FOREWORD

The Department of Health is committed to increasing access to good quality care and improving our health care delivery system by focussing on access, equity, efficiency, quality and sustainability. I am, therefore, proud to present the fifth edition of the Primary Healthcare (PHC) Level Standard Treatment Guidelines and Essential Medicines List.

The Standard Treatment Guidelines are intended to promote equitable access to affordable medicines that are safe, effective and improve the quality of care for all. Essential medicines is a global forward-looking concept. The Essential Medicines List requires regular review of medicine selection based on changes in a dynamic clinical and research environment. It has been promoted as one of the most cost-effective ways of saving lives and improving health.

This edition of the Primary Healthcare Level Standard Treatment Guidelines and Essential Medicines List is the culmination of many months of intensive and painstaking review. The commitment demonstrated by the Expert Review Committee to interpret and contextualise the clinical evidence is sincerely appreciated. In addition, we were privileged to have the collaboration of many stakeholders during the review process. For all those involved, I wish to express my sincerest gratitude.

We should not forget that the implementation of these guidelines will require similar focus and commitment. It is for this reason that I call upon all clinicians at all levels of care to actively support the implementation of the Primary Healthcare Level Standard Treatment Guidelines and Essential Medicines List in pursuit of realising our vision of a long and healthy life for all South Africans.

DR A MOTSOALEDI, MP
MINISTER OF HEALTH
DATE: 14 JULY 2015
INTRODUCTION

Primary healthcare is the cornerstone of our health system and to essential health service delivery. The Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) 2014 edition provides a solid foundation, and standardised criteria guiding clinicians in the provision of essential universal PHC.

Evidence based medicine selection principles and consideration of practical implications were applied during this review. Tools summarising the evidence based changes in the PHC STGs and EML 2014 are available for use with the revised publication.

To promote transparency, in this fifth edition, revisions are accompanied by the level of evidence. All evidence based suggestions submitted through a national call for comment were deliberated. In addition, there was extensive collaboration with health experts, National Department of Health programmes and clinical societies.

In keeping with our National Drug Policy, it is the responsibility of every healthcare professional in our country to support the effective implementation of the revised guidelines. Therefore, I call on all stakeholders in the medicine management system including Provincial Departments of Health, Pharmaceutical and Therapeutics Committees, Health Care Managers, Supply Chain Managers, and every health care professional in South Africa to use and promote the implementation of these revised guidelines.

I congratulate the review committee and external stakeholders on a successful collaboration and revision, and I thank them for their continued commitment to healthcare provision in South Africa.

I encourage you to promote essential health service delivery at the PHC level in South Africa through implementation of the evidence based PHC STGs and EML 2014.

MS MP MATSOSO
DIRECTOR-GENERAL: HEALTH
DATE: 8 APRIL 2015
ACKNOWLEDGEMENTS

The quality of this edition reflects the passion, dedication, commitment and technical expertise of the members of the Primary Healthcare Level Expert Review Committee. We thank you for sacrificing the time. We also thank the many stakeholders (dieticians, nurses, pharmacists, doctors, professional societies and other health care professionals) for their comments and contributions with appropriate evidence. The willingness to participate provided additional rigour to this peer review consultative process. We look forward to continuous constructive engagement.

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THE ESSENTIAL MEDICINES CONCEPT

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

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

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

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

» To ensure the availability and accessibility of essential medicines to all citizens.
» To ensure the safety, efficacy and quality of 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.
HOW TO USE THIS BOOK

Principles

The National Drug Policy makes provision for an Essential Drugs Programme (EDP) which is a key component in promoting rational medicines use.

The Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) should be used by healthcare workers providing care at clinics, community health centres and gateway clinics at hospitals to provide access to pharmaceuticals for the management of conditions commonly presenting at this level. It is the responsibility of the Pharmaceutical and Therapeutics Committees (PTCs) to ensure availability of medicines.

The medicines listed in the PHC EML should also be available at higher levels of care.

Provincial PTCs have the authority to facilitate and control access to additional medicines listed on the Adult and Paediatric hospital level EMLs at specific PHC facilities. In addition, provincial PTCs are authorised to reasonably adapt the STGs/EML according to local conditions and circumstances.

Provincial PTCs are also responsible for facilitating access of medicines using down referral from a higher to a lower level of care.

PHC treatment guidelines are designed to be a progression in care to the relevant Adult and Paediatric hospital level guidelines, with referral of patients with more complex and uncommon conditions to facilities with the skills and resources to provide further care. In addition, where a referral is recommended, the relevant medicines have either been reviewed and included in the Adult and Paediatric hospital level EMLs, or are in the process of being reviewed. Given that the STGs and EML for the various levels are reviewed at different times, there is a period when the STGs and EMLs are not always perfectly aligned.

All reasonable steps have been taken to align the STGs with Department of Health guidelines that were available at the time of review. A medicine is included or removed from the list using an evidence based medicine review of safety and effectiveness, followed by consideration of cost and other relevant practice factors.
The EML has been developed down to generic or International Non-propriety Name (INN) level. It is anticipated that each Province will review the EML and prevailing tenders to compile a formulary which:

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

Therapeutic classes are designated in the “Medicine treatment” section of the STGs which provides a class of medicines followed by example such as, HMGCoA reductase inhibitors (statins) e.g. simvastatin. These therapeutic classes have been designated where none of the members of the class offer any significant benefit over the other registered members of the class. It is anticipated that by limiting the listing to a class there is increased competition and hence an improved chance of obtaining the best possible price in the tender process. In circumstances where you encounter such a class always consult the local formulary to identify the example that has been approved for use in your facility.

The perspective adopted is that of a competent prescriber practicing in a public sector facility. As such, the STGs serve as a standard for practice but do not replace sound clinical judgment.

Navigating the book

It is important that you become familiar with the contents and layout of the book in order to use the STGs 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) guidelines 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 criteria 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. The dosing regimens provide the recommended doses used in usual circumstances however the final dose should take into consideration capacity to eliminate the medicine, interactions and co-morbid states.

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 of certain PHC centres exceeds that of an average clinic, PTCs are encouraged to tailor the availability of medicines at these centres. Adopting a more flexible approach promotes better utilisation of resources with healthcare provided that is more convenient for patients.

The STGs are arranged into chapters according to the organ systems of the body. Conditions and medicines are cross referenced in two separate indexes of the book. In some therapeutic areas that are not easily amenable to the development of a STG, the section is limited to a list of medicines.

This edition of the PHC STGs and EML provides medicine information services with contact numbers.

The section on Patient Education in Chronic Conditions aims to assist health workers to improve patient adherence and health.

**Medicines Safety**

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

In accordance with the Medicines Control Council’s guidance on reporting adverse drug reactions in South Africa, the healthcare worker (with the support of the PTC) should report the relevant adverse reactions to the National
Adverse Drug Event Monitoring Centre (NADEMC). To facilitate reporting, a copy of the Adverse Drug Reaction form and guidance on its use has been provided at the back of the book.

Feedback

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.

Paediatric Dose Calculation

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

Different conditions require different dosing of medication. In children most conditions can use standardised doses. These standardised paediatric weight-band dosing tables for specific conditions are contained in an appendix. Where a specific condition is not indicated in the appendix, refer to the STGs in the main text of the book for the dosing specific to that condition.

Prescription Writing

Medicines should be prescribed only when they are necessary for treatments following clear diagnosis. Not all patients or conditions need prescriptions for medication. In certain conditions simple advice and general and supportive 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, in the case of children, weight of the patient;
have contact details of the prescriber e.g. name and telephone number.

In all prescription writing the following should be noted:

» The name of the medicine or preparation should be written in full using the generic name.

» No abbreviations should be used due to the risk of misinterpretation. Avoid the Greek mu (ų): 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 .5ml.

» 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,
  • e.g. 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 scripts for chronic medication are for 28 days; check that the patient will be able to access a repeat before the 28 days are completed.

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

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

Barriers that contribute toward poor adherence

---

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

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

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

Towards concordance when prescribing
Establish the patient’s:
» occupation,
» daily routine,
» recreational activities,
» past experiences with other medicines, and
» expectations of therapeutic outcome.
Balance these against the therapeutic alternatives identified based on clinical findings. Any clashes between the established routine and lifestyle with the chosen therapy should be discussed with the patient in such a manner that the patient will be motivated to change their lifestyle.

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

Education points to consider
» Focus on the positive aspects of therapy 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.
» Do not change doses without good reason.
» Never blame anyone or anything for non-adherence before fully investigating the cause.
» If the clinical outcome is unsatisfactory - investigate adherence (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 which deteriorates further on a 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**

<table>
<thead>
<tr>
<th>Self-Reporting Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you sometimes find it difficult to remember to take your medicine?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When you feel better, do you sometimes stop taking your medication?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thinking back over the past four days, have you missed any of your doses?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes if you feel worse when you take the medicine, do you stop taking it?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Visual Analogue Scale (VAS)**

<table>
<thead>
<tr>
<th>Score ____.%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Pill Identification Test (PIT)**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Knows the name (Y/N)</th>
<th>Knows the number of pills per dose (Y/N)</th>
<th>Time the medication is taken</th>
<th>Considered Acceptable (Y/N)</th>
<th>Knows any additional instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Morning (hour)</td>
<td>Evening (hour)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Pill Count**
Did the client return the medication containers?

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

\[
\text{Dispensed} - \text{Returned} \quad \text{X 100} = \quad \text{Expected to be taken} \quad \text{X 100} = \quad \%
\]

<table>
<thead>
<tr>
<th>Adherence Assessment</th>
<th>Answered ‘No’ to all questions</th>
<th>Answered ‘Yes’ to 1 question</th>
<th>Answered ‘Yes’ to 2 or more questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-reporting</td>
<td>~ 95%</td>
<td>75–94%</td>
<td>Less than 75%</td>
</tr>
<tr>
<td>VAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIT—Client knows the...</td>
<td>Dose, Time, and Instructions</td>
<td>Dose and Time</td>
<td>Dose only or confused</td>
</tr>
<tr>
<td>Pill count</td>
<td>~ 95%</td>
<td>75–94%</td>
<td>Less than 75%</td>
</tr>
<tr>
<td>Overall Adherence</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
</tbody>
</table>
Chapter 1: Dental and oral conditions

1.1 Abscess and caries, dental
   1.1.1 Abscess, dental
   1.1.2 Caries, dental

1.2 Candidiasis, oral (thrush)

1.3 Gingivitis and periodontitis
   1.3.1 Gingivitis, uncomplicated
   1.3.2 Periodontitis
   1.3.3 Necrotising periodontitis

1.4 Herpes simplex infections of the mouth and lips

1.5 Aphthous ulcers

1.6 Teething, infant
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 chewing
» pus collection and drainage either intra-orally or on the face

MEDICINE TREATMENT
Initiate treatment before referral:
Children
- Amoxicillin, oral, 10–20 mg/kg 8 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;11–25 kg</td>
<td>250 mg</td>
<td>10 mL 5 mL 1 cap –</td>
<td>&gt;8 months–7 years</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>500 mg</td>
<td>– – 2 caps 1 cap</td>
<td>&gt;7 years</td>
</tr>
</tbody>
</table>

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

AND

Children
- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.6.

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

Penicillin allergy:
Children < 18 kg
- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18-35 kg (able to take tablets)
- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

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

**Children**
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

**Adults**
- Paracetamol, oral, 1 g 6 hourly when required.

**REFERRAL**
All cases.

**1.1.2 CARIES, DENTAL**
K02

To be managed by a dentist.

For local anaesthesia for dental procedures:
- Lidocaine (Dentist only).
- Lidocaine with epinephrine (adrenaline) (Dentist only).

**1.2 CANDIDIASIS, ORAL (THRUSH)**
B37.0

**DESCRIPTION**
A candida infection of the mouth and sometimes of the pharynx. Commonly presents as painful creamy white patches that can be scraped off the tongue and buccal mucosa. Often occurs in healthy babies up to one month of age.

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

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

**MEDICINE TREATMENT**
- Nystatin suspension, oral, 100 000 IU/mL, 1 mL 6 hourly after each meal/feed for 7 days.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
In older children, ask the child to swirl in the mouth, prior to swallowing.

In infants, advise mothers to apply to front of the mouth and spread over the oral mucosa with a clean finger.

Continue for 48 hours after cure.

Note: Oesophageal involvement in HIV infected patients with oral candidiasis who have pain or difficulty when swallowing requires fluconazole. See Section 11.3.3: Candida oesophagitis.

**REFERRAL**

- No improvement.
- Uncertain diagnosis.
- Pharyngeal or oesophageal involvement.

### 1.3 GINGIVITIS AND PERIODONTITIS

#### 1.3.1 GINGIVITIS, UNCOMPLICATED

**K05.1/K05.0**

**DESCRIPTION**

An inflammation of the gum margin causing the gums to separate from the teeth. Pockets (recesses) form between the gums and the teeth. Pus and bacteria can collect in these pockets, eventually causing periodontitis. See section 1.3.2: Periodontitis.

Characteristics of uncomplicated gingivitis:

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

**PROPHYLAXIS AND GENERAL MEASURES**

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

- Oral hygiene after each meal to remove plaque and food debris.
- Brush teeth twice daily.
- Floss teeth at least once daily.
- Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).

**MEDICINE TREATMENT**

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

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

**Note:** Do not eat or drink immediately after this.

LoE: III
1.3.2 PERIODONTITIS

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

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

MEDICINE TREATMENT
Brush, floss, rinse mouth with water and then rinse with:
• Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  o Do not swallow.
  Note: Do not eat or drink immediately after this.

