
    - over 50 kg: 10 mg

Adults

Fluid overload

- Furosemide, as an IV bolus, 80 mg.
  - o Do not put up a drip **and do not** give a fluid infusion

If hypertension

If diastolic blood pressure is greater than 100 mmHg or systolic blood pressure is above 150 mmHg:

- Amlodipine, oral, 5 mg as a single dose

Referral

» All cases

The definitive treatment of nephritis depends on the cause – an assumption of acute post streptococcal nephritis or any other disease cannot be made without specific investigation which may include renal biopsy.

8.3.2 Glomerular disease - Nephrotic syndrome

N04

Description

Glomerular disease characterised by:

» severe proteinuria defined as:
  – children: ≥ 3 + proteinuria on dipstick test, or urine protein: creatinine ratio (PCR) ≥ 0.2 g/mmol on spot urine sample
  – adults: 2.5 g/day, or greater as determined by a spot urine protein measurement, i.e. protein creatinine ratio (PCR)
» and resultant 'classical' clinical picture (not always present) which includes:
  – oedema and
  – hypoalbuminaemia and
  – hyperlipidaemia.

Accurate diagnosis requires a renal biopsy.

Drug treatment

The management of glomerular disease depends on the type/cause of the disease and is individualised guided by a specialist according to the biopsy result.

Referral

» All cases

8.4 Urinary tract infection (UTI)

N39.0

Description

Urinary tract infections may involve the upper or lower urinary tract. Infections may be complicated or uncomplicated.
Uncomplicated cystitis is a lower UTI in a non-pregnant woman of reproductive age and who has a normal urinary tract.
All other UTIs should be regarded as complicated.

Differentiation of upper from lower urinary tract infection in young children is not possible on clinical grounds.
Upper UTI is a more serious condition and requires longer and sometimes intravenous treatment. Features of upper UTI (pyelonephritis) that may be

detected in adults and adolescents include:

» flank pain/tenderness
» temperature 38°C or higher
» other features of sepsis, i.e.:
  – tachypnoea,
  – tachycardia
  – confusion, and
  – hypotension
» vomiting

In complicated, recurrent or upper UTIs, urine should be sent for microscopy, culture and sensitivity.

Features of urinary tract Infections in children

Signs and symptoms are related to the age of the child and are often non-specific.
Uncomplicated urinary tract infections may cause very few signs and symptoms.
Complicated infections may present with a wide range of signs and symptoms.

Neonates may present with:

» fever
» poor feeding
» vomiting
» failure to thrive
» hypothermia
» sepsis
» prolonged jaundice
» renal failure

Infants and children may present with:

» failure to thrive fever
» persisting fever
» abdominal pain
» diarrhoea
» frequency
» dysuria
» enuresis or urgency

In any child with fever of unknown origin, the urine must be examined.

In children the diagnosis must be confirmed.
If a bag specimen reveals the following, a urine specimen must be collected aseptically for culture and sensitivity:

» positive leukocytes or nitrites on dipsticks in freshly passed urine
» motile bacilli and increased leukocytes or leukocyte casts on urine microscopy

Urine dipstix should be performed on a fresh urine specimen.

» If leucocytes and nitrites are not present, a urinary tract infection is highly unlikely.
» If leucocytes are present on a second specimen, a urinary tract infection must be suspected.

General measures

» Women with recurrent UTIs, should be advised to:
  – void bladder after intercourse and before retiring at night
  – not postpone voiding when urge to micturate occurs
  – change from use of diaphragm to an alternative type of contraception

Drug treatment

Empirical treatment is indicated only if:
» positive leucocytes and nitrites on freshly passed urine, or
» leucocytes or nitrites with symptoms of UTI, or
» systemic signs and symptoms.

Alkalinising agents are not advised.

Uncomplicated cystitis

Adults:

- Ciprofloxacin, oral, 500 mg as single dose

Complicated cystitis

Adults:

- Ciprofloxacin, oral, 500 mg 12 hourly for 7 days

For pregnant women and adolescents:

- Amoxicillin/clavulanic acid 250/125 mg, oral, 1 tablet 8 hourly for 7 days

Children who do not meet criteria for urgent referral:

- Amoxicillin/clavulanic acid, oral, 12.5–20 mg/kg of amoxicillin component, 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup 125/ 31.25 mg per 5 mL	**Syrup** 250/ 62.5 mg per 5 mL	**Tablet** 500/125 mg	
≥ 3.5–5 kg	75/18.75 mg	3 mL	1.5 mL	–	≥ 1–3 months
≥ 5–7 kg	100/25 mg	4 mL	2 mL	–	≥ 3–6 months
≥ 7–9 kg	125/31.25 mg	5 mL	2.5 mL	–	≥ 6–12 months
≥ 9–11 kg	150/37.5 mg	6 mL	3 mL	–	≥ 12–18 months
≥11–14 kg	187.5/46.9	7.5 mL	4 mL		≥ 8 months–3 years
≥ 14–25 kg	250/62.5 mg	10 mL	5 mL	–	≥ 3–7 years
≥ 25 kg and above	250/125 mg	–	–	1 tablet	≥ 7 years and adults

Acute pyelonephritis

Outpatient therapy is only indicated for women of reproductive age, who do not have any of the danger signs – see referral criteria. All other patients should be referred.

- Ciprofloxacin, oral, 500 mg 12 hourly for 7–10 days

It is essential to give at least a 7-day course of therapy.

Referral

Urgent

» Acute pyelonephritis with:
  – vomiting
  – sepsis
  – diabetes mellitus
» Acute pyelonephritis in:
  – pregnant women
  – women beyond reproductive age
  – men
» Children over 3 months who appear ill.
» Children less than 3 months of age with any UTI.

Ill patients awaiting transfer

» Ensure adequate hydration with intravenous fluids

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adult

! CAUTION !

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Contra-indicated in neonatal jaundice.

Annotate dose and route of administration in referral letter.

Non-urgent
» All children for urinary tract investigations after completion of treatment
» No response to treatment.
» UTI more than 3 times within a one-year period in women, and more than 1 time for men
» Recurrent UTI in children for assessment and consideration of prophylaxis

8.5 Prostatitis
N41.0

Description
Infection of the prostate caused by urinary or STI pathogens.

Clinical features include:
» perineal, sacral or suprapubic pain
» dysuria and frequency
» varying degrees of obstructive symptoms which may lead to urinary retention
» sometimes fever
» acutely tender prostate on rectal examination

The condition may be chronic, bacterial or non-bacterial, the latter usually being assessed when there is failure to respond to antibiotics.

Drug treatment
Acute bacterial prostatitis
In men < 35 years or if there are features of associated urethritis (STI regimen):
- Cefixime, oral, 400mg as a single dose

Followed by:
- Doxycycline, oral, 100 mg 12 hourly for 7 days

In men > 35 years or if there is associated cystitis:
- Ciprofloxacin, oral, 500 mg 12 hourly for 14 days

Referral
» No response to treatment
» Urinary retention
» High fever
» Chronic/relapsing prostatitis

8.6 Haematuria

R31

Description

Bleeding from the urinary tract, which can be from the kidneys, collecting system, bladder, prostate and urethra.
Glomerular disease is suggested if proteinuria is present as well as casts on routine microscopy.
Schistosomiasis (bilharzia) is a common cause of haematuria. **Exclude schistosomiasis.**
When haematuria is accompanied by colicky pain a kidney stone should be excluded.

Note:
The presence of blood on urine test strips does not indicate infection and should be investigated as above.

Drug Treatment

If evidence of Schistosomiasis – treat as in Section 10.13: Schistosomiasis
If symptoms of UTI and leucocytes and nitrite positive in urine – treat as UTI

If Haematuria does not resolve rapidly after treatment referral for formal investigation will be required, i.e. next 48 hours.

Referral

» All cases not associated with schistosomiasis or UTI
» All cases not responding to specific drug treatment

8.7 Benign prostatic hyperplasia

N40

Description

Benign prostatic hyperplasia is a noncancerous (benign) growth of the prostate gland.
May be associated with both obstructive (weak, intermittent stream and urinary hesitancy) and irritative (frequency, nocturia and urgency) voiding symptoms.
Digital rectal examination reveals a uniform enlargement of the prostate.
Urinary retention with a distended bladder may be present in the absence of severe symptoms, therefore it is important to palpate for an enlarged bladder during examination.

General measures

Annual follow-up with digital rectal examination (DRE).
For patients presenting with urinary retention, insert a urethral catheter as a temporary measure while patient is transferred to hospital
Remove drugs that prevent urinary outflow e.g. tricyclics and neuroleptics.

Referral

» All patients with suspected BPH

8.8 Prostate cancer

D29.1

Description

Usually occurs in men over 50 years and is most often asymptomatic.
Systemic symptoms, i.e. weight loss, bone pain, etc. occurs in 20% of patients.
Obstructive voiding symptoms and urinary retention are uncommon.

The prostate gland is hard and may be nodular on digital rectal examination.
As the axial skeleton is the most common site of metastases, patients may present with back pain or pathological fractures.
Lymph node metastases can lead to lower limb lymphoedema.

Serum prostate specific antigen (PSA) is generally elevated and may be markedly so in metastatic disease.

Referral

» All patients with suspected cancer

8.9 Enuresis

R32

Description

Enuresis is bedwetting after the age of 5 years.
It is a benign condition which mostly resolves spontaneously.
It is important, however, to differentiate between nocturnal enuresis and enuresis during daytime with associated bladder dysfunction.
Secondary causes of enuresis include:

» diabetes mellitus
» urinary tract infection
» physical or emotional trauma

Note:
Clinical evaluation should attempt to exclude the above conditions.
Urine examination should be done on all patients.

General measures

» Motivate, counsel and reassure child and parents.
» Advise against punishment and scolding.
» Spread fluid intake throughout the day.
» Nappies should never be used as this will lower the child's self esteem.

Referral

» Suspected underlying systemic illness or chronic kidney disease.
» Persistent enuresis in a child 8 years or older.
» Diurnal enuresis

8.10 Impotence

N48.4/F52.2

Description

The inability to attain and maintain an erect penis with sufficient rigidity for vaginal penetration. Organic causes include neurogenic, vasculogenic, endocrinological as well as many systemic diseases and medications.

General measures

» Thorough medical and psychosexual history
» Physical examination should rule out gynaecomastia, testicular atrophy or penile abnormalities.
» Consider the removal of drugs that may be associated with the problem.
» A change in lifestyle or medications may resolve the problem, e.g. advise cessation of smoking and alcohol abuse.

Drug treatment

» Treat the underlying condition.

8.11 Renal calculi

N20.2

Description

This is a kidney stone or calculus which has formed in the renal tract i.e. pelvis, ureters or bladder as a result of urine which is supersaturated with respect to a stone-forming salt.

Clinical features of obstructing urinary stones may include:

» sudden onset of acute colic, localized to the flank, causing the patient to move constantly.
» nausea and vomiting
» referred pain to the scrotum or labium on the same side as the stone moves down the ureter

Urinalysis usually reveals microscopic or macroscopic haematuria.

General measures

» Ensure adequate hydration.

Drug treatment

Adults:

Analgesia for pain, if needed:

- Morphine, 10–15 mg, IM/slow IV as a single dose and refer.

Referral

» All patients

Chapter 9: Endocrine System

Diabetes mellitus

9.1 Diabetes mellitus type 1, in children
9.2 Diabetes mellitus type 2, in adolescents
9.3 Diabetes mellitus type 1, in adults
9.4 Diabetic emergencies
    9.4.1 Hypoglycaemia in diabetics
    9.4.2 Diabetic ketoacidosis (DKA)
9.5 Metabolic syndrome/obesity/dyslipidaemia
9.6 Diabetes mellitus type 2, in adults
9.7 Microvascular complications of diabetes
    9.7.1 Diabetic foot
    9.7.2 Diabetic nephropathy

Diabetes mellitus

Description

Diabetes occurs either because of a lack of insulin (type 1) or additionally because of the presence of factors that oppose the action of insulin (type 2). The result is an increase in blood glucose concentration.

Diagnostic criteria

1. Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
   Random is defined as any time of day without regard to time since last meal. The classic symptoms of diabetes include polyphagia, polyuria and, polydypsia, and in type 1 diabetes, unexplained weight loss.
2. Fasting plasma glucose ≥ 7.0 mmol/L, or fasting blood glucose ≥ 6.1 mmol/L.
   Fasting is defined as no caloric intake for at least 8 hours.
3. Two hour blood glucose ≥ 11.1 mmol/L during oral glucose tolerance test using a 75 g glucose load.

General measures

» Achieve and maintain optimum weight.
» Dietary emphasis should be on fruit, vegetables, and low-fat dairy products on the one hand; and reduced amounts of fat, red meat, sweets, and sugar-containing beverages on the other.
  – a diet high in fruit and vegetables
  – low fat dairy products
  – variety of unsalted nuts
  – fish/skinless chicken in preference to red meat
  – restrict amounts of red meat

Person centred approach to diet therapy

The following issues need to be explored before counselling can be given:

» weight (and preferably weight history)
» most recent and previous glycated haemoglobin (HbA_{1C}) results
» diabetes medication
» diet assessment
» lifestyle and physical activity
» cultural, social and economic issues

Monitoring

» HbA_{1C} annually in patients who meet treatment goals and 3–6 monthly in patients whose therapy has changed.
» Blood glucose should ideally be monitored at home in all patients on more than 2 daily doses of insulin.
» Weight, abdominal circumference (target less than 88 cm in women and 102 cm in men) and blood pressure at every visit.
» Potassium, creatinine and lipids annually

» Fundoscopy annually (following dilation of the pupils)
» Proteinuria annually – See chapter 8: Kidney and urological disorders

Parameter	Optimal	Acceptable	Additional action suggested
Capillary blood glucose values (finger-prick)			
fasting (mmol/L)	4–6	6–8	> 8
2-hour post-prandial (mmol/L)	4–8	8–10	> 10
Glycated haemoglobin (HbA_{1C}) (%)	< 7	7–8	> 8
BMI (kg/m^2)	18.5 – 25		> 27

Diabetes mellitus type 1 is always treated with insulin.
In diabetes mellitus type 2, drug treatment is initiated with oral hypoglycaemic agents, insulin may be needed at a later stage.

9.1 Diabetes mellitus type 1, in children

E10.9

Description

Diabetes mellitus type 1, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM).

Suspect diabetes in any child presenting with the following symptoms:
» loss of weight despite a good appetite
» polyuria
» polydipsia
» sweet smell on the breath with a positive test for urine ketones with or without loss or impairment of consciousness
» tiredness
» abdominal pain

Diagnosis

A diagnosis can be made when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:
» random blood glucose (RBG) 11.1 mmol/L or higher

or

» fasting blood glucose (FBG) 7 mmol/L or higher

A small proportion of children present with less severe symptoms and may require fasting blood glucose measurement and referral to a specialist centre for assessment. Others may present with features of ketoacidosis.

General measures

» A regular meal pattern is important.
» Regular exercise.
» Lifestyle modification, including self care practices.
» The patient should be told to carry a disease identification bracelet, necklace or card.
» Regular self glucose monitoring should be continued and the patients taught to self adjust insulin doses

Drug treatment

» Oral antidiabetic drugs should not be used to treat patients with type 1 diabetes.
» Almost all childhood diabetics require several insulin injections per day to control their diabetes.
» Prefilled insulin syringes should be made available for all children.
» The regimen is individualised depending on factors such as adherence. If adherence is good, then these patients may be candidates for basal / bolus regimens. Other children may be managed with biphasic insulin given twice daily.
» Adherence to insulin treatment regimens should be emphasised.

Referral

All children with suspected diabetes mellitus type 1 should be referred to hospital immediately for:
» confirmation of diagnosis
» initiation and stabilisation of therapy
» education
» long term monitoring of control
» ideally, management at a hospital with specialised services

9.2 Diabetes mellitus type 2, in adolescents

E11.9

Description

The majority of adolescent diabetics are of type 1**.** However, an increasing number of adolescents are being diagnosed with type 2 diabetes. These patients may be diagnosed on screening; later presentation includes the classical symptoms of diabetes.

Criteria for screening for type 2 diabetes in children

» Body mass index is > 85% for age and gender
» Family history of diabetes
» Presence of hyperlipidaemia, hypertension or, polycystic ovarian syndrome.

and

» Physical signs of puberty **or** age > 10 years

Referral

» All

9.3 Diabetes mellitus type 1, in adults

E10.9

Description

Diabetes mellitus type 1, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM).

Diabetes mellitus type 1 presents with:

» hunger
» polyuria
» ketoacidosis
» thirst
» weight loss
» tiredness

Note:
All patients must be referred on presentation for diagnosis, stabilisation, initiation of treatment and planning.

General measures

» Dietary control, regular exercise and self care practices are important control factors.
» Regular home blood glucose monitoring.

Note:
The patient should be advised to carry a disease identification bracelet, necklace or card.

Drug treatment

As diabetes mellitus type 1 usually presents with diabetic ketoacidosis, treatment is usually initiated with insulin and the patient is stabilised at hospital level.

Types of insulins

- Insulin, short acting, SC, three times daily, 30 minutes prior to meals
  - Regular human insulin.
  - Onset of action: 30 minutes.
  - Peak action: 2–5 hours.
  - Duration of action: 5–8 hours.

- Insulin, intermediate acting, SC, once or twice daily usually at night at bedtime, approximately 8 hours before breakfast
  - Neutral Protamine Hagedorn (NPH) insulin.

- Onset of action: 1–3 hours.
- Peak action: 6–12 hours.
- Duration of action: 16–24 hours.

- Insulin, biphasic, SC, once or twice daily
  - Mixtures of regular human insulin and NPH insulin in different proportions, e.g. 30/70 (30% regular insulin and 70% NPH insulin).
  - Onset of action: 30 minutes.
  - Peak action: 2–12 hours.
  - Duration of action: 16–24 hours.

Drawing up insulin from vials

Clean the top of the insulin bottle with an antiseptic swab.

Draw air into the syringe to the number of marks of insulin required and inject this into the bottle; then draw the required dose of insulin into the syringe. Before withdrawing the needle from the insulin bottle, expel the air bubble if one has formed.

» The skin need not be specially cleaned.
» Repeated application of antiseptics hardens the skin.
» Stretching the skin at the injection site is the best way to obtain a painless injection. In thin people it may be necessary to pinch the skin between thumb and forefinger of the left hand.
» The needle should be inserted briskly at almost 90 degrees to the skin to almost its whole length (needles are usually 0.6cm to 1.2 cm long).
» Inject the insulin.
» To avoid insulin leakage, wait 5 –10 seconds before withdrawing the needle.
» Injection sites need to be rotated to avoid lipohypertrophy.

Referral

» All patients

9.4 Diabetic emergencies

Description

Diabetics may present with a decreased level of consciousness due to hyperglycaemia (diabetic ketoacidosis (DKA) or hyperosmolar non-ketotic coma (HONK)) or hypoglycaemia. A blood glucose determination and urine test for ketones are essential to distinguish these conditions, as each one needs urgent management.

In all patients with abnormal levels of consciousness, try to determine if the blood glucose level is high or low.

If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently.

Low blood glucose presents the most immediate danger to life.

Diagnostic criteria

	Hyperglycaemia		Hypoglycaemia
	DKA	HONK	
Blood glucose test	11.1 mmol/L or higher		3.5 mmol/L or lower
Urine test for ketones	Usually positive and > 1+	Negative	usually negative

9.4.1 Hypoglycaemia in diabetics

E16.2

Description

Diabetic patients on therapy may experience hypoglycaemia for reasons such as intercurrent illness (e.g. diarrhoea), missed meals, inadvertent intramuscular injections of insulin or miscalculated doses of insulin, alcohol ingestion, and exercise without appropriate dietary preparation.

Hypoglycaemia in diabetic patients can graded according to the table below:

Mild hypoglycaemia	Moderate hypoglycaemia	Severe hypoglycaemia
» Capable of self treatment*	» Cannot respond to hypoglycaemia (i.e. cannot self treat)	» Semi-conscious **or** » Unconscious/ comatose
	» Requires help from someone else	» Requires medical help
	» May respond to prompting	
	» Oral treatment is successful	

*Except children less than 6 years

Symptoms (autonomic)	Neurological symptoms (neuroglycopenia)	Neurological signs (neuroglycopenia)
» Tremors, » Palpitations, » Sweating, » Hunger, » Fatigue	» Headache » Mood changes » Low attentiveness	» Depressed level of consciousness/ convulsions

***Note:**

Children, particularly under 6 years of age, generally are not capable of self management and are reliant on supervision from an adult.

Patients may fail to recognise that they are hypoglycaemic when neuroglycopenia (impaired thinking, mood changes, irritability, dizziness, tiredness) occurs before autonomic activation.

Diagnosis

» Blood glucose < 3.5 mmol/L with symptoms in a known diabetic patient
» Blood glucose levels should be measured with a glucometer to confirm hypoglycaemia.

Hypoglycaemia must be managed as an emergency. If a diabetic patient presents with an altered level of consciousness and a glucometer is not available, treat as hypoglycaemia.

Treatment

Mild or moderate hypoglycaemia

Immediate: oral rapidly absorbed simple carbohydrate, e.g.

» Sugar, oral, 5–15 g (± 1–3 teaspoons)
  – Wait 10–15 minutes.
  – If no response, repeat above.

As symptoms improve: the next meal or oral complex carbohydrate should be ingested, e.g. fruit, bread, cereal, milk, etc.

Severe hypoglycaemia

Children

- Dextrose 10%, IV, 2–5 mL/kg over 5 minutes
  - 10% solution – dilute 1 part dextrose 50% with 4 parts water for injection

or

If the IV route is not easily accessible

- Dextrose 10%, 5 mL/kg via a carefully placed nasogastric tube

Give adequate glucose to maintain normal blood glucose levels.

Adults

See section 21.11 Hypoglycaemia and hypoglycaemic coma

9.4.2 Diabetic ketoacidosis (DKA)

E10.1/E11.1

Description

Clinical features of DKA include:

» dehydration
» abdominal pain
» vomiting
» deep sighing respiration
» drowsiness, confusion, coma
» acetone/fruity smelling breath

Drug treatment

Note:
Early administration of large amounts of fluid initially is life saving.

Adults
Average deficit 6 L, and may be as much as 12 L.
Be cautious in renal and cardiac disease.
In the absence of renal or cardiac compromise:

- Sodium chloride 0.9%, IV, 15–20 mL/kg in the first hour
  - Subsequent infusion rate varies from 5–15 mL/kg/hour depending on the clinical condition.
  - Correction of estimated deficits should take place over 24 hours.
  - The volume infused in the first 4 hours should not exceed 50 mL/kg.

Refer urgently with drip in place and running at planned rate.

When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:

- Insulin, short acting, IM, 0.1 unit/kg

!CAUTION!
Do not administer IV short-acting insulin if the serum electrolyte status, especially potassium is not known.
Continue with IV fluids but delay giving insulin in these cases in consultation with referral facility as this delay should not negatively influence the patient, but hypokalaemia with resultant cardiac dysrhythmias definitely will.
See section 21.10: Hyperglycaemia and ketoacidosis

Children
If in shock:

- Sodium chloride 0.9%, IV, 20 mL/kg within 1 hour as a bolus
  - If shock not corrected, repeat the bolus

If no shock or after shock is corrected

- Sodium chloride 0.9%, IV

10 – 20 kg	75 mL/hour
20 – 30 kg	110 mL/hour
30 – 40 kg	140 mL/hour
40 – 50 kg	165 mL/hour

Refer urgently with drip in place and running at planned rate.

When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed and provided glucose is monitored hourly

- Insulin, short acting, IM, 0.1 units/kg as a bolus
  - When giving insulin IM, do not use insulin needle

9.5 Metabolic syndrome/obesity/dyslipidaemia

E66.9

Description

The metabolic syndrome is a cluster of risk factors:

» impaired glucose metabolism
» central obesity
» dyslipidaemia
» hypertension.

Diagnostic criteria

There is still some controversy as to whether the metabolic syndrome is a true syndrome or a cluster of risk factors. There are also varying diagnostic criteria around the world.

The more components of the syndrome, the higher the risk.

» Abdominal obesity, i.e. waist circumference > 102 cm in men, and > 88 cm in women.
» BMI: determined by weight in kg ÷ (height in m)^2

BMI (kg/m^2)	
18.5 – 24.9	normal
25.0 – 29.9	overweight
30.0 – 34.9	mildly obese
35.0 – 39.9	moderately obese
> 40	extremely obese

» Fasting plasma triglycerides > 1.70 mmol/L (HDL cholesterol < 1.04mmol/L in men, and < 1.30 mmol/L in women)
» Blood pressure > 130/85 mmHg
» Fasting blood glucose > 6.10 mmol/L

General measures

A decrease in food intake together with an increase in physical activity is crucial to losing weight.

Drug treatment

Treat the metabolic risk factors, i.e. dyslipidemia, hypertension, and hyperglycemia

Hyperlipidaemia

Dyslipidemia may be successfully treated through lifestyle modifications alone. However, LDL-lowering medications may be indicated to achieve target LDL levels in higher risk patients, and thereby reduce risk for major cardiovascular disease events.

HMGCoA reductase inhibitors (statins) are the first-choice lipid-lowering agents e.g.:

- Simvastatin, oral, 10 mg daily

Hypertension

See section 4.7: Hypertension

Hyperglycaemia

See section 21.10: Hyperglycaemia and ketoacidosis

9.6 Diabetes mellitus type 2, adults

E11

Description

Diabetes mellitus type 2 is a chronic debilitating metabolic disease characterised by an abnormally high blood glucose level with serious acute and chronic complications. It is an important component of the metabolic syndrome (syndrome X).

In adults the condition may only be diagnosed when complications are discovered, e.g.:

» ischaemic heart disease
» peripheral artery disease
» stroke
» deteriorating eyesight
» foot ulcers

Symptoms of an abnormally high blood sugar level are:

» thirst, especially noticed at night
» polyuria
» tiredness
» periodic changes in vision due to fluctuations in the blood glucose level
» susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note:
It is important to distinguish diabetes mellitus type 2 from diabetes mellitus type 1.

Treatment targets

Biochemical Index	Optimal	Acceptable	Additional action suggested
Capillary blood glucose values (finger-prick) fasting (mmol/L) 2-hour post-prandial (mmol/L)	 4 – 6 4 – 8	 6 – 8 8 – 10	 > 8 > 10
Glycated haemoglobin (HbA_{1C}) (%)	< 7	7–8	> 8
Weight BMI (kg/m^2)	< 25		> 27

» Control the blood sugar level and HbA_{1C} (value) within acceptable limits (determined by the physician) (glycaemic control)
» Prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma
» Manage chronic conditions associated with diabetes
» Prevent complications, e.g. foot care to prevent gangrene

General measures

Diet and lifestyle

Lifestyle changes include:

» Weight loss
» Moderate daily exercise and increased physical activity e.g. walking at least half an hour for 3 days a week, clean house, climb stairs, etc.

See ideal weight table on page xxix

Diet rich in fruit and vegetables

» Eat 4 or 5 portions on a daily basis
  – One portion of which is a good source of vitamin C, e.g. tomato, cabbage family, citrus fruit and guavas
  – One portion, a dark green vegetable e.g. broccoli, green beans, spinach and baby marrow, or
  – One dark yellow/ orange vegetable, e.g. carrots, pumpkin and butternut prepared without butter.
» Eat only one fruit (fresh) at a time.
  – Fruit must preferably be eaten with a meal or as a snack.
  – When eating dried fruit, limit the portion to the equivalent of a fresh fruit, e.g. 2 dried pear halves = 1 pear
» Low fat dairy products
  – Adults require 2 cups of milk per day i.e. skimmed milk
  – Limit the intake of cheese to a 30 g portion (a matchbox size or a third cup grated cheese) three times per week.
  – Where possible use low fat cheese.
» Nuts
» Fish/chicken in preference to red meat.
  – Chicken without the skin; fish should not be fried but steamed or grilled.
» Small amounts of red meat (lean portions) not more than three times per

week.

» Reduce total intake of fat and saturated fat
  – Use healthy types of fat, e.g. avocado pear, nuts, peanut butter, canola oil, canola margarine, olive oil and olives
  – Unhealthy fats include: hard margarine, butter, cheese and any type of oil heated to a high temperature.
  – Soft low fat margarine (in the tub) should preferably be used instead of butter or hard margarine.
  – Never use 2 “fats” on bread e.g. when using a spread containing fat, do not use margarine as well
» Restrict the intake of food high in cholesterol, e.g. egg yolks, tripe, caviar, fish roe, calamari, prawns and meat
  – A maximum of 1 egg a day is allowed.
» Increase intake of fibre
» Avoid refined foods e.g. sweets and sugary foods
  – Use food and drinks containing sugar sparingly and not between meals.
» Make starchy foods the basis of most meals e.g. whole-wheat or brown bread, rye bread, high fibre porridge (oats or whole wheat cereals),
» Other recommended foods:
  – Legumes, e.g. dried peas and beans, lentils and soya products
  – Brown rice
  – Samp
  – Whole-wheat pasta
» Water
  – Women should drink at least 4 glasses (of 250 mL) of water per day
  – Men should drink at least 6 glasses (of 250 mL) of water per day.

Drug treatment

To prevent long-term cardiovascular complications of diabetes:

» Statin therapy should be added to lifestyle changes for all type 2 diabetic patients, regardless of baseline lipid levels:

- Simvastatin, oral, 10 mg daily
  - Maximum dose at PHC level: 10 mg daily
  - If higher doses are required, refer patient

Persistent proteinuria

See chapter 9: Kidney and urological disorders.

STEP 1
Lifestyle modification plus metformin

Entry to Step 1	Treatment and duration	Target
» Typical symptoms - thirst, tiredness, polyuria **and** » Random blood glucose above 11 mmol/L **or** » Fasting blood glucose level ≥ 7 mmol/L	» Lifestyle modification for life » Appropriate diet » Weight loss until at ideal weight » Initiate drug therapy with: • Metformin » Assess monthly » If indicated: • Aspirin • Simvastatin	» Random blood glucose below 10 mmol/L **or** fasting glucose 6–8 mmol/L **and/or** » HbA_{1C} 6–7.5%

Biguanide
In overweight patients biguanides should be the first choice unless contraindicated.

Biguanides (metformin)
Contraindicated in:
» chronic kidney disease, CrCl < 60 mL/min
» severe hepatic impairment
» pregnancy
- Metformin, oral, 500 mg daily.
  - o Dose increments if the blood glucose is uncontrolled:
    Increase to 500 mg 12 hourly after two weeks
    Increase to 850 mg 12 hourly after another two weeks, if needed
    Maximum dose: 850 mg 8 hourly

STEP 2
Add sulphonylurea

Entry to Step 2	Treatment and duration	Target
» Failed step 1: HbA_{1C} > 8 % or fasting blood glucose above 8 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months **or** » Random blood glucose above 10 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months	» Lifestyle modification **and** » Combination oral hypoglycaemic agents, i.e.: • Metformin **and** • Sulphonylurea	» Random blood glucose below 10 mmol/L **or** » fasting glucose 6 – 8 mmol/L **and/or** » HbA_{1C} 6 – 7.5%

Sulphonylureas (glibenclamide or gliclazide)
Contraindicated in:
» chronic kidney disease, CrCl < 60 mL/min
» severe hepatic impairment
» pregnancy

Missing meals while taking sulphonylureas may lead to hypoglycaemia.

- Glibenclamide, oral, 2.5 mg in the morning with a meal.
  - o Dose increments if the blood glucose is uncontrolled:
    Increase with 2.5 mg daily at two-weekly intervals.
    Maximum dose: 15 mg daily.
    If 7.5 mg daily or more is needed, divide the total daily dose into two, with the larger dose in the morning.
  - o Use with caution in the elderly due to an increased risk of hypoglycaemia.
  - o Every dose should be taken with a meal.

  or

  Gliclazide, oral, 40 mg daily in the morning with a meal.
  - o Dose increments if the blood glucose is uncontrolled:
    Increase with 40 mg daily at two-weekly intervals.
    Maximum dose: 160 mg twice daily
    If more than 80 mg daily is needed then divide the total daily dose into two
  - o Every dose should be taken with a meal.

STEP 3

Insulin therapy – See section 9.3: Diabetes mellitus type 1 in adults

» Insulin is indicated when oral combination therapy fails.
» Continue lifestyle modification.
» Insulin therapy must be initiated by a doctor
» Sulphonylurea should be discontinued once insulin therapy is initiated but continue with metformin.

Education on insulin therapy should include:

» types of insulin
» injection technique and sites
» insulin storage
» glucose monitoring, urine and blood
» meal frequency as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal
» recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia

Insulin type	Starting dose	Increment	Maximum daily dose
Add on therapy: • Intermediate to long-acting	10 units in the evening before bedtime	If 10 units not effective, increase gradually to 20 units	20 units
Substitution therapy: • Biphasic	Twice daily Total daily dose: 15 units divided as follows: o 2/3 of total daily dose, i.e. 10 units, 30 minutes before breakfast o 1/3 of total daily dose, i.e. 5 units, 30 minutes before supper	4 units weekly First increment is added to dose before breakfast Second increment is added to dose before supper.	30 units Refer if more than 30 units are needed

Referral

Urgent – same day

» Metabolic complications:
» Dehydration and hypotension
» Nausea and vomiting
» Ketonuria (more than 1+)
» Keto-acidosis
» Hyperglycaemia over 25 mmol/L
» Complications, e.g. infections which may have the following symptoms:
  – slow onset of progressive apathy leading to confusion, stupor, pre-coma and coma
  – gangrene
  – sudden deterioration of vision
  – serious infections

Note:
Before transferring very ill patients, consider IV infusion with sodium chloride 0.9%.

Referral

» All type 1 diabetics
» Pregnancy
» Failure of step 4 to control diabetes

9.7 Microvascular complications of diabetes

9.7.1 Diabetic foot

E10.5/E11.5

Description

Ulcers develop at the tips of the toes and on the plantar surfaces of the metatarsal heads and are often preceded by callus formation.
If the callus is not removed then haemorrhage and tissue necrosis occurs below the plaque of callus which leads to ulceration. Ulcers can be secondarily infected by staphylococci, streptococci, coliforms, and anaerobic bacteria which can lead to cellulites, abscess formation, and osteomyelitis.

Diagnosis

The three main factors that lead to tissue necrosis in the diabetic foot are:
» Neuropathy
» Infection, and
» Ischaemia.

General measures

» Removal of excess keratin by a chiropodist with a scalpel blade to expose the floor of the ulcer and allow efficient drainage of the lesion.
» Cleanse with sodium chloride 0.9% solution daily and apply non-adherent dressing

Drug treatment

- Amoxicillin/clavulanic acid 500/125 mg (625 mg), oral 8 hourly for 10 days

Referral

Urgent

Threatened limb, i.e. if the ulcer is associated with:
» Cellulitis
» Abscess
» Discolouration of surrounding skin, or
» Crepitus

9.7.2 Diabetic nephropathy

E10.2/E11.2

Description

Significant proteinuria = spot urine protein creatinine ratio of > 0.1 g/mmol or ACR (albumin-creatinine ratio) > 100 g/mol. Confirm as positive if raised on at least 2 of 3 occasions, in the absence of infection, cardiac failure and menstruation.

General measures

Screening
» Check annually for proteinuria in an early morning urine sample using a dipstix
» If dipstix positive:
  – check for urinary tract infection
  – obtain a laboratory urine protein: creatinine ratio (PCR)
» If dipstix negative, check urine albumin using laboratory or site-of-care urine albumin:creatinine ratio
» Measure serum creatinine annually, and calculate GFR
» If PCR or ACR is raised, repeat within 4 months.
» Confirm as positive if proteinuria or raised urine albumin on both occasions

Diet and lifestyle
» Limit protein intake < 0.8 g/kg daily, if proteinuric
» Advise smoking cessation

Drug treatment

Raised urine albumin or proteinuria or reduced GFR:

» Start treatment with an ACE inhibitor and increase gradually to maximal dose if tolerated, e.g.:

- Enalapril, oral, 10 mg 12 hourly
  - o Monitor potassium.

Hypertension

Target BP: < 130/80 mm Hg

See section 4.7: Hypertension

Diabetes mellitus

Aim for HbA_{1C} < 7%.

» Intensify other renal and cardiovascular protection measures (not smoking, aspirin therapy, lipid lowering therapy).

Referral

To nephrologists:

» When GFR < 60 mL/minute or earlier if symptomatic.

Chapter 10: Infections and related conditions

10.1 Fever

R50.9

Description

Fever, i.e. temperature of 38°C or more, is a natural and sometimes useful response to infection, inflammation or infarction.
Fever alone is not a diagnosis.
Fever can cause convulsions in children under 6 years of age.
Heat stroke is a life threatening medical emergency, which is due to failure of heat loss usually following physical exertion in hot, humid environment. The temperature is more than 40.5°C. Treatment is urgent evaporative cooling – See Treatment
Note:
Temperature above 40°C needs urgent lowering with evaporative cooling. See Treatment.
Fluid losses are increased with fever.
In neonates and the elderly fever is often absent or preceded by other symptoms like confusion, failure to feed.
Malaria must be seriously considered in anyone with fever living in a malaria endemic area or if a malaria area has been visited in the past 12 weeks.

General measures

For patients with heat stroke or fever not responding to paracetamol:
» place patient in a cool place
» remove clothing
» cover patient with a wet sheet or towel – the water should be tepid and not too cold
» keep the sheet or towel wet with regular sponging
» fan the patient

Drug treatment

Only some patients with fever need to be treated:
» children under 6 years of age
» significant symptoms

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months

≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

! CAUTION !
Do not treat undiagnosed fever with antibiotics.
Do not give aspirin to children with fever.

Referral

» All patients with heat stroke.
» All children under 60 days of age with any one of the following:
  – axillary temperature > 37.5°C
  – decreased level of consciousness
  – breathing difficulties, i.e. respiratory rate > 60, chest indrawing or apnoea
  – bulging fontanelle
  – pus forming conditions, i.e. umbilical sepsis, skin sepsis, eye discharge associated with swollen eyelids and ear discharge
» All children in whom a definite and easily managed cause is not found.
» Fever that lasts for more than 3 days without finding a treatable cause.
» Fever that recurs.
» Fever combined with:
  – signs of meningitis
  – coma or confusion
  – toxic-looking patient
  – jaundice
  – convulsion
  – failure to feed

10.2 Antiseptics and disinfectants

Description

Disinfectants are used to kill micro-organisms on working surfaces and instruments, but cannot be relied on to destroy all micro-organisms.
Antiseptics are used for sterilising skin and mucous membranes.
Do not mix products.

Disinfecting surfaces
Guidelines for the use of disinfectants
» Never use a chemical if other more reliable methods are available.

» Cleansing is the **first** and most important step in chemical disinfection.
» The disinfection fluid must entirely cover the object and penetrate all crevices.
» Use the recommended strengths for specific purposes.
» Disinfectants cannot sterilise surgical instruments.
» **No** chemical agent acts immediately - note the recommended exposure time.
» Equipment has to be rinsed after immersion in a chemical.
» Recontamination is very easy at this stage.
» Make sure that the rinsing water and all other apparatus are sterile.
» Equipment must not be stored in chemical disinfectants.
» The best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  – solutions must be prepared freshly
  – **and** discarded after 24 hours to disinfect properly
  – **do not** use on the skin

Intact skin

» Alcohol swabs may be used to swab before injections.
» Antiseptics like povidone iodine or chlorhexidine are used for surgical scrubbing.

Wounds and mucous membranes

- Chlorhexidine 0.05% aqueous solution can be used to clean dirty wounds.
- Sodium chloride 0.9% and sterile water are also used on clean wounds.
- Gentian violet 0.5% solution may be painted onto mucous membranes.

Disinfectant	Indications	Directions for application
• Chlorhexidine solution o 0.05% aqueous solution o 0.5% in 70% alcohol	» Skin disinfection before surgery. » Cleaning dirty wounds.	» Remove all dirt, pus and blood before use. » Clean dirty wounds with 0.05% aqueous solution. » Disinfect instruments with 0.5% in 70% alcohol solution. » Expensive, do not use for normal cleaning. » Use the correct concentration for a specific purpose.

Disinfectant	Indications	Directions for application
• Povidone iodine o solution 10% o ointment 10% o cream 5%	» Skin and wound infections **Contraindication**: iodine allergy	» Use ointment for skin infection. » Use solution for cleaning skin and wounds. » **Avoid** using on large wounds because of danger of iodine absorption

Articles and instruments

» Adhere to the appropriate cleansing and disinfection policy.

10.3 Chickenpox

B01.9

Description

A mild viral infection that presents 2–3 weeks after exposure, with:

» mild fever preceding the rash
» lesions beginning on the trunk and face, later spreading to the arms and legs
» small, red, itchy spots that turn into blisters and burst to form scabs. These stages may all be present at the same time.

Chickenpox is infective for 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting with a duration of about 1 week.
Complications of encephalitis and pneumonia occur rarely and are more likely in adults and immunocompromised patients.

General measures

Isolate from immunocompromised people, and pregnant women until all lesions have crusted.
Ensure adequate hydration.
Cut fingernails very short and discourage scratching.

Drug treatment

! CAUTION !

Avoid the use of aspirin in children and adolescents under 16 years because of risk of Reye's syndrome.

For itch:

- Calamine lotion, applied as needed.

In severe cases

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL	–	≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

For pain and fever:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

If skin infection is present due to scratching, treat as for bacterial skin infection.

Immunocompromised patients and all cases with severe chickenpox:
(Best results are achieved if treatment is started within 24 hours of the onset of rash)

- Aciclovir, oral, 6 hourly for 7 days (Doctor initiated)

Weight kg	**Dose** mg	**Use one of the following:**			**Age** months/years
		Susp 200 mg /5 mL	**Tablet** 200 mg	**Tablet** 400 mg	
≥ 3.5–5 kg	100 mg	2.5 mL	–	–	≥ 1–3 months
≥ 5–7 kg	140 mg	3.5 mL	–	–	≥ 3–6 months
≥ 7–9 kg	160 mg	4 mL	–	–	≥ 6–12 months
≥ 9–11 kg	200 mg	5 mL	1 tablet	½ tablets	≥ 12–18 months
≥ 11–14 kg	240 mg	6 mL	–	–	≥ 18 months–3 years
≥ 14–25 kg	300 mg	7.5 mL	1½ tablets	–	≥ 3–7 years
≥ 25–35 kg	400 mg	10 mL	2 tablets	1 tablet	≥ 7–11 years
≥ 35–55 kg	600 mg	–	3 tablets	1½ tablets	≥ 11–15 years
≥ 55 kg and above	800 mg	–	4 tablets	2 tablets	≥ 15 years and adults

Referral

» Complications such as:
  – meningoencephalitis
  – pneumonia
» Severely ill patients
» Pregnant women
» Neonates whose mothers had chicken pox within 7 days of delivery

10.4 Cholera
(See Chapter 2 - Gastrointestinal conditions)

10.5 Dysentery, amoebic
(See Chapter 2 - Gastrointestinal conditions)

10.6 Dysentery, bacillary
(See Chapter 2 - Gastrointestinal conditions)

10.7 Giardiasis
(See Chapter 2 - Gastrointestinal conditions)

10.8 Malaria

B54

Note: notifiable condition.

Description

The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Test any person resident in or returning from a malaria area **and** who presents with fever (usually within 3 months of exposure). The progression to severe falciparum malaria is rapid and early diagnosis and effective treatment is crucial.

Pregnant women and young children up to 5 years of age are at particularly high risk of developing severe malaria.

Clinical features include:

- severe headache
- fever above 38°C
- muscle and joint pains
- shivering attacks
- nausea and vomiting
- flu-like symptoms

Progression to severe malaria may occur and present with the following additional clinical features:

- sleepiness, unconsciousness or coma, convulsions
- respiratory distress and/or cyanosis
- jaundice
- renal failure
- shock
- repeated vomiting
- hypoglycaemia
- severe anaemia (Hb < 6 g/dL)

Diagnosis

Microscopic examination of thick and thin blood smears. Thick films are more sensitive than thin films in the detection of malaria parasites.
Where rapid diagnostic tests, e.g. plasma reagent dipsticks are available, these can be used to diagnose malaria within 10–15 minutes.

Note:
If neither microscopy nor rapid tests are available diagnosis should be made on the basis of clinical symptoms.
A blood smear should be made and sent for microscopic examination.
One negative malaria test does not exclude the diagnosis of malaria.

General measures

Provide supportive and symptomatic relief.
Monitor for complications.

Ensure adequate hydration.
All patients with *Plasmodium falciparum* malaria should be carefully observed for the first 24 hours.

Drug treatment

All first doses of drugs must be given under supervision and patients must be observed for at least an hour as vomiting is common in patients with malaria. Treatment must be repeated if the patient vomits within the first hour. Vomiting oral treatment is one of the commonest reasons for treatment failure.

In endemic areas of RSA where malaria occurs seasonally, it should be treated at PHC level. In other areas, patients should be referred for treatment.

Uncomplicated *P. falciparum* malaria in South Africa
(If unsure of species, treat as for *P. falciparum malaria)*

- Artemether/lumefantrine 20/120 mg, oral, with fat containing food/milk to ensure adequate absorption
  - o Give the first dose immediately
  - o Follow with second dose 8 hours later
  - o Then 12 hourly for another 2 days (total number of doses in 3 days = 6)

Weight kg	**Tablet** Artemether/lumefantrine 20/120 mg	**Age** months/years
≥ 10–15 kg	1 tablet	≥ 1–3 years
≥ 15–25 kg	2 tablets	≥ 3–8 years
≥ 25–35 kg	3 tablets	≥ 8–12 years
≥ 35–65 kg	4 tablets	≥ 12 years and adults

For fever:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» All patients in non endemic areas.
» Patients not responding to oral treatment within 48 hours.
» Patients with *P. vivax* and *P. ovale* malaria.

10.8.1 Falciparum malaria, severe

B50.0

Description

Any one of the following is associated with a higher mortality and requires urgent referral (give initial quinine dose as below):

» cerebral malaria (depressed level of consciousness or convulsions)
» severe anaemia (haemoglobin < 6 g/dL)
» jaundice
» vomiting
» shock
» spontaneous bleeding
» hypoglycaemia
» respiratory distress

Drug treatment

- Quinine dihydrochloride, IV **or** IM, 15–20 mg/kg immediately as a single dose and refer urgently.
  - IM: dilute quinine dihydrochloride in sodium chloride 0.9% (NaCl) to between 60 and 100 mg/mL. Inject half the volume immediately as a single dose in each thigh (anterior lateral) to reduce pain and prevent sterile abscess formation.
  - IV: dilute with 5–10 mL/kg of dextrose 5% and administer **over 4 hours**

Weight kg	**Dose** mg	**Injection** 300 mg /mL	**Use one of the following:**		**Age** Months/years
			IM volume of NaCl	**IV** volume of dextrose 5%	
≥ 9– 11 kg	150	0.5 mL	2 mL	75 mL	≥ 12–18 months
≥ 11–14 kg	200	0.7 mL	2.5 mL	100 mL	≥ 18 months–3 years
≥ 14–17.5 kg	250	0.8 mL	3 mL	125 mL	≥ 3–5 years
≥ 17.5–25 kg	350	1.2 mL	4.5 mL	175 mL	≥ 5–7 years
≥ 25–35 kg	500	1.7 mL	7.5 mL	250 mL	≥ 7–11 years
≥ 35–55 kg	700	2.3 mL	10 mL	350 mL	≥ 11–15 years
≥55 kg and above	900	3 mL	10 mL	450 mL	≥ 15 years and adults

Due to evolving resistance patterns in South Africa, refer to the most recent Malaria Treatment Guidelines from the Department of Health for the most suitable management in the various endemic areas. As these guidelines are updated regularly, the most recently updated guidelines should be followed.

Referral

Urgent

» Features of severe malaria.
» All children less than 1 year.
» Pregnant women, give dose of medication prior to referral.

10.8.2 Malaria, prophylaxis (Self provided care)

In the high-risk malaria areas from September to May in South Africa, malaria prophylaxis should be used, together with preventive measures against mosquito bites. State facilities do not provide prophylactic therapy. It is recommended that persons intending to travel to high-risk areas take the relevant prophylactic therapy.

Preventative measures against mosquito bites include:

» use of treated mosquito nets, screens, coils or pads
» application of insect repellent to exposed skin and clothing
» wearing long sleeves, long trousers and socks if outside between dusk and dawn, as mosquitoes are most active at this time
» visiting endemic areas only during the dry season

! CAUTION !

Pregnant women and children under 5 years should avoid visiting malaria-endemic areas, as they are more prone to the serious complications of malaria

Refer to National Malaria Guidelines.

10.9 Measles

B05.9

Note: notifiable condition.

Case definition

» Fever

and

» Maculopapular (blotchy) rash

and

» Cough or coryza (runny nose) or conjunctivitis

Inform the local EPI co-ordinator about all cases of suspected measles, (i.e. which fulfil the case definition criteria). Send clotted blood and urine to confirm (or exclude) a diagnosis of measles.

Description

A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.
Initial clinical features occur 7–14 days after contact with an infected individual.

These include:
» symptoms and signs of a cold or flu
» fever
» diarrhoea
» conjunctivitis which may be purulent
» cough, bronchitis and otitis media

After 2–3 days a few tiny white spots like salt grains appear in the mouth (Kopliks' spots)
The skin rash appears 1–2 days later and lasts about 5 days and:
» usually starts behind the ears and on the neck
» then on the face and body
» thereafter, on the arms and legs

Secondary bacterial infection (bronchitis, bronchopneumonia, otitis media) may occur, especially in children with poor nutrition or other concomitant conditions.

General measures

» Isolate the patient to prevent spread.

Drug treatment

All children under five years of age with measles should be given an extra dose of vitamin A unless the last dose received within a month:

- Vitamin A (retinol), oral, as a single dose
  - children 6 – 12 months: 100 000 IU
  - children more than 12 months: 200 000 IU

Give the first dose immediately. If the child is sent home, the caregiver should be given a second dose to take home, which should be given the following day.

For fever above 38.5°C (axillary), pain, or a history of febrile convulsions:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Children with diarrhoea:

Treat dehydration according to Acute diarrhoea in children (Section 2.8.1)

Children with pneumonia or otitis media:

- Amoxicillin, oral, 25–30 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** months/ years
		Syrup		**Capsule** 250 mg	
		125 mg/ 5mL	250 mg/ 5mL		
≥ 2–2.5 kg	62.5 mg	2.5 mL	–	–	–
≥ 2.5–3.5 kg	100 mg	4 mL	2 mL	–	Birth to 1 month
≥ 3.5–5 kg	125 mg	5 mL	2.5 mL	–	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	–	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	1 capsule	≥ 6–18 months
≥ 11–14 kg	375 mg	15 mL	7.5 mL	–	≥ 18 months–5 years
≥ 14–55 kg	500 mg	–	10 mL	2 capsules	≥ 5–15 years

Penicillin–allergic patients:

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months / years
		Syrup 125 mg / 5 mL	**Tablet** 250 mg	
≥ 2.5–3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5	200 mg	8 mL		≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

Purulent conjunctivitis:

- Chloramphenicol, 1%, ophthalmic ointment 8 hourly into lower conjunctival sac

Referral

» All adults
» Children under 6 months
» Children who are malnourished or immunocompromised, or who have TB
» Where complications are present. These include:
  – stridor/croup
  – pneumonia
  – dehydration
  – neurological complications
  – severe mouth and eye complications

Provide emergency treatment, if needed, before referral.

10.10 Meningitis (See Chapter 15 - Central nervous system)

10.11 Mumps

B26.9

Description

Incubation period: 14–21 days
A viral infection primarily involving the salivary glands.
Signs and symptoms:
» fever
» pain on opening the mouth or eating
» about two days later a tender swelling appears below the ears at the angle of the jaw
» often first on one side and later on the other
» the swelling disappears in about 10 days

General measures

» Bed rest during febrile period.
» Isolate until swelling subsides.
» Advise on oral hygiene.
» Recommend plenty of fluids and soft food during acute stage.
» Patient is infectious from 3 days before parotid swelling to 7 days after it started. Children may return to school 1 week after initial swelling

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» Abdominal pain (to exclude pancreatitis)
» Painful testes or orchitis
» Suspected meningo-encephalitis

10.12 Rubella (German measles)

B06.9

Description

Incubation period: 14–21 days.
A viral infection with skin lesions that is less severe than measles and lasts only 3–4 days.
A maculopapular rash starts on the face spreading to the trunk, arms and legs. It usually fades as it spreads.
Note:
If cough, coryza or conjunctivitis are also present, it is essential to exclude measles – See case definition of measles.

Clinical features include:
» mild rash
» swollen and tender lymph nodes behind the ears (suboccipital)
» in adults, a small joint arthritis may occur
Note:
Infection during the first or second trimester of pregnancy may lead to severe permanent deformities in the baby. Family should be counselled regarding these risks and termination of pregnancy should be offered in all cases.

General measures

Bed rest if needed.
Isolate from pregnant women for seven days after onset of the rash.

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

Urgent

» Pregnant women with rubella
» Pregnant women who have been in contact with a patient with rubella

10.13 Schistosomiasis

B65.9

Description

A parasitic infestation with:
» *Schistosoma haematobium*: primarily involves the bladder and renal tract, or
» *Schistosoma mansoni*: primarily involves the intestinal tract.

Infestation occurs during washing, bathing or paddling in water harbouring snails shedding this parasite.
Clinical features vary with the location of the parasite.
Most cases are asymptomatic.
Acute schistosomiasis, consisting of a non-specific febrile illness with marked eosinophilia, may occur in non-immunes several weeks following initial exposure, especially with *Schistosoma mansoni* infection.

Chronic schistosomiasis may present with local or systemic complications due to fibrosis, including urinary tract obstruction with ensuing renal failure, portal hypertension or other organ involvement.

	Schistosoma haematobium	***Schistosoma mansoni***
Clinical features	» blood in the urine » recurrent cystitis » other urinary symptoms	» diarrhoea with blood and mucus in the stools » colicky abdominal pain » enlarged liver and spleen
Diagnosis	» eggs in urine or stool on microscopy » rectal biopsy	

General measures

If bilharzia is endemic, educate the community to avoid contact with contaminated water.
Do not urinate or pass stools near water used for drinking, washing or bathing.
Do not swim in contaminated water.
Collect water from rivers and dams at sunrise when the risk of infestation is lowest.

Boil all water before use

Drug treatment

In endemic areas patients with haematuria should be treated empirically. Exclude possible glomerulonephritis: raised blood pressure, oedema and shortness of breath. – See section 8.3: Glomerular Diseases (GN)
In non-endemic areas treatment should be given only if eggs of *S. haematobium* or *S. mansoni* are found in the urine/faeces.

- Praziquantel, oral, 40 mg/kg as a single dose

Weight kg	**Dose** mg	**Tablet** 600 mg	**Age** years
≥ 10–17.5 kg	600 mg	1 tablet	≥ 2–5 years
≥ 17.5–25 kg	900 mg	1½ tablets	≥ 5–7 years
≥ 25–35 kg	1 200 mg	2 tablets	≥ 7–11 years
≥ 35–55 kg	1 800 mg	3 tablets	≥ 11–15 years
≥ 55 kg and above	3 000 mg	5 tablets	Adults

Referral

» Children under 2 years
» Ongoing urinary tract symptoms
» Signs of bleeding disorders or glomerulonephritis

10.13 Typhoid fever (See Chapter 2 - Gastrointestinal conditions)

10.14 Tuberculosis (See Chapter 17 - Respiratory conditions)

Chapter 11: Human immunodeficiency virus and acquired immunodeficiency syndrome (HIV AND AIDS)

Human immunodeficiency virus infection in adults

B33.3

Description

HIV enters lymphocytes and replicates, leading to progressive destruction of the immune system, until the infected person becomes unable to fight infection and develops the syndrome of **A**cquired **I**mmune **D**eficiency **S**yndrome (AIDS).

During the course of the initial HIV infection antibodies are developed to the virus and the person changes from HIV negative to HIV positive. This is known as seroconversion or primary infection and is characterised by:

» glandular fever type illness
» maculopapular rash
» small orogenital ulcers

South African Adapted WHO staging system for HIV infection and disease in adults and adolescents

Clinical stage I

» Asymptomatic
» Persistent generalized lymphadenopathy

Clinical stage II

» Unexplained moderate weight loss (less than 10% of presumed or measured body weight)
» Recurrent respiratory tract infections (sinusitis, otitis media and pharyngitis)
» Herpes zoster (shingles)
» Angular cheilitis
» Recurrent oral ulceration
» Papular pruritic eruption
» Seborrheic dermatitis
» Fungal nail infections

Clinical stage III*

» Unexplained severe weight loss (more than 10% of presumed or measured body weight)
» Unexplained chronic diarrhoea for longer than 1 month
» Unexplained persistent fever (above 37.5ºC intermittent or constant for longer than 1 month)
» Persistent oral candidiasis (thrush)
» Oral hairy leukoplakia
» Tuberculosis (pulmonary and extrapulmonary)
» Severe recurrent bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis or bacteraemia)
» Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5×10^9/L) and/or chronic thrombocytopaenia (< 50×10^9/L)

Clinical stage IV*

» HIV wasting syndrome
» Pneumocystis pneumonia
» Recurrent severe bacterial pneumonia
» Chronic herpes simplex infection (orolabial, genital or anorectal of more than one moths duration or visceral at any site)
» Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs)
» Kaposi's sarcoma
» Cytomegalovirus infection (retinitis or infection of other organs)
» Central nervous system toxoplasmosis
» HIV encephalopathy
» Extrapulmonary cryptococcosis including meningitis
» Disseminated non-tuberculous mycobacterial infection
» Progressive multifocal leukoencephalopathy
» Chronic cryptosporidiosis
» Chronic Isosporiasis
» Disseminated mycosis (extrapulmonary histoplasmosis or coccidiomycosis)
» Recurrent septicaemia (including non-typhoidal *Salmonella*)
» Lymphoma (cerebral or B cell non-Hodgkin)
» Invasive cervical carcinoma
» Atypical disseminated leishmaniasis
» Symptomatic HIV-associated nephropathy or symptomatic HIV-associated cardiomyopathy

* Note that TB has been moved to Stage 3 in the South African Adapted WHO Staging

Diagnosis

» Adequate pre- and post-test counselling must be provided
» Ensure patient confidentiality
» HIV in adults must be confirmed with a second test. This can either be two rapid tests, using kits from different manufacturers or with a laboratory test, usually ELISA
» There is a window period of up to 3 months in which antibodies are not detected by blood tests. This is the time period between becoming infected and the appearance of antibodies, which are detectable by blood tests

General measures

» Patients and their families must be supported and encouraged to join support or peer groups.
» Counsel patients on preventive methods of reducing the spread of the disease
  – use condoms during sexual intercourse
  – seek early treatment for sexually transmitted infections
  – safe handling of blood spills

- Multivitamin, oral, once daily
  - o Do not exceed the dose
  - o Do not give with vitamin B complex

Proposed content of formulation:

vitamin A: 700–800 mcg,
vitamin D: 200–300 units
vitamin E: 10–15 mg
ascorbic acid: (vitamin C) 70–90 mg
folic acid: 200–400 mcg
thiamine (vitamin B_1): 1.4–1.5 mg
niacin: 10–20 mg
riboflavin (vitamin B_2): 1.4–1.6 mg
vitamin B_6: 1.9mg–2.5 mg
vitamin B_{12}: 1–3 mcg
iron: 4–9 mg
zinc: 5–15 mg
selenium: 55–65 mcg
copper: 1.5–2 mg

11.1 Antiretroviral therapy, adults

Only facilities accredited as CCMT service points may initiate long term ARV therapy.
For detail of criteria for initiation of ART, consult the latest National Clinical Guidelines for the Management of HIV and AIDS in Adults.
What follows in the text below is only a summary, which may not be applicable to patients with complications.

! CAUTION !
Anti-retroviral drugs frequently interact with TB drugs.
Consult the latest National Clinical Guidelines for the management of HIV and AIDS in adults.

All HIV-infected patients must have a CD4 count requested and WHO clinical staging done. The CD4 count should be repeated every 6 months. All eligible patients must be referred to the nearest CCMT service point for antiretroviral therapy. The patients should be counselled about antiretroviral therapy prior to referral.

Regimen 1

- Stavudine, oral, 30 mg 12 hourly

or

<u>For overweight patients with a BMI >28:</u>

- Zidovudine, oral, 300 mg 12 hourly

and

- Lamivudine, oral, 150 mg 12 hourly

plus

- Efavirenz, oral, 600 mg at night

or

<u>For women of child-bearing potential:</u>

- Nevirapine, oral, 200 mg daily for the first 2 weeks increasing to 200 mg 12 hourly thereafter

Regimen 2

- Zidovudine, oral, 300 mg 12 hourly

and

- Didanosine, oral, 400 mg once daily on an empty stomach
  - o If < 60 kg: 250 mg once daily

plus

- Lopinavir/ritonavir 400/100 mg, oral, 12 hourly

Patients on long term ARV treatment, who become pregnant, should be referred back to their CCMT site.

<u>Patients with a positive hepatitis B surface antigen:</u>

The combination of tenofovir 300 mg daily and lamivudine 300 mg daily will replace:

- stavudine and lamivudine in regimen 1
- zidovudine and didanosine in regimen 2

Note:

In patients with hepatitis B, do not stop tenofovir and lamivudine as this can cause a severe flare of hepatitis B. Even if patients fail regimen 1 and commence regimen 2, continue with tenofovir and lamivudine, replacing zidovudine and didanosine.

Tenofovir may be substituted for stavudine if lipo-atrophy occurs.
Tenofovir and lamivudine are recommended to substitute for stavudine and lamivudine or zidovudine and didanosine if patients develop symptomatic hyperlactataemia.

11.2 Opportunistic infections, prophylaxis in adults

Z29.2

Primary prophylaxis with cotrimoxazole prevents many infections, e.g.:

- Pneumocystis pneumonia
- toxoplasmosis
- bacterial pneumonia
- bacteraemia
- isosporiasis

Indications for primary prophylaxis:

» WHO Clinical stage II, III or IV for HIV infection and disease in adults and adolescents

» CD4 count less than 200 cells/microL

Prophylaxis may be discontinued if the CD4 count increases on antiretroviral therapy to more than 200 cells/microL for at least 6 months.

- Cotrimoxazole, oral, 160/800 daily.

Note:

Cotrimoxazole hypersensitivity is common and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of cotrimoxazole, the drug must be immediately and permanently stopped and the patient referred to hospital.

If a patient is referred back on antiretroviral agents, and the CD4 count has risen to more than 200 cells/microL, prophylaxis with cotrimoxazole can be stopped.

11.2.1 TB chemoprophylaxis

Patients with HIV infection are more susceptible to TB infection than HIV-negative patients.

The indication for preventive therapy is a Mantoux 5 mm or larger or a recent TB contact. Initiate only once active TB is excluded.

- Isoniazid, oral, 300 mg daily for 6 months.
  - o Educate patients on the symptoms of hepatotoxicity and the need to be followed up monthly.
  - o Instruct patient to present early if these symptoms arise.
- Pyridoxine, oral, 25 mg once daily

Note:

Only some primary care facilities are able to do Mantoux testing and exclude TB reliably. Consult with local TB Programme managers.

11.3 Opportunistic infections, treatment in adults

11.3.1 Aphthous ulcers in HIV infection

B20.3

Description

Painful ulcers in the oropharynx. Minor ulcers (<1 cm diameter) usually heal within 2 weeks. Major ulcers (>1 cm diameter) are very painful, often very deep and persist. Major ulcers generally resolve rapidly on antiretroviral therapy. Herpes simplex, histoplasmosis and mycobacteria may also present with major mucosal ulcers

Drug treatment

Minor aphthous ulcers:

- Choline salicylate/ cetalkonium chloride 8.7/0.01% oral gel, applied 6 hourly until healed

Referral

» Major aphthous ulcers for further diagnostic evaluation

11.3.2 Candidiasis, oral

B20.4

See section 1.2: Candidiasis, oral (thrush)

11.3.3 Candida oesophagitis

B20.4

Description

Infection of the oesophagus with candida, a fungus causing oral thrush. Occurs in patients with oral thrush who have pain or difficulty on swallowing. (See section 1.2: Candidiasis, oral (thrush))

General measures

» Maintain hydration

Drug treatment

- Fluconazole, oral, 200 mg daily for 14 days
  Note: Women of child–bearing age should use an effective contraceptive

Referral

» Inability to swallow
» Frequent relapses
» Poor response to fluconazole
» For ARV treatment

11.3.4 Diarrhoea, HIV associated

A09

Description

Diarrhoea that persists for longer than 2 weeks. Often associated with wasting. Stool for ova, cysts and parasites should be requested in all cases.

Drug treatment

If stool is negative for parasites or shows *Cryptosporidium*:

- Loperamide, oral, 2 mg as required
  - Maximum 8 mg daily

If stool shows *Isospora belli*:

- Cotrimoxazole, oral, 1920 mg (4 tablets) 12 hourly for 10 days followed by 960 mg (two tablets) daily

Referral

» Stool contains blood or mucus
» All cases for consideration for ARV treatment

11.3.5 Eczema, seborrhoeic

L30.9

See section 5.7.3: Dermatitis, seborrhoeic

11.3.6 Fungal nail infections

B37.2

This is common in HIV infected patients and can involve multiple nails. Treatment is not generally recommended because it is mostly of only cosmetic importance and therefore the risk of systemic therapy is not warranted. It generally resolves when patient is on antiretroviral therapy.

11.3.7 Fungal skin infections

B37.2

See section 5.5: Fungal infections of the skin

11.3.8 Gingivitis, acute necrotising ulcerative

K05.0

See section 1.3.3: Necrotising peridontitis

11.3.9 Herpes simplex ulcers, chronic

B20.3

Description

Painful ulcers due to herpes simplex virus, involving the skin around the anogenital area or in and around the mouth and nostrils in patients with advanced HIV infection. Ulcers persist for weeks and may be several centimeters in diameter.

General measures

» Keep affected areas clean with soap and water or diluted antiseptic solution.

Drug treatment

- Aciclovir, oral, 400 mg 8 hourly for 7 days

For pain relief

- Paracetamol, oral 1 000 mg when needed up to 4 times a day

Referral

» No response to therapy
» Frequent relapses
» For ARV treatment

11.3.10 Herpes zoster (Shingles)

B20.3

Description

Painful vesicular rash in a dermatomal distribution, usually presenting as a band on one side of the body, due to recrudescence of the varicella-zoster virus that causes chickenpox. The surrounding skin is inflamed and the vesicles often contain cloudy fluid. Secondary bacterial infection is often suspected, but is very uncommon.
The elderly and HIV-infected are most affected.

Severe pain can occur after shingles has healed (post-herpetic neuralgia).

Drug treatment

If fresh vesicles are present:

- Aciclovir, oral, 800 mg five times daily (4 hourly missing the middle of the night dose) for 7 days.

If secondary infection is present:

- Erythromycin, oral, 500 mg 6 hourly

For pain relief

- Paracetamol, oral, 1 000 mg 6 hourly when needed

plus

If inadequate pain relief

Add:

- Tramadol, oral, 50 mg 6 hourly (Doctor initiated)

For prolonged pain occurring after shingles has healed (post herpetic neuralgia), or if pain not responding to paracetamol and tramadol:

- Amitriptyline, oral, 25 mg at night.
  - o Increase dose to 50 mg after two weeks if needed
  - o Increase further to 75 mg after a further two weeks if needed.

Referral

» Involvement of the eye
» Disseminated disease (many vesicles extending beyond the main area)
» Features of meningitis (headache and neck stiffness)
» Severe post-herpetic neuralgia not responding to amitriptyline

11.3.11 Meningitis, cryptococcal

B45.1

Description

Fungal meningitis occurring in advanced HIV infection.
Presents with headache, often lasting for weeks.
Neck stiffness is often absent.
Decreased level of consciousness, confusion and fever are common.

Drug treatment

All patients should be treated for cryptococcal meningitis at hospital level.
Patients may be down referred for secondary prophylaxis treatment.

Secondary prophylaxis

After completion of fluconazole 400 mg daily for 8 weeks:

- Fluconazole, oral, 200 mg daily for a minimum of 12 months.
  - o Continue with fluconazole if the CD4 count does not increase to >200 cells/microL on antiretroviral therapy.

Referral

» All patients for initial management in hospital
» For ARV treatment

11.3.12 Papular pruritic eruption

L30.9

Description

Itchy inflamed papules at different stages of evolution. Healed lesions are often hyperpigmented. The itch is difficult to manage. It may flare after starting antiretroviral therapy, but generally improves as the CD4 count increases. It is essential to exclude scabies.

General measures

» Minimise exposure to insect bites, e.g. by regularly dipping pets.

Drug treatment

- Chlorpheniramine, oral, 4 mg 8 hourly
- Hydrocortisone acetate 1% cream, applied twice daily for 7 days.
  - o Apply sparingly to the face.

11.3.13 Pneumonia, bacterial

J15

See section 17.3: Respiratory infections

11.3.14 Pneumonia, pneumocystis

B20.6

See section 17.3: Respiratory infections

11.3.15 Toxoplasmosis

B58.9

Initial diagnosis can only be made at hospital level.

- Cotrimoxazole, oral, 320/1 600 mg 12 hourly for 4 weeks,
  - Then 160/ 800 mg 12 hourly for 12 weeks.

Secondary prophylaxis

- Cotrimoxazole, oral 160/ 800 mg daily
  - Continue until the CD4 count has risen to >200 cells/microL on antiretroviral therapy.

Referral

» For ARV treatment

11.3.16 Tuberculosis (TB)

B20.0

See section 17.3: Respiratory infections.

Human immunodeficiency virus infection in children

B33.3

Description

HIV enters lymphocytes and replicates, leading to progressive destruction of the immune system (CD4 cells). As the disease progresses, the CD4 cells decrease in number and quality making the HIV-infected person at risk of infections and other diseases e.g. cancers. The most advanced stage of disease is Acquired Immunodeficiency Syndrome (AIDS).

WHO staging of HIV and AIDS for children with confirmed HIV infection

Clinical Stage 1

» Asymptomatic
» Persistent generalised lymphadenopathy

Clinical Stage 2

» Unexplained persistent hepatosplenomegaly
» Papular pruritic eruptions
» Extensive wart virus infection
» Extensive molluscum contagiosum
» Fungal nail infections

» Recurrent oral ulcerations
» Unexplained persistent parotid enlargement
» Lineal gingival erythema
» Herpes zoster
» Recurrent or chronic upper respiratory tract infections (otitis media, otorrhoea, sinusitis, tonsillitis)

Clinical Stage 3

» Unexplained moderate malnutrition not adequately responding to standard therapy
» Unexplained persistent diarrhoea (14 days or more)
» Unexplained persistent fever (above 37.5ºcintermittent or constant, for longer than one month)
» Persistent oral candidiasis (after the first 6 weeks of life)
» Oral hairy leukoplakia
» Acute necrotising ulcerative gingivitis or periodontitis
» Lymph node tuberculosis
» Pulmonary TB
» Severe recurrent presumed bacterial pneumonia
» Symptomatic lymphoid interstitial pneumonitis
» Chronic HIV-associated lung disease including bronchiectasis
» Unexplained anaemia ($<$ 8 g/dL), neutropaenia (<0.5x10^9/L) and/or chronic thrombocytopaenia (< 50x10^9/L)

Clinical Stage 4

» Unexplained severe wasting or severe malnutrition not responding to standard therapy
» Pneumocystis pneumonia
» Recurrent severe bacterial infections (such as empyema, pyomyositis, bone or joint infection or meningitis but excluding pneumonia)
» Chronic herpes simplex infection; (orolabial or cutaneous of more than one month's duration)
» Extrapulmonary tuberculosis
» Kaposi sarcoma
» Oesophageal candidiasis (or candida of trachea, bronchi or lungs)
» Central nervous system toxoplasmosis (after one month of life)
» HIV encephalopathy
» Cytomegalovirus infection: retinitis or cytomegalovirus infection affecting another organ with onset at age older than 1 month
» Extrapulmonary cryptococcosis (including meningitis)
» Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis)
» Chronic cryptosporidiosis
» Chronic isosporiasis
» Disseminated non-tuberculous mycobacteria infection
» Cerebral or B cell non-hodgkin lymphoma
» Progressive multifocal leukoencephalopathy
» Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy

Diagnosis in children

Infant HIV testing (0–18 months)

» Early HIV testing in infants exposed to HIV during pregnancy and/or breastfeeding is essential to optimise child survival because children can then access care, treatment and support as early as possible. HIV tests can never be 100% accurate. Therefore if HIV test results are discrepant with the clinical picture, repeat the HIV test.

» Testing children younger than 18-months:
  – Virological testing using PCR is the test of choice.
  – After counselling and consent is obtained, test ALL HIV-exposed infants **at six weeks** of age using PCR.
  – **If an infant is symptomatic for HIV infection, do not wait until 6 weeks** to perform the PCR test. Perform the test and retrieve the result as a matter of urgency. If PCR test result is negative, consider other causes for symptoms.
  – If the PCR test was performed earlier than 4 weeks of age in an HIV-exposed child and the result is negative, repeat the PCR at 6 weeks of age to exclude HIV infection.
  – Up to 18 months, an antibody test could be falsely positive, because of the presence of the circulating antibodies from the mother. An antibody test cannot definitively diagnose HIV in this age group.
  – However, a negative antibody test in children under the age of 18 months can be helpful in excluding HIV infection in symptomatic children.
  – In an HIV-exposed, HIV PCR negative breastfed infant, repeat PCR 6 weeks after cessation of breastfeeding. If the cessation of breastfeeding happens after the child turns 18 months then an antibody test is done.
  – In an HIV-exposed, HIV PCR negative breastfed child becomes symptomatic for HIV infection, perform a repeat PCR.

Testing children older than 18 months:

» At 18 months ALL HIV exposed children (PCR negative and positive) should be tested with an antibody test to confirm their HIV status to rule out false positive results and also to exclude a new infection

» HIV antibody testing can be used to confirm HIV status in children older than 18 months as contained in the VCT policy

» Testing should be done with counselling of parent/legal guardian/primary caregiver and, where appropriate, the child

Management of HIV infected children

All HIV positive children

All HIV positive children should receive standard preventative care, i.e.:
Immunisation – See chapter 15: Immunisation
Deworming – See section 2.1: Helminth infestation
Vitamin A – See section 3.3: Vitamin A deficiency

Children under 1 year of age:

» Refer as soon as possible to an accredited CCMT service point for assessment.

Children over 1 year of age:

» At PHC facility, do:
  – Routine clinical staging every 3 months
  – 6 monthly CD4 percentage and absolute count
» Once the child fulfils the medical and social criteria for ART, refer to a CCMT service point for initiation of ART.

Stabilised children on ART at PHC

» Ongoing care for children on ART includes:
  – Monitoring treatment adherence
  – Ensuring the child receives the necessary ARVs on a monthly basis
  – Referral for laboratory investigations and re-assessment as required
  – Assessment for drug side effects or other complications
  – Routine care for immunisation and weight monitoring as per the EPI schedule and the Road-to-Health card.
  – Management of intercurrent infections, including TB
  – Counselling and support of the parents/caregivers
  – Arranging for palliative care where appropriate with the support of NGOs.

General measures

» Ensure that a well-balanced diet is maintained.
» Support all members of the family:
  – psychosocial support
  – community support
» Infant feeding:
  – feeding choices are either, exclusive formula/replacement feeding or exclusive breastfeeding based on the AFASS criteria.
  – mixed breastfeeding should be discouraged

For each woman, the Acceptability, Feasibility, Affordability, Safety and Sustainability (AFASS) of avoiding all breastfeeding should be considered. The woman should be assisted to make the feeding choice that would be most appropriate for her individual situation, taking into account her home circumstances, the SAFETY of avoiding all breastfeeding and the background profile of childhood illness and mortality rate in the areas in which she lives.

11.4 Antiretroviral therapy, children

!CAUTION!
Anti-retroviral drugs frequently interact with TB drugs.
Consult the latest National Guideline for the Management for HIV-infected children.

Eligibility for antiretroviral therapy

Patients must satisfy all the clinical and social criteria before being accepted for treatment.

Clinical Criteria
Consult the latest National Guideline for the Management for HIV-infected children.

Social criteria
» At least one identifiable caregiver who is able to supervise the child for administering medication
  – All efforts should be made to ensure that the social circumstances of vulnerable children, e.g. orphans, are addressed so that they too can receive treatment.
» These criteria are extremely important for the success of the program and need to be adhered to – the principle is that adherence to treatment must be at least probable.

Antiretroviral drug choices for children

Only facilities accredited as CCMT service points may initiate long term ARV therapy.
For detail of ARV therapy, consult the current National Guidelines.
What follows in the text below is only a summary, which may not be applicable to patients with complications.

	Starting age under 3 years
1st Line	Stavudine (d4T) Lamivudine (3TC) Lopinavir/ritonavir (LPV/r)
2nd Line	Zidovudine (AZT) Didanosine (ddI) Nevirapine (NVP) or Efavirenz (EFV)*

*Efavirenz if the child is over 3 years and > 10 kg; otherwise use nevirapine

	Starting age over 3 years and > 10 kg
1st Line	Stavudine (d4T) Lamivudine (3TC) Efavirenz (EFV)
2nd Line	Zidovudine (AZT) Didanosine (ddI) Lopinavir/ritonavir (LPV/r)

First line regimens

Option 1.1
Age birth to 3 years **or** < 10 kg
- Stavudine, oral, 1 mg/kg/dose 12 hourly

plus
- Lamivudine, oral, 4 mg/kg/dose 12 hourly

plus
- Lopinavir/ritonavir 80/20, oral, 230 mg/m^2/dose of lopinavir component 12 hourly .
  - o Administer with food.
  - o A high-fat meal increases absorption, especially of the solution.
  - o If co-administered with didanosine, didanosine should be given 1 hour before or 2 hours after lopinavir/ritonavir

Option 1.2
Age > 3 years **and** > 10 kg
- Stavudine, oral, 1 mg/kg/dose 12 hourly

plus
- Lamivudine, oral, 4 mg/kg/dose 12 hourly

plus
If < 40 kg
- Efavirenz, oral, 350 mg/m^2/dose as a single daily dose

Second line regimens

Option 2.1
<u>If previously on stavudine, lamivudine and lopinavir/ritonavir:</u>
- Zidovudine, oral, 180–240 mg/ m^2/dose 12 hourly <u>after checking full blood count</u>

plus
- Didanosine, oral, 12 hourly

< 8 months	100 mg/m^2/dose
> 8 months	120 mg/m^2/dose

  - o Can be given as a single daily dose in older children.
  - o Do not give simultaneously with other ARV medication.
  - o Administer 2 hours before/after other ARV medication.

plus
<u>If age < 3 years or < 10 kg</u>
- Nevirapine, oral, 120 mg/m^2/dose as a single daily dose for 2 weeks, then 12 hourly if no rash or severe side effects

or
<u>If age > 3 years or > 10 kg</u>
- Efavirenz, oral, 350 mg/m^2/dose as a single daily dose

Option 2.2

<u>If previously on stavudine, lamivudine and efavirenz:</u>

- Zidovudine, oral, 180–240 mg/ m^2/dose 12 hourly

plus

- Didanosine, oral, 12 hourly

< 8 months	100 mg/m^2/dose
> 8 months	120 mg/m^2/dose

  - o Can be given as a single daily dose in older children.
  - o Do not give simultaneously with other ARV medication.
  - o Administer 2 hours before/after other ARV medication.

plus

- Lopinavir/ritonavir 80/20, oral, 230 mg/m^2/dose of lopinavir component 12 hourly
  - o Administer with food.
  - o A high-fat meal increases absorption, especially of the solution.
  - o If co-administered with didanosine, didanosine should be given 1 hour before or 2 hours after lopinavir/ritonavir
  - o Where TB treatment and lopinavir/ritonavir are given together seek expert advice on dosage adjustment

Important side effects of ARVs requiring referral to/consultation with CCMT site:

	Continue ART with careful monitoring. Consider single drug replacement with expert advice.	**Consider stopping treatment URGENTLY. Consult expert.**
» Symptomatic hyperlactataemia/ » lactic acidosis	» lactate 2.5– 5 mmol/L	» lactate > 5 mmol/L or acidosis
» anaemia	» Hb = 7.0–9.9 g/dL	» Hb < 7 g/dL or cardiac failure
» neutropenia	» 0.4–1.2 X 10^9/L	» < 0.4 X 10^9/L
» increase liver enzymes and hepatitis	» ≤ 9.9 X upper normal limit	» ≥ 10.0 X upper normal limit
» increased serum triglycerides	» 5.65 – 8.48 mmol/L	» ≥ 8.49 mmol/L
» increased LDL cholesterol	» 3.35–4.9 mmol/L	» ≥ 4.91 mmol/L
» skin reactions	» diffuse maculo-papular rash, or » dry desquamation	» vesiculation, or » ulcers, or » exfoliative dermatitis, or » Stevens-Johnson syndrome, or » erythema multiforme, or » moist desquamation, or with elevated ALT or AST
» peripheral neuropathy » myopathy » abdominal pain » nausea and vomiting » pancreatitis » headache » fatigue » sedative effect » sleep disturbance » confusion » abnormal thinking » probably teratogenic	» clinical evaluation: **Discuss all cases with a clinician with antiretroviral experience, before interrupting therapy**	

Knowledge about HIV and AIDS is constantly being updated. Practices may require changes based on the latest information.