Pain:
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required.

1.3.3 NECROTISING PERIODONTITIS

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

GENERAL MEASURES
» Relieve pain.
» Improve oral hygiene.
CHAPTER 1
DENTAL AND ORAL CONDITIONS

MEDICINE TREATMENT

Children
- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.6.

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

Brush, floss, rinse mouth with water and then rinse with:
- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.
  - Note: Do not eat or drink immediately after this.

Pain:

Children
- Paracetamol, oral, 10-15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

All cases for dental treatment.

1.4 HERPES SIMPLEX INFECTIONS OF THE MOUTH AND LIPS
B00.2

DESCRIPTION

Acute, painful vesicular eruptions of the lips or ulcerations of the lips and mouth caused by Herpes simplex virus and characterised by:
- shallow painful ulcers on the lips, gingiva and tongue
- pain exacerbated on eating

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

GENERAL MEASURES

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

MEDICINE TREATMENT

Children
- Paracetamol, oral, 10-15 mg/kg/dose 6 hourly when required. See dosing table, pg 227.
CHAPTER 1 DENTAL AND ORAL CONDITIONS

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

Extensive oral herpes:
For children > 6 years and adults
- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.
**Note:** Safety in children < 6 years of age has not been established.

The following patients should be treated with aciclovir:
- Children with extensive oral herpes **provided treatment can be started within 72 hours of onset of symptoms.**
- HIV infected patients with *Herpes simplex* of the lips or mouth.

Children < 15 years of age
- Aciclovir, oral, 250 mg/m\(^2\)/dose, 8 hourly for 7 days. See dosing table, pg 22.1.

Children > 15 years of age and adults
- Aciclovir, oral, 400 mg, 8 hourly for 7 days.

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

1.5 APTHOUS 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. Major ulcers usually indicate advanced HIV infection.

MEDICINE TREATMENT
Minor aphthous ulcers:
Children < 6 years of age
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Children > 6 years of age and adults
- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.
**Note:** Safety in children < 6 years of age has not been established.

**REFERRAL**
Major ulcers for further diagnostic evaluation.
1.6 TEETHING, INFANT

K00.7

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

Symptoms often associated with teething include:
- fretfulness
- biting or chewing on hard objects
- drooling, which may often begin before teething starts
- gum swelling and tenderness
- refusing food
- sleeping problems

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

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

GENERAL MEASURES
Teething is a normal physiological process, simple self-care measures are recommended.
- Gentle massage to the gum or biting on objects (such as teething rings) may produce relief by producing counter-pressure against the gums (beware of choking risks).
- Cold objects may help to ease symptoms.

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

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

1Chlorhexidine.DRUGDEX® Drug Point, 2009.
Chapter 2: Gastro-intestinal conditions

2.1 Abdominal pain
2.2 Dyspepsia, heartburn and indigestion, in adults
2.3 Gastro-oesophageal reflux/disease, in infants
2.4 Nausea and vomiting, non-specific
2.5 Anal conditions
   2.5.1 Anal fissures
   2.5.2 Haemorrhoids
   2.5.3 Perianal abscesses
2.6 Appendicitis
2.7 Cholera
2.8 Constipation
2.9 Diarrhoea
   2.9.1 Diarrhoea, acute in children
   2.9.2 Diarrhoea, persistent in children
   2.9.3 Diarrhoea, acute, without blood in adults
   2.9.4 Diarrhoea, chronic in adults
2.10 Dysentery
   2.10.1 Dysentery, bacillary
2.11 Helminthic infestation
   2.11.1 Helminthic infestation, tapeworm
   2.11.2 Helminthic infestation, excluding tapeworm
2.12 Irritable bowel syndrome
2.13 Typhoid fever
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 conditions.

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

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

MEDICINE TREATMENT
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, in adults.

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

Renal and biliary colic or acute surgical abdomen:
- Morphine, IM/IV, 10 mg as a single dose and refer (Doctor initiated).
  For IV morphine:
  o Dilute in 10 mL sodium chloride 0.9%.
  o Administer slowly over 5 minutes.

Abdominal cramp-like pains:
- Hyoscine butylbromide, oral, 10 mg 6 hourly for a maximum of 3 days.
CHAPTER 2  
GASTRO-INTESTINAL CONDITIONS

Cancer pain e.g. pancreatic, gastric cancer
See Section 20.3: Chronic cancer pain.

REFERRAL
» Severe pain that cannot be managed at primary health care level.
» Signs of acute abdomen.
» Associated bloody non-diarrhoeal stools.
» Associated abdominal mass.

2.2 DYSPEPSIA, HEARTBURN AND INDIGESTION, IN ADULTS
K30/R12

DESCRIPTION
Dyspepsia, heartburn and indigestion are common conditions. These conditions often present with epigastric discomfort and minimal change in bowel habits. Intermittent indigestion, heartburn or dyspepsia may be associated with:
» use of NSAIDs e.g. aspirin, ibuprofen, pain powders
» spicy food, alcohol, carbonated drinks
» smoking

Note: Dyspeptic symptoms may possibly be due to acute coronary syndrome.

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

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

REFERRAL
» Presence of warning signs:
  - weight loss
  - persistent vomiting
  - dysphagia
  - anaemia
  - haematemesis
  - palpable abdominal mass
» No response within 7 days of starting proton-pump treatment.
» Recurrence of symptoms, especially:
  - > 50 years of age
  - previous gastric surgery
  - family history of gastric carcinoma
2.3 GASTRO-OESOPHAGEAL REFLUX/DISEASE IN INFANTS

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

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

GENERAL MEASURES
In the absence of referral criteria (features of GORD), no medicine treatment is required. Counselling and non-medicinal measures are suggested:
» Explain that GOR is common and resolves in the majority of children by the age of 12–18 months.
» Upright positioning after feeds.

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

2.4 NAUSEA AND VOMITING, NON-SPECIFIC

DESCRIPTION
There are many possible causes of nausea and vomiting.

Some important causes to exclude are:
» gastro-intestinal disease
» liver disease
» renal failure
» alcohol abuse
» early pregnancy
» medicines

Establish if the vomiting is associated with:
» abdominal pain
» diarrhoea
» headache
» constipation

GENERAL MEASURES
» Maintain adequate hydration with clear fluids. See Section 2.9: Diarrhoea.
» In children, do not stop feeds for more than 1 hour. Restart feeds in smaller and more frequent amounts.
MEDICINE TREATMENT

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

Adults
- Metoclopramide, IM/IV/oral, 10 mg 8 hourly.

REFERRAL

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

2.5 ANAL CONDITIONS

2.5.1 ANAL FISSURES

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

GENERAL MEASURES
Dietary advice to promote soft stools.

MEDICINE TREATMENT

Children
- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 22.5.
  o If poor response, increase frequency to 12 hourly.

Adult
- Lactulose, oral, 10–20 mL once daily.
  o If poor response, increase frequency to 12 hourly.

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.
  OR
  Lidocaine 2%, cream, topical, applied before and after each bowel action.

REFERRAL
» Severe pain.
» Recurrent episodes.
» Poor response to symptomatic treatment.
2.5.2 HAEMORRHOIDS

I84.9

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

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

MEDICINE TREATMENT
Symptomatic treatment for painful haemorrhoids:
• Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.
  OR
  Bismuth subgallate compound suppositories, insert one into the rectum 3 times daily.
  OR
  Lidocaine 2%, cream, topical, applied before and after each bowel action.

Constipation
See Section 2.8: Constipation.

REFERRAL
» For surgical intervention if necessary:
  – if the haemorrhoid cannot be reduced
  – if the haemorrhoid is thrombosed
  – poor response to conservative treatment
» Children.

2.5.3 PERIANAL ABSCESSES
K61.0

An abscess forming adjacent to the anus.
Caused by organisms spreading through the wall of the anus into peri-anal soft tissues.
Treatment is by surgical drainage.

2.6 APPENDICITIS
K37

REFERRAL
» All patients with suspected appendicitis:
  – right iliac fossa tenderness
  – right iliac fossa rebound pain
  – severe persistent abdominal pain
2.7 CHOLERA
A00.9

Note: notifiable condition.

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

Note: Prevent and treat dehydration.

GENERAL MEASURES
Rehydrate aggressively with oral rehydration solution (ORS).

MEDICINE TREATMENT

Treat dehydration

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

In all children who are able to take oral medication
- Zinc (elemental), oral for 14 days:
  - If < 10 kg give 10 mg/day.
  - If > 10 kg give 20 mg/day.

Adults
Oral treatment:
- ORS.

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

Oral rehydration is preferred. In stuporose patients administer ORS by nasogastric tube.

IV treatment:
- Sodium chloride 0.9%, IV.

Antibiotic treatment

Children
- Ciprofloxacin, oral, 20 mg/kg as a single dose immediately. (Ciprofloxacin is specifically used for this indication in children).
### 2.8 Constipation

#### K59.0

**DESCRIPTION**

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

Constipation may have many causes, including:

- incorrect diet (insufficient fibre and fluid)
- pregnancy
- medicines, e.g. opiates and anticholinergic
- hypothyroidism
- lower bowel abnormalities
- chronic use of enemas and laxatives
- behavioural problems in children

**CAUTION**

In adults be especially suspicious of a change in bowel habits, as there may be 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.
CHAPTER 2  

GASTRO-INTESTINAL CONDITIONS

» Ensure adequate hydration.
» Encourage regular bowel habits.
» Discourage continuous use of laxatives.

MEDICINE TREATMENT

Children > 12 months of age
• Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables, pg 22.5.
  o If poor response, increase frequency to 12 hourly.

Adults and children > 15 years of age
• 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 adults.

REFERRAL

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

2.9 DIARRHOEA

A09

CAUTION

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

2.9.1 DIARRHOEA, ACUTE IN CHILDREN

A09.0

DESCRIPTION

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

Special risk situations

Diarrhoea in:
» Infants < 4 weeks.
» Malnourished babies.
» Babies with other danger signs such as:
- convulsions
- altered level of consciousness
- persistent vomiting/vomiting everything
- respiratory distress
- persistent diarrhoea
- hypothermia
- surgical abdomen
- blood in stool in babies < 1 year of age

**Note:** Refer these babies urgently for treatment.

Before referral, begin management for dehydration (see below), and administer:
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

### CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

### Special types of diarrhoea
- Bloody diarrhoea: consider dysentery. See Section 2.10: Dysentery.
- Diarrhoea with high fever or very ill: consider typhoid. See Section 2.13: Typhoid fever.
- Persistent diarrhoea, > 14 days: refer patient.
- Diarrhoea in children in the context of an adult epidemic: consider cholera. See Section 2.7: Cholera.
## Treatment according to hydration classification

Assess hydration and begin hydration (Plan A, B and C) based on this assessment.

<table>
<thead>
<tr>
<th></th>
<th>Plan C Severe dehydration</th>
<th>Plan B Some dehydration</th>
<th>Plan A No visible dehydration</th>
</tr>
</thead>
</table>
| **Classification** | 2 of the signs below:  
» lethargic or unconscious  
» eyes sunken  
» drinks poorly or not able to drink  
» severe decrease in skin turgor (skin pinch returning ≥ 2 seconds) | 2 of the signs below, but not severe dehydration:  
» restless or irritable  
» eyes sunken  
» thirsty, drinks eagerly  
» moderate decrease in skin turgor - by slow skin pinch, returning in < 2 seconds | Only one or none of the signs of dehydration. |
| **Treatment** | Give rapidly:  
• Sodium chloride 0.9%, IV, 20 mL/kg.  
  ○ If signs of acute severe malnutrition decrease the bolus to 10 mL/kg over 10 minutes.  
  ○ 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 further management, continuing with 20 mL/kg every hour for the next 5 hours. | 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 | » Show the caregiver how to give ORS with a cup and spoon using frequent small sips.  
» Encourage caregiver to give:  
• ORS, oral, 10 mL/kg after each diarrhoeal stool until diarrhoea stops.  
  ○ child ≤2 years of age: 50–100 mL  
  ○ child >2 years of age: 100–200 mL  
» Continue at home.  
» Encourage the caregiver to continue feeding the child, especially |
<table>
<thead>
<tr>
<th>Treatment</th>
<th>2.12 Treatment hours unless the child is reclassified as B: Some dehydration.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>» Reassess every 2 hours while awaiting transfer.</td>
</tr>
<tr>
<td></td>
<td>» If hydration status does not improve, give IV fluids more rapidly.</td>
</tr>
<tr>
<td></td>
<td>» As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give:</td>
</tr>
<tr>
<td></td>
<td>• ORS, oral,</td>
</tr>
<tr>
<td></td>
<td>» 5 mL/kg/hour.</td>
</tr>
<tr>
<td></td>
<td>» If IV administration is not possible, insert a nasogastric tube. While awaiting, and during urgent transfer, give:</td>
</tr>
<tr>
<td></td>
<td>• ORS, NG, 20 mL/kg/hour over the next 6 hours.</td>
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<td></td>
<td>» If only oral administration is possible, or the condition is not improving, transfer the child urgently. While awaiting, and during urgent transfer, give:</td>
</tr>
<tr>
<td></td>
<td>• ORS, oral, 20 mL/kg/hour</td>
</tr>
<tr>
<td></td>
<td>» Reassess and reclassify the child every 4 hours.</td>
</tr>
<tr>
<td></td>
<td>If improves reclassify as B: Some dehydration and treat accordingly.</td>
</tr>
</tbody>
</table>

2.12 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. 

breastfeeding. » Instruct the caregiver how to make ORS/SSS at home and to continue treatment.
CHAPTER 2 GASTRO-INTESTINAL CONDITIONS

Child should return immediately if:
» condition does not improve  » fever develops
» condition deteriorates  » eyes sunken
» poor drinking or feeding  » slow skin pinch
» blood in stool

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 is recommended for home use and to prevent dehydration.