- Multivitamin syrup (with the recommended daily allowance of zinc), oral, daily

Less than 6 months	2.5 mL
6 months – 5 years	5 mL
over 5 years	10 mL

11.5 Opportunistic infections, prophylaxis in children

Z29.2

Description

Primary prophylaxis with cotrimoxazole prevents many infections, e.g.:

» Pneumocystis pneumonia
» toxoplasmosis
» bacterial pneumonia
» bacteraemia
» isosporiasis

Do a PCR test at 6 weeks (or earlier if child is symptomatic).
For long term prophylaxis if PCR is positive or until PCR is known to be negative:

- Cotrimoxazole, oral, once daily

Age	Weight	Dose
≥ 6 weeks –2 months	≥ 2.5–5 kg	2.5 mL
≥ 2 –12 months	≥ 5–10 kg	5 mL
≥ 12 – 24 months	≥ 10–15 kg	7.5 mL
≥ 24–60 months	≥ 15–20 kg	10 mL

When can prophylaxis be stopped?
When there is evidence of immune reconstitution, i.e. in a child 18 months or older with a CD4 count of > 20% on more than 2 occasions no less than 3 months apart. If CD4 count is not available consider stopping cotrimoxazole only after 6 months of good ART adherence with clinical evidence of immune reconstitution. Cotrimoxazole may be of benefit even with clinical improvement. Mother no longer breastfeeding.

11.5.1 Immunisation

Z26.9

Follow the normal immunisation schedule. Siblings should also be fully immunised.

Do not give BCG to children with symptomatic HIV.
See chapter 13: Immunisation

11.5.2 TB Chemoprophylaxis

B20.0

See section 17.3.9: Tuberculosis

11.6 Opportunistic infections, treatment in children

11.6.1 Candidiasis, oral (thrush), recurrent

B20.4

- Nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed.
  or
  Gentian violet, 0.5%, topical aqueous solution, applied to the inside of the mouth three times daily
  - Continue for 48 hours after cure.

If there is oral candidiasis and the child cannot swallow, this indicates the presence of oesophageal candidiasis – see below.

11.6.2 Candidiasis, oesophageal

B20.4

- Fluconazole, oral, 3 mg/kg per day as a single daily dose for 21 days.
  - o Maximum dose 200 mg a day.

Weight kg	Dose mg	Use one of the following:		Age Months/years
		Suspension 50 mg/5mL	Capsule 50 mg	
≥ 2.5–3.5 kg	10 mg	1 mL	–	≥ Birth–1 month
≥ 3.5–5.5 kg	15 mg	1.5 mL	–	≥ 1–3 months
≥ 5–7 kg	25 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	30 mg	3 mL	–	≥ 6–12 months
≥ 9–11 kg	40 mg	4 mL	–	≥ 12–18 months
≥ 11–14 kg	50 mg	5 mL	1 capsule	≥ 18 months–3 years
≥ 14–25 kg	75 mg	7.5 mL	–	≥ 3–7 years
≥ 25–35 kg	100 mg	10 mL	2 capsules	≥ 7–11 years
≥ 35–55 kg	150 mg	15 mL	3 capsules	≥ 11–15 years

11.6.3 Diarrhoea

B23.8

See section 2.8: Diarrhoea

11.6.4 Pneumonia

B23.8

See section 17.3: Respiratory infections

11.6.5 Measles and chickenpox

B20.7

» Refer all patients

11.6.6 Skin conditions

B20.7

These are common and include scabies, seborrhoeic eczema and others. See chapter 5: Skin conditions.

If no response to care as directed in the chapter, refer.

11.6.7 Tuberculosis (TB)

B20.0

Manage children with TB according to the national TB guidelines. See section 17.3.9: Tuberculosis

TB should be considered earlier in non-resolving pneumonias.
Tuberculin tests are often not reliable and a negative test does not exclude TB.
If TB is suspected but cannot be proven, refer for diagnosis.

11.7 Developmental delay or deterioration

B23.8

» Refer for assessment

11.8 Anaemia

B23.8

See section 3.1: Anaemia

11.9 Supportive Care

Respite care in hospital or hospice or help in the home by community health workers, etc. can provide relief from the burden of nursing a dying family member and providing care at the same time.
Counselling, listening, caring and loving can provide relief from grief and bereavement.

Pain relief
See section 20.2: Chronic non-cancer pain.

Fever relief

» Tepid sponging

and/or

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

11.10 HIV and kidney disease

Description

Various forms of kidney disorders are described among patients who are HIV positive.

Early detection of HIV kidney disease may be beneficial in an attempt to protect the kidney from further disease progression.

Screening should include all patients at time of HIV diagnosis.

Patients at high risk or susceptible for HIV renal disease include:

» CD4 count < 200 cells/microL

» History of nephrotoxic medications

» Comorbidity such as diabetes mellitus, hypertension, or hepatitis C virus co-infection

Screening in HIV for Renal Disease

» Tests should include:
  – A urinalysis for haematuria and proteinuria or albuminuria
  – A measure of kidney function, i.e. creatinine to estimate GFR

» If there is no evidence of kidney disease at the initial evaluation, screening

should be repeated annually.

» 6 monthly monitoring of kidney function and urinary markers of kidney damage is warranted for patients receiving tenofovir.

Referral

» Patients with persistent abnormal urinalysis.
» Estimated creatinine clearance less than 60 mL/minute.

Chapter 12: Sexually transmitted infections

The syndromic approach to STI diagnosis and management is to treat the signs or symptoms (syndrome) of a group of diseases rather than treating a specific disease. This allows for the treatment of one or more conditions that often occur at the same time and has been accepted as the management of choice.

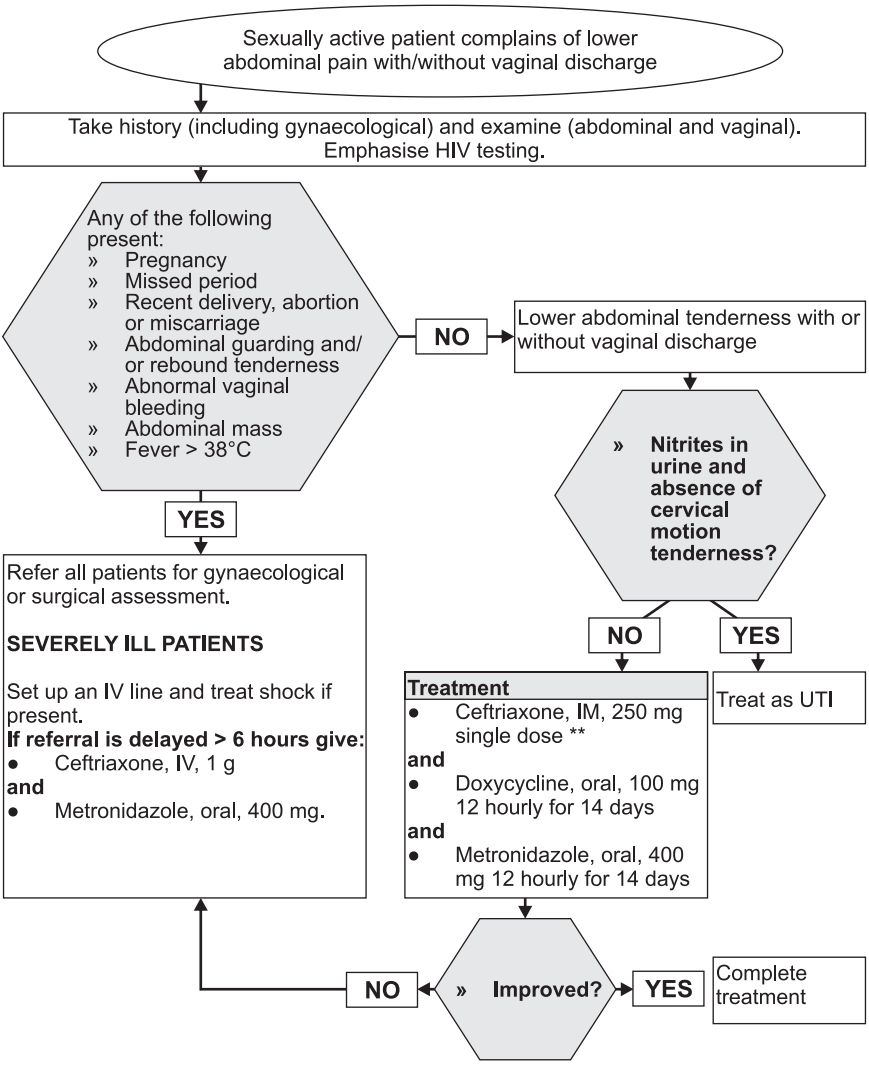
General measures

» Educate, ensure adherence, and counsel.
» Promote abstinence from penetrative sex during the course of treatment.
» Promote and demonstrate condom use, and provide condoms.
» Stress the importance of partner treatment and issue one notification slip for each sexual partner. Follow up partner treatment during review visits.

Promote HIV counselling and testing. For negative test results repeat test after 3 months.

12.1 Lower abdominal pain (LAP)

N73.9

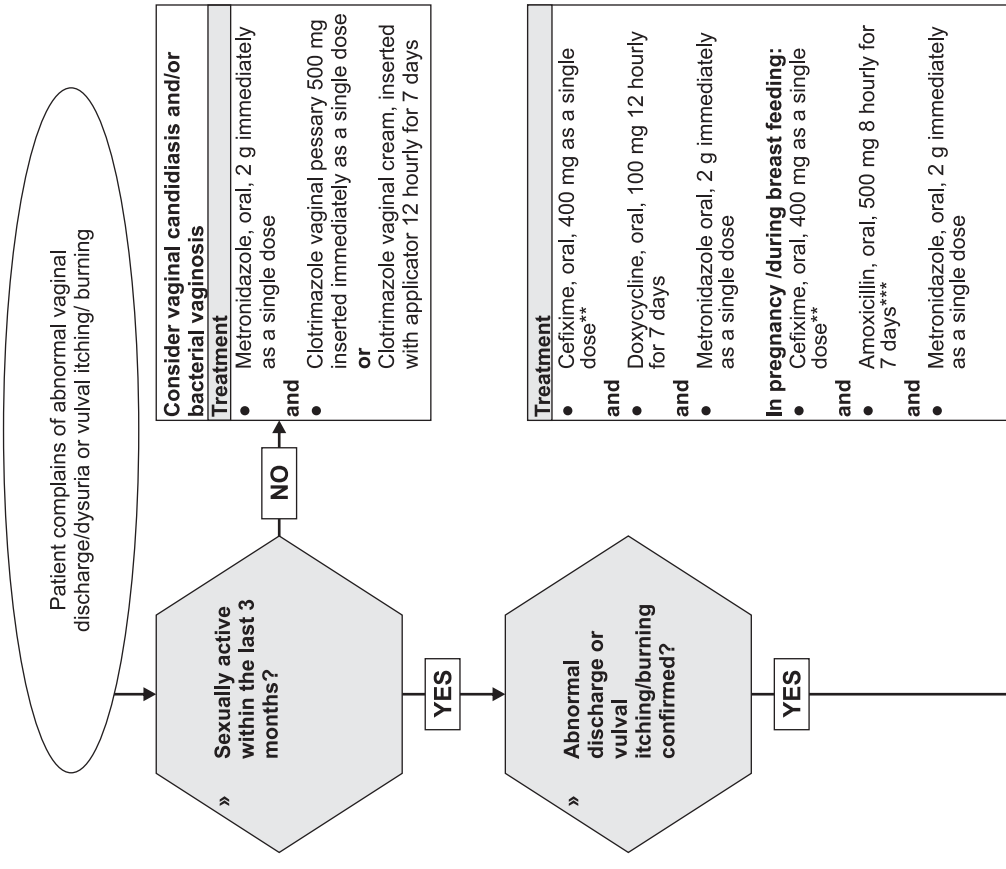


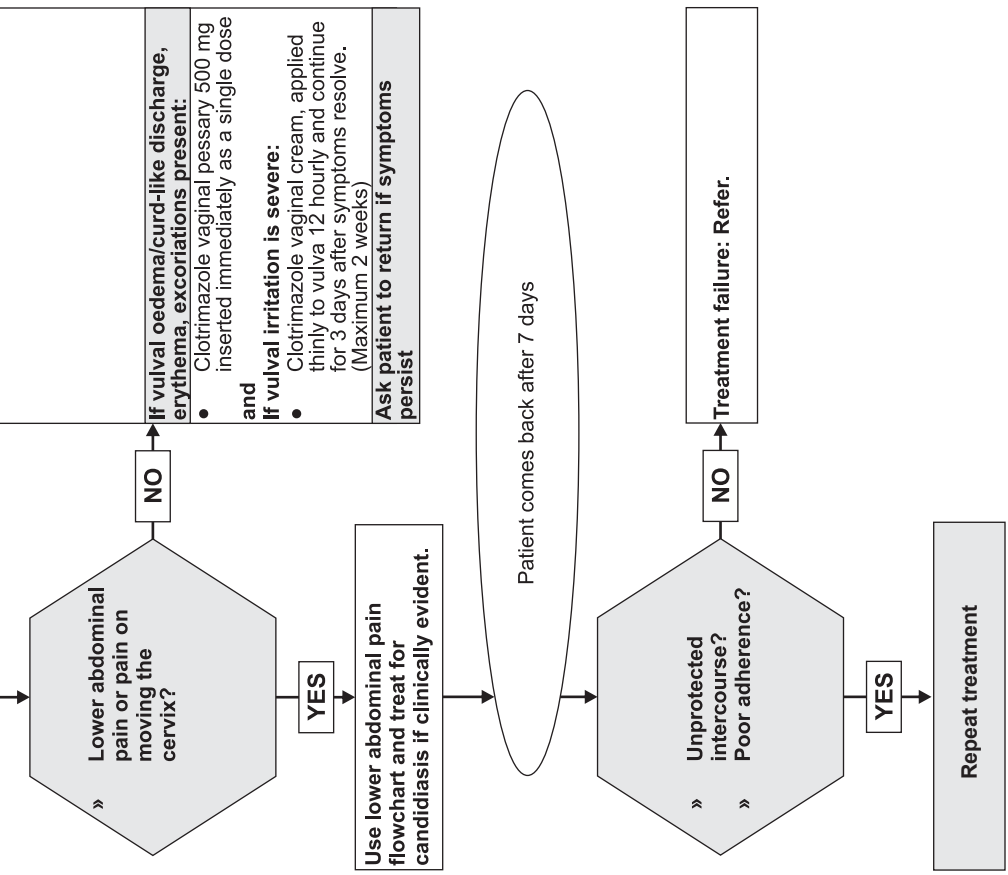
People who are allergic to penicillin may also react to cephalosporins.
****If severe penicillin allergic, i.e. angioedema, anaphylactic shock or bronchospasm, replace ceftriaxone with:**
- **Ciprofloxacin**, oral, 500 mg 12 hourly for 3 days.

If no response after 48 hours – refer

12.2 Vaginal discharge syndrome

B37.4/N73.9





People who are allergic to penicillin may also react to cephalosporins.
****If severe penicillin allergic, i.e. angioedema, anaphylactic shock or bronchospasm, replace cefixime with:**

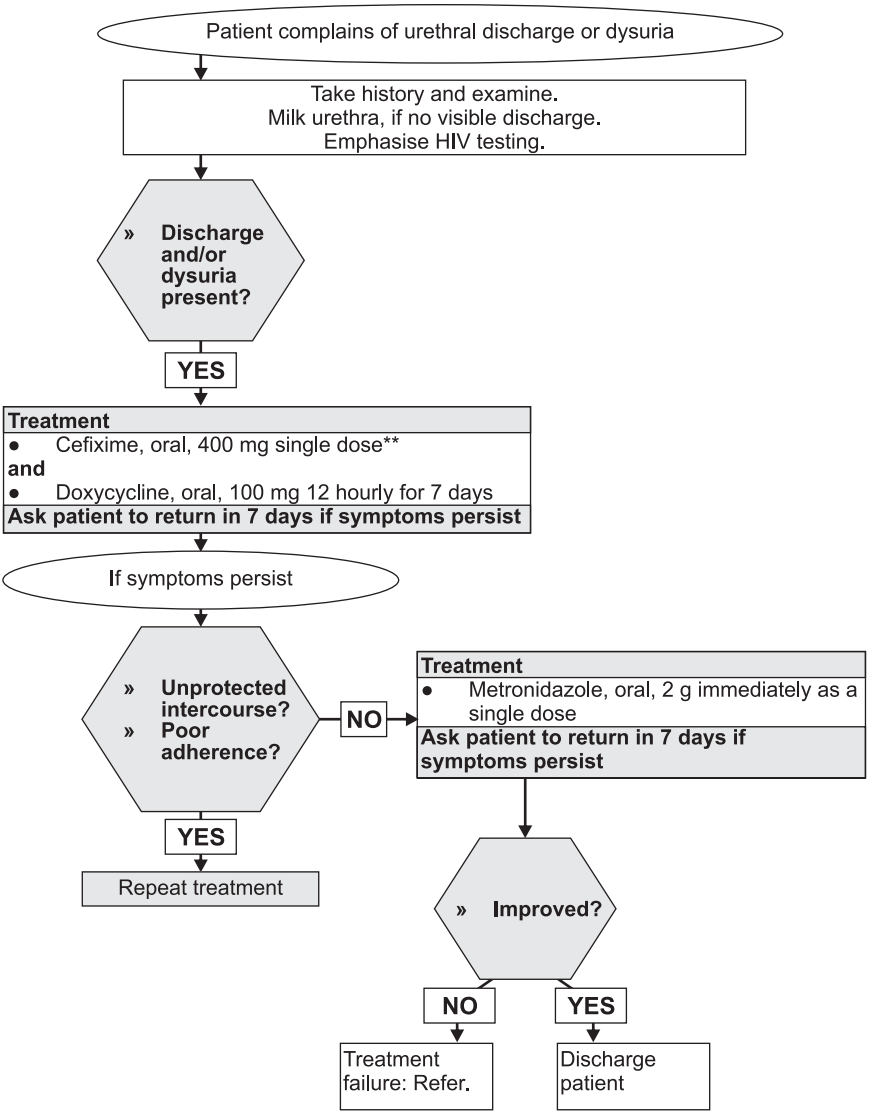
- Ciprofloxacin, oral, 500 mg as a single dose (not in pregnancy or during breast-feeding)

If no response after 48 hours – refer
*****Penicillin allergic pregnant/breast-feeding women, replace amoxicillin and cefixime with:**

- Erythromycin, oral 500 mg 6 hourly for 7 days

12.3 Male urethritis syndrome (MUS)

N34.1



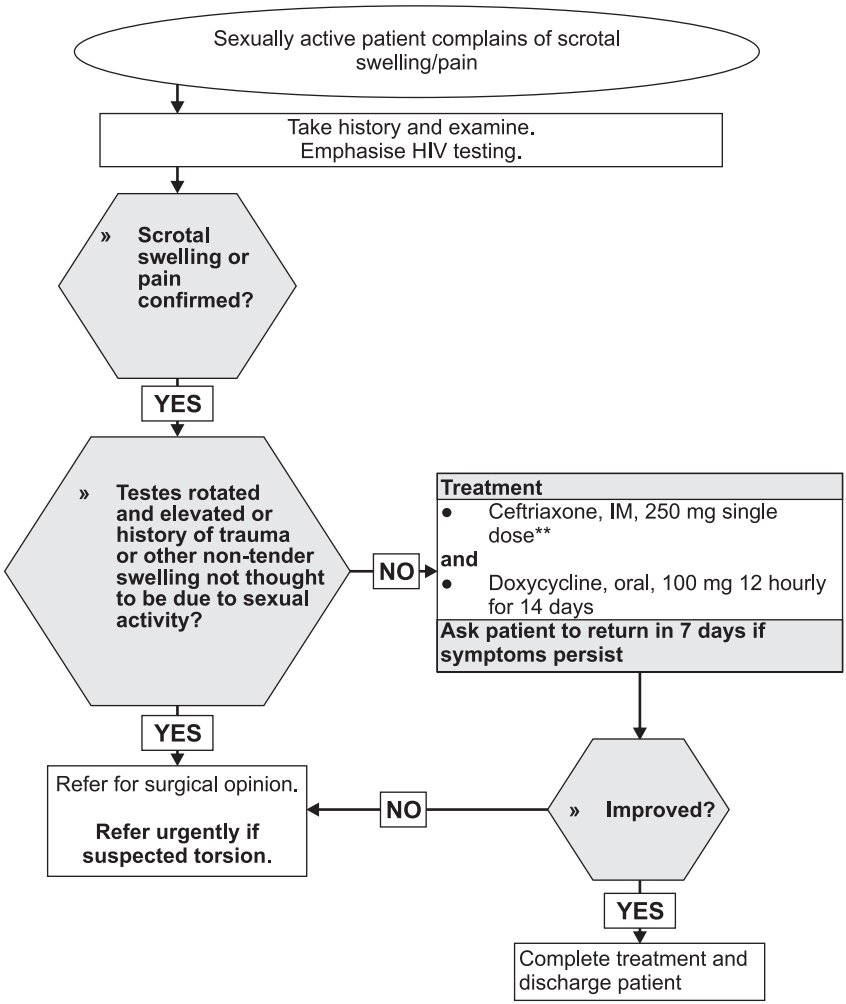
People who are allergic to penicillin may also react to cephalosporins.
****If severe penicillin allergic, i.e. angioedema, anaphylactic shock or bronchospasm, replace cefixime with:**

- Ciprofloxacin, oral, 500 mg as a single dose

If no response after 48 hours – refer.

12.4 Scrotal swelling (SSW)

N45.9



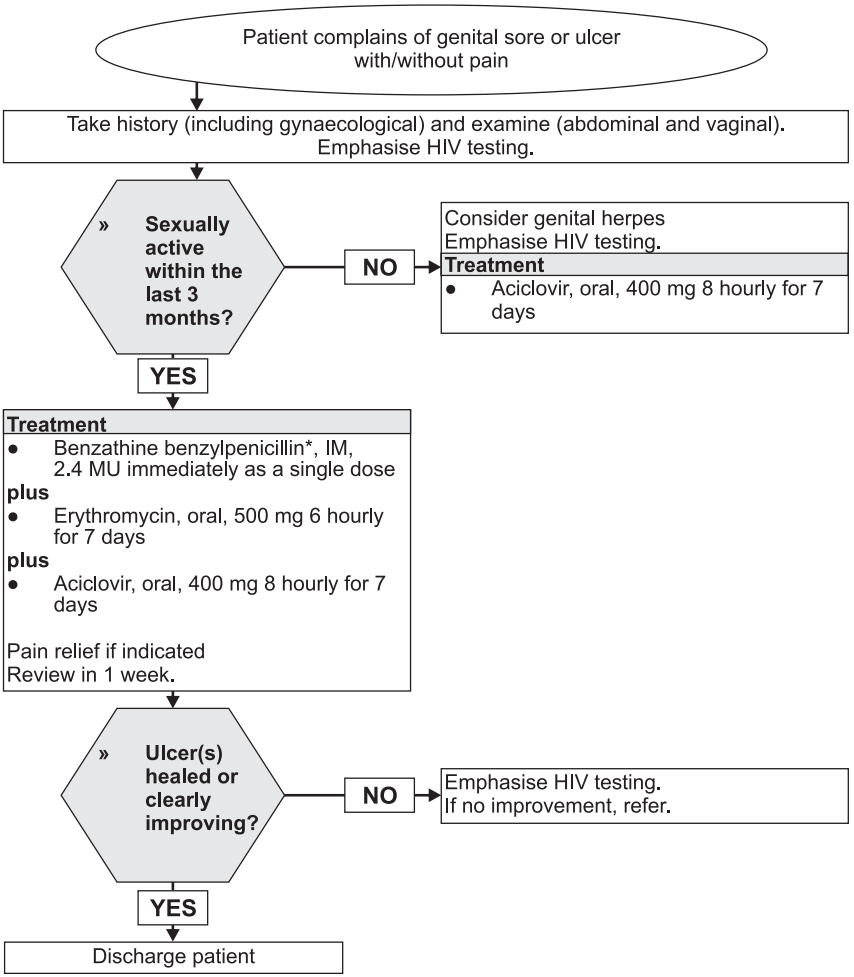
People who are allergic to penicillin may also react to cephalosporins.
****If severe penicillin allergic, i.e. angioedema, anaphylactic shock or bronchospasm, replace ceftriaxone with:**

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

If no response after 48 hours – refer

12.5 Genital ulcer syndrome (GUS)

A60.9



*** Penicillin allergic men and non-pregnant women:**

» replace benzathine benzylpenicillin with:

• Doxycycline, oral, 100 mg 12 hourly for 14 days

» And replace erythromycin with:

• Ciprofloxacin, oral, 500 mg 12 hourly for 3 days

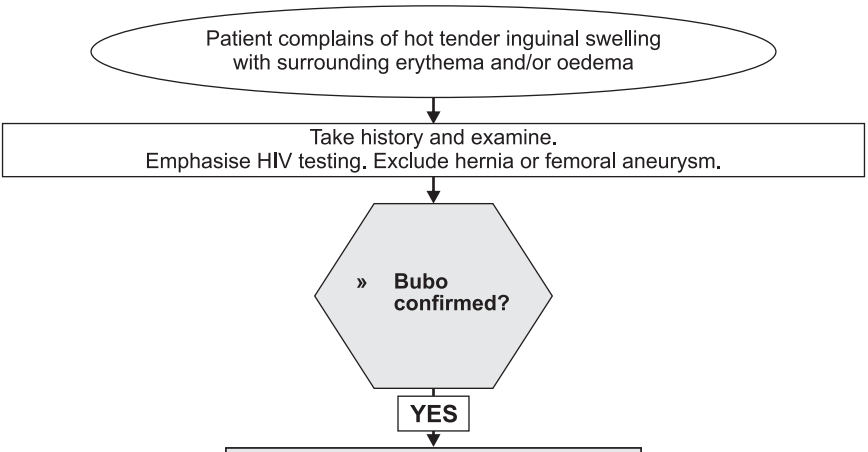
*** Penicillin allergic pregnant women/breast feeding women, replace benzathine benzylepenicillin with:**

• Erythromycin, oral, 500 mg 6 hourly for 14 days

If no response after 48 hours – refer.

12.6 Bubo

A58



Treatment

- Doxycycline, oral, 100 mg 12 hourly for 14 days

and

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

In pregnancy/during breast-feeding, replace the above with:

- Erythromycin, oral, 500 mg 6 hourly for 14 days

If bubo is fluctuant

Aspirate pus in sterile manner.
Repeat every 72 hours, as necessary.

If ulcer is also present

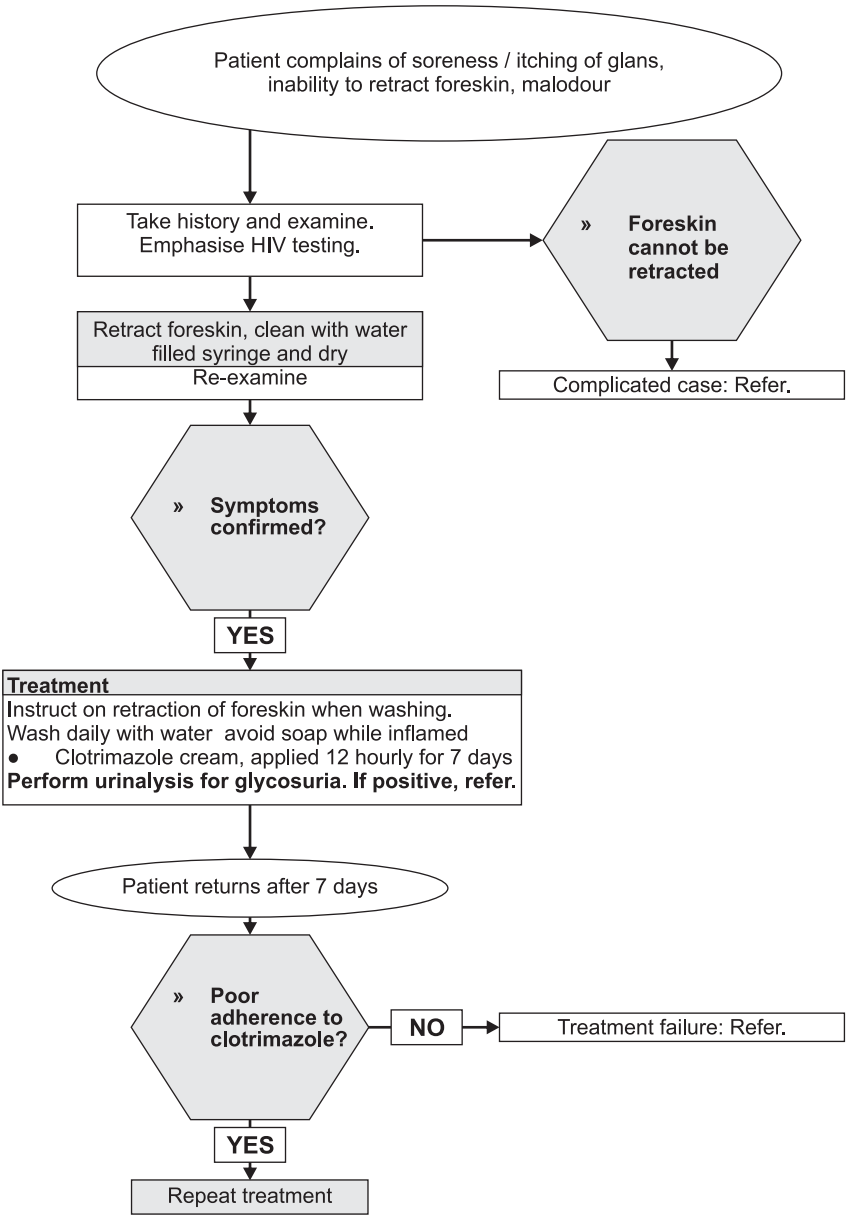
- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose

plus

- Aciclovir, oral, 400 mg 8 hourly for 7 days

12.7 Balanitis/balanoposthitis (BAL)

N48.1



12.8 Syphilis serology and treatment

A53.9

Syphilis serology

The Rapid Plasmin Reagin (RPR) and Venereal Diseases Reference Laboratory (VDRL) tests measure disease activity, but are not specific for syphilis. False RPR/VDRL positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre <1:8). For this reason, positive RPR/VDRL results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test, e.g.:

» *Treponema pallidum* haemagglutination assay (TPHA),
» *Treponema pallidum* particle agglutination assay (TPPA)
» Fluorescent Treponemal Antibody (FTA) test, and
» *Treponema pallidum* ELISA.

Once positive, specific treponemal tests generally remain positive for life.

The RPR/VDRL can be used:

» to determine if the patient's syphilis disease is active or not,
» to measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» to determine a new re-infection.

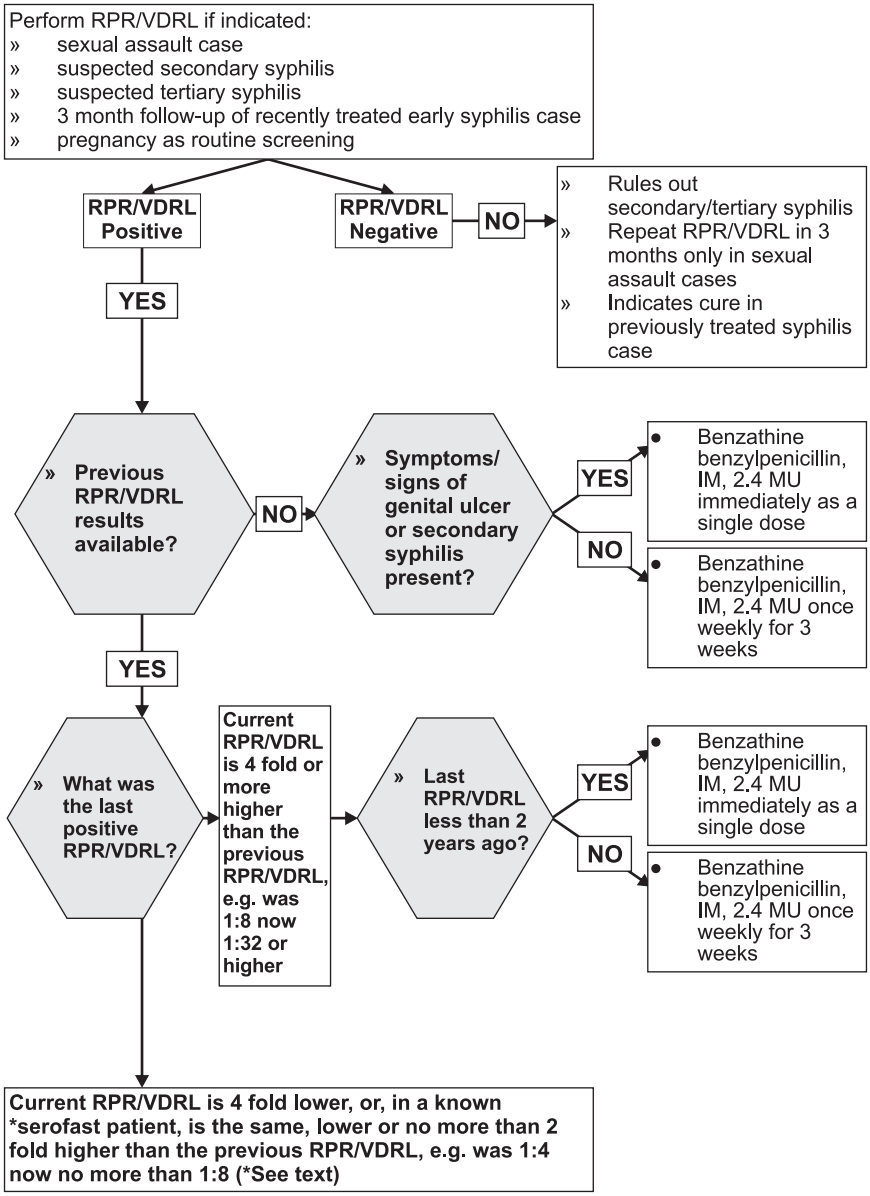
Some patients, even with successful treatment for syphilis, may retain life-long positive RPR/VDRL results at low titres (≤1:8), which do not change by more than one dilution difference over time (so-called serofast patients).

Note:

Up to 30% of primary syphilis cases, i.e. those with genital ulcers, may have a negative RPR/VDRL.

The RPR/VDRL is always positive in the secondary syphilis stage and remains high during the first two (infectious) years of syphilis.

RPR/VDRL should be repeated in three months in patients following sexual assault.


Perform RPR/VDRL if indicated:
» sexual assault case
» suspected secondary syphilis
» suspected tertiary syphilis
» 3 month follow-up of recently treated early syphilis case
» pregnancy as routine screening
RPR/VDRL Positive
RPR/VDRL Negative
NO
» Rules out secondary/tertiary syphilis
» Repeat RPR/VDRL in 3 months only in sexual assault cases
» Indicates cure in previously treated syphilis case
YES
» Previous RPR/VDRL results available?
NO
» Symptoms/ signs of genital ulcer or secondary syphilis present?
YES
NO
• Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose
• Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks
YES
» What was the last positive RPR/VDRL?
Current RPR/VDRL is 4 fold or more higher than the previous RPR/VDRL, e.g. was 1:8 now 1:32 or higher
» Last RPR/VDRL less than 2 years ago?
YES
NO
• Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose
• Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks
Current RPR/VDRL is 4 fold lower, or, in a known *serofast patient, is the same, lower or no more than 2 fold higher than the previous RPR/VDRL, e.g. was 1:4 now no more than 1:8 (*See text)

Late and early syphilis
» record titre on patient's record
» issue a partner notification slip
and
» repeat RPR/VDRL in 3 months

Drug Treatment

Early syphilis treatment

Check if treated at initial visit.
- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose

In penicillin-allergic patients:
- Doxycycline, oral, 100 mg twice daily for 14 days

If penicillin-allergic and pregnant: See Section 6.2.4 Syphilis in pregnancy.
- Erythromycin, oral, 500 mg four times a day for 14 days

Note:
Erythromycin does not reliably cure syphilis in either the mother or the baby. It is essential to re-treat both the mother and the baby.

Baby
See Section 6.2.4 Syphilis in pregnancy.

Mother, once she has stopped breast-feeding
- Doxycycline, oral, 100 mg twice daily for 14 days

Late syphilis treatment

Check if treatment was commenced at initial visit.
- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks

In penicillin-allergic patients:
- Doxycycline, oral, 200 mg twice daily for 21 days

If penicillin-allergic and pregnant:
See Section 6.2.4 Syphilis in pregnancy.
- Erythromycin, oral, 500 mg four times a day for 28 days

Note:
Erythromycin does not reliably cure syphilis in either the mother or the baby. It is essential to re-treat both the mother and the baby.

Baby
See Section 6.2.4 Syphilis in pregnancy.

Mother, once she has stopped breast-feeding
- Doxycycline, oral, 200 mg twice daily for 21 days

Referral

» Neurosyphilis
» Clinical congenital syphilis

12.9 Treatment of more than one STI syndrome

STI syndromes	Treatment (new episode)
MUS + SSW	Treat according to SSW flow chart
MUS + BAL	Treat according to MUS flow chart **plus** • Clotrimazole cream, 12 hourly for 7 days
MUS + GUS	• Cefixime, oral, 400 mg immediately as a single dose **plus** • Benzathine benzylpenicillin*, IM, 2.4 MU immediately as a single dose **plus** • Doxycycline, oral, 100 mg 12 hourly for 7 days **plus** • Aciclovir, oral, 400 mg 8 hourly for 7 days
VDS + LAP	Treat according to LAP flow chart **plus** treat for candidiasis, if required
VDS + GUS (non-pregnant)	• Cefixime, oral, 400 mg immediately as a single dose **plus** • Metronidazole, oral, 2 g immediately as a single dose **plus** • Benzathine benzylpenicillin*, IM, 2.4 MU immediately as a single dose **plus** • Doxycycline, oral, 100 mg 12 hourly for 7 days **plus** • Aciclovir, oral, 400 mg 8 hourly for 7 days **plus** • treat for candidiasis, if required

STI syndromes	Treatment (new episode)
VDS + GUS (pregnant, breastfeeding)	• Cefixime, oral, 400 mg immediately as a single dose **plus** • Metronidazole, oral 2 g immediately as a single dose **plus** • Benzathine benzylpenicillin*, IM, 2.4 MU immediately as a single dose **plus** • Amoxicillin, oral, 500 mg 8 hourly for 7 days **plus** • Aciclovir, oral, 400 mg 8 hourly for 7 days **plus** • treat for candidiasis, if required
LAP + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose **plus** • Metronidazole, oral, 400 mg 12 hourly for 14 days **plus** • Doxycycline, oral, 100 mg 12 hourly for 14 days **plus** • Aciclovir, oral, 400 mg 8 hourly for 7 days
Penicillin allergic men and non-pregnant women, replace benzathine benzyl penicillin with: • Doxycycline, oral, 100 mg 12 hourly for 14 days **Penicillin allergic pregnant or breast feeding women, replace benzathine benzylpenicillin and amoxicillin with:** • Erythromycin, oral 500 mg 6 hourly for 14 days	

12.10 Genital molluscum contagiosum (MC)

B08.1

Description

This is a viral infection which can be transmitted sexually and non-sexually.
It is usually self-limiting but can be progressive in an advanced stage of immunodeficiency.
Clinical signs include papules at the genitals or other parts of the body.
Usually, the papules have a central dent (umbilicated papules).

Drug treatment

- Tincture of iodine BP
  - o Apply with an applicator to the core of lesions

12.11 Genital warts (GW): *condylomata accuminata*

A63.0

Description

The clinical signs include:
» warts on the anogenital areas, vagina, cervix, meatus or urethra
» warts can be soft or hard

General Measures

» if warts do not look typical or are fleshy or wet, perform an RPR/VDRL test to exclude secondary syphilis, which may present with similar lesions.
» Emphasise HIV testing.

Drug treatment

Soft warts (< 10 mm)

- Tincture of podophyllin solution 20 %
  - o Apply at weekly intervals to the lesions at the clinic by a health care professional until lesions disappear
  - o Apply petroleum jelly to the surrounding skin for protection
  - o Wash the solution off after 4 hours
  - o If lesions do not improve after 5 treatments, refer
  - o Podophyllin is a cytotoxic agent
  - o Avoid systemic absorption.
  - o Contraindicated in pregnancy
  - o Exclude pregnancy before using podophyllin

Referral

» All patients with:
  – hyper-keratinised warts
  – warts larger than 10 mm
  – inaccessible warts, e.g. intra-vaginal or cervical warts
  – non-responding soft warts

12.12 Pubic lice (PL)

B85.1

Description

Infestation of lice mostly confined to pubic and peri-anal areas, and occasionally involves eyelashes.
The bites cause intense itching, which often results in scratching with bacterial super-infection.