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

REFERRAL
» Severe dehydration.
» Dysentery in children < 12 months of age.
» Malnourished children.
» Children with general danger signs, e.g.:
  – convulsions
  – altered level of consciousness
  – intractable vomiting
  – suspected acute surgical abdomen
  – inability to feed or drink

2.9.2 DIARRHOEA, PERSISTENT IN CHILDREN
A09.0

DESCRIPTION
Diarrhoea for 7–14 days.

GENERAL MEASURES
» Assess for possible HIV infection, and manage appropriately.
» Prevent dehydration using homemade sugar and salt solution.
» Counsel mother regarding feeding.
  – If breastfeeding, give more frequent, longer feeds.
  – If replacement feeding, replace milk with breast milk or with fermented milk products such as amasi (maas) or yoghurt, if available.
  – Continue with solids: give small, frequent meals at least 6 times a day.
» Follow up 5 days later. If diarrhoea persists, refer to doctor.
MEDICINE TREATMENT

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months old</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months to 5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

Administration of a vitamin A capsule

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

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

REFERRAL

- Child < 2 months of age.
- Signs of dehydration. See Section 2.9.1: Diarrhoea, acute in children.
- Malnutrition or weight loss.
- Diarrhoea that persists for > 5 days with treatment.
- Diarrhoea present for > 14 days.

2.9.3 DIARRHOEA, ACUTE, WITHOUT BLOOD, IN ADULTS
K52.9

DESCRIPTION

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

MEDICINE TREATMENT

Treat dehydration vigorously.

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

Homemade sugar and salt solution (SSS)

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

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool
CHAPTER 2  GASTRO-INTESTINAL CONDITIONS

2.15 up to 6 hourly.
   o Not more than 12 mg daily.

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

2.9.4 DIARRHOEA, CHRONIC, IN ADULTS
K52.9

DESCRIPTION
Diarrhoea lasting > 2 weeks.
The majority of cases may be HIV related. Encourage HIV testing.
Send a stool sample for microscopy for ova, cysts and parasites.

Note: Do not request culture and sensitivity of the stool sample. Giardiasis is a
common cause of chronic diarrhoea in adults, and may be difficult to diagnose on
stools. Therefore empiric treatment for giardiasis is recommended before referring
such patients.

MEDICINE TREATMENT
Giardiasis
   • Metronidazole, oral, 2 g daily for 3 days.
     o Avoid alcohol.

Chronic diarrhoea in HIV/AIDS
See Section 11.3.6: Diarrhoea, HIV associated.

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

2.10 DYSENTERY
A06.0

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

REFERRAL
   » No response to treatment.
   » Abdominal distension.
   » Intussusception.
2.10.1 DYSENTERY, BACILLARY
A03.0/ A02.0

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 mucous in the stools
» convulsions (in children)
» fever
» tenesmus

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

MEDICINE TREATMENT
Treat dehydration vigorously.

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

Adults
Oral treatment:
• Oral rehydration solution (ORS).
OR
Homemade sugar and salt solution.

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

Oral rehydration volume will depend on the severity of the dehydration.
IV treatment:
• Sodium chloride 0.9%, IV.

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

Children
• Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days. See dosing tables, pg 22.3.
Children < 12 months of age

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.

Annotate the dosage and route of administration in the referral letter.

Adults

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

**Note:**

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

**REFERRAL**

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

**2.11 HELMINTHIC INFESTATION**

B82.0

**2.11.1 HELMINTHIC INFESTATION, TAPEWORM**

B81.4

**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*
CHAPTER 2  
GASTRO-INTESTINAL CONDITIONS

Signs and symptoms include:
» vague abdominal pain  
» diarrhoea  
» flat white worm segments seen in the stool  
(blunt ended)

GENERAL MEASURES
Health education about adequate preparation and cooking of meat.

MEDICINE TREATMENT
If the patient has diarrhoea, wait for it to settle.
• Albendazole, oral, daily for 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.

2.11.2 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 (growth faltering). The infestations are often asymptomatic.

<table>
<thead>
<tr>
<th>Type of worm</th>
<th>Description</th>
<th>Signs and symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Roundworm</strong></td>
<td>» Long pink/white worms with sharp ends.</td>
<td>» Cough.</td>
</tr>
<tr>
<td><em>Ascaris lumbricoides</em></td>
<td>» Up to 25–30 cm long.</td>
<td>» If there is vomiting consider intestinal obstruction.</td>
</tr>
<tr>
<td></td>
<td>» Often seen in the stools and vomitus.</td>
<td></td>
</tr>
<tr>
<td><strong>Pinworm</strong></td>
<td>» White and thread-like.</td>
<td>» Anal itching – worse at night.</td>
</tr>
<tr>
<td><em>Enterobius vermicularis</em></td>
<td>» Up to 10 mm long.</td>
<td>» Sleeplessness.</td>
</tr>
<tr>
<td></td>
<td>» Often seen in the stools.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Self-infection common.</td>
<td></td>
</tr>
<tr>
<td><strong>Hookworm</strong></td>
<td>» Up to 8 mm long.</td>
<td>» No symptoms or pain.</td>
</tr>
<tr>
<td><em>Necator americanus</em></td>
<td></td>
<td>» Anaemia.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Whipworm</strong></td>
<td>» Up to 5 cm long.</td>
<td>» No symptoms.</td>
</tr>
<tr>
<td><em>Trichuris trichiura</em></td>
<td>» Anterior half thinner than posterior half.</td>
<td>» Abdominal pain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Diarrhoea.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Possible anaemia and rectal prolapse.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Abdominal discomfort.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Weight loss.</td>
</tr>
</tbody>
</table>
CHAPTER 2

GASTRO-INTESTINAL CONDITIONS

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

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

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

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

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

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

GENERAL MEASURES
For patients with an established diagnosis:
» Reassure patient that there is no serious organic disorder.
» High fibre/bran diets may be tried for patients with constipation.
  – warn about temporary increased flatus and abdominal distension.
  – High fibre/bran diets are not effective for Global IBS (i.e. all symptoms).
» Dietary advice by dietician.
CHAPTER 2 GASTRO-INTESTINAL CONDITIONS

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

- Laxatives only for constipation-specific IBS. See Section 2.8: Constipation.
- Anti-diarrhoeals only for diarrhoea-specific IBS. See Section 2.9: Diarrhoea.

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

2.13 TYPHOID FEVER
A01.0
Note: notifiable condition.

DESCRIPTION
A septicemic illness with fever caused by the micro-organism Salmonella typhi. The cause of the fever is difficult to diagnose except in an epidemic. It may present with:
» acute abdomen. See Section 2.1: Abdominal pain
» prolonged or high fever in a previously healthy individual
» fever with a slower pulse rate than expected
» headache and convulsions
» constipation during the first week
» diarrhoea may occur later in the illness and may be accompanied by frank bleeding
» diagnosis is confirmed only by stool culture or blood tests

MEDICINE TREATMENT
Treat dehydration if present and refer.

REFERRAL
Urgent
All cases or suspected cases.

\[\begin{align*}
\text{\textsuperscript{i} Morphine: SAMF 10\textsuperscript{th} edition, 2012.} \\
\text{\textsuperscript{ii} Proton pump inhibitor: Sigterman KE, van Pinxteren B, Bonis PA, Lau J, Numans ME. Short-term treatment with proton pump inhibitors, H2-receptor antagonists and prokinetics for gastro-oesophageal reflux disease-like symptoms and endoscopy negative reflux disease. Cochrane Database Syst Rev. 2013 May 31;5:CD002095.} \\
\end{align*}\]


Chapter 3: Blood and nutritional conditions

3.1 Anaemia
   3.1.1 Anaemia, iron deficiency
   3.1.2 Anaemia, macrocytic or megaloblastic

3.2 Childhood malnutrition, including not growing well
   3.2.1 Severe acute malnutrition (SAM)
      3.2.1.1 Complicated SAM
      3.2.1.2 Uncomplicated SAM
   3.2.2 Not growing well (including failure to thrive/growth faltering)

3.3 Vitamin A deficiency

3.4 Vitamin B deficiencies
   3.4.1 Vitamin B₃/Nicotinic acid deficiency (Pellagra)
   3.4.2 Vitamin B₆/Pyridoxine deficiency
   3.4.3 Vitamin B₁/Thiamine deficiency (Wernicke encephalopathy and beriberi)
3.1 ANAEMIA
D50.9/D50-D53

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 such as HIV, TB, malignancy.
» Blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, abnormal menstruation.

Other causes include:
» Vitamin B\textsubscript{12} deficiency.
» Infiltration or replacement of the bone marrow.
» Abnormal Hb or red cells.
» Haemolysis.

DIAGNOSIS

<table>
<thead>
<tr>
<th>Hb less than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>women</td>
</tr>
<tr>
<td>12 g/dL or 11 g/dL in pregnancy</td>
</tr>
<tr>
<td>men</td>
</tr>
<tr>
<td>13 g/dL</td>
</tr>
<tr>
<td>children 1–5 years of age</td>
</tr>
<tr>
<td>10 g/dL</td>
</tr>
<tr>
<td>children &gt; 5 years of age</td>
</tr>
<tr>
<td>11 g/dL</td>
</tr>
</tbody>
</table>

Children < 5 years of age
Anaemia is most often due to iron deficiency. See Section 3.1.1: Anaemia, iron deficiency.

Children > 5 years of age and adults
Request a full blood count.
» If MCV is normal (normocytic):
   – then systemic disease is the most likely cause.
» If MCV is low (microcytic):
   – then iron deficiency is the most likely cause.
» If MCV is high (macrocytic):
   – then folate and/or vitamin B\textsubscript{12} deficiency is the most likely cause.

Pregnant women
See Section 6.2.3: Anaemia in pregnancy.

REFERRAL
» Unknown cause.
» Symptomatic 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.
» Evidence of acute blood loss or bleeding disorder.
» Menorrhagia or dysfunctional uterine bleeding.
» Blood in stool or melaena.
CHAPTER 3  BLOOD AND NUTRITIONAL CONDITIONS

» Pregnant women > 34 weeks of gestation and Hb < 7 g/dL.
» Children with Hb ≤ 7 g/dL. (If Hb cannot be done, look for severe palmar pallor).
» Anaemia associated with other abnormalities on FBC or smear.
» No improvement despite correct treatment.

3.1.1 ANAEMIA, IRON DEFICIENCY
D50.9

DESCRIPTION
A common cause of anaemia in younger children and women of childbearing age.
A full blood count showing a low MCV suggests the diagnosis of iron deficiency anaemia. A full blood count is not required for children, unless referral criteria above are present.

Note: Iron deficiency anaemia in children > 5 years of age, adult males and non-menstruating women, is generally due to occult or overt blood loss. Refer all cases for investigation and treatment of the underlying cause.

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

MEDICINE TREATMENT
Treatment
Children < 5 years of age
• Iron, oral, 1–2 mg/kg/dose of elemental iron 8 hourly with meals.
  o Follow up Hb after 14 days.
    » If Hb is lower than before, refer.
    » If Hb is the same/higher, continue treatment and repeat after another 28 days.
    » Continue treatment for 3 months after Hb normalises.
  LoE: II

Empirical treatment for worms (this will not treat tapeworm)
• Mebendazole, oral.
  o Children 1–2 years: 100 mg 12 hourly for 3 days.
  o Children > 2–5 years: 500 mg as a single dose.

Adults
• Ferrous sulphate compound BPC, oral, 170 mg (± 65 mg elemental iron) 8 hourly with food.
  LoE: II
CHAPTER 3  BLOOD AND NUTRITIONAL CONDITIONS

3.4

**OR**

Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 8 hourly with food.

- Follow up at monthly intervals
- The expected response is an increase in Hb of ≥ 2 g/dL in 4 weeks.
- Continue for 3–6 months after the Hb normalises in order to replenish body iron stores.
- Do not take iron tablets within 4 hours of taking calcium tablets.

**Pregnant women**

See Section 6.2.3: Anaemia in pregnancy.

**Prophylaxis**

**Infants from 6 weeks:**

If < 2.5 kg at birth:

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

**OR**

Ferrous gluconate syrup, oral, 0.8 mL daily until 6 months of age.

**CAUTION**

Iron is extremely toxic in overdose, particularly in children.

Store all medication out of reach of children.

**REFERRAL**

» As in Section 3.1: Anaemia.

» Children > 5 years of age, men and non-menstruating women.

» No or inadequate response to treatment.

3.1.2 ANAEMIA, MACROCYTIC OR MEGALOBLASTIC

D52.0/D53.1

**DESCRIPTION**

Anaemia with large red blood cells is commonly due to folate or vitamin B$_{12}$ deficiency. Folate deficiency is common in pregnant women and in the postpartum period. Macrocytic anaemia in these women can be assumed to be due to folate deficiency and does not require further investigation. See Section 6.2.3: Anaemia in pregnancy. Vitamin B$_{12}$ deficiency occurs mainly in middle-aged or older adults, and can cause neurological damage if not treated. Macrocytic anaemia outside of pregnancy or the postpartum period requires further investigations to establish the cause.

**INVESTIGATIONS**

FBC will confirm macrocytic anaemia.

» MCV will be elevated.

» White cell count and/or platelet count may also be reduced.

» If there is a poor response to folate, a serum vitamin B$_{12}$ should be done.
Note: Zidovudine and stavudine cause elevated MCV. Zidovudine often causes anaemia and/or decreased white cell count. It is not necessary to measure folate and B\textsubscript{12} if the patient is not anaemic.

GENERAL MEASURES

» Dietary advice: Increase intake of folic acid rich foods such as:
  – Liver, eggs, fortified breakfast cereals, citrus fruit, spinach and other green vegetables, lentils, dry beans, peanuts.
  – Reduce alcohol intake.

» Vitamin B\textsubscript{12} deficiency anaemia:
  – High protein diet is recommended (1.5 g/kg/day).
  – Increase intake of dietary vitamin B\textsubscript{12} sources, including meat (especially liver), eggs and dairy products.

MEDICINE TREATMENT

Folic acid deficiency:
• Folic acid, oral, 5 mg daily until Hb is normal.
  o Check Hb monthly.

Folic acid given to patients with vitamin B\textsubscript{12} deficiency can mask vitamin B\textsubscript{12} deficiency and eventually leads to neurological damage, unless vitamin B\textsubscript{12} is also given.

REFERRAL

» Patients with suspected vitamin B\textsubscript{12} deficiency.
» Chronically diarrhoea.
» Poor response within a month of treatment.
» Macrocytic anaemia, of unknown cause.

3.2 CHILDHOOD MALNUTRITION, INCLUDING NOT GROWING WELL

E40–E46

In all children, check for malnutrition and anaemia:
» Plot the weight on the Road to Health chart/booklet.
» Look at the shape of the weight curve:
  - is the weight curve rising parallel to the reference lines?
  OR
  - is it flattening?
  OR
  - is there weight loss?
» Look for visible wasting.
» Look and feel for oedema of both feet.
» Look for palmar pallor.
» Check Hb if anaemia is suspected.
3.2.1 SEVERE ACUTE MALNUTRITION (SAM)  
E40–E43

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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measure</th>
<th>Cut-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe wasting</td>
<td>Weight-for-Height Z-score (WHZ)</td>
<td>&lt; –3</td>
</tr>
<tr>
<td></td>
<td>Mid Upper Arm Circumference (MUAC)</td>
<td>&lt; 115 mm</td>
</tr>
<tr>
<td>Bilateral nutritional oedema</td>
<td>Clinical signs of nutritional oedema*</td>
<td></td>
</tr>
</tbody>
</table>

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

» **Severe underweight**
  - WHZ < –3 (usually clinically reflective of marasmus) where no other explanation is present, and/or
  - clinically severe wasting (usually clinically reflective of marasmus – thin arms, thin legs, "old man" appearance, baggy pants folds around buttocks, wasted buttocks).

» **Nutritional oedema** *supported by findings of skin changes, fine pale sparse hair, enlarged smooth soft liver, moon face.

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

3.2.1.1 COMPLICATED SAM  
E40–E43

DESCRIPTION
Any child with SAM who has any **ONE** of the following features:

» < 6 months of age or weighs < 4 kg.
» Pitting oedema.
» Refusing feeds or is not eating well.
» Any of the danger signs listed below.

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

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

Initiate treatment while waiting for transport to hospital.
GENERAL MEASURES

» Keep the child warm.

» Test for and prevent hypoglycaemia in all children.

If the child is able to swallow:

– If breastfed: ask the mother to breastfeed the child, or give expressed breastmilk.

– If not breastfed: give a breastmilk substitute (F-75). Give 30–50 mL before the child is referred.

– If no breastmilk substitute is available, give 30–50 mL of sugar water. To make sugar water: Dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of clean water.

– Repeat 2 hourly until the child reaches hospital.

If the child is not able to swallow:

– Insert a nasogastric tube and check the position of the tube.

– Give 50 mL of milk or sugar water by nasogastric tube (as above).

If blood sugar < 3 mmol/L treat with:

• 10% Glucose:
  o Nasogastric tube: 10 mL/kg.
  o Intravenous line: 2 mL/kg.

CAUTION

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

MEDICINE TREATMENT

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

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

• Amoxicillin, oral, 30 mg/kg as a single dose. See dosing table, pg 22.1.

If the child has any danger signs:

• Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose and refer. See dosing table, pg 22.2.
  o Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.
Give an additional dose of Vitamin A:
- Vitamin A (retinol), oral.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

**3.2.1.2 UNCOMPPLICATED SAM**
E40–E43

**DESCRIPTION**
Children with SAM who meet the following criteria:
- The child is > 6 months of age and weight > 4 kg, and
- There is no pitting oedema, and
- The child is alert (not lethargic), and
- The child has a good appetite and is feeding well, and
- The child does not have any danger signs or severe classification.

All cases require careful assessment for possible TB or HIV.

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

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

Give an additional dose of Vitamin A:
- Vitamin A (retinol), oral.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

- Multivitamin, oral, daily.

**Empiric treatment for worms:**
- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.
CHAPTER 3  
BLOOD AND NUTRITIONAL CONDITIONS

3.9  
REFERRAL  
» When RUTF cannot be provided and follow-up on an ambulatory (outpatient) basis is not possible.  
» The child develops pitting oedema or any of the danger signs (see above).  
» Failure to gain weight despite provision of nutritional supplements.

3.2.2 NOT GROWING WELL (INCLUDING FAILURE TO THRIVE/ GROWTH FALTERING)  
R62.8  
DESCRIPTION  
Children and infants who have either:  
» Unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health chart/booklet.  
OR  
» Low weight for age, i.e. WHZ < –2 but > –3

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

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

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

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

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

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

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

CONDITIONS WHICH JUSTIFY RECOMMENDING THAT MOTHERS DO NOT BREASTFEED
Infants with a small number of metabolic diseases qualify to receive specialised infant formula. These infants should be managed in tertiary centres. Maternal medical condition that may justify temporary or permanent avoidance of breastfeeding:
» Severe illness that prevents a mother from caring for her infant, for example sepsis, renal failure.
» Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother’s breasts and the infant’s mouth should be avoided until all active lesions have resolved.
» Maternal medications: sedating psychotherapeutic medicines, anti-epileptic medicines and opioids (may cause drowsiness and respiratory depression in the infant), radioactive iodine-131, excessive use of topical iodine or iodophors (especially on open wounds or mucous membranes), cytotoxic chemotherapy.

Infants who qualify to receive infant formula as part of the supplementation scheme
» The mother has died or infant has been abandoned.
» Other individual circumstances deemed necessary by a multidisciplinary team.

MEDICINE TREATMENT
• Multivitamin, oral, daily.

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 > 2–5 years: 500 mg as a single dose.

• Vitamin A (retinol), oral.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>
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 1–5 years of age. If associated with measles and diarrhoea there is an increased risk of illness and death. If not identified and treated early, it can cause blindness.

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

GENERAL MEASURES
Dietary supplementation with vitamin A rich food including:
- fortified maize meal and/or bread, fortified margarine
- carrots, sweet potato, mangoes and pawpaw, broccoli, sprouts
- dark green leafy vegetables e.g. morogo/imifino and spinach
- apricots, melon, pumpkin
- liver, eggs, full cream milk and fish

MEDICINE TREATMENT
Prophylaxis
• Vitamin A (retinol), oral, every 6 months up to the age of 5 years.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

Treatment
Children 0–5 years of age, with:
» severe under nutrition/malnutrition
» persistent diarrhoea
» any of the clinical signs of vitamin A deficiency
» measles
3.12

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

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose Units (IU)</th>
<th>Capsule 100 000 IU</th>
<th>Capsule 200 000 IU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant &lt; 6 months</td>
<td>50 000</td>
<td>½ capsule</td>
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</tr>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td></td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsule</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

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

Children > 5 years of age and adults with:
- any clinical signs of vitamin A deficiency
- measles

**Note:**
- 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 vitamin A supplements.

**REFERRAL**
All complicated cases.

### 3.4 VITAMIN B DEFICIENCIES

**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.

**MEDICINE TREATMENT**
For all forms of vitamin B deficiencies:
- Vitamin B complex, oral, 2 tablets 3 times daily for one week, then 1 tablet daily for 3 months.

**LoE: III**
3.4.1 VITAMIN B₃/NICOTINIC ACID DEFICIENCY (PELLAGRA) E52

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

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

MEDICINE TREATMENT
For severe deficiency
Children
- Nicotinamide, oral, 50 mg 8 hourly for one week.

Adults
- Nicotinamide, oral, 100 mg 8 hourly for one week.

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

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

REFERRAL
Failure to respond.

3.4.2 VITAMIN B₆/PYRIDOXINE DEFICIENCY E53.1

DESCRIPTION
Commonly presents as signs of peripheral neuropathy including:
- tingling sensation
- burning pain or numbness of the feet

Pyridoxine deficiency is related to:
- malnutrition

LoE: III"
» alcoholism
» isoniazid or combination TB therapy

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

MEDICINE TREATMENT
For deficiency
Children
• Pyridoxine, oral, 12.5 mg daily for 3 weeks.

Adults
• Pyridoxine, oral, 25 mg daily for 3 weeks.

For medicine-induced neuropathy
Children
• Pyridoxine, oral, 50 mg daily for 3 weeks.

Adults
• Pyridoxine, oral, 200 mg daily for 3 weeks.
Then follow with:
• Pyridoxine, oral, 25 mg daily as maintenance dose (for patients on TB therapy/isoniazid).

REFERRAL
» Failure to respond.
» Children.

3.4.3 VITAMIN B₁/THIAMINE DEFICIENCY (WERNICKE ENCEPHALOPATHY AND BERIBERI)

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

LoE:III³
CHAPTER 3  BLOOD AND NUTRITIONAL CONDITIONS

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

GENERAL MEASURES
» Lifestyle adjustment including discouraging of alcohol abuse.
» Dietary advice to increase intake of thiamine rich foods such as:
  - Wholewheat breads, oatmeal
  - Pulses, nuts, yeast
  - Fortified cereals
  - Pork, bacon and marmite
  - Potatoes and peas

MEDICINE TREATMENT
Peripheral neuropathy and cardiac failure
• Thiamine, oral, 100 mg daily.

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

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

Chapter 4: Cardiovascular conditions

4.1 Prevention of ischaemic heart disease and atherosclerosis
4.2 Angina pectoris, stable
4.3 Angina pectoris, unstable/ Non ST elevation myocardial infarction (NSTEMI)
4.4 Myocardial Infarction, acute (AMI)/ ST elevation myocardial infarction (STEMI)
4.5 Cardiac arrest, cardiopulmonary resuscitation
4.6 Cardiac failure, congestive (CCF)
   4.6.1 Cardiac failure, congestive (CCF), adults
   4.6.2 Cardiac failure, congestive (CCF), children
4.7 Hypertension
   4.7.1 Hypertension in adults
   4.7.2 Hypertension in children
4.8 Pulmonary oedema, acute
4.9 Rheumatic fever, acute
4.10 Valvular heart disease and congenital structural heart disease
4.1 PREVENTION OF ISCHAEMIC HEART DISEASE ANDATHEROSCLEROSIS

I25.1

Major risk factors for ischaemic cardio- and cerebrovascular disease:
» diabetes mellitus
» hypertension
» central obesity: waist circumference ≥ 94 cm (men) and ≥ 80 cm (women)
» smoking
» dyslipidaemia (fasting levels):
  – total cholesterol > 5 mmol/L, or
  – LDL > 3 mmol/L, or
  – HDL < 1 mmol/L in men and < 1.2 mmol/L in women
» family history of early onset cardiovascular disease in male relatives < 55 years of age and in female relatives < 65 years of age
» age: men > 55 years of age, women > 65 years of age

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 kg/m²
» weight reduction in the overweight patient, i.e. BMI > 25 kg/m²
» reduce alcohol intake to ≤ 2 standard drinks/day for men and ≤ 1 for women on no more than 5 out of 7 days per week (1 standard drink is equivalent to 25 mL of spirits, 125 mL of wine, 340 mL of beer or sorghum beer, or 60 mL of sherry)
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with adequate fresh fruit and vegetables
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week (150 minutes/week)
» stop smoking
Calculation of risk of developing cardiovascular events over 10 years (in the absence of cardiovascular disease)

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

### SECTION A

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>30–34</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35–39</td>
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<td>2</td>
</tr>
<tr>
<td>40–44</td>
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<td>4</td>
</tr>
<tr>
<td>45–49</td>
<td>6</td>
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</tr>
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</tr>
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<td>55–59</td>
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</tr>
<tr>
<td>60–64</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>65–69</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>70–74</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>75–79</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total cholesterol (mmol/L)</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4.1–5.19</td>
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<td>1</td>
</tr>
<tr>
<td>5.2 – 6.19</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.2–7.2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>&gt;7.2</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HDL cholesterol (mmol/L)</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1.5</td>
<td>−2</td>
<td>−2</td>
</tr>
<tr>
<td>1.3–1.49</td>
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<td>−1</td>
</tr>
<tr>
<td>1.2–1.29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.9–1.119</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&lt;0.9</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoker Diabetic*</th>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Diabetic*</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Type 2 diabetics > 40 years of age qualify for statin therapy irrespective of risk score.
### CHAPTER 4

#### CARDIOVASCULAR CONDITIONS

### 4.4 MEN WOMEN

<table>
<thead>
<tr>
<th>Systolic BP (mmHg)</th>
<th>MEN Untreated</th>
<th>MEN Treated</th>
<th>WOMEN Untreated</th>
<th>WOMEN Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;120</td>
<td>−2</td>
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<td>120–129</td>
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<td>130–139</td>
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<td>140–149</td>
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<td>150–159</td>
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<tr>
<td>≥160</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>7</td>
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</table>

### SECTION B

#### Total points

<table>
<thead>
<tr>
<th>MEN</th>
<th>10-year risk %</th>
<th>WOMEN</th>
<th>10-year risk %</th>
</tr>
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<td>≤−3</td>
<td>&lt;1</td>
<td>≤−2</td>
<td>&lt;1</td>
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</tr>
<tr>
<td>0</td>
<td>1.6</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
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<td>1.9</td>
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<td>1.7</td>
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<td>4</td>
<td>2.4</td>
</tr>
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<td>3.3</td>
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<td>3.9</td>
<td>6</td>
<td>3.3</td>
</tr>
<tr>
<td>6</td>
<td>4.7</td>
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<td>7</td>
<td>5.6</td>
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</tr>
<tr>
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<td>15.6</td>
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<td>18.4</td>
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<td>21.6</td>
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<td>25.3</td>
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<td>18.5</td>
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<tr>
<td>17</td>
<td>29.4</td>
<td>18</td>
<td>21.5</td>
</tr>
<tr>
<td>≥18</td>
<td>&gt;30</td>
<td>19</td>
<td>24.8</td>
</tr>
</tbody>
</table>

### MEDICINE TREATMENT

**Indication for lipid lowering medicine therapy**

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

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

» Type 2 diabetics > 40 years of age, or diabetes for > 10 years, or have existing
cardiovascular disease, or chronic kidney disease (eGFR < 60 mL/min).