General measures

Thoroughly wash clothing and bed linen that may have been contaminated by the patient in the 2 days prior to start of treatment in hot water and then iron.

Drug treatment

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

Pediculosis of the eyelashes or eyebrows

- Petroleum jelly
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes.

Referral

» All children with lice on pubic, perianal area and eyelashes to exclude sexual abuse

Chapter 13: Immunisation

13.1 Immunisation schedule

» Every clinic day is an immunisation day.
» Immunisations are given in a specific sequence at certain ages. This is known as the immunisation schedule.
» Never miss a chance to immunise – never turn a child away if an immunisation is needed, even if it means opening a multidose vial for just one child.
» Check the Road to Health Chart every time the child visits the clinic, and give missed immunisations.
» Mild illnesses are not a contra-indication to immunisation – any child who is well enough to be sent home, is well enough to be immunised.
» Do not immunise a sick child if the mother seriously objects, but encourage her to bring the child for immunisation on recovery.
» Give doses no closer than 4 weeks - make follow-up dates with a minimum of 4 weeks from the previous dose.
» Give an extra dose if in doubt whether a child has had a certain dose or not, as extra doses are not harmful.
» All vaccines listed in the table can be given safely at the same time, **but should not be mixed in the same syringe.**
» Serious adverse events following immunisation are uncommon. All adverse events other than mild systemic symptoms (irritability, fever < 39°C) and minor local reactions (redness/swelling at infection site) should be reported.

There are very few contra-indications, but many missed opportunities!

Adverse events requiring reporting
Local reactions
» Severe local reaction (swelling extending more than five cm from the injection site or redness and swelling for more than three days)
» Lymphadenitis
» Injection site abscess.
Systemic reactions
» All cases of hospitalisation (thought to be related to immunisation)
» Encephalopathy within seven days
» Collapse or shock-like state within 48 hours
» Fever or more than 40.5°C within 48 hours
» Seizures within three days
» All deaths (thought to be related to immunisation).

Conditions that are *not* contraindications to any of the standard EPI vaccines
» Family history of any adverse reactions following vaccination
» Family history of convulsions
» Previous convulsions
» Previous measles, mumps, rubella or pertussis-like illness

» Preterm birth
» History of jaundice after birth
» Stable neurological conditions such as cerebral palsy and trisomy 21
» Contact with an infectious disease
» Minor illness (without systemic illness and with a temperature below 38.5°C)
» Treatment with antibiotics
» Asthma, eczema, hay fever or 'snuffles'
» Treatment with locally acting (inhaled or low-dose topical) steroids
» Child's mother is pregnant
» Child being breastfed
» Underweight, but otherwise healthy child
» Over the age recommended in vaccination schedule
» Recent or imminent surgery

13.2 Dosage and administration

Immunisation schedule for children

Age	Vaccine dose *
At birth	BCG, OPV0**
6 weeks	OPV1, DTP1, HepB1, Hib1
10 weeks	OPV2, DTP2, HepB2, Hib2
14 weeks	OPV3, DTP3, HepB3, Hib3
9 months	Measles1
18 months	Measles2, OPV4, DTP4
6 years	OPV5, Td
12 years	Td

*The number that follows the immunisation name (e.g. DTP3) indicates the dose number of that immunisation.
** Refers to dose at birth.

The following vaccines will be introduced over the next few years:
- Pneumococcal vaccine (PCV)
- Rotavirus vaccine (RV)

Consult the latest EPI schedule for further information .

Catch-up doses
Any child who is unimmunised should be given a full schedule of immunisations.
Note:
» BCG is given until one year of age provided HIV infection has been excluded by PCR.
» DTP-Hib combination given until two years of age (above two years give Td).

If more than one vaccine is overdue, it is appropriate to give all the vaccines at one visit.

Pregnant women

First pregnancy

» Give three doses of TT:
  – **first dose** on first contact
  – **second dose** 4 weeks later
  – **third dose** 6 months later (even if it is given in the postnatal period)

Subsequent pregnancy:

» One dose TT during the antenatal period (up to a total of 5 recorded doses)

Trauma

» Give booster dose of TT after each trauma episode (unless given in previous 5 years)

All personnel working in a health care facility (including cleaning staff)

» Hepatitis B, 3 doses of 1 mL
  – **first dose** administered immediately
  – **second dose** 1 month after the first dose
  – **third dose** 6 months after the first dose.

13.3 Vaccines for routine administration

Note:
Children with HIV should receive the full schedule of vaccines.
Exception: BCG should not be given to children with symptomatic HIV-infection children

BCG *(Bacillus Calmette-Guérin)*
Protects against **TB meningitis and miliary TB** in children under 2 years.

- BCG**,** 0.05 mL of reconstituted intradermal BCG vaccine, administered into the skin (intradermally) on the right upper arm, at insertion of the deltoid
  » Storage:
    – Store diluent and vaccine in fridge at 2–8°C
    – Discard opened vial after 6 hours or at end of immunisation session, whichever comes first
  » Adverse events:
    – Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar (visible in 40%)
    – In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a usual reaction and not a cause for alarm.
    – Lymphadenopathy less than 1.5 cm is not clinically significant
    – Occasionally the papule becomes a pustule.

- Refer all cases with significant lymphadenopathy or a draining sinus

» Contraindications:
- Children with signs of symptomatic HIV infection (AIDS) should not get BCG vaccination

DTP (Diptheria, tetanus and pertussis vaccine)
Protects against diphtheria, tetanus and pertussis.

- DTP, IM, 0.5 mL
  - o under 1 year: outer side of left thigh
  - o over 1 year: upper arm
    - » Storage:
      - Fridge middle shelves at 2–8°C
      - Easily damaged by freezing
      - Keep opened vials for next session if kept at correct temperature and not contaminated
      - Discard after 30 days
      - Record date of reconstitution
    - » Adverse events:
      - 60% have fever and pain at the injection site
      - Some infants have excessive somnolence and disruption of daily routines
      - 5% have prolonged inconsolable crying lasting more than 4 hours
      - Side-effects: mild fever, pain, local swelling occasionally
    - » Contraindications: Do not use if:
      - over 2 years
      - previous severe reaction to DTP
      - epilepsy that is not controlled

Td (Tetanus and diphtheria vaccine)
Protects against diphtheria and tetanus.

- Td, IM, 0.5 mL in upper arm
  - » Storage:
    - Fridge middle shelves at 2–8°C
    - Easily damaged by freezing
    - Keep opened vials for next session if kept at correct temperature and not contaminated
    - Discard after 30 days
    - Record date of reconstitution
  - » Adverse events:
    - Mild fever
    - Pain
    - Local swelling occasionally
  - » Contraindications:
    - Previous anaphylaxis

HepB (Hepatitis B vaccine)
Protects against hepatitis B.

- HepB, IM, 0.5 mL (paediatric vaccine)
  - o under 1 year: outer side of right thigh
  - o over 1 year: upper arm
  - o use opposite side to DTP/Td
    - » Storage:
      - – Fridge middle shelves at 2–8°C
      - – Easily damaged by freezing
      - – Keep opened vials for next session if kept at correct temperature and not contaminated
      - – Discard after 30 days
      - – Record date of reconstitution
    - » Side effects:
      - – Mild fever
      - – Pain
      - – Local swelling occasionally
    - » Contraindications:
      - – Previous anaphylaxis

Hib (*Haemophilus influenzae* type b vaccine)
Protects against Hib disease (meningitis, pneumonia, otitis media)

- Hib, given as DTP-Hib, IM into outer side of the left thigh
  - » Storage:
    - – Fridge middle shelves at 2–8°C
    - – Easily damaged by freezing
    - – Keep opened vials for next session if kept at correct temperature and not contaminated
    - – Discard after 7 days
    - – Record date of reconstitution
  - » Contraindications:
    - – Previous anaphylaxis

OPV (Oral polio vaccine)
Protects against polio.

- OPV, oral, 2 drops given by mouth
  - o If spat out or vomited, repeat immediately
  - o Not affected by feeding (breast or other)
    - » Storage:
      - – Fridge: top shelf **(in clinics);** or freezer **(in Pharmacy)**
      - – **Not damaged** by freezing
      - – easily damaged by temperature above 8°C
      - – vials can be reused if the VVM's inner square remains lighter than the outer circle

- » Adverse events:
  - May be associated with a flu-like illness and gastroenteritis
  - Mild fever
- » Contraindications:
  - Previous anaphylaxis

Measles

- Measles vaccine, IM, 0.5 mL into outer mid right thigh over one year of age use upper arm
  - » Storage:
    - Fridge at 2–8°C, diluent on middle shelf and vaccine on top shelf.
    - Discard opened vial after 6 hours or at end of immunisation session (whichever comes first)
  - » Adverse events:
    - Transient morbilliform rash and mild pyrexia 6–11 days after vaccination
  - » Contraindications:
    - Previous anaphylaxis

TT (Tetanus toxoid)
Protects against tetanus (neonatal and after wounds)

- TT, IM, 0.5 mL into arm
  - » Storage:
    - Fridge middle shelves at 2–8°C
    - Easily damaged by freezing
    - Keep opened vials for next session if kept at correct temperature and not contaminated
    - Discard after 30 days
    - Record date of reconstitution
  - » Contraindications:
    - Previous anaphylaxis

Influenza vaccine
Recommended for:

- » Elderly patients over 65 years
- » Medical and nursing personnel
- » HIV-infected people (Do not use the live vaccine)
- » All patients with chronic cardiac or pulmonary conditions
- Influenza vaccine, IM, 0.5 mL

13.4 The cold chain

Maintaining the cold chain means keeping vaccines at the right temperature throughout distribution, storage and use. The cold chain can be maintained by:

- » **never** exposing vaccines to heat or freezing conditions, especially during

transportation from one point to another
» **always** using a **cold box** to keep the vaccines cold during transport and immunisation

Correct packing of the cold box
» **Fully** conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top
» If there are not enough ice packs, place available ice packs at the sides and on top of the vaccines
» DTP, Td, TT, HepB and Hib vaccines must not be allowed to freeze
» Keep measles and polio vaccines very cold - place on bottom of the cold box, closest to the ice packs
» BCG can be placed anywhere in the box
» Keep the lid firmly closed and the box out of the sun
» Keep a thermometer in the cold box with the vaccines and the temperature
» 2–8°C
» Live vaccines (BCG, OPV, measles) contain weakened organisms and are very sensitive to heat, sunlight and skin antiseptics

How to pack your fridge correctly
» Top shelf: measles and polio vaccines in the coldest part
» Middle shelf: BCG, DTP, Td, HepB, Hib and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles for 2 days
» Do not let DTP, Td, HepB, Hib and TT vaccines touch the evaporator plate at the back of the fridge - they are destroyed by freezing
» Do not keep vaccines in the fridge door
» Store the same kind of vaccines together in one tray
» Leave about 5 cm space between each tray to allow the cold air to move around
» Bottles filled with salt water stored in the bottom of the fridge will keep the fridge contents cold when the door is opened
» **Do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door**
» If there has been a power failure consult the supervisor
» Monitor and record temperature twice daily

! CAUTION !
Do not use vaccines that have expired, missed the cold chain or that VVM has reached discard point.
Keep the fridge temperature between 2–8°C.

Note:
All vaccines with a “T” in the name are sensitive to freezing – D**T**P, **TT**, **T**d Hepa**T**i**T**is B, liquid Hib-**T**ype B and even diluen**T.**

13.5 The Revised Opened Multi-Dose Vial Policy

Opened vials of DTP, TT, Td, HepB and OPV vaccines:

» May be used in subsequent immunisation sessions **for a maximum of one month,** provided that each of the following conditions have been met:
  – the expiry date has not passed
  – each vial must be dated when opened
  – the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording)
  – the vaccine vial septum has not been submerged in water
  – aseptic technique has been used to withdraw all doses

If one of these vaccines has a VVM e.g. OPV, the vaccine vial monitor (VVM) will indicate the potency of the vaccine and the vaccine may be used for any length of time as long as the VVM has not reached discard point, and the other conditions above apply.

Reconstituted vials of DTP-Hib may be used for 7 days if:

» each vial is dated when reconstituted
» the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording, measured by the condition of the VVM, if any)
» the expiry date has not passed
» the vaccine vial septum has not been submerged in water
» aseptic technique has been used to withdraw all doses
» the VVM, if attached, has not reached the discard point

Opened vials of measles, BCG

Check the VVM and expiration date prior to reconstitution
Reconstituted vials of measles and BCG vaccines must be discarded at the end of each immunisation session or at the end of six hours, whichever comes first.

All opened vials must be discarded immediately if:

- sterile procedures have not been fully observed
- there is even a suspicion that the opened vial has been contaminated
- there is visible evidence of contamination such as a change in appearance or floating particles, etc.

Chapter 14: Musculoskeletal conditions

14.1 Arthralgia

M25.5

Description

Joint pain without swelling, warmth, redness or systemic manifestations such as fever. It is usually self-limiting.

Arthralgia may be a manifestation of degenerative joint conditions (osteoarthrosis) or of many local and systemic diseases, in which arthralgia may be an early manifestation.

Suspect rheumatic fever in children, especially if arthralgia affects several joints in succession.

Arthralgia may follow injury to the joint, e.g. work, play and position during sleep.

General measures

Advise patient to:

» apply heat locally to the affected joint, taking precautions not to burn oneself
» exercise after relief from pain
» reduce weight if overweight to decrease stress on the joint

Reassure patient after other causes have been excluded

Drug treatment

Treat for 1 week (maximum 2 weeks) provided no new signs develop.

- Methyl salicylate ointment, topical, applied to affected areas may be considered in selected patients.

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» Pain for 1 week in children
» Pain for over 2 weeks in adults

» Recurrent pain
» Severe pain
» Backache with radiation to one or other lower limb or neurological signs
» Signs of arthritis (swelling, redness, tender on pressure, warmth)
» Fever

14.2 Arthritis, rheumatoid

M06.9

Description

A chronic, inflammatory, systemic condition of fluctuating course. It may affect many organs, predominantly joints with:

» swelling or fluid, affecting at least 3 joint areas simultaneously
» pain
» limited movement with morning stiffness for longer than 30 minutes, which improves with activity. This distinguishes osteoarthrosis from rheumatoid arthritis.
» destruction

The arthritis affects mainly the small joints of the fingers and hands with the exception of the distal interphalangeal joints, although any joint can be involved. The distribution is symmetrical.

Referral

» All patients

14.3 Arthritis, septic

M00.9

Description

An acute infective condition involving one or more joints.
The joint is hot, swollen, severely painful and with restricted movements.

Signs of systemic infection, including fever, are usually present. The infection is usually blood borne, but may follow trauma to the joint. The course may be acute or protracted. A wide spectrum of organisms is involved, including staphylococci and *N. gonorrhoea*.

Note:
Haemophiliacs may present with an acute arthritis similar to septic arthritis. This is due to a joint bleed and not due to infection.

Referral

Urgent

» All patients for stabilisation and surgical drainage

If referral in children is delayed for longer than 2 hours, administer:

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	5 years and adult

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate dose and route of administration in referral letter.

Treat shock if present, while preparing for transfer.

14.4 Gout

14.4.1 Gout, acute

M10.9

Description

A metabolic disease in which uric acid crystal deposition occurs in joints and other tissues and is characterised by following features:

» recurrent attacks of a characteristic acute arthritis
» often one joint
» extreme pain and tenderness

» swelling
» redness and very hot
» inflammation may extend beyond the joint
» in the majority of patients the first metatarso-phalangeal joint is initially involved
» the instep, ankle, heel, and knee are also commonly involved
» bursae (such as the olecranon) may be involved

The condition is most common in men above 40 years of age and postmenopausal women.

Investigations

» Increased serum uric acid concentration. However, this may be normal during acute attacks.
» Serum creatinine

General measures

Immobilise the affected joint during the acute painful attack.
Increase (high) fluid intake.
Avoid alcohol.
Avoid aspirin.
Advise on weight reduction, if overweight.

Drug treatment

Initiate treatment as early as possible in an acute attack.

- NSAID, e.g. ibuprofen, oral, 800 mg 8 hourly with or after a meal for 24–48 hours.

  Thereafter, if needed:

  Ibuprofen, oral, 400 mg 8 hourly with or after a meal until pain and inflammation has subsided

If NSAIDS are contraindicated, e.g. peptic ulceration, warfarin therapy and renal dysfunction:

- Prednisone, oral, 40 mg daily for 3–5 days. (Doctor initiated)

Referral

» No response to treatment
» Confirmation of diagnosis, if in doubt
» Patients with chronic kidney disease
» Patients with suspected secondary gout (e.g. haematological malignancies)

Note:
Patients with suspected metabolic syndrome often have impaired renal function and the use of NSAIDs has safety implications.

Gout may be secondary to other medical conditions, e.g. haematological malignancies.
Gout may co-exist with hypertension, diabetes mellitus (as a risk factor for degenerative vascular disease) and chronic renal disease. The medicine treatment of these conditions could precipitate gout.

14.4.2 Gout, chronic

M10.9

Description

Gout with one or more of the following:
» uric acid deposits in and around the joints and cartilages of the extremities (tophi)
» initial involvement of the first metatarsal phalangeal joint in the majority of patients
» involvement of the instep, ankle, heel and knee
» further involvement of bursae (such as the olecranon)
» significant periarticular inflammation
» serum uric acid over 0.5 mmol/L
» bone destruction
» prolongation of attacks, often with reduction in pain severity
» incomplete resolution between attacks

General measures

Avoid known precipitants and drugs that increase uric acid, if possible, e.g.: low dose aspirin, ethambutol, pyrazinamide, diuretics, especially hydrochlorothiazide 25 mg or greater.
Encourage weight loss.
Avoid alcohol.
Avoid aspirin.

Drug treatment

Uric acid lowering therapy
Urate lowering therapy is required in all of the following:
» > 2 acute attacks per year
» chronic tophaceous gout
» urate renal stones
» urate nephropathy

When the acute attack has settled completely, i.e. usually after 3 weeks:
- Allopurinol, oral, 100 mg daily. (Doctor initiated)
  - o Increase monthly by 100 mg according to urate blood levels.
  - o Titrate dose to reduce serum urate to < 0.3 mmol/L.
  - o Average dose: 300 mg/day.

- Maximum dose: 400 mg daily.

The elderly and patients with renal impairment require lower doses.

Referral

» Suspected secondary gout
» No response to treatment
» Non-resolving tophaceous gout

14.5 Osteoarthrosis (osteoarthritis)

M19.9

Description

A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:
» pain
» limited movement
» morning stiffness, lasting less than 30 minutes
» joint swelling

General measures

Patient and family education on:
» weight reduction
» exercise
Rest during acute painful episodes.
Recommend the use of a walking stick or crutch to alleviate stress on the weight bearing joint.
Physiotherapy and/or occupational therapy.

Drug treatment
For pain relief:

- Paracetamol, oral, 1 000 mg, 6 hourly.
  - Maximum 4 000 mg per day.
- Methyl salicylate ointment, topical, applied to affected areas may be considered in selected patients.

If patient responds to paracetamol reduce the dose to:

- Paracetamol, oral, 500 mg, 6–8 hourly as needed.

If no response and inflammation is present:
add

- NSAID, e.g. ibuprofen, oral, 200–400 mg, 8 hourly with or after meals, as needed. (Doctor initiated)

! CAUTION !
Long-term use of NSAIDs has adverse effects on renal and cardiac function, the GIT and on joint cartilage.

Referral

All cases with:
» intractable pain
» infection
» uncertain diagnosis
» for consideration of joint replacement

Chapter 15: Central nervous system conditions

15.1 Stroke

I64

Description

Stroke consists of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting more than 24 hours or leading to death. Most strokes are ischaemic (embolism or thrombosis) whilst others may be caused by cerebral haemorrhage.

A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.

The diagnosis of stroke depends on the presentation of sudden onset of neurological loss, including:

» Weakness, numbness or paralysis of the face or an arm or a leg on one or both sides of the body
» Sudden onset of blurred or decreased vision in one or both eyes or double vision
» Difficulty speaking or understanding
» Dizziness, loss of balance or any unexplained fall or unsteady gait
» Headache (severe, abrupt)

Treatment

Acute management

» Assess airway, breathing, circulation and disability.
» Measure blood glucose and treat hypoglycaemia if present. – See section 21.11 Hypoglycaemia and hypoglycaemic coma.
» Patients should be nil by mouth until swallowing is formally assessed.

Secondary prevention

All patients, if not contra-indicated (e.g. haemorraghic stroke, peptic ulcer, etc):

- Aspirin, oral, 150 mg daily

Lipid lowering drug therapy – See section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Hypertension

For blood pressure management, section 4.7: Hypertension

Diabetes mellitus

See chapter 9: Endocrine system

Referral

» All patients including patients with TIA
  – A witness should be encouraged to accompany the patient
  – All medications should be brought with the patient
  – History of event, including time of onset, signs and symptoms and previous medical, drug, and social history, should be taken from patient and/or witness

15.2 Seizures (convulsions/fits)

R56.8

Description

A seizure is a change in movement, attention or level of awareness that is sustained or repetitive, and occurs as a result of abnormal neuronal discharge within the brain. Seizures may be secondary (where there is an underlying cause) or idiopathic (where no underlying cause is evident). When seizures are recurrent or typical of a specific syndrome, then the term epilepsy is used.

Seizures should be differentiated from:
» syncope
» hyperventilation
» transient ischaemic attack (TIA)
» pseudoseizure

Important conditions that should be excluded include:
» meningitis
» encephalitis or encephalopathy (including hypertensive encephalopathy)
» metabolic conditions, e.g. hypoglycaemia
» brain lesions

Treatment

If convulsing:

Children

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.
  - Diazepam for injection 10 mg in 2 mL is used undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage

Weight kg	**Dose** mg	**Ampoule** 10 mg/2 mL	**Approx age**
≥ 3–6 kg	2 mg	0.4 mL	Less than 6 months
≥ 6–10 kg	2.5 mg	0.5 mL	≥ 6 months–1 year

≥ 10–18 kg	5 mg	1 mL	≥ 1–5 years
≥ 18–25 kg	7.5 mg	1.5 mL	≥ 5–8 years
≥ 25–40 kg	10 mg	2 mL	≥ 8–12 years

- Maximum dose: 10 mg in 1 hour.
- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after the second dose of diazepam, manage as Status Epilepticus – See section 21.19: Status epilepticus

Adults

- Diazepam, slow IV infusion, 10 mg at a rate not exceeding 2 mg/minute
  - Repeat within 10–15 minutes, if needed.
  - If no response after the second dose of diazepam manage as Status Epilepticus – See section 21.19: Status epilepticus.

Always check blood glucose levels to exclude hypoglycaemia.

After seizure

» All patients presenting with a first seizure need to be investigated to exclude underlying causes.
» Meningitis must always be excluded.
» A patient who presents with a first seizure should not automatically be labeled as an epileptic, or started on treatment.
» When indicated, long term therapy should be initiated by a doctor.

Referral

Urgent:

» All patients with status epilepticus or suspected meningitis – See section 15.5: Meningitis
» All patients following a first seizure should be examined by a doctor to exclude underlying causes

Note:

Known persons with epilepsy who recover fully following a seizure do not usually require referral – see criteria for referral under epilepsy

15.3 Febrile convulsions

R56.0

Description

A febrile convulsion is a seizure occurring in a child between the ages of 6 months and 5 years in association with a significant fever in the absence of an intracranial infection. These are the most common type of seizures in children of this age.

However, the diagnosis requires the exclusion of other causes of seizures.

Febrile convulsions can be simple or complex. Simple febrile convulsions:
» are generalised
» occur once per illness
» always lasts for less than 15 minutes (typically lasting 1–2 minutes)
» are not associated with any neurological deficit

Children with febrile convulsions have a good prognosis, and very rarely develop epilepsy

If convulsing:
Children
- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.
  - Diazepam for injection 10 mg in 2 mL is used undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage

Weight kg	**Dose** mg	**Ampoule** 10 mg/2 mL	**Approx age**
≥ 3–6 kg	2 mg	0.4 mL	Less than 6 months
≥ 6–10 kg	2.5 mg	0.5 mL	≥ 6 months–1 year
≥ 10–18 kg	5 mg	1 mL	≥ 1–5 years
≥ 18–25 kg	7.5 mg	1.5 mL	≥ 5–8 years
≥ 25–40 kg	10 mg	2 mL	≥ 8–12 years

  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1–5 minutes.

If no response after the second dose of diazepam, manage as Status epilepticus – See section 21.19: Status epilepticus

» Look for a cause of the fever.
» **Always exclude meningitis**
  – For the first episode in children under 12 months of age, this will require lumbar puncture.

General measures

» If the child is feverish:
  – remove excess clothing
  – cool the body by tepid sponging with lukewarm water
» Parents/caregivers should be counselled on how to prevent a rapid rise in temperature during illnesses:

- remove excess clothing
- tepid sponging
- give child paracetamol)

Drug treatment

» Treat the underlying cause.

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours

Weight kg	**Dose** mg	**Syrup** 120 mg/5mL	**Age** months/years
≥ 7 – 14 kg	120 mg	5 mL	≥ 6 months–3 years
≥ 14 –17.5 kg	180 mg	7.5 mL	≥ 3–5 years

Referral

» All febrile convulsions except where:
- the diagnosis of recurrent simple febrile seizures has been well established
  and
- the child regains full consciousness and function immediately after the seizure
  and
- meningitis has been excluded

» Complex convulsions

15.4 Epilepsy

G40.9

Description

Epilepsy is defined as recurrent seizures. Epilepsy is associated with many psychological, social and legal problems, and cultural perceptions.

Diagnosis

» is usually made clinically
» requires an accurate witness description of the seizure

Some different types of seizure

Partial	» simple partial	Seizure on one side of the body with no loss of consciousness
	» complex partial	Partial seizure associated with loss of consciousness

Generalised	» generalised tonic clonic	Loss of consciousness preceded by: » a brief stiff phase followed by » jerking of all of the limbs
	» tonic	One or more limbs become stiff without any jerking
	» myoclonic	Brief, usually generalised jerks, with retained awareness
	» absence	» occurs in childhood » sudden cessation of activity followed by a blank stare » usually no muscle twitching » some children will smack their lips

General measures

» Extensive health education.
» Record keeping in a seizure diary recording dates and if possible the times of the seizures.
» Present seizure diary at each consultation for assessment of therapy.
» Carry a disease identification bracelet, necklace or card.
» Counselling and advice on:
  – the adverse effect of alcohol on seizures
  – the effect of missing a dose of medication
  – discontinuing the drug treatment without advice of the doctor

Patient should be counseled about driving, working at heights and operating machinery - the patient should sign in the notes that they have received this advice.

Drug treatment

Note:
» General rule: a single drug is best.
» Combination therapy should only be initiated by a specialist.
» Recommended doses are general guides and will be effective in most patients. Some patients may need much higher or lower doses. Doses should only be increased at 2 weekly intervals. Therapeutic monitoring will assist with dosage adjustments, or in suspected non-adherence. However, it is only mandatory in the case of higher than usual doses of phenytoin.

Carbamazepine, phenytoin and phenobarbitone are associated with many drug interactions.
» Always check for possible interactions before prescribing any other drug in combination with these agents.
» Oral contraceptives may be less effective, and depot or IUCD is preferred. See chapter 7: Family planning.

Generalised tonic clonic seizures

Adults

- Phenytoin, oral, 4.5–5 mg/kg daily on lean body mass, at night
  or
  Carbamazepine, oral, 100 mg 12 hourly for one week then, 200 mg 12 hourly.
  - o Titrate further upwards every 2 weeks according to response up to a maximum dose of 600 mg 12 hourly.

» The choice between these two agents must be made on the acceptability of side-effects and how the number of doses influences lifestyle.
» Carbamazepine is preferred in women because phenytoin may cause hirsutism and coarsening of the facial features.
» Be aware of dose-related side effects. Phenytoin is a useful and effective agent. However, all doses above 300 mg/day are potentially toxic, and increased dosages should be monitored carefully, both clinically and by drug levels.

Children

The decision to initiate long-term therapy is generally made if the child has experienced two or more convulsions (except febrile convulsions).

» Phenobarbitone and carbamazepine are both effective in generalised tonic clonic seizures.
» The behaviour profile and academic performance of children on phenobarbitone should be monitored. Treatment should be changed if any problems are identified.

- Phenobarbitone, oral, 3.5–5 mg/kg at night (under 6 months of age). (Doctor initiated.)
  or
  Carbamazepine, oral, 5 mg/kg 12 hourly for 2 weeks, then 7.5 to 10 mg/kg 12 hourly. (Doctor initiated.)
  - o Maximum dose: 10 mg/kg 12 hourly.

HIV infected individuals on ARVS

Children

For HIV infected children on ARV therapy, valproate is preferred because of fewer drug interactions. When switching to valproate, commence treatment with maintenance dose of the drug as below and discontinue the other anticonvulsant after 7 days.

- Valproate, oral, 7.5–10 mg/kg 12 hourly.
  - o Titrate according to response over 4 weeks up to 15 mg/kg 12 hourly.
  - o If poorly tolerated divide total daily dose into 3 equal doses.

Adults

For HIV infected adults on ARV therapy, lamotrigine is preferred because of fewer drug interactions. When switching to lamotrigine, commence treatment as below and discontinue the other anticonvulsant after 28 days.

- Lamotrigine, oral
  - 25 mg daily for 2 weeks
  - Then 50 mg daily for 2 weeks
  - Thereafter increased by 50 mg every 2 weeks according to response
  - Usual maintenance dose: 100–200 mg/day as a single dose

Note:

The dose of lamotrigine will need to be doubled when patients are switched from regimen 1 (either efavirenz- or nevirapine-based ARV therapy) to lopinavir/ritonavir because the metabolism of lamotrigine is induced by lopinavir/ritonavir.

Poorly controlled epilepsy

Ask about the following as these can influence decisions on drug therapy:

» has the patient been compliant in taking the medication regularly for at least 2 weeks or more before the seizure? Ask about drug dosage and frequency.
» has the patient recently used some other medication?
» is there a chance that alcohol or some other drug is involved?

If one or more of the above can be identified as a problem there is no need to adjust therapy at this time.

Referral

» All new patients, for diagnosis and initiation of therapy by a doctor
» Patients with seizures other than generalised tonic clonic seizures, including absence seizures
» Increased number of seizures or changes in the seizure type
» Patients who have been seizure free on therapy for 2 years or more (to review therapy)
» Pregnancy or planned pregnancy
» Development of neurological signs and symptoms
» Adverse drug reactions
» Suspected toxicity

Information on the seizures that should accompany each referral case

» Number and frequency of seizures per month (or year)
» Date and time of most recent seizures
» Detailed description of the seizures, including
  – aura or warning sign
  – what happens during the seizure? (give a step-by-step account)
  – is the person conscious during the seizure?
  – how long do the seizures last on average?
  – what does the patient experience after the seizure?
  – how long does this experience last?
» Is there a family history of seizures?

» What is the initial date of diagnosis?
» Is there evidence of alcohol use?
» Is there another medical condition present, e.g. diabetes and what medication is used?
» What is the name and dosage of the antiepileptic drug used to date?
» Does the person return regularly for repeat of medication?

15.5 Meningitis

15.5.1 Meningitis, acute bacterial

G00.9

Description

Infection of the membranes of the brain.
Clinical signs and symptoms include:

» headache
» neck stiffness
» vomiting
» fever
» impaired level of consciousness
» photophobia
» bulging fontanelle in infants

Neck stiffness is generally not elicited in young children, and especially neonates, and may be absent in adults, especially debilitated patients and the elderly. Young children with fever, vomiting and convulsions or an impaired level of consciousness must be assumed to have meningitis. Signs may be even more subtle in newborns.

Initial management

» If possible perform a lumbar puncture. Send cerebro-spinal fluid (CSF) in separate sterile containers (for culture, microscopy and chemistry and for glucose) with patients.

Emergency measures

» Stabilise before referral.
» Treat for shock if present.
» If patient's level of consciousness is depressed:
  – maintain airway
  – give oxygen
» Ensure hydration

If convulsing:

Children

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.
  - Diazepam for injection 10 mg in 2 mL is used undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage

Weight kg	**Dose** mg	**Ampoule** 10 mg/2 mL	**Approx age**
≥ 3–6 kg	2 mg	0.4 mL	Less than 6 months
≥ 6–10 kg	2.5 mg	0.5 mL	≥ 6 months–1 year
≥ 10–18 kg	5 mg	1 mL	≥ 1–5 years
≥ 18–25 kg	7.5 mg	1.5 mL	≥ 5–8 years
≥ 25–40 kg	10 mg	2 mL	≥ 8–12 years

  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1–5 minutes.

If no response after the second dose of diazepam, manage as Status Epilepticus – See section 21.19: Status epilepticus.

Adults

- Diazepam, slow IV infusion, 10 mg at a rate not exceeding 2 mg/minute
  - Repeat within 10–15 minutes, if needed
  - If no response after the second dose of diazepam manage as Status Epilepticus – See section 21.19: Status epilepticus.

Drug treatment

If bacterial meningitis is strongly suspected, or if any danger signs are present (depressed level of consciousness, purpura), initiate drug treatment before transfer. The threshold for giving antibiotics before referral to young children, especially neonates, should be extremely low.

- Ceftriaxone, IM, 50–80 mg/kg/dose immediately as a single dose before referral.
  - o Do not administer if calcium containing IV fluids administered within 48 hours.
  - o Do not inject more than 1 g (1 000 mg) at one injection site.

Weight kg	**Dose** mg	**Injection mixed with water for injection (WFI): (Chose one of the below)**			**Age** Months/ years
		250 mg WFI 2 mL	**500 mg** WFI 2 mL	**1 000 mg** WFI 3.5mL	
≥ 2–2.5 kg	200 mg	1.6 mL	0.8 mL	-	-
≥ 2.5–3.5 kg	250 mg	2 mL	1 mL	-	Birth – 1 month
≥ 3.5 – 5.5 kg	375 mg	3 mL	1.5 mL	–	≥ 1–3 months
≥ 5–7 kg	500 mg	4 mL	2 mL	–	≥ 3–6 months
≥ 7–9 kg	700 mg	5.6 mL	2.8 mL	–	≥ 6–12 months
≥ 9–11 kg	800 mg	6.4 mL	3.2 mL	–	≥ 12–18 months
≥ 11–14 kg	1 000 mg	–	4 mL	3.5 mL	≥ 18 months–3 years
≥ 14–17.5 kg	1 250 mg	–	5 mL	4.4 mL	≥ 3–5 years
≥ 17.5–25 kg	1 500 mg (1½ g)	–	6 mL	5.25 mL	≥ 5–7 years
≥ 25–55 kg	1 750 mg	–	7 mL	6.1 mL	≥ 7–15 years
≥ 55 kg and above	2 000 mg (2 g)	–	–	7 mL	≥ 15 years and above

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dose and route of administration on the referral letter.

Referral

» All patients with meningitis, or suspected meningitis

15.5.2 Meningitis meningococcal, prophylaxis

A39.9

In cases of confirmed meningococcal infection, the following close contacts should receive prophylaxis. Close contacts include:

» household members,
» child-care center contacts, and
» anyone directly exposed to the patient's oral secretions, e.g., through kissing, mouth-to-mouth resuscitation, endotracheal intubation, or

endotracheal tube management.

Chemoprophylaxis is only effective for the present exposure.

Drug treatment

Prophylaxis

Children < 6 years

- Ceftriaxone, IM, 125 mg, single dose

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone. Contra-indicated in neonatal jaundice.

Children 6 – 12 years

- Ciprofloxacin, oral, 250 mg, single dose

Children > 12 years and adults

- Ciprofloxacin, oral, 500 mg, single dose

15.6 Status epilepticus (See Chapter 21 - Trauma and emergencies)

G41.9

15.7 Headache, mild, non-specific

R51

Description

Headache can be benign or serious.
Headache can have serious underlying causes including:

- » encephalitis
- » meningitis
- » mastoiditis
- » benign intracranial hypertension
- » hypertensive emergencies
- » venous sinus thrombosis
- » stroke
- » brain tumour

Headache due to a serious disease will often be associated with neurological symptoms and signs including:

- » vomiting
- » fever
- » mood change
- » cranial nerve fall-out
- » convulsions
- » confusion
- » impaired consciousness
- » pupillary changes and difference in size
- » focal paralysis
- » visual disturbances
- » neck stiffness

Tension headache due to muscle spasm:

- » may be worse in the afternoon, but often present all day.
- » is normally felt in the neck and the back of the head, but may be felt over the entire head
- » is often associated with dizziness and/or blurring of vision
- » is often described as a tight band around the head or a pressure on the top of the head
- » does not progress through stages like a migraine (no nausea, no visual symptoms)

General measures

- » Teach relaxation techniques where appropriate.
- » Reassurance, where applicable.

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 11–14 kg	120 mg	5 mL		≥ 18 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

- » Suspected meningitis should be referred immediately after initial treatment – See section 15.5: Meningitis
- » Headache in children lasting for 3 days
- » Recent headache of increasing severity

» Headache with neurological manifestations
» Newly developed headache persisting for more than 1 week in an adult.
» Chronic recurrent headaches in an otherwise healthy patient, refer if no improvement after 1 month of treatment
» Tension headache due to muscle spasm, refer if no improvement after 1 month of treatment

Chapter 16: Mental health conditions

Maintenance treatment of medicines mentioned in this chapter may be continued by nurses with proven competency to do so, under medical supervision and subject to regular review in accordance with best practice and prevailing legislation.

16.1 Aggressive disruptive behaviour

F23.9

Manage as Acute psychosis. See Section 16.5: Psychosis, acute

16.2 Anxiety and stress related disorders

F41.9

Referral

» Poor response to counselling

16.3 Delirium – acutely confused, aggressive patient

F05.9

See section 21.5: Delirium with acute confusion and aggression.

16.4 Mood disorders

F32.9

Description

Mood disorders include:

» major depressive disorder: episodes of major depression
» dysthymia: not all the criteria for a major depression episode are met – lasts at least 2 years
» bipolar mood disorder: both episodes of major depression and of mania
» mood disorder due to a general medical disorder: the mood disturbance is secondary to an underlying medical condition
» substance-induced mood disorder: mood disorder is secondary to substance use or withdrawal

Disorders with disturbances of mood include:

» adjustment disorder with depressed mood: depressive symptoms as a response to a major crisis or event
– usually lasts no longer than 6 months unless the stressor persists

Major depressive disorder

Major depressive disorder is a mood disorder characterised by at least 2 weeks of depressed mood as well as diminished interest and pleasure in activities and is associated with:

» somatic symptoms, e.g. change in appetite and sleep, agitation or retardation and loss of energy
» psychic symptoms, e.g. feeling of worthlessness, guilt, diminished concentration or indecisiveness, thoughts of death and suicide

Major depressive episodes can be further described in terms of:

» severity: mild, moderate or severe
» duration: chronic
» other features: e.g. psychotic, postpartum

Note:

Consultation with a community psychiatrist or medical practitioner is recommended to verify diagnosis and to rule out other conditions, e.g. hypothyroidism.

General measures

Effective psychotherapies include:

» cognitive-behavioural psychotherapy
» interpersonal psychotherapy

Broader stressors may need to be addressed:

» stress management / coping skills
» marital and family issues
» accommodation and vocational issues

Medicine treatment

Major depressive disorder, particular if there are severe or melancholic features:

Adults

- Amitriptyline, oral, at bedtime.
  - Initial dose 25–50 mg per day.
  - Increase by 25 mg per day at 3–5 day intervals.
  - Maximum dose: 150 mg per day.

Elderly

- Amitriptyline, oral, at bedtime.
  - Initial dose 25 mg per day.
  - Increase by 25 mg per day at 7–10 day intervals.
  - Maximum dose: 75 mg per day.

! CAUTION !

» Tricyclic antidepressants can be fatal in overdose.
» Caution is advised when prescribing these agents to outpatients with possible suicidal ideation and requires risk assessment.
» The elderly are more sensitive to side-effects and need lower doses of tricyclic antidepressants (amitriptyline).
» Avoid tricyclic antidepressants (amitriptyline) in patients with heart disease, urinary retention, glaucoma, epilepsy.

Major depressive disorder, dysthymia or if amitriptyline is contra-indicated:
Adults

- Fluoxetine, oral.
  - Initial dose: 20 mg per day (in morning).
  - Increase to 40 mg per day if there is partial, or no response after 4–8 weeks and if well tolerated.

  Refer if no response after 8 weeks.