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

- A risk of MI > 20% in 10 years (see table above).
- Such high-risk patients will benefit from lipid lowering (statin) therapy irrespective of their baseline LDL levels.

**Note:** When lipid-lowering medicines 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 at night.

**Lipid lowering medicine therapy for patients taking protease inhibitors**

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

**REFERRAL**

- Random cholesterol > 7.5 mmol/L.
- Fasting (14 hours) triglycerides > 10 mmol/L.

### 4.2 ANGINA PECTORIS, STABLE

**DESCRIPTION**

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

**GENERAL MEASURES**

MEDICINE TREATMENT (Doctor initiated)

Long-term prophylaxis for thrombosis:
- Aspirin soluble, oral, 150 mg daily.

AND
- Nitrates, short acting e.g.:
  - Isosorbide dinitrate, sublingual, 5 mg.
    - May be repeated if required at 5–10 minute intervals for 3 doses.

AND

Step 1
- Atenolol, oral, 50–100 mg daily.
  - Titrate to resting heart rate of approximately 60 beats/minute.
  - If ß-blocker cannot be tolerated or is contraindicated, consider long acting calcium channel blocker.

Step 2
ADD
- Long acting calcium channel blocker e.g.:
  - Amlodipine, oral, 5 mg daily.

Step 3
ADD
- Isosorbide mononitrate, oral, 10–20 mg twice daily.

OR
- Isosorbide dinitrate, oral, 20–40 mg twice daily.
  - At 8:00 and 14:00 hours for both medicines in order to provide a nitrate free period to prevent tolerance.
  - Modify for night shift workers.

Angina is a high-risk condition for cardiovascular disease and is an indication for a statin for patients with proven lesions.
- HMGCoA reductase inhibitors, e.g.:
  - Simvastatin, oral, 10 mg at night.
Therapy should be initiated with appropriate lifestyle modification and adherence support.

REFERRAL
- When diagnosis is in doubt.
- Failed medical therapy.

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

DESCRIPTION
Unstable angina is a medical emergency and if untreated can progress to NSTEMI. Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:
» angina at rest or minimal effort
» angina occurring for the first time, particularly at rest
» prolonged angina > 10 minutes, not relieved by sublingual nitrates
» the pattern of angina accelerates and gets worse

**DIAGNOSIS**
» Made from good history.
» ECG may show ST segment depression or transient ST segment elevation.
» Abnormal ECG does not exclude the diagnosis.

**MEDICINE TREATMENT**
- Oxygen 40% via facemask, if saturation < 92% or if in distress.
- Aspirin soluble, oral, 300mg immediately, as a single dose.
- Isosorbide dinitrate, sublingual, 5 mg immediately and then repeat once if necessary for pain relief.
- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  - Can be repeated after 4–6 hours if necessary, for pain relief.
  - Beware of hypotension.

Unstable angina is a high-risk condition for cardiovascular disease and is an indication for a statin for patients with proven lesions.
- HMGCoA reductase inhibitors, e.g.:
  - Simvastatin, oral, 10 mg, at night.
- 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 with lifestyle modification and adherence support.

**REFERRAL**
**Urgent**
All suspected or diagnosed cases.

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

**DESCRIPTION**
AMI/STEMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and intensive care management.
The major clinical feature is severe chest pain with the following characteristics:

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

May be associated with:

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

**Note**: Not all features have to be present.

**EMERGENCY TREATMENT**

**Before transfer**

- Cardio-pulmonary resuscitation if necessary (See Section 21.6: Cardiac arrest – cardiopulmonary resuscitation).

- **Oxygen**: 40% via facemask, if saturation < 92% or if in distress.

- **Aspirin soluble**, oral, 300 mg as a single dose (chewed or dissolved) as soon as possible.

- **Isosorbide dinitrate**, sublingual, 5 mg, every 5–10 minutes as needed for relief of pain to a maximum of 3 tablets.

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

- **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, once diagnosed, preferably within the first 3 hours.

<table>
<thead>
<tr>
<th>Indications</th>
<th>Contra-indications</th>
</tr>
</thead>
</table>
| **For acute myocardial infarction with ST elevation:**
  - if history of onset is < 6 hours, or
  - if on-going ischaemic pain, or
  - for new left bundle branch block. | **Absolute:**
  - streptokinase used within the last year,
  - previous allergy,
  - CVA within the last 3 months,
  - history of recent major trauma,
  - serious bleeding within the last month,
  - aneurysms,
  - brain or spinal surgery or head injury within the preceding month, or
  - active bleeding or known bleeding disorder. |
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Relative:
» refractory hypertension,
» warfarin therapy,
» recent retinal laser treatment,
» subclavian central venous catheter,
» pregnancy,
» TIA in the preceding 6 months, or
» traumatic resuscitation.

For the full list of contra-indications refer to the package insert for streptokinase.

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

Monitor the following, 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 cardiovascular disease and is an indication for a statin for patients with proven lesions.
- HMGCoA reductase inhibitors, e.g.:
  - Simvastatin, oral, 10 mg at night.
- Statin 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 with appropriate lifestyle modification and adherence support.

REFERRAL
Urgent
All suspected or diagnosed cases.

4.5 CARDIAC ARREST, CARDIO-PULMONARY RESUSCITATION
See Chapter 21: Trauma and emergencies.
4.6 CARDIAC FAILURE, CONGESTIVE (CCF)

4.6.1 CARDIAC FAILURE, CONGESTIVE (CCF), ADULTS

I50.0

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

Signs and symptoms include:

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

GENERAL MEASURES

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

MEDICINE TREATMENT

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

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

**STEP 1: Diuretic plus ACE-inhibitor**

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

- Hydrochlorothiazide, oral, 25–50 mg daily.

Significant volume overload or abnormal renal function – loop diuretic

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

Acute pulmonary oedema

- Furosemide, IV. See Section 21.16: 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.
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All patients with CCF, unless contraindicated or poorly tolerated

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

  \[\text{STEP 2: After titration of ACE-inhibitor, add carvedilol (α-1 and non-selective β-blocker) unless contra-indicated.} \]
  \(\text{(Refer to package insert for full prescribing information).}\)

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

\[\text{Note: Do not use atenolol for cardiac failure.}\]

\[\text{OR}\]

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

\[\text{CAUTION}\]

Spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored.
Do not use together with potassium supplements.
\[\text{Do not use in kidney failure (Do not use if eGFR < 30 mL/min).}\]
**STEP 3:** Add spironolactone, if patient remains symptomatic despite optimal therapy AND if serum potassium can be monitored.

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

**CAUTION**

Spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored. Do not use together with potassium supplements. **Do not use in kidney failure (Do not use if eGFR < 30 mL/min).**

**OR**

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

**STEP 4:**

Symptomatic CCF despite above-mentioned therapy

Refer to hospital for step up therapy with digoxin.

**CAUTION**

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

**REFERRAL**

**Urgent**

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

**Non urgent**

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

### 4.6.2 CARDIAC FAILURE, CONGESTIVE (CCF), CHILDREN

**I50.0**

**DESCRIPTION**

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

**Signs and symptoms**

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

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

**GENERAL MEASURES**

**While arranging transfer:**
- Oxygen, using nasal cannula at 2–3 L per minute.
  - OR
    - Oxygen 40%, using face mask at 2–3 L per minute.
    - Semi-Fowlers position.

**Note:** If hypertensive, consider glomerulonephritis in children.

**MEDICINE TREATMENT**

While arranging transfer:
- If CCF is strongly suspected
  - Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing tables, pg 22.4.
    - Do not put up a drip or run in any IV fluids.

**REFERRAL**

All children with suspected congestive cardiac failure.

**4.7 HYPERTENSION**

**4.7.1 HYPERTENSION IN ADULTS**

**DESCRIPTION**

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

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

» Systolic BP ≥ 140 mmHg and/or
» Diastolic BP ≥ 90 mmHg.

**LEVELS OF HYPERTENSION IN ADULTS**

<table>
<thead>
<tr>
<th>Level of hypertension</th>
<th>Systolic mmHg</th>
<th>Diastolic mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>mild</td>
<td>140–159</td>
<td>90–99</td>
</tr>
<tr>
<td>moderate</td>
<td>160–179</td>
<td>100–109</td>
</tr>
<tr>
<td>severe</td>
<td>≥180</td>
<td>≥110</td>
</tr>
</tbody>
</table>

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

**GENERAL MEASURES**

All patients with hypertension require lifestyle modification:

» weight loss if overweight
» stop smoking
» restrict salt intake
» regular physical exercise (150 minutes/week)
» avoid excessive alcohol intake
» restrict fat intake

**MEDICINE TREATMENT**

Initial medicine choices in patients qualifying for treatment are dependent on presence of compelling indications.

**Medicine 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 medicine therapy.

**Presence of risk factors**

Medicine therapy as well as lifestyle modification should be initiated after confirmation of diagnosis (Step 2).

**Moderate hypertension**

Diagnosis must be confirmed within 2 weeks. Initiate treatment after confirmation of diagnosis (medicine and lifestyle modification) at Step 2.

**Severe hypertension**

Confirm diagnosis within 1 hour.

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

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

**Special cases**

**Pregnancy-induced hypertension:**

See Section 6.2.2 Hypertensive disorders of pregnancy.

**Asymptomatic severe hypertension**

» These patients have severe hypertension, are asymptomatic and have no
evidence of progressive target organ damage.

» Observe the patient in the health care setting and repeat BP measurement after the patient has rested for 1 hour.

» If the second measurement is still elevated at the same level, start oral treatment with 2 agents (Step 3), one of which should be low dose hydrochlorothiazide and the second medicine is usually a calcium channel blocker, e.g. amlodipine.

» Patient should be followed up within a week.

» Refer to doctor if BP > 160/100 mmHg after 4 weeks.

**Hypertensive urgency**

» Most affected adults have a systolic BP > 220 mmHg and/or diastolic BP > 120 mmHg.

» Patients are symptomatic, usually with severe headache, shortness of breath and oedema.

» Treatment should be commenced with 2 oral agents (Step 3) with the aim to lower diastolic BP to 100 mmHg slowly, over 48–72 hours.

» Amlodipine and furosemide or hydrochlorothiazide should be used, if there is renal insufficiency or evidence of pulmonary congestion (See Section 4.6.1: Cardiac failure, congestive (CCF), adults).

» All patients with hypertensive urgency should be referred to a hospital.

**Hypertensive emergency**

» A markedly elevated BP: systolic BP > 180 mmHg and/or a diastolic BP > 130 mmHg associated with ≥ 1 of the following:
  - unstable angina/chest pain
  - neurological signs, e.g. severe headache, visual disturbances, confusion, coma or seizures
  - pulmonary oedema
  - renal failure

**MEDICINE TREATMENT**

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

If pulmonary oedema:

- Furosemide, IV, 40 mg as a single dose (See Section 21.16: Pulmonary oedema, acute).

**CAUTION**

A hypertensive emergency needs immediate referral to hospital.

**REFERRAL**

**Urgent**

All patients.