Elderly and in patients with panic attacks:

- Fluoxetine, oral.
  - Initial dose: 10 mg per day.

Note:
In cases of first episode of major depressive disorder, continue medicine treatment for at least 9 months after symptoms have ceased.
In cases where there have been multiple episodes, or where other complications exist, longer treatment is indicated which should be reviewed every 2 years.
Do not increase the dose too quickly. Although some patients show early improvement, in others response is delayed for up to 4–8 weeks.

! CAUTION !

» Do not prescribe antidepressants to a patient with bipolar disorder without consultation, as a manic episode may be precipitated
» be careful of interactions between antidepressants and other agents including herbs

Referral

» Suicidal ideation
» Major depression with psychotic features
» Bipolar disorder
» Failure to respond to available antidepressants
» Patients with concomitant medical illness, e.g. heart disease, epilepsy
» Poor social support systems
» Pregnancy and lactation
» Children and adolescents

16.5 Psychosis, acute

F23.9

Description

Schizophrenia is the most common psychotic disorder and is characterised by a loss of contact with reality. It is further characterised by:

» positive symptoms, delusions and hallucinations and thought process disorder
» negative symptoms, blunting of affect, social withdrawal
» mood symptoms such as depression may be present

Clinical features include:

» delusions: fixed, unshakeable false beliefs (not shared by society)
» hallucinations: perceptions without adequate stimuli, e.g. hearing voices
» disorganised thoughts and speech: e.g. derailment or incoherence
» grossly disorganised or catatonic behaviour
» negative symptoms: affective flattening, social withdrawal
» social and/or occupational dysfunction

Only make the diagnosis if:

» there is social or occupational dysfunction
» signs and symptoms are present for at least 6 months (if less: consider schizophreniform disorder)
» general medical and substance-related causes are excluded

General measures

Supportive intervention includes:

» family counselling and psycho-education
» cognitive-behavioural psychotherapy for schizophrenia in stabilised patients
» supportive group therapy for patients with schizophrenia

Rehabilitation may be enhanced by:

» assertive community programs
» work assessment, occupational therapy and bridging programmes prior to return to the community
» appropriate placement and supported employment

Note:
Consultation with a community psychiatrist is essential to confirm diagnosis and treatment.

Medicine treatment

Schizophrenia where a less sedating agent is required:
Adults

- Haloperidol, oral.
  - Initial dose: 2.5 mg daily.
  - Gradually increase until symptoms are controlled or until a maximum of 12.5 mg per day is reached.
  - Once stabilised, administer as a single dose at bedtime.

Elderly

- Haloperidol, oral.
  - Initial dose: 0.5 mg twice daily.
  - Increase dose more gradually until symptoms are controlled or until a maximum of 12.5 mg daily, if tolerated, is reached.
  - Once stabilised, administer as a single dose at bedtime.

Schizophrenia where a more sedating agent is required:

- Chlorpromazine, oral.
  - Initial dose: 25 mg three times daily.
  - Gradually increase until symptoms are controlled.
  - Once stabilised, administer as a single dose at bedtime.
  - Maintenance dose: 75–300 mg at night, but may be as high as 1 000 mg.

Management of acute psychosis (including mania):

- Lorazepam, IM, 2 mg immediately

plus

- Haloperidol, IM, 2–5 mg. May be repeated after 60 minutes if needed.
  - May be repeated 4–8 hourly.
  - Maximum dose 10 mg in 24 hours.
  - Refer if higher doses are required.

or
If known schizophrenia and non-aggressive:

- Zuclopenthixol acetate, IM, 50 mg immediately. Do not repeat within 2 days.

Violent patients:

- Zuclopenthixol acetate, IM, 150 mg immediately.

! CAUTION !

» Always monitor for acute dystonic reactions after administration of short acting depot antipsychotic agents (see below for treatment)

Only for health care workers with advanced psychiatric training

The management of acute psychosis includes the use of antipsychotic agents and benzodiazepines in order to:

» decrease agitation
» decrease positive symptoms

! CAUTION !

Always consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to:

» children and adolescents
» the elderly
» pregnant and lactating women

After the acute phase:

- Haloperidol, oral dose range of 1.5– 10 mg/day, administered 2–3 times daily in divided doses.

Long-term therapy:

- Haloperidol, oral, 1.5– 10 mg daily given as a single dose or in two divided doses.
  or
  Fluphenazine decanoate, IM, 25–50 mg every 4 weeks.
  o Initial dose: 12.5 mg.
  or
  Flupenthixol, decanoate, IM, 40 mg every 4 weeks.
  o Initial dose: 20 mg.
  or
  Zuclopenthixol decanoate, IM, 200 mg every 4 weeks.
  o Initial dose: 100 mg.

Note:

Long acting antipsychotics are particularly useful in patients unable to adhere to their oral medication regimes

Long-term therapy should always be in consultation with a doctor or a psychiatrist. Patients should be re-assessed every 6 months.

Extra pyramidal side-effects

If extrapyramidal side-effects occur with the lowest effective dose of antipsychotic medication:

» an anticholinergic agent, e.g. orphenadrine or biperiden can be co-prescribed for dystonia or rigidity
» the low potency agent, chlorpromazine, is less likely to cause dystonia

- Orphenadrine, oral, 50–150 mg, daily according to individual response
  - 50 mg twice daily is usually enough
  - do not prescribe more than 150 mg per day at primary care level
  - use with caution in the elderly as it may cause confusion and urinary retention

For acute dystonic reaction:

- Biperiden, IM, 2 mg – may be repeated every 30 minutes.
  - Maximum of four doses within 24 hours.

Referral

» First psychotic episode
» Poor social support
» High suicidal risk or risk of harm to others
» Children and adolescents
» The elderly
» Pregnant and lactating women
» No response to treatment
» Intolerance to medicine treatment
» Concurrent medical or other psychiatric illness
» Epilepsy with psychosis

Chapter 17 - Respiratory conditions

17.1 Conditions with predominant wheeze

17.1.1 Bronchospasm, acute associated with asthma and chronic obstructive bronchitis

J45.9

Description

This is an emergency situation recognised by various combinations of:
» wheeze
» breathlessness
» tightness of the chest
» respiratory distress
» chest indrawing in children
» cough

In adults bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).
The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. In patients over 50 years presenting with asthma for the first time, the diagnosis of pulmonary oedema due to left ventricular heart failure should be considered.

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation should also be considered, especially if the wheeze is unilateral.

All PHC facilities should have peak expiratory flow (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

Recognition and assessment of severity of attacks in children

	Moderate	Severe
Respiratory rate	more than 40 per minute	more than 40 per minute
Chest indrawing/recession	present	present
PEF (if > 5 years old)	50–70% of predicted	below 50% of predicted
Speech	normal or difficult	unable to speak
Feeding	difficulty with feeding	unable to feed
Wheeze	present	absent
Consciousness	normal	impaired

Recognition and assessment of severity of attacks in adults

	Moderate	Severe
Talks in	phrases	words
Alertness	usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 per/minute	often more than 30 per minute
Wheeze	loud	loud or absent
Pulse rate	100–120 per minute	above 120 per minute
PEF after initial nebulisation	approx. 50–75%	below 50%; may be too short of breath to blow in PEF meter

Note:
PEF is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment.

Drug treatment

- Oxygen, 40% or higher, using highest concentration face mask
  Note:
  In chronic obstructive pulmonary disease:
  Oxygen, should be given with care (preferably by 24% or 28% facemask if available) and patients should be observed, as a small number may develop increasing hypercarbia deterioration of their condition.

- Salbutamol 0.5%, solution, nebulised over 3 minutes preferably driven by oxygen

  Children: 0.5–1 mL in 3 mL of sodium chloride 0.9%
  Adults: 1–2 mL in 3 mL of sodium chloride 0.9%
  - o If no relief, repeat every 20–30 minutes in the first hour
  - o Thereafter repeat every 2–4 hours if needed

If reversal of bronchospasm is incomplete after the first nebulisation:
Children with asthma

- Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
≥ 11–14 kg	20 mg	4 tablets	≥ 2–3 years
≥ 14–17.5 kg	30 mg	6 tablets	≥ 3–5 years
≥ 17.5 kg and above	40 mg	8 tablets	≥ 5 years and adult

If oral prednisone cannot be taken:

- Hydrocortisone, IV, 4–6 mg/kg immediately.
  - o Maximum dose: 100 mg.

Weight kg	**Dose** mg	**Injection** 100 mg/2 mL	**Age** months/years
≥ 11–14 kg	50 mg	1 mL	≥ 2–3 years
≥ 14–17.5 kg	75 mg	1.5 mL	≥ 3–5 years
≥ 17.5 kg and above	100 mg	2 mL	≥ 5 years and adult

Adults with asthma or COPD

- Prednisone, oral, 40 mg immediately then 20–40 mg once daily for 7 days

If oral prednisone cannot be taken:

- Hydrocortisone, IV, 100 mg immediately

and

- Ipratropium bromide, solution, added to salbutamol solution
  - o Children 0.5–1 mL (0.125–0.25 mg)
  - o Adults 2 mL (0.5 mg)

If no nebuliser available

- Salbutamol, inhalation, 4–8 puffs, using a spacer, every 4 hours.
  - o Inhale one puff at a time and allow for 4 breaths through the spacer between puffs.

If there is no immediate response:
add

- Ipratroprium bromide, inhalation, 4 puffs, using a spacer, every 4 hours.

If no relief:
Repeat salbutamol every 20–30 minutes in the first hour.
Thereafter repeat every 2–4 hours if needed

Note:
Administering salbutamol via a spacer is as effective as and cheaper than using a nebuliser.
In severe cases, nebulisation must be given with oxygen.

! CAUTION !
Avoid sedation of any kind.

Assessment of response in <u>children</u>

	Response	No response
PEF (if possible)	improvement by more than 20%	improvement by less than 20%
Respiratory rate	less than 40 per minute	more than 40 per minute
Chest indrawing or recession	absent	present
Speech	normal	impaired
Feeding	normal	impaired

Assessment of response in <u>adults</u>

	Response	No response
PEF (if possible)	improvement by more than 20%	improvement by less than 20%
Respiratory rate	less than 20 per minute	more than 20 per minute
Speech	normal	impaired

Patients responding to treatment:

» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.
» Advise patient or caregiver on further care at home, danger signs and of follow up required.
» Caution patient on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.
» Ask about smoking: if yes, urge patient to stop.

<u>Referral</u>

Urgent

» Any general danger sign and life-threatening features:
  – tachycardia (pulse > 120 before nebulisation)
  – drowsiness
  – confusion
  – silent chest
  – cyanosis
  – collapse
  – inability to complete a sentence in one breath
» No response to initial treatment.

» PEFR of less than 75% of the predicted normal or of personal best value 15–30 minutes after nebulisation.
» A lower threshold to admission is appropriate in patients when:
  – seen in the afternoon or evening, rather than earlier in the day
  – recent onset of nocturnal symptoms or aggravation of symptoms
  – previous severe attacks, especially if the onset was rapid

Referral

» Patients needing repeated courses of oral corticosteroids (more than twice over six months) should be assessed for maintenance therapy (see chronic asthma below).

17.1.2 Asthma, chronic

J45.9

Description

A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections result in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and if not controlled, eventual bronchial muscle hypertrophy of the airways' smooth muscle. All these factors contribute to airways obstruction. Asthma varies in intensity and is characterised by recurrent attacks of:

» wheezing
» dyspnoea or shortness of breath
» cough, especially nocturnal and
» periods of no airways obstruction between attacks

Acute attacks may be caused by:

» exposure to allergens
» respiratory viral infections
» non-specific irritating substances
» exercise

Asthma must be distinguished from chronic obstructive pulmonary disease, which is often mistaken for asthma – See section 17.1.3. The history is a reliable diagnostic guideline and may be of value in assessing treatment response.

Asthma	COPD
» Young age onset, usually before 20 » History of hay fever, eczema and/ or allergies. » Family history of asthma. » Symptoms are intermittent with periods of normal breathing in between. » Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes or when upset. » Marked improvement with beta agonist.	» Older age onset, usually after 40 » Symptoms slowly worsen over a long period of time. » Long history of daily or frequent cough before the onset of shortness of breath. » Symptoms are persistent rather than only at night or during the early morning. » History of heavy smoking (more than 20 cigarettes/day for 15 years or more), heavy cannibis use or previous TB. » Little improvement with beta agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.

Note:
The diagnosis of asthma can be difficult in children under 6 years of age.
If the diagnosis of asthma is uncertain, refer the patient.

General measures

» No smoking by an asthmatic or in the living area of an asthmatic.
» Avoid contact with household pets.
» Avoid exposure to known allergens and stimulants or irritants.
» Education on early recognition and management of acute attacks.
» Patient and caregiver education including:
  – emphasising the diagnosis and explaining the nature and natural course of the condition
  – teaching and monitoring the technique for use of inhalers
  – reassuring parents and patients of the safety and efficacy of continuous regular controller therapy

Assessing response to therapy
Response to treatment is based primarily on symptoms:
» Frequency of asthma symptoms
» Use of reliever medication
» Nighttime/early morning awakening
» Limitation of daily activities

Peak Expiratory Flow Rate (PEFR)
Refer to pages xxx – xxxii for PEF charts

The Peak Expiratory Flow Rate (PEFR) may provide additional information for assessing response to therapy. See below.

» PEFR is best assessed in the morning and evening
  – The patient is requested to blow forcibly into the device after a deep inspiratory effort
  – Three blows are performed at each testing point.
  – The highest value is taken as the true value.
» The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
  – An improvement of 60 L/minute or 20% or more of the pre-bronchodilator PEFR, 10–20 minutes after inhalation of a beta agonist, e.g. 2 puffs of salbutamol 100 mcg, confirms a diagnosis of asthma.
  – A normal PEFR excludes the possibility of moderate and severe COPD.
» PEFR may be useful in assessing response to therapy.
  – Any value more than 80% of the personal best prior to the use of a bronchodilator is regarded as adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

Note:
Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma should always be done with the use of a peak flow meter to assess severity and treatment response of asthma.

Inhalation therapy
Inhaled therapy is preferable to oral therapy.

Spacer devices
» Spacers are vital for an adequate therapeutic effect of inhaled therapy.
» Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of drug delivery and limit adverse effects.
» Use the spacer appropriate for the age of the patient.

	Spacer volume	Face mask
Infants	150–250 mL	mandatory
Children	500 mL	highly recommended
Adolescents and adults	750 mL	

» Inhalation spacer devices enable parents to administer inhaled therapy even to small children
» Children under 3 years should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly
» Demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure

Patient and caregiver education on inhaler and spacer techniques.
» Under the age of 3 years a mask attachment should be used with the spacer.

Inhalation therapy without a spacer in adults:

1. remove the cap from the mouthpiece
2. shake the inhaler well
3. while standing or sitting upright, breathe out as much air as possible
4. place the mouth piece of the inhaler between the lips and gently close the lips around it
5. while beginning to inhale, press down the canister of the metered dose inhaler once to release one puff while breathing in as deeply as possible
6. hold the breath for 5–10 seconds, if possible
7. breathe out slowly and rest for a few breaths (30–60 seconds)
8. repeat steps 2–6 for the second puff

Inhalation therapy with a spacer in adults and older children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. insert the mouthpiece of the metered dose inhaler into the back of the spacer
4. insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece. Avoid covering any small exhalation holes.
5. press down the canister of the metered dose inhaler once to release one puff into the spacer
6. immediately take 3–4 slow deep breaths.
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs
8. rinse mouth after inhalation of corticosteroids

Inhalation therapy with the spacer alone in younger children:

1. allow to breathe slowly in and out of the spacer continuously for 30 seconds
2. while still breathing, release one puff from the inhaler into the spacer
3. continue breathing for 3–4 breaths
4. if breathing is through the nose, pinch the nose gently while breathing from the spacer

Inhalation therapy with a spacer and mask for infants and small children:

1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. infants may be placed on the caregiver's lap or laid on a bed while administering the medication
4. apply the mask to the face, ensuring that the mouth and nose are well covered
5. with the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer
6. keep the mask in place for at least six breaths, then remove
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

Drug treatment

Drug treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

Reliever drugs in asthma:

- $Beta_2$ agonists, e.g. salbutamol (short acting)
  - o are indicated for the immediate relief of the symptoms of acute attacks
  - o can be used as needed
  - o increasing need for reliever drug indicates poor asthma control

$Beta_2$ agonists:

- $Beta_2$ agonists e.g. salbutamol, inhalation, 100–200 mcg (2 puffs), as required 4–6 hourly until relief is obtained (not continuously).

Controller drugs in asthma:

- Inhaled corticosteroids, e.g. budesonide and beclomethasone.
  - o Must be used twice daily, even when the patient feels well.

Once symptoms and PEFR have improved, the dose should be reduced to the minimum maintenance dose needed for control.
Children:

- Budesonide or beclomethasone, inhalation, 100 mcg, 12 hourly regularly.

Adults:

- Budesonide or beclomethasone, inhalation, 200 mcg, 12 hourly regularly provided the efficacy is controlled with a peak flow meter.

If no improvement, refer to doctor.

Higher doses - doctor initiated as per peak flow results
Children:

- Budesonide or beclomethasone, inhalation, 200 mcg 12 hourly regularly.

Adults:

- Budesonide or beclomethasone, inhalation, 400 mcg, 12 hourly regularly.

STEP 1: MILD INTERMITTENT ASTHMA

Indications for only intermittent reliever therapy:

» not more than one or two episodes of daytime cough and/or wheeze per week
» less than one night-time cough and/or wheeze per month
» no recent (within the last year) admission to hospital for asthma
» PEFR more than 80% predicted between attacks
» exercise-induced asthma – inhaler should be used before exercise

Children and adults:

- Beta$_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 2: MILD PERSISTENT ASTHMA

» 3–4 episodes of wheeze and /or cough per week
» 2–4 episodes of night time wheeze or cough per month
» PEFR more than 80% predicted between attacks

Children:

- Budesonide or beclomethasone, inhalation, 100 mcg, 12 hourly regularly.

and

- Beta$_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

Adults:

- Budesonide or beclomethasone, inhalation, 200 mcg, 12 hourly regularly.

and

- Beta$_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 3: MODERATE PERSISTENT ASTHMA

- more than 4 episodes of day time wheeze, tightness or cough per week
- more than 4 night time awakenings per month
- PEFR more than 60% but less than 80% predicted

Children:

- Budesonide or beclomethasone, inhalation, initiate with 100 mcg 12 hourly regularly.
  - o If no response, refer to doctor to uptitrate to 200 mcg, 12 hourly regularly.

and

- Beta$_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

Adults:

- Budesonide or beclomethasone, inhalation, initiate with 200 mcg, 12 hourly regularly.
  - o If no response, refer to doctor to uptitrate to 400 mcg, 12 hourly regularly.

and

- Beta$_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved.

STEP 4: MODERATE PERSISTENT ASTHMA NOT CONTROLLED ON THESE DOSAGES

Adults:
Add slow release theophylline, doctor initiated.

- Oral theophylline has a limited place in the treatment of asthma after insufficient response to inhaled $beta_2$ stimulants and corticosteroids in sufficient doses and should be prescribed only on the basis of proven benefit via pulmonary function testing in individual patients.
- Ongoing use of theophylline should be re-evaluated periodically – if there is no benefit after 4 weeks it should be discontinued.
- Theophylline slow release, oral, initially 200 mg 12 hourly and may be increased to 300 mg 12 hourly. (Doctor initiated)
  - Higher dosages of theophylline in adherent patients should only be considered using blood level monitoring.
  - The elderly are more susceptible to theophylline toxicity.

CHRONIC MANAGEMENT ASPECTS OF ASTHMA

Stepping treatment down or up
» Review treatment every 3 months

Stepping down treatment:
» Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months
» Gradually reduce the dose or stop regular inhaled corticosteroid therapy
» If the symptoms are seasonal, corticosteroids may often be stopped until the next season
» If symptoms reappear, increase the therapy to the level on which the patient was previously controlled

Stepping up treatment:
» Therapy should be stepped up if a patient is not appropriately controlled
» Inadequate control is recognised by:
  – increasing symptoms
  – increasing use of reliever
  – deteriorating peak flow rates as detected from record in an asthma diary

Referral

» All children less than 6 years should be evaluated by a doctor for assessment and confirmation of diagnosis
» Any patient who has received more than 2 courses of oral prednisone within a 6 month period
» Brittle asthma (very sudden, very severe attacks)
» Inadequate response to acute or chronic treatment

» Diagnosis is uncertain
» With or after a life-threatening episode
» Pregnant women with aggravated asthma
» Children not responding to treatment in step 3: moderate persistent asthma
» Adults not responding to treatment in step 4: moderate persistent asthma not controlled on these dosages

17.1.3 Chronic Obstructive Pulmonary Disease (COPD)

J44.9

Also referred to as chronic obstructive airways disease (COAD), and includes chronic bronchitis and emphysema.

Description

Chronic bronchitis and emphysema are conditions manifested by:
» chronic cough with or without sputum production on most days of 3 or more months for 2 or more consecutive years
» dyspnoea or shortness of breath
» wheezing

This condition is primarily caused by smoking.

The onset is very gradual with progressively worse symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. The airways obstruction is not fully reversible. The main causes of chronic bronchitis and emphysema are chronic irritation of the airways caused by smoking, air pollution, previous TB, previous cannabis (dagga) smoking although there are many other causes. It is not primarily an infection, but a degenerative condition.

Patients usually present with some of the following:
» wheezing
» shortness of breath
» cough with or without sputum
» manifestations of right-sided heart failure
» acute bronchitis after a cold or flu with the above symptoms

Note:
The airways obstruction of chronic bronchitis and emphysema is not completely reversible as in asthma.
Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long term if benefit can be proven by lung function testing.

General measures

» Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
» Chest physiotherapy to improve breathing and coughing mechanics and during infective episodes
» Encourage adequate fluid intake especially in the elderly and those with prolonged dyspnoea

Drug treatment

Acute lower airways obstruction
Treat as for acute asthma

Chronic obstruction management:
» In a stable patient, check PEFR.
» Then give a test dose of salbutamol – 2 puffs.
» Repeat PEFR 15 minutes later.
» If there is a 15% or greater improvement in peak flow, treat as for asthma. See section 17.1.2
» The routine use of inhaled corticosteroids is not recommended, unless there is a 15% or greater improvement in PEFR after a test dose of salbutamol.

Patients failing to respond to the test dose of salbutamol:
- $Beta_2$ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed for relief of wheeze

and if not controlled:
- Ipratropium bromide, MDI, 2 puffs 6–8 hourly – doctor initiated

If response to inhaler therapy is poor:
- Theophylline slow release, oral, initially 200 mg 12 hourly (Doctor initiated)
  - o May be increased to 300 mg 12 hourly.
  - o Higher dosages of theophylline in adherent patients should only be considered using blood level monitoring.
  - o The elderly are more susceptible to theophylline toxicity.
  - o Theophylline interacts with many other drugs including antibiotics such as erythromycin and quinolones.

Acute infective bronchitis:
- Doxycycline, oral, 100 mg 12 hourly for 10 days
  or
  Amoxicillin, oral, 500 mg 8 hourly for 10 days

Prophylaxis against respiratory tract infections:
- Influenza vaccination, annually
- Pneumococcal vaccination, 5 yearly

Referral

» Poor response to above therapy, for further investigations and adjustment of treatment

17.1.4 Bronchiolitis, acute in children

J21.9

Description

Acute bronchiolitis is a common cause of wheezing and cough in the first two years of life.
It is caused by viral infections and presents with lower airways obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.

Child presents with:
» rapid breathing
» chest indrawing
» decreased breath sounds
» an audible wheeze

General measures

» Minimise contact with other children.
» Avoid use of antibiotics and corticosteroids.
» Do not sedate child.

Drug treatment

- Oxygen, humidified, using nasal canula at 1–2 L per minute
- Salbutamol 0.5%, solution, 0.5–1 mL diluted to 2–4 mL with sodium chloride 0.9%, nebulised over 3 minutes (single dose)
  - o Evaluate the response to salbutamol.
  - o Send patient home on salbutamol metered dose inhaler with spacer if there is a good response.

Referral

» Chest indrawing and distress not responding to salbutamol
» Difficulty in feeding
» Sleep disturbance
» Previous admission for same problem
» Oxygen saturation less than 90% in room air

17.2 Upper airways obstruction

J05

17.2.1 Croup (Laryngotracheobronchitis) in children

J05.0

Description

Croup is a common cause of potentially life-threatening airway obstruction in childhood. It is characterised by inflammation of the larynx, trachea and bronchi. Most common causative pathogens are viruses, including measles.

A clinical diagnosis of viral croup can be made if a previously healthy child develops progressive inspiratory airway obstruction with stridor and a barking cough, 1–2 days after the onset of an upper respiratory tract infection. A mild fever may be present.

Suspect foreign body aspiration if there is a sudden onset of stridor in an otherwise healthy child.
Suspect epiglottitis if the following are present in addition to stridor:

» very ill child
» high fever
» drooling saliva
» unable to swallow
» sitting upright with head held erect

Assessment of the severity of airway obstruction and management in croup

Grade 1 inspiratory stridor only	• Prednisone, oral, 1–2 mg/kg, single dose o Do not give if measles or herpes infection present » Refer
Grade 2 inspiratory and expiratory stridor	• Adrenaline, 1:1 000 diluted in sodium chloride 0.9%, nebulised, immediately o Dilute 1 mL of 1:1 000 adrenaline with 1 mL sodium chloride 0.9% o Repeat every 15–30 minutes until expiratory stridor disappears • Prednisone, oral, 1–2 mg/kg, immediately as a single dose » Refer

Grade 3 inspiratory and expiratory stridor with active expiration using abdominal muscles	» Treat as above » If no improvement within one hour, refer **urgently** (intubate before referral if possible)
Grade 4 Cyanosis, apathy, marked retractions, impending apnoea	» intubate (if not possible give treatment as above) » Refer **urgently**

General measures

» Keep child comfortable.
» Continue oral fluids.
» Encourage parent or caregiver to remain with the child.

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL		≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

If the child requires referral - while awaiting transfer:

- Adrenaline, 1:1000, nebulised, immediately using a nebuliser.
  - o If there is no improvement, repeat every 15 minutes, until the child is transferred
  - o Dilute 1 mL of 1:1000 adrenaline with 1 mL sodium chloride 0.9%.
  - o Nebulise the entire volume with oxygen at a flow rate of 6–8 L/minute

- Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days

Weight kg	**Dose** mg	**Tablet** 5 mg	**Age** months/years
≥ 11–14 kg	20 mg	4 tablets	≥ 2–3 years
≥ 14–17.5 kg	30 mg	6 tablets	≥ 3–5 years

If epiglottitis suspected

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	5 years and adult

!CAUTION!
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate dose and route of administration in referral letter.

Management during transfer:

» Give the child oxygen
» Continue nebulisations with adrenaline
» If grade 3 contact ambulance or nearest doctor
» If grade 4 intubate and transfer

Referral

Urgent

» All children grade 2 or more stridor
» Children with
  – chest indrawing.
  – rapid breathing
  – altered consciousness
  – inability to drink or feed
» For confirmation of diagnosis
» Suspected foreign body
» Suspected epiglottitis

17.3 Respiratory infections

17.3.1 Common cold and influenza

J11.1

Description

Colds and influenza are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days and influenza within 7 days.

Colds present with nasal stuffiness and throat irritation. In addition, influenza presents with headache, muscular pain and fever.

Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

!CAUTION!

Malaria, measles, and HIV sero conversion may present with flu-like symptoms.

Complications

Secondary bacterial infections, including:

» pneumonia secondary to influenza
» otitis media
» sinusitis

General measures

» “Steam” inhalations.
» Bed rest if feverish.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and cough or fever persists for longer than a week.

Drug treatment

Antibiotics are of no value for the treatment of the common cold and influenza.

Pain and fever:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Infants:

- Sodium chloride 0.9%, instilled into each nostril

Referral

» Severe complications

17.3.2 Bronchitis, acute in adults or adolescents

J20.9

Description

Acute airways, infections mostly of viral origin, accompanied by cough, sputum production and sometimes a burning retrosternal chest pain in patients with otherwise healthy lungs.

Clinical features:

» initially – non productive cough
» later – productive cough with yellow or greenish sputum

Viral bronchitis is usually part of an upper respiratory viral infection. It may be accompanied by other manifestations of viral infections. It is important to exclude underlying bronchiectasis or an acute exacerbation of chronic bronchitis in adults.

No antibiotics are indicated in uncomplicated acute bronchitis.
However, antibiotics may be considered for HIV positive patients because of the higher incidence of bacterial lower respiratory tract infections in this subgroup:

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

In penicillin-allergic HIV positive patients:
- Erythromycin, oral, 500 mg 6 hourly for 5 days

For symptomatic relief
- Cough syrup, oral

17.3.3 Pneumonia
J18.9

Description

Infection of the lung parenchyma, usually caused by bacteria, especially Pneumococcus.

Management is guided by:
» age
» health status
» severity of the pneumonia

Manifestations include:
» malaise
» fever, often with sudden onset and with rigors
» cough, which becomes productive of rusty brown or yellow-green sputum
» pleuritic type chest pain
» shortness of breath
» in severe cases, shock and respiratory failure

On examination there is:
» fever
» tachypnoea
» crackles or crepitations
» bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.

Predisposing conditions include:
» the very young and old
» other concomitant diseases
» malnutrition
» HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults.
Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4 Pneumonia in children

J18.9

Description

Pneumonia should be distinguished from viral upper respiratory infections. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia

Classify children according to the severity of the illness:

» no pneumonia – fever and cough
» pneumonia – fever, cough and rapid breathing
» severe pneumonia – fever, cough, rapid breathing, chest indrawing (of the lower chest wall) and flaring nostrils.
Note:
Children less than 2 months of age with rapid breathing should be classified as having severe pneumonia.

Rapid breathing is defined as:

» infants birth to 2 months	60 or more breaths per minute
» infants 2 months to 1 year	50 or more breaths per minute
» children 1–5 years	40 or more breaths per minute

Danger signs indicating urgent and immediate referral include:

» low oxygen saturation of less than 90% in room air
» inability to drink
» impaired consciousness
» cyanosis
» age less than 2 months
» grunting

General measures

» Ensure adequate hydration
» Continue feeding

Drug treatment

For pneumonia:

- Amoxicillin, oral, 25–30 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup		**Capsule** 250 mg	
		125 mg/ 5mL	250 mg/ 5mL		
≥ 3.5–5 kg	125 mg	5 mL	2.5 mL	–	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	–	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	1 capsule	≥ 6–18 months
≥ 11–14 kg	375 mg	15 mL	7.5 mL	–	≥ 18 months–3 years
≥ 14–25 kg	500 mg	–	10 mL	2 capsules	≥ 3–7 years
≥ 25–35 kg	750 mg	–	–	3 capsules	≥ 7–11 years
≥ 35 kg and above	1000 mg	–	–	4 capsules	≥ 11 years and adult

Penicillin–allergic patients:

» Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** mg			**Age** Months / years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Severe pneumonia:

» Oxygen, using nasal canula at 1–2 L per minute before and during transfer

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	≥ 5 years and adult

! CAUTION !

Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Contra-indicated in neonatal jaundice.

Annotate dose and route of administration on referral letter.

and

- Cotrimoxazole, oral, initial dose (before referral)

Weight kg	**Use one of the following:**		**Age** Month/years
	Suspension mL	**Tablet** 80/400 mg	
≥ 2.5–3.5 kg	2.5 mL	–	Birth–1 month
≥ 3.5–7 kg	5 mL	–	≥ 1–6months
≥ 7–11 kg	7.5 mL	–	≥ 6–18months
≥ 11–17.5 kg	10 mL	–	≥ 18 months–5 years
≥ 17.5–25 kg	15 mL	1½ tablets	≥ 5–7 years
≥ 25–35 kg and above	20 mL	2 tablets	≥ 7–11 years

Referral

Urgent

» All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis
» All children under 2 months

Non-urgent

» Inadequate response to treatment
» Children coughing for more than 3 weeks to exclude other causes such as TB, foreign body aspiration, pertussis

17.3.5 Pneumonia, uncomplicated in adults

J18.9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Two sputum smears to exclude TB should be done.

General measures

» Encourage high oral fluid intake

Drug treatment

If not severely ill (see referral criteria below):

- Benzylpenicillin, IM, 2 MU immediately

and

- Amoxicillin, oral, 1 000 mg 8 hourly for 5 days

If no response to treatment after 48 hours **add:**

- Erythromycin, oral, 500 mg 6 hourly for 5 days

In penicillin-allergic patients:

- Erythromycin, oral, 500 mg 6 hourly for 5 days

For fever:

- Paracetamol, oral, 1 000 mg oral 4–6 hourly when required to a maximum of four doses daily

Referral

Any of the following:

» Confusion or decreased level of consciousness
» Cyanosis
» Respiratory rate of 30 breaths or more per minute
» Systolic BP less than 90 mmHg
» Diastolic BP less than 60 mmHg
» Deterioration at any point
» No response to treatment after 48 hours
» Patients with pneumonia
  – from a poor socio-economic background
  – who are unlikely to comply with treatment
  – living a considerable distance from health centres
  – have no access to immediate transport

17.3.6 Pneumonia in adults with underlying medical conditions or over 65 years

J18.9

Common underlying conditions include:

» Diabetes mellitus
» HIV infection
» Cardiac failure
» COPD
» Alcoholism
» Chronic liver disease
» Chronic kidney disease

Most of these patients will require referral to a doctor.

Mild pneumonia:

- Amoxicillin/clavulanic acid 250/125 (375), oral 8 hourly for 5–10 days

plus

- Amoxicillin, oral, 500 mg 8 hourly for 5–10 days.

17.3.7 Pneumonia, severe in adults

J18.9

Pneumonia is defined as severe by 2 or more of the following:

» confusion or decreased level of consciousness
» respiratory rate of 30 breaths or more per minute
» systolic BP less than 90 mmHg
» diastolic BP less than 60 mmHg
» age over 65 years

While awaiting transfer:

- Oxygen

- Ceftriaxone, IV/IM, 1 000 mg, single dose before referral

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.

Referral

Urgent

» All patients

17.3.8 Pneumocystis pneumonia in adults

B59

Description

Interstitial pneumonia occurring with advanced HIV infection due to *Pneumocystis jiroveci* (formerly *carinii*). Patients usually present with shortness of breath or dry cough with onset within 12 weeks.
Chest X-ray may be normal in the early stages but typically shows bilateral interstitial or ground glass pattern.

This diagnosis cannot be made without a chest X-ray.

General measures

» Ensure adequate hydration

Drug treatment

- Cotrimoxazole, oral, 6 hourly for 14–21 days

Approx weight kg	**Use one of the following**	
	Tablet 80/400	**Tablet** 160/800
less than 40 kg	2 tablets	1 tablet
≥ 40–56 kg	3 tablets	1½ tablet
≥ 56 kg and above	4 tablets	2 tablets

For secondary prophylaxis:

- Cotrimoxazole, oral, daily

Use one of the following	
Tablet 80/400	**Tablet** 160/800
2 tablets	1 tablet

Referral

» Breathing rate more than 24 per minute
» Shortness of breath with mild effort
» Cyanosed patients
» All patients for ARVs

17.3.9 Tuberculosis

A16.9

Note: notifiable condition

TB guidelines are updated regularly. The most recent National Tuberculosis Control Programme Guidelines should be consulted.

Description

Tuberculosis is a disease due to infection by *Mycobacterium tuberculosis*. It is a serious and growing health problem in South Africa and is expanded and complicated by HIV/AIDS and multiple drug-resistant mycobacteria.

Note:
A standard TB register monitoring system and treatment guidelines have been introduced.
All patients on TB treatment must be entered into a TB register to enable the completion of quarterly reports for case finding and holding. This is essential for TB control at local, provincial and national level.

General measures

» The relationship between the person providing the care and the patient is an important factor for compliance in patient-centred care
» Care providers should explain the importance of completing treatment and the following should be discussed:
  – feelings and emotions
  – expectations
  – potential barriers or problems which may prevent success
  – habits and past experience
  – monitor
  – encouragement and motivation
  – provide feedback on progress
» Lifestyle adjustment
» Avoid the use of tobacco
» Avoid alcohol
» If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have

Note:
A private practitioner may elect to monitor the progress of the patient personally. In this case, the patient should remain on the clinic TB patient register.

Drug treatment

The total daily amount of each drug should be administered in one dose and not divided.

Ethambutol and isoniazid as single formulations will be retained to facilitate appropriate doses of available fixed-dose combinations in the continuation phase of treatment

Fixed-dose combinations are strongly encouraged in adults to enhance patient adherence and reduce the risk of inappropriate monotherapy.

Adult TB patients
» during pregnancy
» in alcoholics
» with diabetes mellitus
» with epilepsy
» with HIV infection

- Pyridoxine, oral, 25 mg daily

Important drug interactions
Rifampicin reduces the efficacy of oral contraceptives, resulting in possible unplanned pregnancies (See chapter 7: Family planning)

» Discuss contraception and explain the problem and the consequences
» If necessary, alter the oral contraceptive to a high dose preparation for the duration of TB treatment or use an injectable contraception or IUCD
» Combined oral contraceptives should contain at least 50 mcg of ethinylestradiol

! CAUTION !
Antiretroviral drugs frequently interact with TB drugs.
Consult the DoH antiretroviral treatment guidelines.

Contra-indications to TB drugs

» Streptomycin should not be given to:
  – pregnant women
  – persons over 65 years old
  – persons with impaired renal function
» Ethambutol should not be given to:
  – children under 8 years
  – persons with impaired renal function
» All patients with jaundice and suspected drug induced hepatitis
  – manage at hospital level
  – stop treatment and refer

Adverse effects of TB drugs:

» Nausea
  – May be a manifestation of liver dysfunction. If available, serum transaminase levels should be done in these patients.
  – taking drugs with meals can minimise nausea
» Skin hypersensitivity or allergy
  – can be severe and may need anti-histamines, e.g. chlorpheniramine
  – discontinue treatment and refer if extensive.
» Neuropathy (adults only)
  – can be prevented by taking pyridoxine on the same day as TB treatment

TB CHEMOPROPHYLAXIS

Initiate only after active disease is excluded.
See TB and HIV and AIDS section below

Indication for TB chemoprophylaxis:

» Children less than 5 years in close household contact with a smear-positive case of pulmonary TB (Contacts of MDR or XDR TB should be referred for expert advice)

and

» Children less than 5 years of age who have a positive tuberculin test but show no other evidence of disease, including on chest X-ray.

- Isoniazid, oral, 10–15 mg/kg daily for 6 months.
  - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
≥ 2–3.4 kg	¼ tablet
≥ 3.5–6.9 kg	½ tablet
≥ 7–9.9 kg	1 tablet
≥ 10–14.9 kg	1½ tablets
≥ 15–19.9 kg	2 tablets
≥ 20–24.9 kg	2½ tablets
≥ 25 kg	3 tablets

plus for adults and children with HIV or malnutrition:

- Pyridoxine, oral, daily for duration of prophylaxis.
  - Adults: 25 mg
  - Children: 12.5 mg

TB AND HIV AND AIDS

Sputum smears in HIV and AIDS patients with TB are often negative as cavitation does not occur until the TB is far advanced. Sputum culture is more useful in these patients to confirm the diagnosis of tuberculosis.
HIV/AIDS patients with suspected TB should have two or more negative sputum smears before sputum is sent for culture.
Standard treatment regimens are also effective in patients with HIV/AIDS.
Advise HIV/AIDS patients to present to a clinic if they develop common TB symptoms:

» persistent cough
» night sweats
» loss of weight

Side-effects of TB drugs are more pronounced in HIV/AIDS patients.

<u>TB prophylaxis in HIV infection:</u>
Indicated for patients with HIV who have either been in contact with a person with open TB or is tuberculin test positive **and** has no evidence of TB disease on chest X-ray or clinically.
Refer contacts of MDR or XDR for expert advice.

- Isoniazid, oral, 10–15 mg/kg daily for 6 months.
  - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
≥ 2–3.4 kg	¼ tablet
≥ 3.5–6.9 kg	½ tablet
≥ 7–9.9 kg	1 tablet
≥ 10–14.9 kg	1½ tablets
≥ 15–19.9 kg	2 tablets
≥ 20–24.9 kg	2½ tablets
≥ 25 kg	3 tablets

plus for adults and children with HIV or malnutrition:

- Pyridoxine, oral, daily for duration of prophylaxis.
  - Adults: 25 mg
  - Children: 12.5 mg

MULTIPLE DRUG-RESISTANT (MDR) TB

All cases should be referred to a specialised centre.

MDR TB is usually the result of irregular adherence to TB treatment and is identified when there is resistance to rifampicin **and** isoniazid on sputum culture sensitivity testing. The current regimen is 18–24 months. The cure rate is only between 30–50%

Resistance can be prevented by ensuring cure the first time round.

The effectiveness of preventive therapy in persons exposed to MDR TB bacteria is not known. All close contacts should be screened for signs and symptoms of MDR TB and by sputum sampling to detect early disease.

TB CONTROL PROGRAM DRUG REGIMENS

Treatment should be given once daily **seven days per week** in both the intensive and continuation phases.

All adult patients and children with malnutrition or HIV infection should receive pyridoxine 25 mg daily for the duration of therapy.

R – Rifampicin
H – Isoniazid
Z – Pyrazinamide
E – Ethambutol

Fixed dose drug combination available	
Adults	**Children**
RH –150,75 mg	RH–60,30 mg
RH – 150,150 mg	RH–60,60 mg
RH –300,150 mg	RHZ–60,30,150 mg
RHZE–150,75,400,275 mg	

Regimen 1 – New cases with age above 8 years and adults

New smear-positive and new smear-negative patients and extrapulmonary TB

Pre-treatment body weight	Two months initial phase Treatment given 7 days a week	Four months continuation phase Treatment given 7 days a week	
	RHZE (150,75,400,275)	RH (150,75)	RH (300,150)
20–24 kg	1½ tablet	1½ tablet	–
25–29 kg	1½ tablet	2 tablets	–
30–37 kg	2 tablets	2 tablets	–
38–54 kg	3 tablets	3 tablets	–
55–70 kg	4 tablets	–	2 tablets
> 71kg	5 tablets	–	2 tablets

Regimen 2 – Retreatment cases

Previously treated TB patients after cure, completion, interruption and failure
Previously treated TB patients returning for treatment after cure or completion, default and failure.

Initial phase:

Pre-treatment body weight	Two months **initial phase** Treatment given 7 days a week		3rd month **initial phase** Treatment given 7 days a week
	RHZE	Streptomycin	RHZE
	(150,75, 400,275)	(g)	(150,75,400,275)
30–37 kg	2 tablets	0.5	2 tablets
38–54 kg	3 tablets	0.75	3 tablets
55–70 kg	4 tablets	1.0	4 tablets
≥71 kg	5 tablets	1.0	5 tablets

Continuation phase: (after 3rd month initial phase)

Pre-treatment body weight	Five months **continuation phase** Treatment given 7 days a week			
	RH	E	RH	E
30–37 kg	(150,75)	(400)	(300,150)	(400)
38–54 kg	2 tablets	2 tablets	–	–
55–70 kg	3 tablets	2 tablets	–	–
≥71 kg	–	–	2 tablets	3 tablets

» Streptomycin should NOT be given during pregnancy and to those over 65 years.
» Keep strictly to the correct dose and the duration of treatment.
» Cure of the new PTB patients depends on taking Regimen 1 for 6 months.

» Cure of re-treatment PTB patients depends on taking Regimen 2 for 8 months.
» The patient should be continued on the pre-treatment body weight throughout the treatment period, there is no need to adjust the dosages based on weight gain.

Regimen 3 – Children

For treatment of uncomplicated intrathoracic tuberculosis and extra pulmonary tuberculosis such as lymph gland and pleural effusion in children.

Body weight kg	Intensive Phase (2 months) Treatment given 7 days a week	Continuation phase (4 months) Treatment given 7 days a week
	RHZ* 60,30,150	RH 60,30
2–2.9 kg	½ tablet	½ tablet
3–5.9 kg	1 tablet	1 tablet
6–8.9 kg	1½ tablets	1½ tablet
9–11.9 kg	2 tablets	2 tablets
12–14.9 kg	2½ tablets	2½ tablets
15–19.9 kg	3 tablets	3 tablets
20–24.9 kg	4 tablets	4 tablets
25–29.9 kg	5 tablets	5 tablets
30–35.9 kg	6 tablets	6 tablets
36–40 kg	7 tablets	7 tablets

Keep strictly to the correct dose and the duration of treatment.
The patient should be weighed regularly and the dose adjusted according to the current weight.

Referral

» All patients who cannot be managed on an ambulatory basis
» Impaired renal function
» Children under 12 years should have a chest X-ray for diagnostic purposes if mantoux positive and/or symptoms of TB (and sputum negative)
» MDR or XDR TB patients
» Retreatment cases of children
» Children who are contacts of patients with open MDR or XDR TB

Chapter 18: Eye conditions

18.1 Conjunctivitis

H10

An inflammatory condition of the conjunctiva. It may be caused by:

» allergies
» bacterial or viral (pink eye) infections

18.1.1 Conjunctivitis, allergic

H10.1

Description

An inflammatory condition caused by allergy to pollen, grass, animal fur, medication, cosmetics etc. There is usually a history of allergies, including hay fever. Common features include:

» itching, watery eyes and photophobia
» conjunctiva may appear normal or slightly red
» conjunctival swelling in severe cases
» normal cornea, iris and pupil
» normal visual acuity

General measures

» Cold compresses to relieve symptoms, i.e. a clean moistened cloth over the eyes for 10 minutes

Drug treatment

Adults and children over the age of 6 months:

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for 7 days
  or
  Antazoline/tetrahydrozoline HCl 0.05/0.04% eye drops, instil 1–2 drops 6 hourly for 7 days

Severe cases or rhinoconjunctivitis:

For long term use in adults and school going children:

- Cetirizine, oral, once daily at night

Weight kg	**Dose mg**	**Use one of the following:**		**Age** Months / years
		Syrup 1mg / mL	**Tablet** 10 mg	
≥ 14 – 25 kg	5 mg	5 mL	–	≥ 3–7 years
≥ 25 – 55 kg	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	≥ 15 years and adults

or

Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL		≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

Referral

» No response to treatment
» Persons wearing contact lenses

18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)

H10.9

Description

An inflammatory purulent condition of the conjunctiva caused by bacteria and characterised by:

» itchy eyes and swollen lids
» stickiness of eyelids on awakening in the morning
» discharge from one or both eyes
» redness especially of conjunctival angles (fornices)

General measures

» Patient education on personal hygiene to avoid spread.
» Educate patient on correct application of ophthalmic ointment.
» Advise patient:
  – to wash hands thoroughly before applying ophthalmic ointment
  – not to not share ophthalmic ointments or drops
  – not to rub eyes
  – never to use urine or milk to wash the eyes

Drug treatment

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days

Pain relief, if required:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» No response after 5 days
» Loss of vision
» Irregularity of pupil
» Haziness of the cornea
» Persistent painful eye

18.1.3 Conjunctivitis of the newborn

P39.1

Description

Inflammation of the conjunctiva in the neonatal period presenting with purulent discharge, inflamed conjunctiva and eyelid oedema (in severe cases).
Common infectious agents include *N. gonorrhoea*, *S. aureus, and Chlamydia.*

! CAUTION !
If not treated immediately this condition can become worse, damage the cornea and lead to blindness.

General measures

» Screen all pregnant women for sexually transmitted infections (STI) and treat
» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab
» Advise against harmful applications, such as urine, to the eyes of newborn babies

Drug treatment

PREVENTION

Routine administration for every newborn baby:

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth

TREATMENT

Purulent discharge:

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose
  - o Contraindicated in neonatal jaundice

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone. Contra-indicated in neonatal jaundice. Annotate dose and route of administration in referral letter.

- Sodium chloride 0.9%, eye washes, initially then hourly until referral.

Sticky eye without purulent discharge:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days

Referral

Urgent

» All neonates with purulent discharge

18.1.4 Conjunctivitis, viral (pink eye)

B30.9

Description

A highly contagious, viral infection, which is spread by contact with:

» hands
» towels
» face cloths

It may start in one eye and spread to the other, or more commonly both eyes are infected. Common symptoms include:

» itchy eyes
» sore eyes, feeling of grittiness (roughness) or burning which can be painful
» photophobia
» watery discharge. A yellow discharge indicates a secondary bacterial infection.
» reddened and swollen conjunctiva, which may become haemorrhagic
» swelling of the eyelids
» enlarged pre-auricular node

» The cornea, iris and pupil are completely normal with normal visual acuity.

General measures

» Advise on correct cleansing or rinsing of eyes
» Cold compresses for symptomatic relief

Drug treatment

Adults and children over 6 months:

- Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for 7 days

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» A unilateral red eye for more than one day
» Suspected herpes conjunctivitis indicated by vesicles on skin next to eye
» No response after 5 days
» Loss of vision
» Irregularity of pupil
» Haziness of the cornea
» Persistent painful eye

18.2 Eye injuries

18.2.1 Eye injury, chemical burn

T26.9

This is a medical emergency.

Description

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid, presenting with:

» pain
» inability to open eye
» blurred vision
» excessive teary and watery eye

General measures

» Irrigate or wash the eye immediately and continuously with clean water or saline for at least 20 minutes
» In severe alkaline burn cases, irrigation should be prolonged further.

Drug treatment

Local anaesthetic if needed:

- Tetracaine 0.5% eye drops, instil 2 drops in the affected eye
  - o repeat irrigation or washing out of eye
  - o evert upper eyelid and remove debris with cotton bud
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» All cases within 12 hours

18.2.2 Eye injury, (blunt or penetrating) foreign body

S05.9/S05.5

Description

A foreign body may be embedded in the conjunctiva or cornea or deeper, causing:

» possible corneal abrasion
» disturbance of vision which is serious
» complaints of something in the eye
» pain

General measures

» Establish the cause
» Wash eye with clean water or sodium chloride 0.9%,
» Remove foreign body if visible on sclera or conjunctiva with cotton tipped stick or bud.
» If foreign body is not visible, check visual acuity first, before testing with fluorescein
» Stain with fluorescein to reveal corneal foreign body or complications such as abrasion.
» Check after removal of foreign body
» Cover injured eye with eye pad.

Drug treatment

- Sodium chloride 0.9%, eye washes or irrigations as soon as possible.
  - o If sodium chloride 0.9% is not available use cooled boiled water or sterile water.

Deep corneal or scleral injuries

Cover with an eye shield and refer immediately

If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately
- Chloramphenicol 1%, ophthalmic ointment applied immediately

Pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

! CAUTION !
Review the problem daily
Do not use an eye pad with ecchymosis, lid oedema or bleeding

Referral

Immediately:

» If the foreign body cannot be removed or an intraocular foreign body is suspected
» Laceration, perforation or diffuse damage to the cornea or sclera
» Damage to other structures of the eye, including the eyelid
» Visual abnormalities or limitation of movement of the eye

18.3 Glaucoma, acute

H40.9

Description

Glaucoma is damage to the optic nerve caused by a level of intra-ocular pressure (often raised), which results in loss of vision usually in one eye only.

Clinical features:

» the pupil is moderately dilated and may be oval in shape
» corneal haziness
» pericorneal conjunctival inflammation
» sudden onset of extremely severe, bursting pain and eye redness
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. cinema

» coloured haloes around lights (bright rings)
» the eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
» severe pain in eye (acute)
» nausea and vomiting in severe cases

Emergency drug treatment before referral (Doctor initiated)

- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly.
- Pilocarpine, 1%, eye drops, instilled into the affected eye every 15 minutes for 4 doses

Referral

Urgent

» All patients to an ophthalmologist within 12 hours

18.4 Painful red eye

H57.1

Description

Pain and redness of the eye indicate inflammation of the anterior structures of the eye.

» Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain)
» Consider acute glaucoma and manage appropriately – See section 18.3: Glaucoma, acute

Referral

Urgent:

» All patients (excluding those with conjunctivitis)

18.5 Structural abnormalities of the eye

These include:

» eyelashes rubbing on the cornea (trichiasis)
» eyelids bent into the eye (entropion)
» eyelids bent out too much (ectropion)
» ptosis (drooping eyelid)

Referral

» All patients

18.6 Visual problems

H53.9

Description

Visual problems may be due to refractive errors, or to damage to the eye or optic nerve. They may be an indication of underlying disease such as diabetes or hypertension.

Assessment

Look for abnormalities of the eye

Determine visual acuity accurately in both eyes by Snellen chart. If vision is diminished (less than 6/12) perform the following tests:

Pin hole test

» Make a hole of about 1 mm wide in a piece of dark/black paper.
» Ask the patient to look through this hole at the Snellen chart.
» If vision improves, this means that the patient has a refractive error.

Red reflex test

The patient looks past the examiner's head focussing on a distant target.

» with the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea
» the examiner stands about 60 cm away from the patient
» in normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina

Significance of an absent red reflex

If there is a history of trauma or diabetes the absence of a red reflex is probably due to:

» retinal detachment
» a vitreous or internal haemorrhage
» mature cataract

If there are cataracts one usually sees:

» black shadows against the red reflex in immature cataracts
» absence of red reflex in mature cataracts

In a patient above the age of 50 years with no history of trauma, diabetes or previous eye disease, an absent red reflex is almost sure to be due to cataract formation, especially with decreased visual acuity.

Note:

Associated diabetes or hypertension should be adequately managed before referral, as surgery can only be considered with appropriately managed disease.

Referral

Urgent: within 12–24 hours

» Sudden visual loss **in one or both eyes**
» Pain or redness **in one eye only** or unilateral watery eye especially with visual and pupil abnormalities,
» Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos / keratoglobus) in children
» Hazy cornea in children
» Squint of recent onset

Within days

» Chronic glaucoma
» Double vision except following recent injury
» Leucokoria (white reflex from the pupil)
» Squint at any age if not previously investigated by ophthalmologist
» Visual loss in patients with systemic disease such as diabetes

Non-urgent referral

» Cataracts
» Refractive errors
» Long-standing blindness – first visit to health facility

Chapter 19: Ear, nose and throat conditions

19.1 Allergic rhinitis

J30.4

Description

Recurrent inflammation of the nasal mucosa due to hypersensitivity to inhaled allergens, e.g. pollen, house dust, grasses and animal proteins.
Allergic rhinitis is characterised by recurrent episodes of:

» blocked stuffy nose
» watery nasal discharge
» frequent sneezing, often accompanied by nasal itching and irritation
» conjunctival itching and watering
» oedematous pale grey nasal mucosa
» mouth breathing
» snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, side effects of antihypertensives and antidepressants.

General measures

» Avoid allergens and irritants.

Drug treatment

- Corticosteroid, e.g. beclomethasone, aqueous nasal solution, 2 sprays in each nostril twice daily
  - o Aim the nozzle vertically and not to the back of the throat.
  - o Do not sniff vigorously.

For short term symptomatic use:

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL		≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥ 35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy.

For long-term use in adults and school going children:

- Cetirizine, oral, once daily at night

Weight kg	**Dose** mg	**Use one of the following:**		*Age* months / years
		Syrup 1 mg / mL	**Tablet** 10 mg	
≥ 14 – 25	5 mg	5 mL	–	≥ 3–7 years
≥ 25 – 55	10 mg	10 mL	1 tablet	≥ 7–15 years
≥ 55 kg and above	10 mg	–	1 tablet	≥ 15 years and adults

Referral

» Chronic persistent symptoms
» Severe symptoms

19.2 Epistaxis (See Chapter 21 - Trauma and emergencies)

19.3 Otitis

19.3.1 Otitis, externa

H60.9

Description

Inflammation of the external ear may be one of the following two types:

Type	Description
» diffuse	Usually due to an infection, usually a mixed infection, involving one or more of the following organisms: » Staphylococcus » Streptococcus » *P. aeruginosa* » Proteus species » *E. coli* Infections are usually due to: » mixed infections » allergic dermatitis (often caused by shampoo or soaps) » swimming pool chemicals » trauma caused by scratching, e.g. matchsticks, earbuds.
» furuncular	Usually caused by Staphylococcus

General measures

» Exclude any underlying chronic otitis media before commencing treatment.

» Most cases recover after thorough cleansing and drying of the ear.
» Keep the ear clean and dry.
» Do not leave pieces of cotton wool, etc. in the ear.
» Do not instil anything into the ear unless prescribed.

Drug treatment

Diffuse

Does not usually require an antibiotic.
Make a wick where possible, using ribbon gauze or other suitable absorbent cloth, e.g. paper towel to clean and dry the ear.

- Acetic acid 2% in alcohol, topical, instilled into the ear every 6 hours for 5 days
  - o Instill 3–4 drops after cleaning and drying the ear

Furuncular

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** m**g**	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5mL	**Capsule** 250 mg	
≥ 2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
≥ 5 – 11 kg	125 mg	5 mL	–	≥ 3–18 months
≥ 11 – 25 kg	250 mg	10 mL	1 capsule	≥ 18 months–7 years
≥ 25 kg and above	500 mg	–	2 capsules	≥ 7 years and adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 2.5 – 3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5 – 5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5 – 7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7 – 9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9 – 11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

Referral

» No response to treatment

19.3.2 Otitis, media, acute

H66.9

Description

Inflammation of the middle ear characterised by:

» pain
» loss of the normal light reflex of the eardrum
» red bulging eardrum
» drum perforation
» fever in about half of the cases
» loss of hearing

Mild redness of the eardrum and rubbing the ear are not reliable signs.

General measures

» Do not instil anything into the ear.
» Avoid getting the inside of the ear wet.
» Do not plug the ear with cotton wool, etc.

Drug treatment

- Amoxicillin, oral, 25–30 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup		**Capsule** 250 mg	
		125 mg/ 5mL	250 mg/ 5mL		
≥ 3.5–5 kg	125 mg	5 mL	2.5 mL	–	≥ 1–3 months
≥ 5–7 kg	175 mg	7 mL	3.5 mL	–	≥ 3–6 months
≥ 7–11 kg	250 mg	10 mL	5 mL	–	≥ 6–18 months
≥ 11–14 kg	375 mg	15 mL	7.5 mL	–	≥ 18 months–3 years
≥ 55 kg and above	500 mg	–	10 mL	2 capsules	≥ 3 years and adult

Penicillin–allergic patients:

- Erythromycin, oral, 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg / 5 mL	**Tablets** 250 mg	
≥ 2.5 – 3.5 kg	35 mg	1.4 mL	–	Birth–1 month
≥ 3.5 – 5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5 – 7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7 – 9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9 – 11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
» Recurrent otitis media
» Painful swelling behind the ear or tenderness on percussion of the mastoid
» Suspected meningitis

19.3.3 Otitis media, chronic, suppurative

H66.3

Description

A purulent discharge from the ear for more than 2 weeks.
If the eardrum has been ruptured for 2 weeks or longer, a secondary infection with multiple organisms usually occurs. Multiple organism infection makes oral antibiotic treatment ineffective and patients may need to be referred.
TB is an important cause of a chronically discharging ear in South Africa.
If pain is present, suspect another condition or complications.
Note:
A chronically draining ear can only heal if it is dry.
Drying the ear is time consuming but it is the most effective treatment.

General measures

» Dry mopping is the most important part of the treatment. It should be demonstrated to the child's caregiver or patient if old enough.
  – roll a piece of clean absorbent cloth into a wick
  – carefully insert the wick into the ear with twisting action
  – remove the wick and replace with a clean dry wick
  – repeat this until the wick is dry when removed
» Do not leave anything in the ear.
» Do not instill anything else in the ear.
» Avoid getting the inside of the ear wet while swimming and bathing.
» Exclude TB as a cause.

Referral

» All sick children, vomiting, drowsy, etc.
» Painful swelling behind the ear
» No improvement after 4 weeks
» Any attic perforation
» Any perforation not progressively improving after 3 months or closed by 6 months, even if dry
» Moderate or severe hearing loss

19.4 Sinusitis, acute, bacterial

J01.9

Description

Bacterial infection of one or more sinuses that occurs most often after a viral nasal infection or allergic rhinitis.
Bacterial sinusitis is characterised by:
» deterioration of a common cold after 5–7 days

» purulent nasal discharge, especially if unilateral
» pain and tenderness over one or more sinuses
» nasal obstruction
» occasional fever

Note:
Sinusitis is uncommon in children under 5 years, as sinuses are not fully developed.

General measures

» Steam inhalation may be effective in liquefying and removing secretions blocking the nose.

Drug treatment

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

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/ years
		Syrup 250 mg/ 5 mL	**Capsule** 250 mg	
≥ 14 kg and above	500 mg	10 mL	2 capsules	≥ 3 years and adult

Penicillin–allergic patients:

- Erythromycin, oral, 10–15 mg/kg 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/ 5 mL	**Tablets** 250 mg	
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adult

Note:
Erythromycin is suboptimal therapy for this because of pneumoccocal resistance.

For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥ 14–17.5 kg	120 mg	5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously
  - Children: 0.025%
  - Adults: 0.05%

and/or

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Referral

» Fever lasting longer than 48 hours
» Poor response after 5 days
» Dental focus of infection is present, e.g. apical tooth abscess causing maxillary sinusitis
» Complications, e.g. periorbital cellulitis with periorbital swelling
» Oedema over a sinus
» Recurrent sinusitis
» Meningeal irritation

19.5 Tonsillitis and pharyngitis

J03.9

Description

A painful red throat and/or enlarged inflamed tonsils. Yellow exudates may be present. Tender anterior cervical lymphadenopathy may be present. Viruses are the cause in the majority of cases. However, streptococcal pharyngitis/tonsillitis may cause local suppurative complications as well as rheumatic fever, which can cause serious heart disease. Antibiotics to eradicate streptococci should be given to patients with pharyngitis/tonsillitis who are at risk for rheumatic fever (age 3 to 15 years) **unless** one of the following features of viral infection is present (do **not** give antibiotics if these are present):

» runny nose
» cough
» a rash (excluding scarlet fever)

General measures

» Homemade salt mouthwash, gargle for 1 minute twice daily:
  – ½ medicine measure of table salt in a glass of lukewarm water
  – do not give to children unable to gargle
» Advise adequate hydration.
» Avoid irritants e.g. vaporubs inserted into nostrils.

Drug treatment

Preferred treatment option:

- Benzathine benzylpenicillin, IM, immediately as a single dose

Weight kg	**Dose** units	**Use one of the following injections**		**Age** Months/ years
		1 200 000 mixed with 4 mL WFI	2 400 000 mixed with 8 mL WFI	
Less than 15 kg	300 000	1 mL		18 months–3 years
15 – 30 kg	600 000	2 mL		3–11 years
More than 30 kg	1 200 000	4 mL		11–15 years

or

If IM injection refused:

- Phenoxymethylpenicillin, oral, 12 hourly for 10 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/ years
		Syrup 250 mg/ 5 mL	**Tablet** 250 mg	
≥ 11–35 kg	250 mg	5 mL	1 tablet	≥ 18 months –11 years
≥ 35 – 55 kg	500 mg	–	2 tablets	≥11–15 years
≥ 55 kg and above	500 mg	–	2 tablets	Adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL	–	≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adult

For pain relief:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

For children under 6 years of age:

- Simple linctus or tussi infans, oral, 8 hourly for 3 days
  - o 0 – 6 months: 2.5 mL
  - o 6 months – 5 years: 5 mL

Referral

» Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
» Suspected acute rheumatic fever.
» Suspected acute glomerulonephritis.
» Tonsillitis accompanied by difficulty in opening the mouth (trismus).
» History of previous rheumatic fever or rheumatic heart disease.
» Heart murmurs not previously diagnosed.

Chapter 20: Pain

20.1 Pain control

R52.9

Description

Pain is an unpleasant sensation or emotional experience associated with actual or potential tissue injury. It is always subjective. It is affected by the patient's mood, morale and the meaning the pain has for the patient.
Self-report is the key is to pain assessment.
In non- or pre verbal children, facial expression is the most valid indicator of pain.
Consider using visual analogue scale or faces pain scale to assess severity.
Pain should be assessed by:

» duration
» severity, e.g. does the patient wake up because of the pain
» site
» character, e.g. stabbing, throbbing, crushing, cramp like
» persistent or intermittent
» relieving or aggravating factors
» accompanying symptoms
» distribution of pain
» referred pain

Assessment of pain in children

Pain Score (The Alder Hey Pain Triage Score)			
Response	**Score 0**	**Score1**	**Score 2**
1. Cry Voice	» no complaint/ cry » normal conversation	» consolable » not talking negative	» inconsolable » complaining of pain
2. Facial expression	» normal	» short grimace » < 50% of time	» long grimace » > 50% of time
3. Posture	» normal	» touching / rubbing / sparing	» defensive/ tense
4. Movement	» normal	» reduced or restless	» immobile or thrashing
5. Colour	» normal	» pale	» very pale/"green"

This system does not give an absolute assessment of severity of pain, but rather increases observer sensitivity to the presence of pain, the response to analgesia and the child's experience of pain.

The Pain Score should be used as a tool, to guide interpretation of pain and adequacy of response to analgesia.

General measures

» Patient counselling.
» Lifestyle adjustment.

ACUTE PAIN CONTROL

Drug treatment

Acute, mild pain

» Non-opioid treatment

Non-inflammatory or post trauma

Children:

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

Pain associated with trauma or inflammation

Adults:

- Ibuprofen, oral, 400 mg 6–8 hourly with food, to a maximum of 2400 mg daily
  - o Nurse may only prescribe up to 1 200 mg per day

or

Adults:

If no relief after two or three doses, combine paracetamol and ibuprofen at the above dosages.

Acute, moderate pain

Children:

» If no relief to paracetamol, refer.

If pain is moderate or severe consider careful use of morphine while arranging and during transfer (See **Precautions and special comments on the use of morphine** below)

Adults

If still no relief to simple analgesics as above,

add

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - o May be increased to a maximum of 400 mg daily.

Acute severe pain
If no response to Step 3 in moderate pain, initiate one of the following opioids:

Children:
» Refer
If pain is severe consider careful use of morphine while arranging and during transfer (See **Precautions and special comments on the use of morphine** belowe)

Adults:
- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - o May be increased to a maximum of 400 mg daily.

plus
- Paracetamol, oral 1 000 mg 4–6 hourly, when required to a maximum of eight tablets (4 g) daily

OR

- Morphine, IM, 10–15 mg, 4–6 hourly when required. (Doctor initiated)

OR

- Morphine, IV, 10–15 mg 4–6 hours as required. (Doctor initiated)
  - o Dilute in 10 mL sodium chloride 0.9%
  - o Administer slowly over 4–5 minutes
  - o Titrate dose slowly

Patients requiring morphine for acute pain of unknown cause or pain not responding with 1 dose must be referred for definitive treatment.

Precautions and special comments on the use of morphine
» Morphine may cause respiratory depression. This can be reversed with naloxone. Refer to section 21.6: Exposure to poisonous substances.
» **Do not administer** morphine in:
  – advanced liver disease
  – severe head injury
  – acute asthma
  – advanced chronic obstructive bronchitis, emphysema or other respiratory disease with imminent respiratory failure
  – untreated hypothyroidism

A systematic review has shown that morphine can be used for acute abdominal pain without leading to surgical misdiagnosis.

» **Use** morphine **with extreme care** if there is:
  – recent or concurrent alcohol intake or other CNS depressants

- hypovolaemia or shock
- in the elderly

In these circumstances use:

Children:

- Morphine, IV, 0.1 mg/kg/dose 4–6 hourly as necessary
  - Give small portions of the dose every 10 minutes until pain relief is adequate or the maximum dose is reached.

Weight kg	**Dose** mg	**Injection** 10 mg/ mL	**Age** Months/ years
≥ 7–9 kg	0.5 mg	0.05 mL	≥ 6–12 months
≥ 9–11 kg	0.75 mg	0.075 mL	≥ 12–18 months
≥ 11–14 kg	1 mg	0.1 mL	≥ 18 months–3 years
≥ 14–17.5 kg	1.25 mg	0.125 mL	≥ 3–5 years
≥ 17.5–25 kg	1.5 mg	0.15 mL	≥ 5–7 years
≥ 25–35 kg	2 mg	0.2 mL	≥ 7–11 years
≥ 35 – 55 kg	3 mg	0.3 mL	≥ 11–15 years

Adults:

- Morphine, IV, small incremental doses, starting at 2–5 mg with increments of 2 mg every 10 minutes.
  - Maximum dose: 10–15 mg depending on body weight

If morphine has been administered the time and dose should be clearly documented on the referral letter as this may alter some of the clinical features of acute abdomen or head injury.

Referral

» All children with moderate and acute severe pain
» No response to oral pain control and unable to initiate opioid therapy
» Uncertain diagnosis
» Management of serious underlying conditions

20.2 Chronic non-cancer pain

R52.2

Description

Pain that is present for more than 4–6 weeks.

It can arise from:

» tissue damage (nociceptive pain), e.g. arthritis, fibromyalgias, lower back pain, pleurisy, cancer pain (discussed below) etc.; or
» injury to nerves (neuropathic pain) e.g. post herpetic neuralgia (pain following shingles), trigeminal neuralgia, diabetic neuropathy, HIV related

peripheral neuropathy, drug induced peripheral neuropathy or phantom limb; or

» abnormal nerve activity following disease

Assess pain severity, functional status, medication use including self-medication, co-morbid illnesses, etc.

Actively look for concomitant depression and anxiety or somatoform pain disorders.

General measures

» Lifestyle adjustments.
» Occupational therapy and physiotherapy as appropriate.
» Address psycho-social problems e.g. stress, anxiety, sleep disturbances

Drug treatment

The principles are the same as with cancer pain relief. Analgesics should be given by mouth, regularly, in a stepwise manner to ensure adequate relief. Neuropathic pain is best treated with analgesics in addition to tricyclic antidepressants.
It is useful combine different classes of drugs for the additive effects depending on pain severity.

Mild pain
Adults:
- Paracetamol, oral, 1 000 mg 6 hourly

Pain associated with trauma or inflammation
Adults:
- Ibuprofen, oral 400 mg 6–8 hourly with food.
  - Maximum dose: 2 400 mg daily.
  - Discontinue if no improvement after 2–3 days.
  - Nurse may only prescribe up to 1 200 mg per day.

or

Combine paracetamol and ibuprofen at the above dosages.

Moderate pain
Adults:
If still no relief to simple analgesics as above,
add
- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - May be increased to a maximum of 400 mg daily.

Adjuvant therapy
Adults:
In addition to analgesia as above:
- Amitriptyline, oral, 25 mg at night. (Doctor initiated)
  - Titrate up to a maximum of 75 mg at night.

Under-recognition of pain and under-dosing of analgesics is common in chronic pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

Referral

» Pain requiring strong opioids
» Pain requiring definitive treatment for the underlying disease
» All children

20.3 Chronic cancer pain

R52.2

Description

Cancer pain is usually chronic and unremitting. Pain assessment requires training in:

» psycho-social assessment
» assessment of need of type and dose of analgesics
» pain severity assessment

Pain severity and not the presence of pain determines the need for treatment.
Drug treatment for pain should never be withheld.
Pain is what the patient says it is.

Under-recognition of pain and under-dosingwith analgesics is common in chronic cancer pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

General measures

» Counselling/hospice care.
» Occupational therapy may be required.
» Management of psycho-social factors.

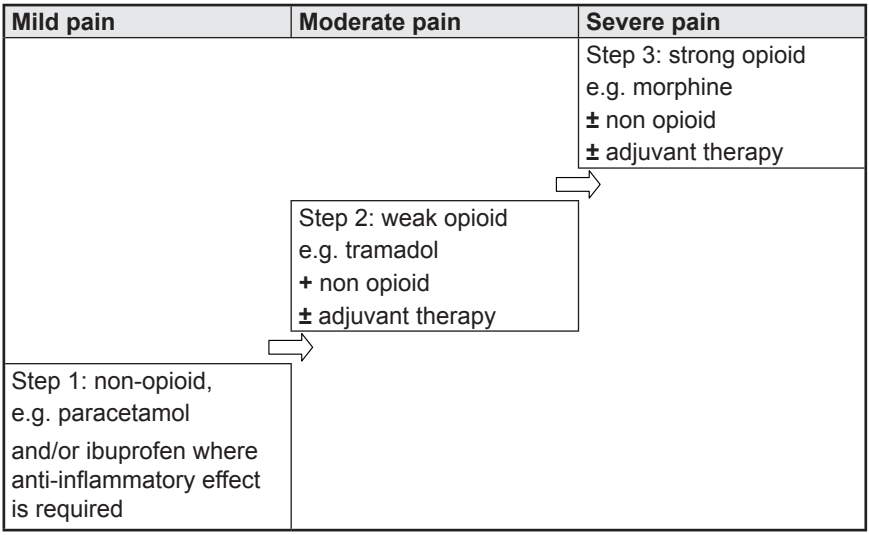
Note:
Appropriate care is provided from the time of diagnosis.
Home palliative care is provided by the family or caregiver with the support of health care professionals: It also involves:

» spiritual care
» social care
» cultural care
» radiation/chemotherapeutic care as appropriate and adjunctive care for emotional pain, nerve root pain, bone pain
» providing moral support for caregivers

Drug treatment

When pain is not controlled according to step 1 and 2, morphine is the treatment of choice for chronic cancer-related pain. Cancer pain in children is managed by the same principles but using lower doses of morphine than adults.

Recommended steps in management of cancer pain



Step 1

» Non-opioid

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1000 mg	–	Up to 2 tablets	≥ 15 years and adults

- NSAIDs, e.g.: ibuprofen, oral, 6 hourly with food
  - o Paediatric dose: 5 mg/kg/dose
  - o Maximum dose in adults: 2 400 mg/day. (Nurse may only prescribe up to 1 200 mg per day)
  - o Discontinue if not effective after 2–3 days

Weight kg	**Dose** mg	**Syrup** 100 mg/ 5mL	**Tablet** 200 mg	**Age** Months/ years
≥ 9–11 kg	50 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	60 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	80 mg	4 mL	–	≥ 3–5 years
≥ 17.5 – 25 kg	100 mg	5 mL	–	≥ 5–7 years
≥ 25 – 35 kg	150 mg	7.5 mL	–	≥ 7–11 years
≥ 35 – 55 kg	200 mg	10 mL	1 tablet	≥ 11–15 years
≥ 55 kg and above	400 mg	–	2 tablets	Adults

Step 2
Add weak opioid to Step 1

Children:
- Codeine, oral, 0.5 mg/kg/dose 6 hourly

Weight kg	**Dose** mg	**Syrup** 25 mg/ 5mL	**Tablet** 30 mg	**Age** Months/ years
≥ 14–17.5 kg	10 mg	2 mL	–	≥ 3–5 years
≥ 17.5 – 25 kg	15 mg	3 mL	–	≥ 5–7 years
≥ 25 – 35 kg	20 mg	4 mL	–	≥ 7–11 years
≥ 35 – 55 kg	30 mg	–	1 tablet	≥ 11–15 years

Adults:
- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - o May be increased to a maximum of 400 mg daily.

Step 3

Paracetamol and/or ibuprofen can be used with morphine in step 3

Children:

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly according to severity of the pain

Weight kg	**Dose** mg	**Syrup** 1 mg/ mL	**Tablet** 10 mg	**Age** Months/ years
≥ 7–9 kg	2 mg	2 mL	–	≥ 6–12 months
≥ 9–11 kg	3 mg	3 mL	–	≥ 12–18 months
≥ 11–14 kg	4 mg	4 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	5 mg	5 mL	–	≥ 3–5 years
≥ 17.5–25 kg	6 mg	6 mL	–	≥ 5–7 years
≥ 25–35 kg	7.5 mg	7.5 mL	–	≥ 7–11 years
≥ 35–55 kg	10 mg	10 mL	1 tablet	≥ 11–15 years

Adults:

- Morphine, oral, 4 hourly. (Doctor initiated)
  - o **Start with** 5–10 mg.

Elderly adults or severe liver impairment:

- Morphine solution, oral, 4 hourly. (Doctor initiated)
  - o **Start with** 2.5–5 mg.

Titrate the dose and dose frequency against the effect on pain.

Note:

There is no maximum dose for morphine – dose is titrated upward against the effect on pain.

For the management of morphine overdose, see section 21.6: Exposure to poisonous substances.

Adjuvant therapy

Adults:

In addition to analgesia as above:

- Amitriptyline, oral, 25 mg at night. (Doctor initiated)
  - o Titrate up to a maximum of 75 mg at night.

For **significant** nausea and vomiting

Adults:

- Metoclopramide oral, 10 mg, 8 hourly as needed.

For constipation

» A common problem due to long-term use of opioids.

- Lactulose, oral, 0.5 mL/kg/dose once daily
  - o If poor response, increase frequency to 12 hourly

Weight kg	**Syrup** 3.3 g/5 mL	**Age** years
≥ 5–9 kg	2.5 mL	≥ 3 months–1 year
≥ 9–17.5 kg	5 mL	≥ 1–5 years
≥ 17.5–25 kg	7.5 mL	≥ 5–7 years
≥ 25–35 kg	10 mL	≥ 7–11 years
≥ 35 kg and above	10–20 mL	≥ 11 years and adult

For pruritus or nausea

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL	–	≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥ 35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

For anxiety

Children:

- Diazepam, oral, 0.04 mg/kg/dose 8–12 hourly
  - o May be increased to 0.2 mg/kg/dose
  - o Beware of respiratory depression if given with morphin

Weight kg	**Dose** mg	**Use one of the following tablets:**		**Age** months/years
		2 mg	5 mg	
≥ 9–11 kg	0.5 mg	¼ tablet	–	≥ 12–18 months
≥ 11–17.5 kg	1 mg	½ tablet	–	≥ 18 months–3 years
≥ 17.5–25 kg	1.5 mg	¾ tablet	–	≥ 5–7 years
≥ 25–35 kg	2 mg	1 tablet	–	≥ 7–11 years
≥ 35 kg and above	2.5 mg	–	½ tablet	≥ 11 years and adults

Adults:

- Diazepam, oral, 2–5 mg every 12 hours for a maximum of two weeks

Breakthrough pain

Breakthrough pain is pain that occurs before the next regular dose of analgesia. This is due to an inadequate regular dose.

It is recommended that the full dose equivalent to a 4 hourly dose of morphine be administered for breakthrough pain, but it is important that the next dose of morphine be given at the prescribed time, and not be delayed because of the intervening dose.

The dosage should be titrated upward against the effect on pain in the following way:

» add up the amount of "breakthrough morphine" needed in 24 hours.
» divide this amount by 6 (the number of 4 hourly doses in 24 hours)
» the next day increase each dose by that amount.

Example:
Patient gets 10 mg morphine every four hours.
The patient has 3 episodes of breakthrough pain:
3 x 10 mg = 30 mg

30 mg ÷ 6 = 5 mg
The regular 4 hourly dose of 10 mg will be increased by 5 mg
i.e. 10 mg + 5 mg = 15 mg
The increased morphine dose will be 15 mg 4 hourly

Referral

» Uncontrolled pain
» Pain uncontrolled by step 1 if no doctor available
» Severe emotional or other distress which may aggravate the perception of pain
» Nausea and vomiting associated with pain in children

Chapter 21: Trauma and emergencies

The following conditions are emergencies and must be treated as such. Drugs used for treatment must be properly secured and their use recorded (time, dosage, routine) on the patient's notes and on the letter of referral.

21.1 Angina pectoris, unstable
See chapter 4 – Cardiovascular conditions

21.2 Bites and stings

21.2.1 Animal and human bites
T14.1

Note: Rabies and tetanus are notifiable conditions.

Description

Animal bites may be caused by:
» domestic animals (horses, cows, dogs, cats)
» wild animals (meerkats, jackals, mongooses)

Animal or human bites may result in:
» wound infection, often due to mixed aerobic and anaerobic infection
» puncture wounds
» tissue necrosis
» transmission of diseases, e.g. tetanus, rabies, HIV, hepatitis, syphilis

Suspected rabid bite
Any mammal bite can transmit rabies.
Rabies incubation period is at least 9–90 days, but could be much longer.

In suspected rabies exposure of a person by a domestic animal, observe the suspected rabid animal for abnormal behaviour for 10 days. If the animal remains normal for 10 days, rabies is unlikely.

Note:
In the event of having to put the animal down, care should be taken to preserve the brain as the brain is required by the state veterinarian for confirmation of diagnosis. Note that the animal must not be killed by shooting it in the head as this will damage the brain.

Classification of rabies exposure
Category 1
» touching or feeding the animal
» licking of intact skin

Category 2
» nibbling of uncovered skin
» superficial scratch and no bleeding
» licking of broken skin

Category 3
» bites and scratches which penetrate the skin and draw blood
» licking of mucous membranes

Prevention

» Regular vaccination of domestic cats and dogs.
» Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

Drug treatment

Emergency management
All bite wounds and scratches need thorough and immediate treatment. Lacerations can be sutured later.

Irrigate and cleanse wound:
- Chlorhexidine 0.05%, solution
  or
  Povidone iodine 10%, solution

! CAUTION !
Do not suture puncture wounds.
Suture lacerations after thorough cleaning and debridement.
Do not apply compressive dressings.

Rabies Vaccine and Immunoglobulin
Rabies vaccine and immunoglobulin are available from the nearest district hospital and should be administered as follows:

Note:
For category 1 rabies exposure, do not administer rabies vaccine if history is reliable. If history is not reliable, treat as for category 2.
Stop vaccination if animal is rabies negative on laboratory test, or remains healthy after 10 days of observation.