**Stroke**

BP is often elevated in acute stroke and should only be treated if it persists > 2 days or is severely elevated. Diastolic BP > 120 mmHg. Reduce BP gradually.
**Elderly**
In patients without co-existing disease, initiate medicine treatment only when the BP > 160/90 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.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower BP over a few days.</td>
</tr>
<tr>
<td>A sudden decrease in BP can be dangerous, especially in the elderly.</td>
</tr>
</tbody>
</table>

**Stepwise treatment without compelling indications**

**STEP 1**

<table>
<thead>
<tr>
<th>Entry to Step 1</th>
<th>Treatment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Diastolic BP 90–99 mmHg and/or systolic BP 140–159 mmHg without any existing disease <strong>AND</strong> » No major risk factors.</td>
<td>» Lifestyle modification.</td>
<td>» BP control within 3 months to BP &lt; 140/90 mmHg.</td>
</tr>
</tbody>
</table>

**STEP 2**

<table>
<thead>
<tr>
<th>Entry to Step 2</th>
<th>Treatment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Diastolic BP 90–99 mmHg and systolic BP 140–159 mmHg without any existing disease <strong>AND</strong> » No major risk factors <strong>AND</strong> » Failure of lifestyle modification alone to reduce BP after 3 months <strong>OR</strong> Mild hypertension with major risk factors or existing disease <strong>OR</strong> Moderate hypertension at diagnosis.</td>
<td>» Lifestyle modification <strong>AND</strong> • Hydrochlorothiazide, oral, 12.5 mg daily.</td>
<td>» BP control within 1 month to BP &lt; 140/90 mmHg.</td>
</tr>
</tbody>
</table>
### STEP 3

<table>
<thead>
<tr>
<th>Entry to Step 3</th>
<th>Treatment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy. OR Severe hypertension.</td>
<td>» 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.</td>
<td>» BP control within 1 month to BP &lt; 140/90 mmHg.</td>
</tr>
</tbody>
</table>

### STEP 4

<table>
<thead>
<tr>
<th>Entry to Step 4</th>
<th>Treatment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Failure of step 3 after 1 month of adherence.</td>
<td>» Lifestyle modification AND • Hydrochlorothiazide, oral, 12.5 mg daily AND • ACE-inhibitor, e.g.: • Enalapril, increase to 20 mg daily AND • Long acting calcium channel blocker, e.g.: amlodipine, oral 5 mg daily.</td>
<td>» BP control within 1 month to BP &lt; 140/90 mmHg, with no adverse medicine reactions.</td>
</tr>
</tbody>
</table>

### STEP 5

<table>
<thead>
<tr>
<th>Entry to Step 5</th>
<th>Treatment</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Failure of step 4 after 1 month of adherence.</td>
<td>» Lifestyle modification AND • Hydrochlorothiazide, oral, increase to 25 mg daily. AND • ACE-inhibitor, e.g.: • Enalapril, 20 mg daily. AND • Long acting calcium</td>
<td>» BP control within 1 month to BP &lt; 140/90 mmHg, with no adverse medicine reactions.</td>
</tr>
</tbody>
</table>
channel blocker, e.g. amlodipine, oral 10 mg daily.

**AND ADD**
- Atenolol, oral, 50 mg daily.

If not controlled on step 5 – Refer

<table>
<thead>
<tr>
<th>Compelling indications for specific medicines</th>
<th>Medicine/therapeutic class</th>
</tr>
</thead>
</table>
| Angina                                       | • ß-blocker
   **OR**
   Long acting calcium channel blocker       |
| Prior myocardial infarction                 | • ß-blocker
   **AND**
   • ACE-inhibitor                           |
| Heart failure                               | • ACE-inhibitor
   **AND**
   • Carvedilol.
   **OR**
   Spironolactone                            |
   For significant 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 microalbuminurinra 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 medicines**

**Hydrochlorothiazide**
- gout
- pregnancy
- severe liver failure
- kidney failure
CHAPTER 4

CARDIOVASCULAR CONDITIONS

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 < 50 beats/minute

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

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

Calcium channel blockers, long acting
» heart failure

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

4.7.2 HYPERTENSION IN CHILDREN

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

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

Infants and preschool-aged children are almost never diagnosed with essential hypertension and are most likely to have secondary forms of hypertension.
With age, the prevalence of essential hypertension increases, and after 10 years of age, it becomes the leading cause of elevated BP. Obesity currently is emerging as a common comorbidity of essential hypertension in paediatric patients, often manifesting during early childhood.

**DIAGNOSIS**

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


**REFERRAL**

All cases with BP above the 95th percentile.

**4.8 PULMONARY OEDEMA, ACUTE**

See Section 21.16: Pulmonary oedema, acute.

**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, 3–15 years of age. Recurrences are frequent. Clinical signs and symptoms include:

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

**Eradication of streptococci in throat:**
- Benzathine benzylpenicillin, IM, single dose.
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline) or 3 mL water for injection.
  
  OR
  - Phenoxymethylpenicillin, oral, 12 hourly for 10 days.
    - Children < 30 kg: 250 mg
    - Children ≥ 30 kg and adults: 500 mg

**Penicillin allergy:**
- Children ≤ 18 kg
  - Macrolide, e.g.:
    - Erythromycin, oral, 125 mg, 6 hourly before meals for 10 days. See dosing table, pg 22.4.
- Children > 18–35 kg (able to take tablets)
  - Macrolide, e.g.:
    - Azithromycin, oral, 250 mg daily for 3 days.
- Children > 35 kg and adults
  - Macrolide, e.g.:
    - Azithromycin, oral, 500 mg daily for 3 days.

**Prophylaxis for rheumatic fever:**
- All patients with confirmed rheumatic fever and no persistent rheumatic valvular disease:
  - Treat for 10 years or until the age of 21 years, whichever is longer.
- All patients with confirmed rheumatic fever and persistent rheumatic valvular disease:
  - Treat lifelong.
- Benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks).
  - Children < 30 kg: 600 000 IU
  - Children ≥ 30 kg and adults: 1.2 MU
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline).

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

**OR**

4.21
Phenoxymethylpenicillin, oral, 12 hourly.
- **Children:** 125 mg
- **Adults:** 250 mg

**Penicillin allergy:**
*Children ≤ 11 years of age*
- Macrolide, e.g.:
  - Erythromycin, oral, 125 mg, 12 hourly before meals.

*Children > 11 years of age and adults*
- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily.

**REFERRAL**
All patients for diagnosis and management.

### 4.10 VALVULAR HEART DISEASE AND CONGENITAL STRUCTURAL HEART DISEASE

#### DESCRIPTION
Damage to heart valves, chamber or vessel wall anomalies caused by rheumatic fever or other causes, e.g. congenital heart defects and ischaemic heart disease. May be complicated by:
- **heart failure**
- **atrial fibrillation**
- **infective endocarditis**
- **systemic embolism**

#### GENERAL MEASURES
- Advise all patients with a heart murmur regarding 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.

#### MEDICINE 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 (maximum dose: 2 g), 1 hour before the procedure.
  - Repeat dose 6 hours later.

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
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<tbody>
<tr>
<td>&lt; 5 years of age</td>
<td>750 mg</td>
</tr>
<tr>
<td>5–10 years of age</td>
<td>1 500 mg</td>
</tr>
<tr>
<td>≥ 10 years of age</td>
<td>2 g</td>
</tr>
</tbody>
</table>
Penicillin allergy:  
Refer.

If anaesthetic is required:  
Refer.

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

REFERRAL

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

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Simvastatin: Cochrane centre: E-mail correspondence of 21January 2014.


**CHAPTER 4**

**CARDIOVASCULAR CONDITIONS**

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Chapter 5: Skin Conditions

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  5.15 Warts
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    5.15.4 Genital warts: Condylomata accuminata
  5.16 Psoriasis
  5.17 Hidradenitis suppurativa
5.1 DRY SKIN

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

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

5.2 ITCHING (PRURITUS)

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

GENERAL MEASURES
- Trim fingernails.
- Avoid scratching.

MEDICINE TREATMENT
Diagnose and treat the underlying condition.
- Calamine lotion, apply when needed.

For pruritis associated with dry skin:
- Emollient, e.g.:
- Emulsifying ointment (UE).

Severe pruritus:
For short term use:
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

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

For long term use e.g. for chronic pruritus:
Children: 2–6 years of age
  • Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.
Children > 6 years of age and adults
  • Cetirizine, oral, 10 mg once daily.

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

5.3 ACNE VULGARIS
L70.0

DESCRIPTION
Acne is an inflammatory condition of the hair follicle. It is caused by hormones and sebum gland keratinisation, leading to follicular plugging producing comedones and proliferation of Propionibacterium acnes. Occurs more commonly in adolescence, but may also occur in adulthood. Distributed on face, chest and back. Ranges in severity from mild, with a few blackheads, to severe with nodules and cysts. Severe forms may be seen in HIV disease and itching may be a feature. May also occur as a result of the inappropriate use of topical steroids or as a side effect of medicine e.g. INH therapy.

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

MEDICINE TREATMENT
Many pustules
  • Benzoyl peroxide 5%, gel, apply at night to affected areas as tolerated.
    - Wash off in the morning.
    - If ineffective and tolerated, increase application to 12 hourly.
    - Avoid contact with eyes, mouth, angles of the nose and mucous membranes.

CAUTION
Limit exposure to sunlight.

  • Doxycycline, oral, 100 mg daily for 3 months.
Poor response to benzoyl peroxide:

- Topical retinoids, e.g.:
  - Tretinoin 0.05% cream, topical, apply once daily at bedtime until substantial improvement, for at least 6 weeks. (Doctor initiated)
    - Apply sparingly.

**CAUTION**

Do not use if pregnant or planning pregnancy.
Limit exposure to sunlight.

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5.4 BACTERIAL INFECTIONS OF THE SKIN

5.4.1 BOIL, ABSCESS

**DESCRIPTION**

Localised bacterial skin infection of hair follicles or dermis, usually with *S. aureus*.
The surrounding skin becomes:

- swollen
- hot
- red
- tender to touch

**Note:**

- Check blood glucose level if diabetes suspected or if the boils are recurrent.
- Boils in diabetic or immunocompromised patients require careful management.
- Axillary abscesses and pustules (See Section 5.17: Hidradenitis suppurativa).

**GENERAL MEASURES**

- Encourage general hygiene.
- Drainage of abscess is the treatment of choice.
- Perform surgical incision only when the lesion is fluctuant.

**MEDICINE TREATMENT**

**Systemic antibiotics are seldom necessary, except if there are:**

- swollen lymph nodes in the area
- extensive surrounding cellulitis
- fever
- boils on the face

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

**Children ≤ 7 years of age**

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.
  **OR**
  - Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children > 7 years of age and adults**

- Cephalexin, oral, 500 mg 6 hourly for 5 days.
  **OR**
  - Flucloxacillin, oral, 500 mg 6 hourly for 5 days.
Penicillin allergy:
Children ≤ 18 kg
- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)
- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

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

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

5.4.2 IMPETIGO
L01.0

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

Clinical features:
- starts as blisters containing pus
- subsequently becomes eroded producing honey-coloured crusts
- commonly starts on the face or buttocks
- spreading to neck, hands, arms and legs

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

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

MEDICINE TREATMENT
- Povidone iodine 5%, cream or 10% ointment, apply 8 hourly.
AND
Children ≤ 7 years of age
• Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.
OR
Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults
• Cephalexin, oral, 500 mg 6 hourly for 5 days.
OR
Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Penicillin allergy:
Children ≤ 18 kg
• Macrolide, e.g.:
  • Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)
• Macrolide, e.g.:
  • Azithromycin, oral, 250 mg daily for 3 days.

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

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

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

5.4.3 CELLULITIS
L03.9

DESCRIPTION
A diffuse, spreading, acute infection within skin and soft tissues, commonly caused by streptococci and staphylococci.
Characterised by:
» oedema                       » redness
» increased local temperature  » no suppuration
Frequently associated with lymphangitis and regional lymph node involvement.
Commonly occurs on the lower legs, but may occur elsewhere.
May follow minor trauma.
There may be significant systemic manifestations of infection:
» fever                      » tachycardia                    » hypotension
» chills                     » delirium/ altered mental state
May present as an acute fulminant or chronic condition.

**GENERAL MEASURES**

Elevate the affected limb to reduce swelling and discomfort.

**MEDICINE TREATMENT**

**Children ≤ 7 years of age**

- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.
  **OR**
  - Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children > 7 years of age and adults**

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

**Penicillin allergy:**

**Children ≤ 18 kg**

- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children > 18–35 kg (able to take tablets)**

- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

**Children > 35 kg and adults**

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

**Severe cases:**

Refer for parenteral antibiotics.

**REFERRAL**

**Urgent**

- Children who have significant pain, swelling or loss of function (to exclude osteomyelitis).
- Necrosis.
- Extensive cellulitis.
- Recurrent cellulitis associated with underlying conditions, e.g. lymphoedema.
- Cellulitis with systemic manifestations, e.g. confusion, hypotension.
- Poorly controlled diabetic patients.
- Involvement of the hand, face and scalp.

**Non-urgent**

- Inadequate response to initial antibiotic treatment.
5.4.4 CHRONIC LOWER LIMB ULCERS
L97.8

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

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

MEDICINE TREATMENT
Refer for assessment and initiation of treatment.

Local wound care:
Use bland, non-toxic products to clean the ulcer and surrounding skin.
- Sodium chloride 0.9%.

For venous ulcers:
- Paraffin gauze dressing.

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

5.5 FUNGAL INFECTIONS OF THE SKIN

5.5.1 CANDIDIASIS, SKIN
B37.2

Vaginal candidiasis: See Section 12.1: Vaginal discharge syndrome (VDS).
CHAPTER 5
SKIN CONDITIONS

5.10 DESCRIPTION
A skin infection caused by *C. albicans*.
Most common sites for infection are skin folds such as:

» under the breasts
» natal cleft
» axillae
» groins
» nail folds
» neck folds, peri-anal, perineum and groins in infants

The skin lesions or sores:

» Are red raw-looking patches.
» Appear moist (weeping).
» Have peripheral outlying white pustules, red scaly lesions which become confluent.

GENERAL MEASURES
Exclude diabetes.

MEDICINE TREATMENT

- Imidazole, e.g.:
  - Clotrimazole 2% cream, apply three times daily for 14 days.