Previously immunised patients	Non-immune patients	
	Less than 48 hours after exposure	More than 48 hours after exposure
Human anti-rabies immunoglobulin (RIG) Do not administer	**Human anti-rabies immunoglobulin (RIG)** Administer for category 3 exposure only 20 IU / kg ½ dose IM ½ dose injected in and around the wound	**Human anti-rabies immunoglobulin (RIG)** Administer for category 3 exposure only 20 IU / kg ½ dose IM ½ dose injected in and around the wound
Rabies vaccine (categories 1, 2, & 3) Adults: IM (deltoid muscle) Children: IM (anterolateral thigh) Two doses only: day 0 – single dose day 3 – single dose	**Rabies vaccine** (categories 1, 2, & 3) day 0 – single dose day 3 – single dose day 7 – single dose day 14 – single dose day 28 – single dose	**Rabies vaccine** (categories 1, 2, & 3) day 0 – **double dose** day 3 – single dose day 7 – single dose day 14 – single dose day 28 – single dose

Tetanus prophylaxis if not previously immunised within the last 5 years

- Tetanus toxoid vaccine (TT), IM, 0.5 mL

Note:
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Pre-emptive antibiotic only if the hand is bitten or for extensive wounds or for human bites
Data do not support the use of antibiotics in minor animal bites.
Amoxicillin/clavulanic acid is recommended in severe animal and human bites.

- Amoxicillin clavulanic acid, oral, 12.5–20 mg/kg of amoxicillin component, 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/ years
		Syrup		**Tablet** 500/ 125 mg	
		125/ 31.25 mg per 5 mL	250/ 62.5 mg per 5 mL		
≥ 3.5–5 kg	75/18.75 mg	3 mL	–	–	≥ 1–3 months
≥ 5–7 kg	100/25 mg	4 mL	2 mL	–	≥ 3–6 months
≥ 7–9 kg	125/31.25 mg	5 mL	2.5 mL	–	≥ 6–12 months
≥ 9–11 kg	150/37.5 mg	6 mL	3 mL	–	≥ 12–18 months
≥ 11–14 kg	187.5/46.9 mg	7.5 mL	4 mL	–	≥ 18 months–3 years
≥ 14–25 kg	250/62.5 mg	10 mL	5 mL	–	≥ 3–7 years
≥ 25–35 kg	375/93.75 mg	15 mL	7.5 mL	–	≥ 7–11 years
≥ 35–55 kg	500/125 mg	–	–	1 tablet	≥ 11–15 years
≥ 55 kg and above	500/125 mg	–	–	1 tablet	≥ 15 years and adults

Penicillin–allergic patients

- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months / years
		Syrup 125 mg/5 mL	**Tablets** 250 mg	
≥ 3.5–5 kg	50 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	75 mg	3 mL	–	≥ 3–6 months
≥ 7–9 kg	100 mg	4 mL	–	≥ 6–12 months
≥ 9–11 kg	125 mg	5 mL	–	≥ 12–18 months
≥ 11–14 kg	150 mg	6 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	200 mg	8 mL		≥ 3–5 years
≥ 17.5–25 kg	250 mg	10 mL	1 tablet	≥ 5–7 years
≥ 25−35 kg	375 mg	15 mL	–	≥ 7–11 years
≥ 35 kg and above	500 mg	–	2 tablets	≥ 11 years and adults

plus

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/ 5mL	**Tablets** 200mg	**Tablets** 400mg	
≥5–7 kg	40 mg	1 mL	–	–	≥3–6 months
≥7–9 kg	60 mg	1.5 mL	–	–	≥6–12 months
≥9–11 kg	80 mg	2 mL	–	–	≥ 12–18 months
≥11-14 kg	100 mg	2.5 mL	–	–	≥18 months–3 years
≥14–17.5 kg	120 mg	3 mL	–	–	≥ 3–5 years
≥17.5-25 kg	160 mg	4 mL	–	–	≥ 5–7 years
≥25–35 kg	200 mg	5 mL	1 tablet	½ tablet	≥7–11 years
≥35–55 kg	300 mg	7.5 mL	1½ tablets	–	≥11–15 years
≥ 55 kg and adult	400 mg	–	2 tablets	1 tablet	≥ 15 years and adult

Referral

» Deep and large wounds requiring elective suturing
» Shock and bleeding
» Unimmunised or not fully immunised patients for tetanus immunoglobulin
» Possible rabies exposure (for immunoglobulin and vaccination)

21.2.2 Insect stings and spider bites

T63.2/3/4

Description

Injury from spider bites and stings by bees, wasps, scorpions and other insects. Symptoms are usually local such as pain, redness swelling and itching.

» **Bees and wasps**
  – venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylactic shock (see section 21.17).
» **Spiders and scorpions**
  – most are non-venomous or mildly venomous.

Drug treatment

Emergency treatment:
Treat anaphylactic shock. See section 21.17: Shock, anaphylactic

For severe local symptoms:

- Chlorpheniramine, oral, 0.1 mg/kg/dose 6–8 hourly

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
≥ 9–11 kg	1 mg	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	1.2 mg	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1.5 mg	4 mL	–	≥ 3–5 years
≥ 17.5–25 kg	2 mg	5 mL	–	≥ 5–7 years
≥ 25–35 kg	3 mg	7.5 mL	–	≥ 7–11 years
≥35 kg and above	4 mg	–	1 tablet	≥ 11 years and adults

- Calamine lotion, applied when needed

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Very painful scorpion stings

- Lignocaine 2%, 2 mL injected around the bite as a local anaesthetic

Referral

» Presence of systemic manifestations:
  – weakness
  – drooping eyelids
  – difficulty in swallowing and speaking
  – double vision

Note:
Send the spider or scorpion with the patient if available.

21.2.3 Snakebites

T63.0

Description

Of all the species of snakes found in South Africa, about 12% are considered to be potentially dangerous to humans. However, all snake bites should be considered dangerous until proven otherwise.

South African poisonous snakes can be broadly divided into 3 groups according to action of their venom although there is significant overlap of toxic effects in some snake venoms.

Cytotoxic venoms

» Venom causes local tissue damage and destruction around the area of bite.
» The bite is painful and symptoms usually start within 10 to 30 minutes after the bite.
» Examples include:
  – Puff adder,
  – Gaboon adder
  – Berg adder
  – Night adder
  – Some dwarf adders and the spitting cobras i.e. Mozambique spitting cobra, black spitting cobra, rinkhals

Neurotoxic venoms

» Neurotoxic venom causes weakness and paralysis of skeletal muscles and respiratory failure.
» Bite is not as painful as cytotoxic venom bites.
» Symptoms usually start in 15–30 minutes.
» Examples include:
  – Cape cobra
  – Black mamba
  – Green mamba
  – Berg adder (Berg adder venom is neurotoxic as well as cytotoxic)
  – Black spitting cobra
  – Rinkhals, etc.

Haemotoxic venoms

» Venom affects the clotting of blood causing bleeding tendency which may delayed.
  – Boomslang
  – Vine snake

Symptoms and signs of snakebite envenomation include:

Local

» Bite marks with or without pain.

» Swelling around the bite, which may be severe with discolouration of skin and or blister formation.

Systemic

» Nausea, vomiting
» Sweating and hypersalivation.
» Skeletal muscle weakness. Which may cause
  – drooping eyelids
  – double vision
  – difficulty in swallowing
  – difficulty in breathing
» Shock
» Rarely bleeding (epistaxis, haematuria, haematemesis or haemoptysis)

! CAUTION !
Do not apply a tourniquet.
Do not apply a restrictive bandage to the head, neck or trunk.
Do not squeeze or incise the wound.
Do not attempt to suck the venom out.

General measures

Emergency treatment

Remove clothing from site of the bite and clean the wound thoroughly with chlorhexidine 0.05% solution.

For non-cytotoxic bites only:

» To prevent spread to vital organs, apply a wide crepe bandage firmly from just above the bite site up to 10–15 cm proximal to the bite site immediately. Apply no tighter than for a sprained ankle.
» Immobilise the affected part with a splint or sling.
» Try to obtain an accurate history e.g. time of bite, type of snake.
» If no sign and symptoms, observe the patient for 6–8 hours with repeated examinations.
» Absence of symptoms and signs for 6–8 hours usually indicates a harmless bite.
» However, observation for 24 hours is recommended.

Drug treatment

Venom in the eyes:

Irrigate the eye thoroughly for 15–20 minutes with water or any bland liquid

- Tetracaine 0.5%, drops, instilled into the eye(s) and cover with eye pads.

Refer patient.

For pain

Non-opioid analgesics according to severity – See section 20.2: Chronic non-cancer pain.

Shock
Treat if present.
See section 21.16: Shock

Tetanus prophylaxis
- Tetanus toxoid (TT), IM, 0.5 mL

! CAUTION !
Polyvalent antivenom is only effective for the following snake bites:
» Cape cobra
» Mambas
» puff adder
» gaboon adder
» rinkhals
» spitting cobras

Boomslang requires specific antivenom.

Antivenoms are available from the SAVP.
SAVP emergency number: 083 6520105
Snakebite antivenoms may be available from specific hospitals in each province.

Administration of snake bite antivenom

! CAUTION !
Antivenom can cause anaphylaxis.
Never administer without a good indication.
Always have resuscitative equipment and medication ready.

Note:
The majority of patients do not need and should not be given antivenom.
All patients with suspected black mamba bites should receive antivenom, even before onset of symptoms.
Patients with bites due to other species should only receive antivenom at the onset of any symptoms.
The dose of antivenom is the same for adults and children.

Criteria for antivenom administration
All patients with systemic signs and symptoms or severe spreading local tissue damage or should receive antivenom.
» signs of systemic poisoning
  – drooping eyelids
  – double vision
  – weakness
  – difficulty in swallowing
  – difficulty in breathing

» spreading local damage
  – swelling of a hand or foot within 1 hour of a bite (80% of bites are on hands or feet)
  – swelling extends to elbows or knees within 3–6 hours of a bite
  – swelling of the groin or chest at any time or if actively advancing
  – significant swelling of head or neck
  – muscle weakness and/or difficulty in breathing

- Polyvalent antivenom, slow IV infusion, 100 mL in 200 mL sodium chloride 0.9%. (Doctor initiated)
  - In children dilute 100 mL in 5 mL/kg of sodium chloride 0.9%.
  - In children less than 20 kg, seek advice and if not available, administer over 2 hours observing for signs of fluid overload.
  - Administer slowly for the first 15 minutes as most allergic reactions will occur within this period.
  - Increase the flow rate gradually until the infusion is completed within one hour.
  - Repeat if there is no clinical improvement after the infusion.
  - Black mamba bites may require up to 200 mL or more of antivenom.
  - Monitor for anaphylaxis for at least an hour after the infusion.
  - Prepare to treat possible anaphylaxis. See section 21.7: Shock, anaphylactic.

Note:
Ensure that the antivenom solution is clear.

Anaphylaxis
Administer adrenaline followed by hydrocortisone succinate.
See section 21.7: Shock, anaphylactic

Referral

» All patients with bites or likely bites even if puncture marks are not seen. If possible take the dead snake to the referral centre for identification.

21.3 Burns

T30.0

Description

Burns lead to skin and soft tissue injury and may be caused by:
» heat, e.g. open flame, hot liquids, hot steam
» chemical compounds
» physical agents, e.g. electrical/lightning) or
» radiation.

The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues
Initially, burns are usually sterile.

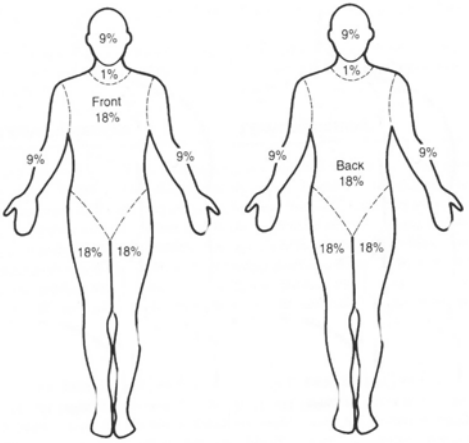
Assessment of burns

Depth of burn wound	Surface /Colour	Pain sensation/healing
Superficial or epidermal	Dry, minor blisters, erythema	» Painful » Heals within 7 days
Partial thickness superficial or superficial dermal	Blisters, moist	» Painful » Heals within 10–14 days
Partial thickness deep or deep dermal	Moist white or yellow slough, red mottled	» Less Painful » Heals within a month or more » Generally needs surgical debridement and skin graft
Full thickness (complete loss of skin)	Dry, charred whitish, brown or black	» Painless, firm to touch » Healing by contraction of the margins (generally needs surgical debridement and skin graft)

The figures below are used to calculate body surface area %[1]
These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not the front or back.

In children the palm of the hand is 1%.

Children 8 years and adults



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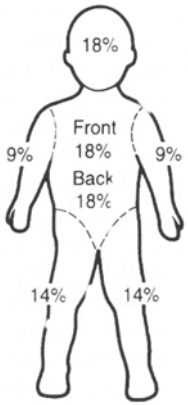
South African Burn Society burn stabilisation protocol. JS Karpelowsky, L Wallis, A Maderee and H Rode. SAMJ Vol 9, No 8 Page 574–7

Children < 8 years of age



Paediatric adjustments

< 1 year

» Head and neck are 18% of BSA
» Each leg is 14% of BSA

> 1 year

For each year of life:

» **Head** decreases by 1% of BSA until 8 years of age
» **Leg** gains $^1/_2$ % of BSA until 8 years of age

Emergency treatment

» Remove smouldering or hot clothing.
» Remove constrictive clothing/rings.
» To limit the extent of the burn, soak the affected area generously with, or immerse in cold water for 30 minutes after the burn.
» In all burns > 10% or where carbon monoxide poisoning is possible (enclosed fire, decreased level of consciousness, disorientation) administer high flow oxygen
» Examine carefully to determine the extent and depth of the burn wounds.
» Respiratory obstruction due to thermal injury or soot inhalation, production of black coloured sputum, shortness of breath, hoarse voice and stridor are serious signals.

Drug treatment

Fluid replacement

Burns under 10% TBSA (Total Body Surface Area):

- Oral fluids

Burns of over 10% of total body surface area (TBSA)

- IV fluid for resuscitation

Calculation of fluid replacement

Replacement fluids for burns

First 24 hours:

- Sodium chloride 0.9%, IV
  - o Calculate total fluid requirement in 24 hours:
    Total % burn ____x weight (kg) ____x 4 mL
  - o Give half this volume in the first 8 hours.
  - o Administer remaining fluid volume in next 16 hours

Note:

If urine output not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Maintenance fluids in children

In children, add oral or intravenous maintenance fluid to above calculated volume.

Maintenance fluids	
≤1 year	120 mL/kg/24 hours
All children older than 1 year – the sum of the following:	
• first 10 kg body weight	100 mL/kg/24 hours
• second 10 kg body weight	50 mL/kg/24 hours
• additional weight greater than 20 kg body weight	20 mL/kg/24 hours

Example: 24 kg child with 10% burns	
1st 24 hours	
• replacement for expected losses: 4 mL/kg x 24kg x 10%	= **960 mL**
• maintenance: first 10 kg = 10 kg X 100 mL/kg/24 hours second 10 kg = 10 kg X 50 mL/kg/24 hours remaining 4 kg = 4 kg X 20 mL/kg/24 hours Total maintenance	 = 1 000 mL+ = 500 mL+ = 80 mL = **1 580 mL**
Total fluids in 1st 24 hours = 960 mL + 1 580 mL	= **2 540 mL**
Thus	
1st 8 hours = total 24 hour volume / 2 = 2 540 / 2	= **1 270 mL**
Next 16 hours = total 24 hour volume / 2 = 2 540 / 2	= **1 270 mL**

For pain

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Severe pain

See section 20.2: Chronic non-cancer pain.

Wound cleansing

» Clean the burn wound gently
- Sodium chloride 0.9% or clean water

Burn dressing

<u>For patients requiring referral:</u>

» If within 12 hours, transfer wrapped in clean dry sheet and blankets
» If delayed by more than 12 hours paraffin gauze dressing and dry gauze on top
» For full thickness and extensive burns cover with an occlusive dressing

<u>For patients not requiring transfer (burns that can be treated at home):</u>

» Paraffin gauze dressing and then dry gauze on top

<u>If infected burn:</u>

- Povidone iodine 5%, cream, applied daily
  or
  Chlorhexidine 0.05%, solution, daily

Tetanus prophylaxis

<u>If not vaccinated within the last 5 years:</u>

- Tetanus toxoid (TT), IM, 0.5 mL

Referral

» All children less than 1 year
» All burns greater than 5% from 1–2 years of age
» Third-degree burns of any size in any age group
» Partial thickness burns greater than 10% total body surface area (TBSA)
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints
» Electrical burns, including lightning injury
» Chemical burns
» Inhalation injury – fire or scald injury
» Circumferential burns of the limbs or chest
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality
» Any patient with burns and concomitant trauma
» Suspected child abuse
» Burns exceeding the capabilities of the referring centre
» Septic burn wounds

21.4 Cardiac arrest – cardiopulmonary resuscitation

I46.9

21.4.1 Cardiac arrest adults

Description

Cardiac arrest is the sudden and unexpected cessation of effective cardiac output, on the basis of asystole or a malignant tachyarrhythmia. Irreversible brain damage can occur within 2–4 minutes.

Clinical features include:
» sudden loss of consciousness
» absent carotid and all other pulses
» loss of spontaneous respiration
» dilatation of the pupils

Emergency treatment

» Diagnose rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Call for skilled help.
» Initiate ABC (airways breathing circulation) sequence of CPR (cardiopulmonary resuscitation).
» A single powerful precordial thump is recommended for witnessed cardiac

arrest where a defibrillator is not immediately available.
» Document medication and progress.

Cardiopulmonary resuscitation

Airway

» Remove vomitus or foreign body and dentures from the mouth, if present.
» To open the airway, lift the chin forward with the fingers of the one hand and tilt the head backwards with other hand on the forehead. Do not do this where a neck injury is suspected.
» Insert artificial airway, if available

Where neck injury is suspected:

» To open the airway, place your fingers behind the jaw on each side.
» Lift the jaw upwards while opening the mouth with your thumbs

Breathing

» Keeping the airway open, check the breathing.
» If breathing well, place the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg.
» If there is no breathing, apply artificial respiration at a rate of **8–10 breaths per minute**
  – mouth-to-mouth
  or
  – mouth-to-nose
  or
  – with Ambubag and face mask
  Continue until spontaneous breathing occurs
» Oxygenate with 100% oxygen
» Intubate as soon as possible. Oxygenate well before intubation.

Circulation

» Check for carotid pulse.
» If there is no pulse, start chest compressions at **100 compressions per minute.**
  Continue until return of the pulse and/or respiration
» Initiate IV fluids
• Sodium chloride 0.9%, IV

In pulseless tacchyarrythmias defibrillate if adequately trained.

Call a doctor, if available, without stopping CPR.

Immediate emergency drug treatment

Adrenaline is the mainstay of treatment and should be given immediately, IV or endobronchial, when there is no response to initial resuscitation or defibrillation.

- Adrenaline, 1:1 000, 1 mL, IV immediately as a single dose

or

If no IV line available

- Adrenaline, endobronchial, 1:1 000, 2 mL through endotracheal tube.
  - Dilute with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

For bradycardia

- Atropine, IV, 0.5 mg.
  - Repeat after 2–5 minutes if no response.
  - Maximum dose: 3 mg.

Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:

» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease

» no success after all the above procedures have been carried out for 30 minutes or longer

Consider carrying on for longer especially when:

» hypothermia and drowning

» poisoning or drug overdose or carbon monoxide poisoning

21.4.2 Cardiopulmonary arrest, children

For advance resuscitation training should be undertaken.

Description

Cardio-pulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a pre-existing critical illness. Resuscitation is less often successful in children and it is better to prevent cardio-pulmonary arrest by recognizing serious illness and managing it appropriately.

The effective treatment of cardio-respiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease.

Cardio-respiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (neurological cause). If any of the following are present this is evidence of serious disease/impending failure and needs urgent effective management.

	Neurological	**Respiratory**	**Circulatory**
Signs of impending failure/severe disease	Decreased level of consciousness	Increased respiratory rate > 60	Increased heart rate: > 160 in infants > 120 in children
	Abnormal posture	Chest indrawing	Decreased pulse volume
	Pupils - abnormal size or equality.	Grunting	Capillary refill time more than 3 seconds
	Presence of convulsions	Flaring alae nasae	

Acute child resuscitation in primary care

SAFE approach:

Shout for help
Approach with care
Free from danger
Evaluate ABC

Airway and Cervical Spine
No trauma: airway chin lift and head position

Head tilt position	**Infant < 1 year**	**Child 1 year and above**
	Neutral	Sniffing

Suspected trauma: keep head in line, use jaw thrust

Look listen feel for effective airway air movement

Breathing
If no effective breaths, give **5 slow initial breaths** to give chest movement

Feel for pulse if no pulse palpable and no signs of life, proceed

Circulation
Cardiac compressions given 100/minute in a ratio of cardiac compressions: lung inflation:
30:2 1 person resuscitation
15:2 2 person resuscitation
Cardiac compression site: one finger breath above xiphisternum

Technique	**Infant < 1 year**	**Child 1 year and above**
	Two fingers	One or two hands

Recheck pulse for signs of life if none, proceed

Drugs
Continue CPR and give:

- Adrenaline 1:10 000, IV, 0.1 mL/kg
  (Dilute 1 mL of 1: 1 000 solution with 9 mL sterile water or sodium chloride 0.9%)

Emergency treatment

» Diagnose rapidly
» Make a note of the time of starting
» Place the patient on a firm flat surface and commence resuscitation immediately
» Call for skilled help
» Initiate ABC (Airways Breathing Circulation) sequence of CPR (Cardiopulmonary Resuscitation)
» Document medication and progress.
» Collect all ampoules used and total them at the end.

Airway

» Manually remove obvious obstruction from the mouth.

! CAUTION !
Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants position head in neutral position, in children position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.
» Look, listen and feel for air movement (breathing) to see if the airway is patent.
» If air movement is not good, insert oral artificial airway if necessary and available (airway size – from tip to top of airway should be the distance between the central upper incisors and the tragus [lobe] of the ear).
» If breathing spontaneously and well, lay the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg.
» If a foreign body; if suspected follow a choking protocol – See section 21.4.3: Management of suspected choking/foreign body aspiration.

Breathing

» If there is **no breathing,** apply artificial respiration:
  – mouth-to-mouth
    or
  – mouth-to-nose
    or
  – preferably with Ambubag and face mask
» Breathe (inflate the chest) give 5 slow rescue breaths at 15 times/minute (faster in babies).
» **Do not** stop unless spontaneous breathing starts, even if cardiac compressions are started – see below.

! CAUTION !
Cardiac massage is ineffective unless there is an open airway and the lungs are being filled with air

Circulation

» Check for a pulse
  – carotid in the older child, or femoral or brachial pulse

If there is no pulse:

» Start cardiac compressions or massage at a rate of 100 beats per minute for 15 compressions then give the following ratio with lung inflations (ventilation):
  – Universal compression-ventilation ratio for all ages (except neonates) is 30 compressions to 2 breaths if there is one rescuer.
  – If two rescuers are present, use a compression – ventilation ratio of 15:2 when giving CPR to children and infants
» Continue until the pulse or respiration returns

Keep patient covered and warm while resuscitating.
Ventilate if there is a pulse but no breathing.

» Call a doctor, if available, without stopping CPR

Immediate emergency Drug treatment

» If still no pulse or signs of life after cardiac compressions and ventilations:

- Adrenaline, IV, 0.1 mL/kg of diluted solution.
  - Adrenaline 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
≥ 2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
≥ 7–11 kg	0.1 mg	1 mL	≥ 6–18 months
≥ 11–17.5 kg	0.15 mg	1.5 mL	≥ 18 months–5 years
≥ 17.5–25 kg	0.2 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	0.3 mg	3 mL	≥ 7–11 years
≥ 35–55 kg	0.5 mg	5 mL	≥ 11–15 years

Hypoglycaemia in sick children, especially infants

Look for evidence during resuscitation and treat proven hypoglycaemia:

- Dextrose 10%, solution, IV, 5 mL/kg.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected
  - Do not give excessive volumes.

Drug administration route:

» **IV** via a drip that flows well.
» Avoid administration of excessive IV fluid during resuscitation.
» Use 60 drop per minute IV administration sets for all drips unless the arrest is due to hypovolaemia.

Assess continuously until the patient shows signs of recovery.

Consider stopping resuscitation attempts and pronouncing death if:
» further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease
» no signs of life are present after 30 minutes of active resuscitation

However, **carry on** for longer in cases of:
» hypothermia and drowning
» suspected poisoning or drug overdose or carbon monoxide poisoning

Referral

» All patients should be transferred on supportive treatment with accompanying skilled worker until taken over by doctor at receiving institution.

21.4.3 Management of suspected choking/foreign body aspiration in children

T18.9

Choking child

Do not use back blows or chest/abdominal thrusts unless sure that foreign body obstruction is life threatening, i.e. apparently complete obstruction.

» To clear foreign body in conscious child with apparently complete obstruction
  – 5 back blows
  ↓
  – 5 chest/abdominal thrusts
  ↓
  – Reassess and repeat if necessary

» In unconscious child
  – Give 5 slow rescue breaths
  ↓
  – Then commence CPR in normal ratio

If the child is still **able to breathe**	Transfer urgently to hospital for treatment – with someone able to treat acute complete choking accompanying the child.
If the child is **able to talk and breathe**	Encourage him to cough repeatedly while arranging transfer urgently with supervision.
If the child is **not breathing or is in a life threatening situation with increasing dyspnoea in spite of correct positioning of the head and jaw**	Urgent attempts should be made to dislodge the foreign body. **These should not be done in a child who is able to breathe as in this situation they may make matters worse.**
If the child is **unconscious with no effective air movement**	Initiate full CPR after at least 2 slow rescue breaths and continue with full CPR.
If the child is **conscious but with no effective cough or air movements**	Give 5 back blows followed by 5 chest/ abdominal thrusts followed by re-assessment of breathing and then repeated as a cycle until recovery or failure of resuscitation.

Back Blows and chest/abdominal thrusts

Infants:

Place the baby along one of the rescuer's arms in a head down position.
Rest the arm along the thigh and deliver 5 back blows to the child.
If this is ineffective turn the baby over and lay it on the rescuer's thigh in the head down position.
Apply 5 chest thrusts – use the same landmarks as for cardiac compression but more slowly. If too large to carry out on the thigh this can be done across the lap.

Children:

In children back blows are also used but usually across the lap.
In place of the chest thrust, abdominal thrusts are used (Heimlich manoeuvre) and may be used standing, sitting, kneeling or lying.
For abdominal thrust in the standing, sitting or kneeling position the rescuer moves behind the child and passes his arms around the child's body.
One hand is formed into a fist and placed against the child's abdomen above the umbilicus and below the xiphisternum. The other hand is placed over the fist and both hands are thrust sharply upwards into the abdomen towards the chest.
In the lying (supine) position the rescuer kneels astride the victim and does the same manoeuvre except that the heel of one hand is used rather than a fist.

This is repeated 5 times and then the breathing reassessed. If not relieved the cycle of back blows →abdominal thrusts→reassessment is repeated until the relief of obstruction or failure of resuscitation.

21.5 Delirium with acute confusion and aggression in adults

F05.9

Description

Delirium is a medical emergency.
Delirium is a sudden onset state of confusion in which there is impaired awareness and memory and disorientation.
Delirium should not be mistaken for psychiatric disorders like schizophrenia or a manic phase of a bipolar disorder. These patients are mostly orientated for time, place and situation, can in a way make contact and co-operate within the evaluation and are of clear consciousness.
There are many possible causes including extracranial causes. Organic or physical illness should also be considered as possible causes.
The elderly are particularly prone to delirium caused by medication, infections, electrolyte and other metabolic disturbances.

Main clinical features are:
» acute onset (usually hours to days)
» impaired awareness
» confusion
» disorientation

Other symptoms may also be present:
» restlessness
» agitation
» hallucinations
» autonomic symptoms such as sweating, tachycardia and flushing
» patients may be hypo-active, with reduced responsiveness to the environment
» a fluctuating course and disturbances of the sleep-wake cycle are characteristic
» aggressiveness
» violent behaviour alone occurs in exceptional cases only

Risk factors for delirium include

» extremes of age
» HIV infection
» pre-existing dementia
» cerebrovascular disease
» pre-existing neurological disease e.g. epilepsy
» drugs such as anticholinergics and hypnotics
» substance intoxication and withdrawal

Checklist for diagnosis:
D – drugs
I – infections
M – metabolic
T – trauma
O – oxygen deficit
P – pre-existing neurological disease, e.g. epilepsy and dementia

Emergency treatment

» Calm the patient
» Manage in a safe environment

If the delirium is caused by seizures or substance withdrawal or if communication is difficult

- Diazepam, IV, 10 mg for immediate sedative or hypnotic action.
  - o If no response give a second dose.
  - o Do not administer at a rate over 5 mg/minute

  or

  Lorazepam, IM/IV, 2 mg.
  - o If no response give a second dose.

Switch to oral once containment is achieved.
» Secure airway
» Exclude hypoglycaemia
» Monitor for respiratory depression

If the most likely cause of delirium is a medical disorder and if very restless:

- Haloperidol, IM, 5 mg, immediately.
  - o If no response give a second dose.

Referral

Urgent
» All cases

21.6 Exposure to poisonous substances

T65.9

Note: Poisoning from agricultural stock remedies is notifiable.

MAJOR POISON INFORMATION CENTRES	
Gauteng: (office hours)	(011) 678 2332 Pharmnet Amayeza Info Centre
Free State: (24-hours, every day)	(051) 401 3111 (051) 401 3177 082 410 4229
Western Cape: (24-hours, every day)	
Tygerberg:	(021) 931 6129
Red Cross:	(021) 689 5227

If the above centres cannot be contacted, enquire at the nearest trauma and emergency unit.

Description

Acute poisoning is a common medical emergency. Poisoning may occur by ingestion, inhalation or absorption through skin or mucus membranes. Frequently encountered poisons include:

» analgesics
» anti epileptic agents
» antidepressants and sedatives
» pesticides
» volatile hydrocarbons, e.g. paraffin
» household cleaning agents
» vitamins and minerals, especially iron in children
» antihypertensive and antidiabetic agents
» theophylline

Signs and symptoms vary according to the nature of poisoning.

General Measures

» Remove the patient from the source of poison, especially pesticides, e.g. clothing, etc.
» If skin contact has occurred, especially pesticides, wash the skin with soap and water, ensuring your safety with protective measures e.g., gloves, gowns, masks, etc.
» Establish and maintain the airway.

» Ensure adequate ventilation and oxygenation.
» Take an accurate history.
  – Obtain collateral information as well, especially in patients with impaired consciousness.
  – A special effort should be made to obtain tablets, packets, containers, etc. of the suspected agent used in order to identify poisons involved.
» Document and respond to abnormalities of:
  – pulse rate
  – blood pressure
  – respiratory rate
  – level of consciousness
  – pupillary size and reaction

Ingested poisons

- Activated charcoal, through nasogastric tube.
  - o Adults: 100 g mixed as a slurry with water.
  - o Children: 1 g/kg mixed as a slurry with water.
  - o Add 300 – 600 mL of water to charcoal and not vice versa.
  - o Do not administer orally if the level of consciousness is reduced. Administer via nasogastric tube to avoid the danger of aspiration.

Weight kg	**Dose** g	**Age** Months/years
≥ 3.5–7 kg	5 g	≥ 1–6 months
≥ 7–11 kg	10 g	≥ 6–18 months
≥ 11–17.5 kg	15 g	≥ 18 months–5 years
≥ 17.5–35 kg	25 g	≥ 5–11 years
≥ 35–55 kg	50 g	≥ 11–15 years
≥ 55 kg and above	100 g	15 years and adult

» Activated charcoal should not be given in the case of:
  – volatile hydrocarbon poisoning, e.g. paraffin, petrol
  – corrosive poisons, i.e. acids or alkalis
  – camphor and other convulsants
  – metals, e.g. iron, lithium etc and
  – all alcohols.

» Protect the airway
  – Place in lateral position if decreased level of consciousness.
  – If level of consciousness is depressed to the state where aspiration is likely, intubate the patient.
» Identify the poison and keep a sample of the poison or container.
» Contact the nearest hospital or poison centre for advice

Emergency management

» If the patient is unconscious, perform resuscitation – See section 20.4: Cardiac arrest – cardiopulmonary resuscitation
» Take a history and identify the nature and route of poisoning.
» Thoroughly wash off any poison from the skin with soap and water and remove contaminated clothes in organophosphate poisoning

Note:
Health care workers and relatives should avoid having skin contact with the poison.

Specific antidotes
Hypoxia, especially in carbon monoxide poisoning:
- Oxygen

Organophosphate and carbamate poisoning
Signs and symptoms of organophosphate poisoning include:
» diarrhoea
» vomiting
» hypersecretions (hypersalivation, sweating,lacrimation, rhinorrhoea)
» brochospasm and bronchorhoea, causing tightness in the chest, wheezing, cough and pulmonary oedema
» bradycardia
» muscle twitching
» weakness
» miosis/mydriasis
» confusion
» convulsions
» coma

- Atropine, IV
  - Adults: initial dose 1 mg, repeat doses are 2–4 mg
  - Children: 0.05 mg/kg/dose
  - Repeat the dose every 10–15 minutes until there is control of bronchial secretions.
  - Refer all patients urgently.
  - Response to a first dose suggests organophosphate poisoning.

Weight kg	**Dose** mg	**Use one of the following injections:**		**Age** months/years
		0.5 mg/mL	1 mg/mL	
≥ 3.5–5.5 kg	0.2 mg	0.4 mL	0.2 mL	≥ 1–3 months
≥ 5–7 kg	0.3 mg	0.6 mL	0.3 mL	≥ 3–6 months
≥ 7–9 kg	0.4 mg	0.8 mL	0.4 mL	≥ 6–12 months
≥ 9–11 kg	0.5 mg	1 mL	0.5 mL	≥ 12–18 months
≥ 11–14 kg	0.6 mg	1.2 mL	0.6 mL	≥ 18 months–3 years
≥ 14–17.5 kg	0.8 mg	1.6 mL	0.8 mL	≥ 3–5 years
≥ 17.5 kg and above	1 mg	2 mL	1 mL	≥ 5 years and adults

Opioid drug overdose in adults

- Naloxone, IV, 0.4–2 mg immediately.
  - o Repeat 0.4 mg every 5 minutes until reversal or pupils dilate.
  - o Total effective dose is 10 mg.
  - o May be administered endotracheally.
  - o Duration of action is short, i.e. 45 minutes.
  - o Repeat doses over 24 hours may be required

  All patients need to be kept under direct observation until the effect of the opiates has completely worn off.
  Further doses of naloxone may be needed while awaiting and during transport as naloxone has a short duration of action.
  Refer all patients.
  In some patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours – this must not prevent the use of naloxone.

Paracetamol poisoning

All patients should be referred **urgently** for paracetamol blood level and consideration of N-acetylcysteine.

Referral

» All intentional overdoses
» All symptomatic patients
» All children in whom toxicity can be expected, e.g. ingestion with:
  – paracetamol > 6 mL/kg (or 140 mg/kg)
  – anti-epileptics
  – warfarin
  – tricyclic antidepressants
  – sulphonylureas
  – paraffin (unless patient has a normal respiratory rate after 6 hours)
  – iron tablets

If in doubt, consult the referral or poison centre.

Note:

Send the following to hospital with the patient:

» written information
» a sample of the poison or the empty poison container

21.7 Eye, chemical burn (See Chapter 18 – Eye conditions)

T26.5

21.8 Eye injury, foreign body (See Chapter 18 – Eye conditions)

S05.9 / S05.5

21.9 HIV prophylaxis, post exposure (PEP)

Z29.2

21.9.1 Penetrative sexual abuse or sexual assault

T74.2

Description

Sexual assault, sexual abuse or rape is considered when a person intentionally and unlawfully commits an act of sexual penetration with another person by force or threat.

Sexual penetration is defined broadly and refers to any act which causes penetration to any extent whatsoever by:

» the genital organs of one person into the mouth, anus or genital organs of another person
» any object, any part of the body of one person into the anus or genital organs of another person in a manner that simulates sexual intercourse.

A person who has sexual intercourse with another person without disclosing that he/she is HIV positive will be guilty of rape, as the consent given will not be valid due to the fact that it was obtained by false pretences.

General measures

If indecision exist with any of the following offer a 1st dose of antiretroviral PEP as soon as possible – the following matters can then be resolved in due course:

» Obtain informed consent from the patient and written consent from parent in case of minors before HIV testing and PEP.
  – Children over the age of:
    (i) 12 years of age or older; or
    (ii) under the age of 12 years and of sufficient maturity to understand the benefits, risks and social implications of such a test; may sign their own consent.
» Determine the patient's HIV-status before initiating PEP.
  – Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance.

» It is the patient's choice to have immediate HIV testing.
  – If the patient declines, only a 3-day starter pack of PEP should be given and the patient encouraged to reconsider testing within those 3 days. **No further PEP will be given in the case of continued refusal of HIV testing.**
» A patient presenting after 72 hours will not be given PEP but should be counselled about the possible risk of transmission.
  – HIV testing should still be offered at the time of presentation and 3 months later.
» Perform a pregnancy test before initiating PEP.
  – Pregnant rape patients should be referred.
» HIV Elisa positive tested sexually abused children under the age of 18 months must have an HIV DNA PCR (polymerase chain reaction) performed.
  – If HIV uninfected or if the child has no access to PCR, they should receive prophylaxis.
» Explain the side effects of the ARV drugs, e.g. tiredness, nausea and flu-like symptoms.
» Emphasise the importance of compliance with ARV treatment.
» Counsel all sexually assaulted patients and caregivers in the case of children
» Provide psychosocial support pertaining to:
  – medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis-B and C
  – risk of pregnancy
  – psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity
  – identify need for support and refer if needed
» Discuss issues relating to stress management at subsequent visits.
  Post traumatic stress may eventually cause exhaustion and illness. Inform the patient of the signs and symptoms of post traumatic stress, including:
  – general irritability
  – trembling
  – pain in neck and/or lower back
  – change in appetite
  – change in sleep pattern
» Medico-legal assessment of injuries
» Complete appropriate registers

Note:
Refer very young or severely traumatised children to a specialised unit or facility. Children with external signs of genital trauma may need an examination under anaesthesia and should be referred. Trauma to the genital area increases transmission. The character of the exposure should be classified as:
» low risk – non receptive or non traumatic intercourse
» high risk – vaginal and/or rectal penetration and traumatic intercourse

» Blood tests
  – The patient should sign a consent form for both testing and PEP
  – Voluntary rapid HIV testing should be made available and should be done on all opting for PEP
  – Further blood tests should include full blood count VDRL-RPR and Hepatitis B serology.
  – Full blood count should be repeated at 2 and 4 weeks if patient receives PEP
  – Blood should be taken at 4 weeks, 3 months and 6 months for HIV testing
  – RPR at baseline and after 6 weeks

Drug treatment

Note:

» Offer PEP if the patient presents within 72 hours of being raped and is HIV non-infected.
» Obtain consent for HIV testing from all patients before initiating PEP.
» Initiate PEP as soon as possible provided the patient is not HIV-infected prior to the incident
  – For low risk exposure, initiate dual therapy.
  – For high risk exposure and children with very physically traumatic assaults, refer for management of these physical injuries and to consider the use of triple therapy. During referral dual therapy should be initiated immediately.
» In children under the age of 15 months antiretroviral therapy should be used while arranging transfer and awaiting confirmation of HIV results
» Initiating therapy within 24 hours is most likely to be effective at preventing transmission of HIV
» Do a pregnancy test in all women and female adolescents. In the case of children who are clearly pre-pubertal this may be omitted.