5.5.2 RINGWORM AND OTHER TINEAS
B35.9

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

5.5.2.1 RINGWORM – *TINEA CORPORIS*
B35.4

DESCRIPTION
Clinical features include:

» itchy ring-like patches
» raised borders
» patches slowly grow bigger

As the patch extends a clear area develops in the center which may become hyper-pigmented in dark skin.

Extensive disease is common in HIV, often with no evidence of the patches developing clear centres.

GENERAL MEASURES

» Prevent spreading the infection to others.

» Do not share:
  - clothes
  - towels
  - toiletries, especially combs and hair brushes
Wash skin well and dry before applying medicine treatment.

**MEDICINE TREATMENT**

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

**REFERRAL**

Extensive disease.

### 5.5.2.2 ATHLETE'S FOOT – *TINEA PEDIS*

**DESCRIPTION**

A common contagious fungal infection of the foot, characterised by itching, burning and stinging between the toes or the sole.

The skin between the toes is moist and white (maceration) and may become fissured. There is also associated erythema, scaling and peeling.

Secondary eczema of the hands may be an associated condition. See Section 5.8.1: Eczema, atopic.

Vesicles may occur in inflammatory cases.

Pain and tenderness in the web spaces may indicate secondary bacterial infection. Re-infection is common.

**GENERAL MEASURES**

» Discourage the use of shared bathing or swimming areas, whilst infected.

» Keep feet dry:
  - wear open sandals
  - do not wear socks of synthetic material
  - dry between toes after washing the feet or walking in water
  - wash and dry feet twice daily before applying medicine treatment

**MEDICINE TREATMENT**

- Imidazole cream, e.g.:
- Clotrimazole 2%, apply twice daily for 4 weeks.

**REFERRAL**

No improvement after 4 weeks.

### 5.5.2.3 SCALP INFECTIONS – *TINEA CAPITIS*

**DESCRIPTION**

Round or patchy bald areas with scales and stumps of broken off hair.
CHAPTER 5  SKIN CONDITIONS

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

MEDICINE TREATMENT
For scalp infections:
Children
• Fluconazole, oral, 6 mg/kg once daily, for 28 days. See dosing table, pg 22.4.  
Adults
• Fluconazole, oral, 200 mg once daily, for 28 days.

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

5.5.2.4 PITYRIASIS VERSICOLOR – TINEA VERSICOLOR
B36.0

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

GENERAL MEASURES
Avoid wearing heavy clothing in hot weather to reduce perspiration.

MEDICINE TREATMENT
Oral antifungal therapy is not indicated.
• Selenium sulphide, 2.5% suspension, apply daily for 7 days.
  o Lather shampoo on affected parts.
  o Leave on for 30 minutes, then wash off.

5.5.2.5 NAIL INFECTIONS – TINEA UNGUIUM
See Section 5.6.3 Nail infections – tinea unguium.

5.6 NAIL AND NAILFOLD INFECTIONS
B37.2

5.6.1 PARONYCHIA, CHRONIC
B37.2

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

**GENERAL MEASURES**
» Avoid hand contact with household detergents, washing powders and softeners.
» Patients to wear rubber gloves when washing clothes, linen and kitchen utensils.

**MEDICINE TREATMENT**
- Imidazole, e.g.:
  - Clotrimazole 2% cream, topical, apply 4–6 hourly until lesions have cleared.
    - After washing hands, massage cream into the nailfold.

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

**REFERRAL**
No response to treatment.

### 5.6.2 PARONYCHIA, ACUTE

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

**GENERAL MEASURES**
» Avoid cutting finger nails too short.
» Avoid nail biting.

**MEDICINE TREATMENT**
Drain abscess by puncture or incision.

**Adults**
- Flucloxacillin 500 mg 6 hourly for 5 days.

**REFERRAL**
Only patients that are distressed by cosmetic appearance.

### 5.6.3 NAIL INFECTIONS – *TINEA UNGUIUM*

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

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

**REFERRAL**
Only patients that are distressed by cosmetic appearance.
5.7 PARASITIC INFESTATIONS OF THE SKIN

5.7.1 LICE (PEDICULOSIS)

DESCRIPTION
An infestation of the body with parasitic lice.
Clinical features include:
» itching
» bite marks
» presence of secondary eczema and secondary infection

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

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

5.7.1.1 HEAD LICE

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

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

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

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

### 5.7.1.2 BODY LICE

Body lice live in the seams of clothing and only come to the skin to feed.

**Note:** Body lice may carry typhus fever.

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

**MEDICINE TREATMENT**

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

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

### 5.7.1.3 PUBIC LICE

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

**GENERAL MEASURES**
Prevent spread by treating other contacts.

**MEDICINE TREATMENT**

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

  **Note:**
  - Do not apply to neck and face.
  - Avoid contact with eyes and broken skin or sores.
  - The lotion is toxic if swallowed.
  - Do not continue if a rash or swelling develops.
  - Itching may continue for 2–3 weeks after treatment.
SECTION 5.16: Pubic lice.

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

5.7.2 SCABIES
B86

DESCRIPTION
An infestation with the parasite *Sarcoptes scabei*. Commonly occurs in the skin folds. The infestation spreads easily, usually affecting more than one person in the household.

Clinical features include:
» intense itching, which is more severe at night
» small burrows between fingers, toes, elbow areas and buttocks where the parasite has burrowed under the skin
» secondary infection which may occur due to scratching with dirty nails
» in small babies, there are often vesicles and pustules on the palms and soles and sometimes on the scalp

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

MEDICINE TREATMENT

Adults and children > 6 years of age
- Benzyl benzoate 25% lotion, applied undiluted to the whole body from neck to feet on 2 consecutive days.
  o Leave on overnight and wash off the next day.

If benzyl benzoate is unsuccessful:
- Permethrin 5% lotion, applied undiluted to the whole body from neck to feet.
  o Leave on overnight (8–12 hours) and wash off the following morning.

Children < 6 years of age
- Permethrin 5% lotion, applied undiluted to the whole body from neck to feet.
  o Leave on overnight (8–12 hours) and wash off the following morning.

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

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

5.7.3 SANDWORM
B76.0

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

MEDICINE TREATMENT
- Albendazole, oral, daily for 3 days.
  - Children ≤ 2 years of age: 200 mg
  - Children >2 years of age and adults: 400 mg

Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

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

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

5.8 ECZEMA AND DERMATITIS
L20.9/B00.0

5.8.1 ECZEMA, ATOPIC
L20.9

DESCRIPTION
An allergic disorder with an itchy red rash or dry rough skin.
In babies it appears at approximately 3 months.
Family history of asthma, hay fever or atopic dermatitis is common.
Clinical features:
  » occurs on the inner (flexural) surfaces of elbows and knees, the face and neck
  » can become chronic with thickened scaly skin (lichenification)
  » secondary bacterial infection may occur with impetigo or pustules
  » can be extensive in infants
  » very itchy at night
Eczema is usually a chronic condition and requires long term care.
Sufferers of atopic eczema are particularly susceptible to herpes simplex and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum). See Section 5.13: Herpes simplex.
GENERAL MEASURES
» Avoid direct skin contact with woollen or rough clothes.
» Avoid overheating by blankets at night.
» Trim finger nails to prevent scratching.
» Good personal hygiene with regular washing to remove crusts and accretions and to avoid secondary infection.
» Diet modification may have no role in atopic eczema treatment.
» Avoid soap on affected areas.

MEDICINE TREATMENT
STEP 1
• Avoid soap, use soap substitutes such as aqueous cream (UEA).
  o Rub on skin, before rinsing off completely.
  o Aqueous cream should not be used as an emollient.
• Emollient, e.g.:
• Emulsifying ointment (UE).

STEP 2
If no response within seven days; or more severe eczema:
• Hydrocortisone 1% cream, applied twice daily for 7 days.
  o Apply sparingly to the face.
  o 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) as a soap.
AND
• Emollient, e.g.:
• Emulsifying ointment (UE).

STEP 3
If no response within seven days, or more severe eczema:
• More potent topical corticosteroids, e.g. betamethasone 0.1% ointment applied twice daily for 7 days (Doctor initiated).
  o Do not apply to face, neck and flexures.
If there is a response:
Reduce use of corticosteroid cream over a few days and maintain treatment with:
• Aqueous cream (UEA) as a soap.
AND
• Emollient, e.g.:
• Emulsifying ointment (UE).

For itching not controlled with topical treatment:
Children
• Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.
CHAPTER 5

SKIN CONDITIONS

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

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

**For long term use in adults and school going children:**

**Children: 2–6 years of age**
- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

**Children > 6 years of age and adults**
- Cetirizine, oral, 10 mg once daily.

**CAUTION**

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

**REFERRAL**

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

**5.8.2 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. Yellow pustules which crust indicate sepsis.

**GENERAL MEASURES**

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

**MEDICINE TREATMENT**

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

**Antibiotic treatment if secondary infection is present:**

**Children ≤ 7 years of age**
- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.
  - OR
    - Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children > 7 years of age and adults**
- Cephalexin, oral, 500 mg 6 hourly for 5 days.
  - OR
    - Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

**Penicillin allergy:**
CHAPTER 5  SKIN CONDITIONS

Children ≤ 18 kg
- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 18–35 kg (able to take tablets)
- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

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

For itching:

Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

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

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

For itching in children < 2 years of age:
- Calamine lotion, applied on the skin.

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

5.8.3 DERMATITIS, SEBORRHOEIC
L21.9

DESCRIPTION
Dandruff is an uninflamed form of seborrhoeic dermatitis.
Pruritus may or may not be present in seborrhoeic dermatitis.
The scalp, face, ears and skin folds e.g. axillae, groins, under the breasts are commonly affected.
May become very extensive, particularly in infants and HIV infected patients.

GENERAL MEASURES
- Trim nails.
- Avoid scratching.
- Avoid perfumed soap.

MEDICINE TREATMENT
- Hydrocortisone 1% cream, apply twice daily until improved.
  - Then apply once or twice weekly for maintenance as needed.
For severe dermatitis:
- Betamethasone 0.1% ointment, applied twice daily for 5–7 days. (Doctor initiated).
  - Do not apply to face neck and flexures.

For itching scalp, scaling and dandruff:
- Selenium sulphide, 2.5% suspension, apply weekly.
  - Lather on the scalp.
  - Rinse off after 10 minutes.
  - Apply weekly, until improved and every second week to maintain control.

5.9 NAPPY RASH

DESCRIPTION
A diffuse reddish eruption in the nappy area, usually caused by irritation from:
» persistent moisture and irregular cleaning and drying of the nappy area,
» diarrhoeal stools,
» underlying skin conditions in some cases, or
» improper rinsing of nappies to remove urine and stool breakdown products.
Rash is predominantly on areas in contact with the nappy, and spares the flexures.

GENERAL MEASURES
» Prompt changing of soiled nappy.
» Avoid waterproof pants. Expose nappy area to air if possible especially with severe nappy dermatitis.
» Educate caregiver on:
  - washing, rinsing and drying of the nappy when soiled.

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

If no improvement within 3 days or if rash involves the flexures, suspect candida:
- Imidazole, e.g.:
- Clotrimazole 2% cream followed by zinc and castor oil ointment applied after each nappy change.

REFERRAL
No improvement after 3 days of clotrimazole treatment.

5.10 ALLERGIES

5.10.1 URTICARIA

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 food stuffs, e.g. fish, eggs, fruit, milk and meat. 

**Note:** Commonly caused by medicines e.g. aspirin, NSAIDs and codeine.

**GENERAL MEASURES**

» Take detailed history to determine trigger factors.

» Lifestyle adjustment.

**MEDICINE TREATMENT**

**Children**
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

**CAUTION**

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

- Calamine lotion, applied on the skin.
  - The use of oral corticosteroids should be avoided.

**REFERRAL**

No improvement or response after 24 hours.

**5.10.2 ANGIOEDEMA**

**T78.3**

**DESCRIPTION**

Localised oedema of the subcutaneous tissue affecting particular parts of the face i.e. lips, eyes and tongue. May also affect the larynx, causing life threatening airway obstruction and anaphylaxis.

The use of ACE-inhibitors is most commonly associated with angioedema in adults. Other causes include other medicines and allergies.

**GENERAL MEASURES**

» Stop all suspected agents e.g. ACE-inhibitor.

» In the case of airway obstruction, a definitive airway must be established if oedema is extensive or progressing.

**MEDICINE TREATMENT**

In severe cases where airway obstruction is present:

**Adults**
- Epinephrine (adrenaline), 1:1000 solution, 0.5 mL into the lateral thigh, administered immediately and repeated every 5 to 15 minutes as needed.

**Children**
- Epinephrine (adrenaline), IM, 0.01 mL/kg of 1:1000 solution, administered immediately.
5.23 Maximum dose of 0.3 mL.

In all cases:
- Hydrocortisone, IV, 100 mg as a single dose.

AND

If the angioedema is not due to an ACE inhibitor
- Chlorphenamine, oral, 4 mg immediately.

OR
- Promethazine, IM, 25–50 mg immediately.

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

Observe all cases until resolution.

REFERRAL
- Failure to respond.
- No obvious cause found.

5.10.3 FIXED DRUG ERUPTIONS
L27.1

DESCRIPTION
Dark coloured round macules that can occur anywhere on the body following the ingestion of a medicine to which the patient has become allergic. They recur on the same spot and increase in number with each successive attack. In the acute stage they are itchy, red around the edge or even bullous.

GENERAL MEASURES
Stop the offending medicine.

MEDICINE TREATMENT
- Hydrocortisone 1%, topical, apply daily for 5 days.

REFERRAL
Widespread eruptions.