STI prophylaxis

Non-pregnant women, men:

- Doxycycline, oral, 100 mg 12 hourly for 7 days
- Cefixime, oral, 400 mg immediately as a single dose
- Metronidazole, oral, 2 g immediately as a single dose

Pregnant women:

- Amoxicillin, oral, 500 mg 8 hourly for 7 days
- Cefixime, oral, 400 mg immediately as a single dose
- Metronidazole, oral, 2 g immediately as a single dose

Children:

<table>
<tr><td>Under 8 years:</td><td>
• Amoxicillin, oral, 8 hourly
<table>
<tr><th rowspan="2">Weight
kg</th><th rowspan="2">Dose
mg</th><th colspan="2">Syrup</th><th rowspan="2">Age
Months/
years</th></tr>
<tr><th>125mg/
5mL</th><th>250mg/
5mL</th></tr>
<tr><td>≥ 2 – 2.5</td><td>50</td><td>2 mL</td><td>–</td><td>34–36 weeks</td></tr>
<tr><td>≥ 2.5 – 3.5</td><td>62.5</td><td>2.5 mL</td><td>–</td><td>Birth–1 month</td></tr>
<tr><td>≥ 3.5 – 5.5</td><td>75</td><td>3 mL</td><td>–</td><td>≥ 1–3 months</td></tr>
<tr><td>≥ 5 – 7</td><td>125</td><td>5 mL</td><td>2.5 mL</td><td>≥ 3–6 months</td></tr>
<tr><td>≥ 7 – 9</td><td>150</td><td>6 mL</td><td>3 mL</td><td>≥ 6–12 months</td></tr>
<tr><td>≥ 9 – 11</td><td>187.5</td><td>7.5 mL</td><td>–</td><td>≥ 12–18 months</td></tr>
<tr><td>≥ 11–17.5</td><td>250</td><td>10 mL</td><td>5 mL</td><td>≥ 18 months–5 years</td></tr>
<tr><td>≥ 17.5 – 20</td><td>375</td><td>15 mL</td><td>7.5 mL</td><td>≥ 5–7 years</td></tr>
</table>
</td></tr>
<tr><td>8–12 years:</td><td>• Doxycycline, oral, 100 mg once daily for 7 days</td></tr>
<tr><td>Over 12 years:</td><td>• Doxycycline 100 mg 12 hourly for 7 days</td></tr>
</table>

plus

- Ceftriaxone, IM
  - o Under 25 kg 125 mg
  - o Over 25 kg 250 mg

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate the dose and route of administration on the referral letter.

plus

- Metronidazole, oral, as a single dose
  - o 1–3 years 500 mg
  - o 3–7 years 600–800 mg
  - o 7–10 years 1 g

Post-coital contraception to prevent unintentional pregnancy in women of reproductive age

- Levonorgestrel 0.75 mg, oral, 2 tablets as a single dose as soon as possible after unprotected intercourse

Or if unavailable:

- Norgestrel/ethinyl oestradiol 0.05/0.5 mg mg, oral, 2 tablets as soon as possible after unprotected intercourse, followed by 2 tablets 12 hours later.

! CAUTION !
Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not more than 5 days later.

An anti-emetic if needed

Hepatitis-B vaccination
See section 13.2: Dosage and administration (Chapter 13: Immunisation)

PEP treatment
Children:
As the body surface area is very difficult to calculate, the following guidelines are provided:

- Zidovudine, oral, 12 hourly for 28 days.
  - o Paediatric dose: 180 mg/m2
  - o Maximum: 300 mg/dose.
    Solution: 10 mg/mL; capsules: 100 mg; tablets: 300 mg (not scored)

Weight (kg)	
≥ 5–5.9 kg	6 mL
≥ 6–6.9 kg	7 mL
≥ 7–7.9 kg	8 mL
≥ 8–8.9kg	9 mL or 1 capsule
≥ 9–11.9 kg	10 mL or 1 capsule
≥ 12–13.9 kg	11 mL or 1 capsule
≥ 14–19.9 kg	2 capsules in the morning and 1 capsule in the evening
≥ 20–29.9 kg	2 capsules
≥ 30–40 kg	1 tablet

plus

- Lamivudine, oral, 4 mg/kg/dose 12 hourly for 28 days.
  - o Maximum: 150 mg/dose.
    Solution: 10 mg/mL; tablet: 150 mg

Weight (kg)	
≥ 5–6.9	3 mL
≥ 7–9.9	4 mL
≥ 10–11.9	5 mL
≥ 12–13.9	6 mL
≥ 14–19.9	7½ mL or ½ tablet (if divisible tablet)
≥ 20–24.9	1 tablet in the morning and 7½ mL or ½ tablet (if divisible tablet) in the evening
≥ 25–40	1 tablet

Dosages may be varied by up to 1 mg/kg/dose more or less to allow a convenient volume of medication.
In children needing more than the maximum dose, use the adult dosage regimen.

Adults

- Zidovudine, oral, 300 mg 12 hourly for 28 days

plus

- Lamivudine, oral, 150 mg 12 hourly for 28 days
  - Initially supply medication for 2 weeks.
  - Evaluate patient after 2 weeks at which the remainder of the PEP treatment should be supplied.

Follow up visits should be at 6 weeks, 3 months and 6 months after the rape.
HIV testing should be performed at each of these visits.

Referral

» All patients with severe physical or psychological injuries
» Infants with significant evidence of sexual assault need referral after beginning dual therapy as soon as possible.

Note:
Refer if there are inadequate resources with regard to:
» counseling
» laboratory for testing
» medico-legal examination
» drug treatment

21.9.2 Occupational post-exposure HIV prophylaxis for health-care workers (HCW)

Z29.2

Description

Exposure to infectious material from HIV seropositive patients including:
» blood
» CSF
» semen
» vaginal secretions
» synovial, pleural, pericardial, peritoneal, amniotic fluid
» The risk of acquiring HIV following occupational exposure is estimated at 0.3%.
» There is a higher risk when:
» the injury is deep
» involves a hollow needle
» or when the source patient is more infectious, e.g.:
  – terminal AIDS

- seroconversion illness
- or known to have a high viral load

Where the source patient is on ARVs or has been on ARVs normal prophylaxis should be started and expert opinion should be sought. An extra blood sample (unclotted - EDTA) of the source patient should be stored in case of need for further viral testing.

Other blood borne infections that can be transmitted include hepatitis B, hepatitis C and syphilis and all source patients should be tested.
Comprehensive and confidential pre-test counselling should be offered.

Drug treatment

» Initiate PEP immediately after the injury and within 72 hours.
  - Do not wait for the confirmatory test results on the source patient and health care worker.

» With very high risk exposures, initiation of treatment may be considered beyond 72 hours.
  - The risks of prophylaxis in this setting may outweigh the benefits.

» Do not consider initiating HIV prophylactic treatment beyond 7 days after exposure.

» Duration of prophylactic treatment is 4 weeks.

» PEP should not be offered for exposures to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva.

» PEP is not indicated for health care workers who are HIV-infected.

» PEP is not indicated when the source is HIV sero-negative unless there are features suggesting seroconversion illness.
  - Continue prophylaxis until the results of additional tests are available.
  - These cases should be discussed with virologists

» Test for HIV infection at the time of the exposure and again at 6 weeks, 3 months and 6 months

» Advise about the need to take precautions, e.g. condom use, to prevent infection of their own sexual partners, should seroconversion occur

» Stop PEP if HIV test of the health care worker is positive at the time of the injury

» Perform full blood count after 2 and 4 weeks on PEP

Combinations of anti-retroviral drugs are used in the prevention of HIV infection:

- Lamivudine, oral, 150 mg 12 hourly

plus

- Zidovudine, oral, 300 mg 12 hourly

With high-risk exposures the addition of a third agent, a protease inhibitor, is recommended.
* High risk HIV source patients include terminal AIDS, seroconversion illness or known to have a high viral load.

Exposure of Healthcare worker	HIV status of source patient		
	Unknown	Positive	High risk*
Intact skin	No PEP	No PEP	No PEP
Mucosal splash or non-intact skin	• Zidovudine + • lamivudine	• zidovudine + • lamivudine	• zidovudine + • lamivudine
Percutaneous – sharps	• zidovudine + • lamivudine	• zidovudine + • lamivudine	• zidovudine + • lamivudine + • lopinavir/ ritonavir
Percutaneous needle in vessel or deep injury	• zidovudine + • lamivudine	• zidovudine + • lamivudine + • lopinavir/ ritonavir	• zidovudine + • lamivudine + • lopinavir/ ritonavir

Referral

» Patients in need of a protease inhibitor

Note:

Refer if there are inadequate resources with regard to:

» counselling
» laboratory for testing
» medico-legal examination
» drug treatment

21.10 Hyperglycaemia and ketoacidosis

See Section 9.4: Diabetic emergencies

21.11 Hypoglycaemia and hypoglycaemic coma

E16.2

Description

Hypoglycaemia is a blood sugar less than 3.5 mmol/L (< 2.6 mmol/L in neonate) and can rapidly cause irreversible brain damage and/or death.

Clinical features include:

» tremor
» sweating
» confusion
» delirium

- tachycardia
- dizziness
- hunger
- headache
- impaired concentration
- coma
- convulsions
- transient aphasia or speech disorders
- irritability

There may be few or no symptoms in the following situations:
- chronically low blood sugar
- patients with impaired autonomic nervous system response, e.g.
  - the elderly
  - very ill
  - malnourished
  - those with long-standing diabetes mellitus
  - treatment with beta-blockers

People at risk of hypoglycaemia:
- neonates with low birth weight or ill or not feeding well
- malnourished or sick children
- shocked, unconscious or convulsing patients
- alcohol binge
- liver disease
- diabetics on treatment

Hypoglycaemia may be a marker of deteriorating renal function.

Emergency treatment

- Obtain blood for glucose determination immediately.
- Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to feed

Breastfeeding child
- administer breast milk

Older children and adults
- sweets, sugar, glucose by mouth
  or
  oral sugar solution
  Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube
- Dextrose 5%
  or
  milk
  or
  sugar solution

Unconscious patient:

Children

- Dextrose 10%, IV, 5 mL/kg
  - 10% solution – e.g. 4 mL 50% dextrose drawn up to 20 mL with water for injection

IV administration of dextrose in children with hypoglycaemia

» Establish an IV line – do not give excessive volumes of fluid
» Take a blood sample for emergency investigations and blood glucose
» Check blood glucose
  – if low, i.e. less than 2.5 mmol/L or if testing strips are not available, administer 5 mL/kg of 10% dextrose solution IV rapidly
    In the majority of cases an immediate clinical response can be expected.
» Recheck the blood glucose after infusion
  – if still low, repeat 5 mL/kg of 10% dextrose solution
» After recovery, maintain with 5% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious

Adults

- Dextrose 50%, IV, 50 mL immediately and reassess.
  - Followed with dextrose 10% solution.
  - In the majority of cases an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution after recovery until blood glucose is stabilised.

Alcoholics

- Thiamine, IV/IM, 100 mg immediately.

! CAUTION !
Thiamine should be preferably be administered prior to intravenous glucose to prevent permanent neurological damage. Do not delay the dextrose administration in a hypoglycaemic patient.

Referral

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents
» Hypoglycaemic patients who do not recover completely after treatment
» All children who have had documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence

21.12 Injuries

T14

Description

Soft tissue injury may present as follows:
» pain only
» traumatic swelling
» bruises with intact skin
» cuts
» abrasions
» puncture wounds
» other open wounds of varying size and severity

Injury to internal organs must be recognised and referred, including subtle signs of organ damage, e.g.:
» blood in the urine – kidney or bladder damage
» shock – internal bleeding
» blood or serous drainage from the ear or nose – skull base fracture
Referral must not be delayed by waiting for a diagnosis.

Human and animal bites can cause extensive injuries and infection. See section 21.2.1: Animal and human bites
An injury causing a sprain or strain may be initially overlooked.
Exclude fractures.
Closed injuries and fractures of long bones may be serious and damage blood vessels. Contamination with dirt and soil complicates the outcome of treatment.

Emergency management

» Immobilise injured limb.
» Monitor vital signs.
» Monitor pulses below an injury on a limb with swelling.

Wound care
» Clean the wound
» Suture or splint when needed
» Avoid primary suture if the wound is infected:
  – dirty or contaminated
  – crushed
  – in need of debridement
  – projectile inflicted
  – caused by bites

Drug treatment

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	Dose mg	Use one of the following:		Age months/years
		Syrup 120 mg/5mL	Tablet 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Tetanus prophylaxis

If not previously immunised within the last 5 years

- Tetanus toxoid (TT), IM, 0.5 mL

Note

In a fully immunised person, tetanus toxoid vaccine might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Referral

Urgent

» Extensive closed or open wounds
» Injury to vital structures or internal organs
» Sepsis
» Shock
» Anaemia
» Blood in the urine
» Infants and young children except when the injury is minor
» Enlarging and/or pulsating swelling

21.13 Myocardial infarction, acute (AMI)

See section 4.6 Myocardial infarction, acute (AMI)

21.14 Nose bleed (epistaxis)

R04.0

Description

Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking and occurs from an area anterior and inferior to the nasal septum. Consider other conditions associated with nosebleeds, especially if recurrent, e.g. hypertension and bleeding tendency.

Management

Acute episode

Most bleeding can be controlled by pinching the nasal wings (alae) together for 5–10 minutes.

If this fails, insert nasal tampons or BIPP stripping into bleeding nostril(s).

Identify the cause.

Referral

» Recurrent nose bleeds
» Failure to stop the bleeding

21.15 Pulmonary oedema, acute

J81

Description

A life-threatening condition with abnormal accumulation of fluid in the lungs. Acute heart failure is a common cause.

Persons with pulmonary oedema may present similarly to acute bronchospasm. It is important to distinguish this condition from an acute attack of asthma.

! CAUTION !
Morphine is contraindicated in acute asthma.

Emergency treatment

Place the patient in a sitting or semi-Fowler's position.

Children:

- Oxygen, using face mask **or** nasal cannula at 2–3 L per minute

- Furosemide, IV, 1 mg/kg immediately.
  - o Do not put up a drip or run in any IV fluids

Weight kg	**Dose** mg	**Injection** 10 mg/mL	**Age** Months/years
≥ 3.5–5 kg	4 mg	0.4 mL	≥1–3 months
≥ 5–7 kg	6 mg	0.6 mL	≥ 3–6 months
≥ 7–9 kg	8 mg	0.8 mL	≥ 6–12 months
≥ 9– 11 kg	10 mg	1 mL	≥12–18 months
≥ 11–14 kg	12 mg	1.2 mL	≥18 months–3 years
≥ 14– 7.5 kg	15 mg	1.5 mL	≥ 3–5 years
≥ 17.5–25 kg	20 mg	2 mL	≥ 5–7 years
≥ 25–35 kg	30 mg	3 mL	≥ 7–11 years
≥ 35 kg and above	40 mg	4 mL	≥ 11 years and adults

Adults:

- Oxygen, using face mask to deliver 40% oxygen at a rate of 6–8 L per minute
- Furosemide, IV, 40 mg

If response is adequate follow with:

- Furosemide, IV, 40 mg in 2–4 hours

If no response within 20–30 minutes:

- Furosemide, IV, 80 mg
- Morphine, IV.
  - o Dilute 10 mg to 10 mL and administer slowly at 1 mg/minute.
  - o Discontinue when patient experiences relief.
  - o Maximum dose: 10 mg

and/or

- Isosorbide dinitrate sublingual 5 mg 4 hourly.
  - o Do not administer if hypotensive.

Pulmonary oedema due to a hypertensive crisis
ADD
To treat hypertension

- ACE inhibitors

Referral

Urgent

» All cases
Continue oxygen during transfer.

21.16 Shock

R57.9

Description

Shock is a life threatening condition characterised by hypotension.

Signs and symptoms of shock

» Low blood pressure (systolic BP below 80 mmHg) is the key sign of shock.
» Weak and rapid pulse
» Rapid shallow breathing.
» Restlessness and altered mental state
» Weakness
» Low urine output

Types of shock		Additional symptoms
» Hypovolemic shock	– Most common type of shock – Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, etc.	Weak thready pulse, cold and clammy skin.
» Cardiogenic shock	– Caused by the failure of heart to pump effectively e.g. in myocardial infarction, cardiac failure, etc.	Distended neck veins, weak or absent pulses.
» Septic shock	– Caused by an overwhelming infection, leading to vasodilation.	Elevated body temperature
» Neurogenic shock	– Caused by trauma to the spinal cord, resulting in sudden decrease in peripheral vascular resistance and hypotension.	Warm and dry skin
» Anaphylactic shock	– Caused by severe allergic reaction to an allergen, or drug.	Bronchospasm, angioedema and/or urticaria

Signs and symptoms of shock in children

Shock must be recognised while still in the compensated state to avoid irreversible deterioration. Therefore, the following are primarily assessed in children:

1. Prolonged capillary filling (more than 3 seconds)
2. Decreased pulse volume (weak thready pulse)
3. Increased heart rate (>160/minute in infants, > 120 in children)
4. Decreased level of consciousness (poor eye contact)
5. Rapid breathing

Decreased blood pressure and decreased urine output are late signs and while they can be monitored the above signs are more sensitive in detecting shock before irreversible.

Emergency treatment

Treatment depends on the type of shock. Intravenous fluid therapy is important in the treatment of all types of shock except for cardiogenic shock. Prompt diagnosis of underlying cause is essential to ensure optimal treatment.

» Maintain open airway
» Administer oxygen with face mask and if needed after intubation with assisted ventilation
» Check for and manage hypoglycaemia

Fluid replacement (Not for cardiogenic shock)

Adults:

- Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  - o Repeat bolus until blood pressure is improved.

Children:

- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - o Repeat bolus if no adequate response.

Note:

Do not administer IV fluids in case of cardiogenic shock but maintain IV access. If patient develops respiratory distress, discontinue fluids.

Septicaemia in children

All children with shock which is not obviously due to trauma or simple watery diarrhoea should receive antibiotic cover for probable septicaemia.

- Ceftriaxone, **IM**, 50–80 mg/kg/dose immediately as a single dose

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI)**:			**Age** Months/ years
		250 mg WFI 2 mL	500 mg WFI 2 mL	1 000 mg WFI 3.5 mL	
≥ 2–2.5 kg	125 mg	1 mL	0.5 mL	–	
≥ 2.5–3.5 kg	200 mg	1.6 mL	0.8 mL	–	Birth–1 month
≥ 3.5–5.5 kg	250 mg	2 mL	1 mL	–	≥ 1–3 months
≥ 5–7 kg	375 mg	3 mL	1.5 mL	–	≥ 3–6 months
≥ 7–9 kg	500 mg	4 mL	2 mL	–	≥ 6–12 months
≥ 9–11 kg	625 mg	5 mL	2.5 mL	–	≥ 12–18 months
≥ 11–14 kg	750 mg	6 mL	3 mL	–	≥ 18 months–3 years
≥ 14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	≥ 3–5 years
≥ 17.5 kg and above	1 000 mg	–	4 mL	3.5 mL	5 years and adult

! CAUTION !
Do not administer calcium containing fluids, e.g. Ringer-lactate, within 48 hours of administering ceftriaxone.
Contra-indicated in neonatal jaundice.
Annotate dose and route of administration on referral letter.

Referral

» All patients urgently after resuscitation.

21.17 Shock, anaphylactic

T78.2

Description

A very severe allergic reaction that usually occurs within seconds or minutes after exposure to an allergen, but may be delayed for up to 1 hour. The reaction may be life threatening.
Clinical features include:
» hypotension and/or shock
» bronchospasm
» laryngeal oedema or angioneurotic oedema

Emergency treatment

» Resuscitate (ABC) immediately, (see section 21.4)

Drug treatment

Adrenaline is the mainstay of treatment and should be given immediately

- Adrenaline, IM,

Age years	Dose mg	Injection 1 mg/mL (1:1 000)
< 2 years	0.1 mg	0.1 mL
≥ 2 – 5 years	0.2 mg	0.2 mL
≥ 6 – 12 years	0.3 mg	0.3 mL
≥ 12 – 15 years	0.5 mg	0.5 mL
≥ 15 years and adults	1 mg	1 mL

  - o Repeat in 5 minutes if no improvement.

- Hydrocortisone IM/slow IV, immediately
  - o Maximum dose: 100 mg.

Weight kg	Dose mg	Injection 100 mg/2 mL	Age months/years
≥ 11–14 kg	50 mg	1 mL	≥ 2–3 years
≥ 14–17.5 kg	75 mg	1.5 mL	≥ 3–5 years
≥ 17.5 kg and above	100 mg	2 mL	≥ 5 years and adult

- Promethazine, IM/slow IV
  - o Children over 2 years: 0.25 mg/kg
  - o Adults: 25–50 mg

Weight kg	Dose mg	Use one of the following injections:		Age Months/ years
		25 mg/mL	50 mg/2 mL	
≥ 11–17.5 kg	5 mg	0.2 mL	0.2 mL	2–5 years
≥ 17.5–25 kg	7.5 mg	0.3 mL	0.3 mL	5–7 years
≥ 25–35 kg	10 mg	0.4 mL	0.4 mL	7–11 years
≥ 35–55 kg	15 mg	0.6 mL	0.6 mL	11–15 years
≥ 55 kg and above	25 mg	1 mL	1 mL	> 15 years and adult

Referral

» All patients

Note:
Adrenaline administration may have to be repeated due its short duration of action. Close observation during transport is essential.

21.18 Sprains and strains

T14.3

Description

Soft tissue injuries.
Clinical features include:
» pain, especially on movement
» tenderness on touch
» limited movement
» history of trauma
May be caused by:
» sport injuries
» slips and twists
» overuse of muscles
» abnormal posture

Note:
In children always bear non-accidental injuries (assault) in mind.

Emergency treatment

» Immobilise with firm bandage and/or temporary splinting

Children over 12 years and adults:

- Ibuprofen, oral, 200–400 mg 8 hourly with or after a meal

plus

- **Paracetamol**, oral, 15 mg/kg/dose 4–6 hourly when required to a maximum of 4 doses per 24 hours
  - o In children under 6 months calculate dose by weight

Weight kg	**Dose** mg	**Use one of the following:**		**Age** months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
≥3.5–5 kg	48 mg	2 mL	–	≥ 1–3 months
≥ 5–7 kg	60 mg	2.5 mL	–	≥ 3–6 months
≥ 7–9 kg	96 mg	4 mL	–	≥ 6–12 months
≥ 9–14 kg	120 mg	5 mL	–	≥ 12 months–3 years
≥ 14–17.5 kg	180 mg	7.5 mL	–	≥ 3–5 years
≥ 17.5–35 kg	240 mg	10 mL	½ tablet	≥ 5–11 years
≥ 35–55 kg	500 mg	–	1 tablet	≥ 11–15 years
≥55 kg and above	Up to 1 000 mg	–	Up to 2 tablets	≥ 15 years and adults

Referral

» Severe progressive pain
» Progressive swelling

» Extensive bruising
» Deformity
» Joint tenderness on bone
» No response to treatment
» Severe limitation of movement
» Suspected serious injury
» Recurrence
» Previous history of bleeding disorder

21.19 Status epilepticus

G41.9

For initial treatment of seizures, see Section 15.2: Seizures

Description

This is a medical emergency.

A series of seizures follow one another lasting more than 30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.

Status epilepticus has the potential for causing high mortality.

General measures

» Place the patient in a lateral - prone (recovery) position.
» **Do not** place anything (spoon or spatula etc) in the patient's mouth.
» Do not try to open the patient's mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen.
» Prepare for suction and intubation.
» Check blood glucose (exclude hypoglycaemia!)
» Monitor vital signs every 15 minutes.
» Establish an IV line (dextrose 5% in sodium chloride 0.9%).

Drug treatment

Children < 12 years

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.
  - o Diazepam for injection 10 mg in 2 mL is used undiluted.
  - o Draw up the required volume in a 2 mL syringe.
  - o Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - o Remove syringe and hold buttocks together to minimise leakage

Weight kg	Dose mg	Ampoule 10 mg/2 mL	Approx age
≥ 3–6 kg	2 mg	0.4 mL	Less than 6 months
≥ 6–10 kg	2.5 mg	0.5 mL	≥ 6 months–1 year
≥ 10–18 kg	5 mg	1 mL	≥ 1–5 years
≥ 18–25 kg	7.5 mg	1.5 mL	≥ 5–8 years
≥ 25–40 kg	10 mg	2 mL	≥ 8–12 years

- Maximum dose: 10 mg in 1 hour.
- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after the second dose of diazepam or if the convulsion has lasted more than 20 minutes, add:

- Phenobarbitone, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.
  - Maximum dose: 210 mg

Weight kg	Dose mg	Tablet 30 mg	Age Months/ years
≥ 2.5–3.5 kg	45 mg	1½ tablets	Birth–1 month
≥ 3.5–5.5 kg	60 mg	2 tablets	≥ 1–3 months
≥ 5–7 kg	90 mg	3 tablets	≥ 3–6 months
≥ 7–9 kg	120 mg	4 tablets	≥ 6–12 months
≥ 9–11 kg	150 mg	5 tablets	≥ 12–18 months
≥ 11–14 kg	180 mg	6 tablets	≥ 18 months–3 years
≥ 11 kg and above	210 mg	7 tablets	≥ 3 years

Adults

- Diazepam, slow IV, 10–20 mg at a rate not exceeding 2 mg/minute
  - Repeat within 10–15 minutes if needed
  - Maximum dose: 30 mg within 1 hour
  - Expect a response within 1–5 minutes

  or

  Lorazepam, IM/IV, 4 mg as a single dose
  - Repeat after 10–15 minutes, if needed
  - Maximum dose: 8 mg within 12 hours

! CAUTION !
Avoid diazepam IM since absorption is slow and erratic.
Do not mix with other drugs.

plus

- Phenytoin, oral or by nasogastric tube at a loading dose of 20 mg/kg as a

single dose.

Referral

Urgent

» Any child where the seizures cannot be controlled within 30 minutes

Non-urgent

» All patients once stabilised
Clinical notes including detail on medication given should accompany patients.

GUIDELINES FOR THE MOTIVATION OF A NEW MEDICINE ON THE NATIONAL ESSENTIAL MEDICINES LIST

Section 1: Medication details

» Generic name
A fundamental principle of the Essential Drug Programme is that of generic prescribing. Most clinical trials are conducted using the generic name.

» Proposed indication
There will usually be many registered indications for the medication. However, this section should be limited to the main indication which is supported by the evidence provided in section 2.

» Prevalence of the condition in South Africa
This information is not always readily available. However, it is an important consideration in the review of a proposed essential medicine.

» Prescriber level
Here the proposed prescriber level should be included. If more than one level is proposed each relevant box should be ticked.

Section 2: Evidence and motivation

» Estimated benefit
- Effect measure: this is the clinical outcome that was reported in the clinical trial such as BP, FEV, CD_4, VL etc.
- Risk benefit: this should reported in the clinical trial and, in most cases, includes the 95% confidence level (95% CI). Absolute risk reduction, also termed risk difference, is the difference between the absolute risk of an event in the intervention group and the absolute risk in the control group.
- Number Need to Treat (NNT): gives the number of patients who need to be treated for a certain period of time to prevent one event. It is the reciprocal of the absolute risk or can be calculated using the formula below.

Calculations

	Bad outcome	Good outcome	Total patients
Intervention group	*a*	*c*	*a + c*
Control group	*b*	*d*	*b + d*

Measure	Equation
Absolute risk:	[b/(b+d)] – [a/(a+c)]
Number needed to treat	$\frac{1}{[b/(b+d)] - [a/(a+c)]}$
Relative risk	[a/(a+c)] ÷ [b/(b+d)]
Odds ratio	$\frac{[a/(a+c)] \div [c/(a+c)]}{[b/(b+d)] \div [d/(b+d)]} = (a/c) \div (b/d)$

Reference - Aust Prescr 2008;31:12–16)

» Motivating information (**Level of evidence based on the SORT system**)
  – The National Essential Drug List Committee has endorsed the adoption of the SORT system for categorising levels of evidence. This system[1] contains only three levels:

Level I	Good quality evidence	Systematic review of RCTs with consistent findings High quality individual RCT
Level II	Limited quality patient orientated evidence	Systematic review of lower quality studies or studies with inconsistent findings Low quality clinical trial Cohort studies Case-control studies
Level III	Other	Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series

1 Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician. 2004;69:550-6.

A: Newer product: for most newer products, level 1 evidence such as high quality systematic reviews or peer-reviewed high quality randomised controlled trials should be identified and referenced in the space provided.
B: Older products: many of these products were developed prior to the wide use of randomised controlled trials. However, there maybe level 1 evidence where the product was used as the control arm for a newer product. If no level 1 evidence can be identified, then level II data from poorer quality controlled trials or high quality observational studies should be referenced in the space provided.

» Cost considerations
  - Where a published reference supporting the review of cost is available comments should be made regarding its applicability to the South African public sector environment.
  - Possible unpublished information that can be included:
    - Cost per daily dose or course of therapy – for long term or chronic therapy such as hypertension the usual daily dose should be calculated (Dose x number of times a day) and converted into the number of dosing units e.g. tablets. This is then used to calculate the cost per day. For medications used in a course of therapy such as antibiotics this is then multiplied by the number of days in the course of therapy.
    - Cost minimisation is used where there is evidence to support equivalence and aims to identify the least costly treatment by identifying all the relevant costs associated with the treatment.
    - Cost-effectiveness analysis is used to compare treatment alternatives that differ in the degree of success in terms of the therapeutic or clinical outcome. By calculating a summary measurement of efficiency (a cost-effectiveness ratio), alternatives with different costs, efficacy rates, and safety rates can be fairly compared along a level playing field.

Where any of these have been performed tick the relevant block and send as an attachment with all the calculations. If possible, the spread sheet should be supplied electronically.

Section 3: Motivator's Details
The receipt of all submission will be acknowledged. In addition, all decisions with supporting arguments will be communicated where appropriate. This section therefore forms a vital link between the motivator and the decision making process.

Motivation form for the inclusion of a new medication on the National Essential Medicines List

Section 1: Medication details			
Generic name (or International Nonproprietary Name):			
Proposed indication:			
Prevalence of condition (based on epidemiological data, if any):			
Prescriber level			
Primary Health Care 1	Medical Officer 2	Specialist 3	Designated Specialist 4

Section 2: Evidence and motivation		
2.1 Estimated benefit		
Effect measure		
Risk difference (95% CI)		
NNT		
2.2 Motivating information (Level of evidence based on the SORT system)		
A. Newer product: High quality systematic reviews or peer-reviewed high quality randomised controlled trials (Level I)		
Author	Title	Journal ref
B. Older product with weaker evidence base: Poorer quality controlled trials or high quality observational studies (Level II)		
Author	Title	Journal ref
2.3 Cost-considerations		
Have you worked up the cost?	YES	NO
Daily cost	Cost minimisation	Cost-effectiveness analysis
Other relevant cost information if available:		
Author	Title	Journal ref
2.4 Additional motivating comments.		

Section 3: Motivator's Details	
PTC Title:	**Date submitted:**

GUIDELINES FOR ADVERSE DRUG REACTION REPORTING

National Pharmacovigilance Programme
The Medicines Control Council (MCC) has a responsibility to ensure the safety, efficacy and quality of all medicines used by the South African public. The National Pharmacovigilance Programme is coordinated by the MCC and has a dedicated Unit, The National Adverse Drug Event Monitoring Centre (NADEMC), in Cape Town, which monitors the safety of all registered medicines in South Africa.

What is Pharmacovigilance?
Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e. adverse drug reactions or ADRs). The ultimate goal of this activity is to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an Adverse Drug Reaction (ADR)?
The Medicines Control Council (MCC) defines an Adverse Drug Reaction (ADR) reaction as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?
All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

What happens to a report?
All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

- Additional investigations into the use of the medicine in South Africa
- Educational initiatives to improve the safe use of the medicine
- Appropriate package insert changes to include the potential for the reaction
- Changes in the scheduling or manufacture of the medicine to make it safer

The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?

An adverse drug reaction report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and that of the patient will be removed before any details about a specific adverse drug reaction are used or communicated to others. The information is only meant to improve the understanding of the medicines used in the country.

Is the event possibly an ADR?

The following factors should be considered when an adverse drug reaction is suspected:

1. What exactly is the nature of the reaction? (*Describe the reaction as clearly as possible and where possible provide an accurate diagnosis.*)

2. Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? *(Some reactions occur immediately after administration of a medicine while others take time to develop.)*

3. Is the reaction known to occur with the particular medicine as stated in the package insert or other reference? *(If the reaction is not documented in the package insert, it does not mean that the reaction cannot occur with that particular medicine.)*

4. Did the patient recover when the suspected medicine was stopped? *(Some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped.)*

5. Did the patient take the medicine again after the reaction abated (i.e. rechallenge). If so, did the same reaction occur again? *(In most situations it is not possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event is a strong indicator that the medicine may be responsible.)*

6. Can this reaction be explained by other causes (e.g. underlying disease/s; other medicine/s; toxins or foods)? *(It is essential that the patient is thoroughly investigated to decide what the actual cause of any new medical problem is. A medicine-related cause should be considered, when other causes do not explain the patient's condition.)*

What types of reactions should be reported?
The following adverse drug reactions should be reported:

- All ADRs to newly marketed drugs or new drugs added to the EDL
- All serious reactions and interactions
- ADRs that are not clearly stated in the package insert.
- All adverse reactions or poisonings to traditional or herbal remedies

Report even if you are not certain that the medicine caused the event.

What Product Quality Problems should be reported?
The following product quality problems should be reported:

- Suspected contamination
- Questionable stability
- Defective components
- Poor packaging or labeling
- Therapeutic failures

How can ADRs be prevented from occurring?
Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?
An Adverse Drug Reaction/Product Quality Report Form is enclosed in this book and should be completed in as much detail as possible before returning it by fax or post to any of the addresses provided below. Additional forms can be obtained by contacting the MCC at these addresses. Report forms may also be accessed via the following website: *http://www.mccza.com*

1. **The Registrar of Medicines**
   Medicines Control Council, Department of Health, Private Bag X828
   Pretoria, 0001
   Tel: (021) 312 0295; Fax: (021) 3123106

2. **The National Adverse Drug Event Monitoring Centre (NADEMC)**
   C/o Division of Pharmacology, University of Cape Town,
   Observatory, 7925
   (021) 447 1618; Fax: (021) 448 6181

ADVERSE DRUG REACTION AND PRODUCT QUALITY PROBLEM REPORT FORM

(*Identities of reporter and patient will remain strictly confidential)*

NATIONAL ADVERSE DRUG EVENT MONITORING CENTRE
Medicines Control Council, Tel : (021) 447-1618
The Registrar of Medicines, Fax: (021) 448-6181
Department of Health In collaboration with the WHO International Drug Monitoring Programme

PATIENT INFORMATION

Name (or initials):_____Age:_____Weight (kg):_____

Sex: M F Date Of Birth :____/____/____ Height (cm):_____

ADVERSE REACTION/PRODUCT QUALITY PROBLEM

Adverse reaction[1] ☐ and/or Product Quality problem[2] ☐ Date of onset of reaction:____/____/_____

Time of onset of reaction:____h_____min

Description of reaction or problem (Include relevant tests/lab data, including dates):

1. MEDICINES/VACCINES/DEVICES (include all concomitant medicines)

Trade Name & Batch No. (Asterisk Suspected Product)	Daily Dosage	Route	Date Started	Date Stopped	Reasons for use

ADVERSE REACTION OUTCOME (Check all that apply)

☐ death
☐ life-threatening
☐ disability
☐ hospitalisation
☐ congenital anomaly
☐ Other_____

Event reappeared on rechallenge:

Y N Rechallenge not done

Treatment (of reaction)_____

_____

_____

Recovered:

☐ required intervention to_____ Y N

_____

prevent permanent_____ Sequelae: Y N

_____

impairment/damage_____ Describe Sequelae:_____

_____ _____

COMMENTS: (e.g. Relevant history, Allergies, Previous exposure, Baseline test results/lab data)

2. PRODUCT QUALITY PROBLEM:

Trade Name	Batch No	Reg No.	Dosage form & strength	Expiry Date	Size/ Type of container

Product available for evaluation?: **Y** **N**

REPORTING DOCTOR/PHARMACIST Etc:

NAME:_____

QUALIFICATIONS:_____

ADDRESS:_____

_____

_____ _____

Signature_____Date_____

TEL:_____

This report does not constitute an admission that medical personnel or the product caused or contributed to the event.

ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:

- medications (drugs, vaccines and biologicals)
- medical devices (including in-vitro diagnostics)
- traditional and herbal remedies
- **For Adverse Events Following Immunisation (AEFI), please follow the reporting procedure recommended by the Expanded Programme in Immunisation (EPI)**

Please report:

- adverse drug reactions to recently marketed products
- serious reactions and interactions with all products
- adverse drug reactions which are not clearly reflected in the package insert.

Report even if:

- you're not certain the product caused the event
- you don't have all the details

Report Product Quality Problems such as:

- suspected contamination
- questionable stability
- defective components
- poor packaging or labelling
- therapeutic failures

Important numbers:

Investigational Products and Product Quality Problems:

- (012) 326-4344 to fax a report
- (012) 312-0000 to report by phone

Registered Medicines and Traditional and Herbal remedies:

- (021) 448-6181 to fax a report
- (021) 447-1618 to report by phone

Adverse Events Following Immunisation:

- (012) 312 0110 to phone for information
- (012) 321 9882 to fax a report

Confidentiality: Identities of the reporter and patient will remain strictly confidential.

Your support of the Medicine Control Council's adverse drug reaction monitoring programme is much appreciated. Information supplied by you will contribute to the improvement of drug safety and therapy in South Africa.

PLEASE USE ADDRESS PROVIDED BELOW- JUST FOLD IN THIRDS, TAPE and MAIL

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0001

INDEX OF DRUGS/MEDICINES

INDEX OF CONDITIONS

ABBREVIATIONS

ABCD	Airways, Breathing, Circulation, Drip/Doctor/Drugs
ACE	angiotensin-converting enzyme
AIDS	acquired immunodeficiency syndrome
AMI	acute myocardial infarction
BCG	Bacillus Calmette-Guerin vaccine
BMI	Body mass index
BP	blood pressure
BSA	Body surface area
C	Celsius
cap	capsule
CCF	congestive cardiac failure
CCMT	Comprehensive care, management and treatment
CCU	Critical Care Unit
CD4	cluster designation 4
CKD	chronic kidney disease
cm	centimetre
CNS	central nervous system
COAD	chronic obstructive airways disease
COPD	chronic obstructive pulmonary disease
CPR	cardio-pulmonary resuscitation
CrCl	creatinine clearance
CSF	cerebro-spinal fluid
CVD	cardiovascular disease
dL	decilitre
DNA	deoxyribonucleic acid
DPT	diphtheria, pertussis and tetanus vaccine
E	ethambutol
ECG	electrocardiogram
EDTA	ethylinediamine tetraacetic acid
ELISA	enzyme-linked immunosorbent assay
EPI	Expanded Programme on Immunisation
ET	Endotracheal tube
FBC	full blood count
FBG	fasting blood glucose
FEV1	forced expiratory volume in 1 second
FTA	Fluorescent Treponemal Antibody
FTT	failure to thrive
g	gram
GFR	glomerular filtration rate
GIT	gastro intestinal tract
H	isoniazid
Hb	haemoglobin
HbA_{1C}	glycated haemoglobin
HCW	health care worker

HDL	high density lipoprotein
Hep B	hepatitis B vaccine
Hib	*Haemophilus influenzae* type B vaccine
HIV	human immunodeficiency virus
IDDM	insulin dependent diabetes mellitus
IM	intramuscular
IMCI	Integrated management of childhood illness
IU	international units
IUCD	intrauterine contraceptive device
IV	intravenous
kg	kilogram
L	litre
LAP	lower abdominal pain
LBBB	left bundle branch block
LDL	low density lipoprotein
LMP	last menstrual period
mcg	microgram
MCV	mean corpuscular volume
MDR TB	multiple drug resistant tuberculosis
mg	milligram
mL	millilitre
mmHg	millimetres mercury
mmol	millimol
MU	million units
NSAID	non-steroidal anti-inflammatory
OPV	oral polio vaccine
ORS	oral rehydration solution
PCP	*Pneumocystis carinii* pneumonia
PCR	polymerase chain reaction
PEFR	peak expiratory flow rate
PEP	post exposure prophylaxis
PHC	primary health care
PIH	pregnancy induced hypertension
PTC	Pharmacy and Therapeutics Committee
R	rifampicin
RBG	random blood glucose
Rh	Rhesus
RH	rifampicin, isoniazid, combination
RHZ	rifampicin, isoniazid, pyrazinamide combination
RHZE	rifampicin, isoniazid, pyrazinamide ethambutol, combination
RIG	human anti-rabies immunoglobin
RPR/VDRL	rapid plasma reagent test/venereal disease research laboratory test
RTH	road to health
S	streptomycin
SC	subcutaneous
SSS	sugar and salt solution

ST	sinus tachycardia
STI	sexually transmitted infections
tab	tablet
TB	tuberculosis
Td	diphtheria and tetanus vaccine
TIA	transient ischaemic attack
TPHA	*Treponema pallidum* haemagglutination assay
TT	tetanus vaccine
UE	emulsifying ointment
UEA	aqueous cream
UTI	urinary tract infection
VVM	vaccine vial monitor
WFI	water for injection
WHO	World Health Organisation
XDR TB	extreme drug resistant tuberculosis