5.10.4 PAPULAR URTICARIA
L50.9

DESCRIPTION
Hypersensitivity response to insect bites. Initial lesion is a red papule, which may blister, become excoriated, and then heal with hyperpigmentation. Usually occur in crops over several months. Common and often severe in HIV infections (Papular pruritic eruption, PPE).
CHAPTER 5 SKIN CONDITIONS

GENERAL MEASURES
Reduce exposure to insects by treating pets, using mosquito nets and fumigating houses regularly. Use of insect repellents may be helpful.

MEDICINE TREATMENT
New, inflamed lesions:
- Hydrocortisone 1%, topical, apply daily for 5 days.

For relief of itch:
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.
Note: Chlorphenamine is sedating and in mild cases may be used only at night.

For long term use in adults and school going children:
Children: 2–6 years of age
- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults
- Cetirizine, oral, 10 mg once daily.

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

REFERRAL
Non-responsive and chronic cases.

5.10.5 ERYTHEMA MULTIFORME
L51.9

DESCRIPTION
A self-limiting and commonly recurrent inflammatory eruption of the skin. Sometimes involves mucous membrane (but not more than one surface) and without systemic symptoms. Usually lasts for 10–14 days before complete recovery occurs. Symmetrically distributed crops of target lesions (dark centre, an inner, pale ring surrounded by an outer red ring) occur on the extremities and in particular on the backs of the hands and forearms, palms and soles. This condition is usually due to an infection, commonly herpes simplex or mycoplasma.

REFERRAL
All patients, except those with erythema multiforme rash limited to the skin without systemic symptoms or mucosal involvement.
5.10.6 SEVERE CUTANEOUS ADVERSE DRUG REACTIONS

5.10.6.1 STEVENS-JOHNSON SYNDROME (SJS)/TOXIC EPIDERMAL NECROLYSIS (TEN)

L51.1/ L51.2

DESCRIPTION

An acute, systemic condition with vesico-bullous lesions involving the skin and mucous membranes (≥ 2 mucosal surfaces), but occasionally only the mucous membranes.

The eruption may start as widespread red irregular macules and patches. There may be a vesicle or bulla in the central area of the lesion. The blisters rupture leaving denuded areas of skin. Mucous membrane erosions often with slough covering the surface are frequently seen.

Toxic epidermal necrolysis (TEN) is a more severe form of the condition and is suggested if the skin lesions cover > 30% of the body surface area. The mucous membranes such as the mouth, eyes and vagina are also more severely affected. The condition is usually caused by medicines e.g. sulphonamides, anti-retrovirals (nevirapine), anti-epileptics (phenytoin, phenobarbitone, carbamazepine, lamotrigine). Systemic involvement with multi-organ dysfunction is common.

GENERAL MEASURES

Immediate withdrawal of offending medicine.

Patients usually require care in a high or intensive care unit with dedicated nursing.

REFERRAL

All patients.

5.10.6.2 DRUG REACTION WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS)

L27.0

DESCRIPTION

Severe hypersensitivity reaction to a medicine.

Typically occurs within 3 months of starting the offending medicine.

Clinical symptoms include:
» maculopapular rash
» fever > 38°C
» lymphadenopathy
» hepatitis or other organ involvement
» blood count abnormalities especially eosinophilia

Medicines that commonly induce the DRESS syndrome include phenobarbital, carbamazepine, phenytoin, lamotrigine, allopurinol, sulphonamides, abacavir and nevirapine.

REFERRAL

All patients.
5.11 PITYRIASIS ROSEA

DESCRIPTION
A common disease of unknown cause, probably due to a viral infection as it occurs in minor epidemics. Most common in young adults but any age may be affected. The rash involves the trunk, neck and mainly proximal parts of the limbs. Presents as pink papules and macules. The macules are oval, and have a thin collar of scale towards, but not at the periphery of the lesions. The eruption is usually preceded by a few days by one larger, oval, slightly scaly area (“herald patch”), commonly found in the scapular area or abdomen. The macules on the thorax characteristically lie parallel to the long axis of the ribs (“Christmas tree” distribution). The itch is usually mild and there are few or no constitutional symptoms. It is self-limiting within about 6–8 weeks.

GENERAL MEASURES
Explain about the benign but prolonged nature of the condition.

MEDICINE TREATMENT
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.
Note: Chlorphenamine is sedating and in mild cases may be used only at night.

CAUTION
Do not give an antihistamine to children < 2 years of age.
- Aqueous cream, applied 3 times daily.

5.12 MOLLUSCUM CONTAGIOSUM

DESCRIPTION
Infectious disease caused by a poxvirus. Presents with dome-shaped papules with a central depression (umbilication). Varies from occasional lesions to large crops of lesions particularly in immunocompromised or HIV-infected patients. Papules are commonly seen on the face in children, but may be found at any skin site, except on the palms and soles. They may also occur on the genitalia as an STI. Most infections resolve spontaneously except in the immunocompromised patient.

GENERAL MEASURES
In non-genital molluscum contagiosum:
» Allow lesions to heal spontaneously if the lesions are few in number and the patient not immunocompromised.
» In adults, contents can be expressed manually remembering it is contagious.
In genital molluscum contagiosum:
» Counsel on risk reduction for transmission of STIs.
» Notify that the partner(s) must be examined and treated.

**MEDICINE TREATMENT**
- Tincture of iodine BP, applied to core of individual lesions using an applicator.

**CAUTION**
Beware of hypersensitivity to iodine.

**REFERRAL**
» Extensive disease.
» Those failing to respond to simple measures.
» Peri-ocular lesions to an ophthalmologist.
» HIV infected patients with extensive lesions may have to be started on ART.

**5.13 HERPES SIMPLEX**

**DESCRIPTION**
Infection caused by herpes simplex virus type 1 or 2.
Primary herpes infection involving gingivostomatitis (usually type 1) or the genital area (usually type 2) may be extensive, but may occur at other sites, e.g. the face. It is characterised by grouped crusted vesicles surrounded by erythema. The vesicles rupture soon producing discrete ulcers.

Recurrences are usually mild and last a few days, except in immunosuppressed patients. Recurrences of oral herpes may be triggered by other respiratory tract infections or exposure to ultraviolet light.

Sufferers of atopic eczema are particularly susceptible to the virus and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).

Herpes simplex mucocutaneous ulceration that persists for > 1 month is an AIDS-defining illness. See Section 11.3.11: Herpes simplex ulcers, chronic. Herpes simplex infection may be the precipitating event in many cases of erythema multiforme.

**GENERAL MEASURES**
Keep the skin lesions clean and dry.

**MEDICINE TREATMENT**
Extensive herpes, eczema herpeticum or chronic mucocutaneous ulcerations:
- Aciclovir, oral, 8 hourly for 10 days.
  - Children dose: 250 mg/m²/dose. See dosing table, pg 22.1.
5.14 HERPES ZOSTER
See Section 11.3.12: Herpes zoster (Shingles).

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
B07.9

DESCRIPTION
Seen most often on the hands and fingers, but can be found anywhere on the body. Raised nodules with a rough ‘warty’ surface.

GENERAL MEASURES
In most cases they should be left alone, as they will spontaneously resolve.

MEDICINE TREATMENT
- Salicylic acid, 15 to 30% topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash well, dry, reapply the wart paint and occlude.
  - Repeat process daily until the wart disappears.

REFERRAL
Extensive warts.

5.15.2 PLANE WARTS
B07.8

DESCRIPTION
Very small warts that are just slightly raised. Present as smooth, flat, skin-coloured or slightly pigmented surface. They occur particularly on the face, back of the hands and knees. Commonly seen in the immunocompromised.

MEDICINE TREATMENT
These warts are notoriously difficult to treat with a poor response.
- Salicylic acid, 2%, topical.
5.29

CHAPTER 5
SKIN CONDITIONS

REFERRAL
» Failure to respond.
» Extensive cases involving the face.

5.15.3 PLANTAR WARTS
A44.1

DESCRIPTION
Appear commonly on the pressure-bearing areas of the soles and can be painful and interfere with walking. Because pressure forces them deep into the dermis they are flat, almost circular lesions, with a rough surface and are often thick and hard due to increased keratin formation. Plantar warts are contagious and walking barefoot in communal areas should be discouraged.

MEDICINE TREATMENT
- Salicylic acid, 15 to 30% topical liquid application.
  o Protect surrounding skin with petroleum jelly.
  o Apply daily to wart and allow to dry.
  o Occlude for 24 hours.
  o Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  o Wash well, dry, reapply the wart paint and occlude.
  o Repeat process daily until the wart disappears.

REFERRAL
» No response to treatment.
» Diabetic patients.

5.15.4 GENITAL WARTS: CONDYLOMATA ACCUMINATA
A63.0
See Section 12.11: Genital warts (GW): condylomata acuminate.

5.16 PSORIASIS
L40.9

DESCRIPTION
Inflammatory condition of the skin and joints of unknown aetiology. Scaly itchy plaques occur especially on the extensor surfaces of the knees, elbows, sacrum and scalp.
Psoriasis may spread to involve any other sites, although the face is usually spared. The nails and skin folds are often involved.
Multiple co-morbidities are recognised, particularly the metabolic syndrome. Check for other markers of the metabolic syndrome e.g. central obesity, hypertension, dyslipidaemia.
Often aggravated by stress and may be provoked by HIV disease.
CHAPTER 5

SKIN CONDITIONS

5.30 GENERAL MEASURES

» Counselling regarding precipitating factors and chronicity.
» HIV test, if acute onset and risk factors present.
» Encourage sun exposure as tolerated.

MEDICINE TREATMENT

For flares (if delay experienced in obtaining a dermatological consultation):

- Coal tar (Liquor picis carbonis (LPC) B.P.) 5%, topical.
- Betamethasone 0.1%, topical, apply 12 hourly (Doctor initiated).
  - Decrease according to severity, reduce to hydrocortisone 1%, topical, and then stop.

REFERRAL

All patients.

5.17 HIDRADENITIS SUPPURATIVA

L73.2

DESCRIPTION

A chronic disorder of the apocrine glands involving the formation of abscesses and cysts, often accompanied by scarring and sinus tract formation. Commonly found in axillae, groin, between the thighs, perianal and perineal areas. Flare-ups may be triggered by perspiration, hormonal changes (such as menstrual cycles), humidity and heat, and friction from clothing.

GENERAL MEASURES

Avoid tight clothing and clothing made of heavy non-breathable material.

REFERRAL

Refer all patients with abscesses, infected cysts or sinuses and suspicion of the diagnoses.

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Chapter 6: Obstetrics & gynaecology

Obstetrics

6.1 Bleeding in pregnancy
  6.1.1 Miscarriage
  6.1.2 Management of incomplete miscarriage in the 1st trimester, at primary health care level
  6.1.3 Antepartum haemorrhage

6.2 Antenatal care
  6.2.1 Care of HIV-infected pregnant women
  6.2.2 Hypertensive disorders of pregnancy
  6.2.3 Anaemia in pregnancy
  6.2.4 Syphilis in pregnancy

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

6.4 Prelabour rupture of membranes at term (PROM)

6.5 Intrapartum care

6.6 Care of the neonate
  6.6.1 Routine care of the neonate
  6.6.2 Sick neonate and neonatal emergencies
  6.6.3 Neonatal resuscitation
  6.6.4 Care of the HIV exposed infant

6.7 Postpartum care
  6.7.1 Cracked nipples during breastfeeding
  6.7.2 Mastitis

Gynaecology

6.8 Pregnancy, ectopic

6.9 Vaginal bleeding
  6.9.1 Abnormal vaginal bleeding during fertile years
  6.9.2 Bleeding, post-menopausal

6.10 Dysmenorrhoea

6.11 Hormone therapy (HT)

6.12 Ulcers, vaginal

6.13 Vaginal discharge/lower abdominal pain in women
6.1 BLEEDING IN PREGNANCY
O20.9

6.1.1 MISCARRIAGE
O08-O09

DESCRIPTION
Bleeding from the genital tract prior to 22 weeks gestation, 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 with associated LAP
  – cervical dilatation is usually 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

» Unsafe (septic) miscarriage:
  – any miscarriage with history of interference, pyrexia, tachycardia and/or offensive products of conception

For perinatal mortality audit and statistics (DHIS or PPIP), all fetuses ≥ 500g are included.

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

MEDICINE 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: USE OF CEFTRIAXONE
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

LOE:III

AND
• Metronidazole, oral, 400 mg
In Rh-negative, non-sensitised women
- Anti-D immunoglobulin, IM, 50–100 mcg preferably within 72 hours but may be given up to 7 days following management of miscarriage.

REFERRAL
Urgent
All patients with unsafe miscarriage.

Note: For patients with safe miscarriage the need for referral is determined by skills and facilities at the primary health care level. A local referral policy should be in place. Ideally midwife obstetric units and community health centres should be able to manage safe miscarriage using manual vacuum aspiration.

6.1.2 MANAGEMENT OF INCOMPLETE MISCARRIAGE IN THE 1\textsuperscript{ST} TRIMESTER, AT PRIMARY HEALTH CARE LEVEL
O02.1

Both Manual Vacuum Aspiration (MVA) and medical evacuation are equally effective for miscarriage.

GENERAL MEASURES
» Counselling.
» Evacuation of the uterus after ripening the cervix.

MEDICINE TREATMENT
Before MVA, to ripen the cervix:
- Misoprostol, oral/vaginal, 400 mcg as a single dose.

Medical evacuation:
- Misoprostol, oral/vaginal, 600 mcg as a single dose.
  » Repeat after 24 hours if necessary.

Follow up after one week to ensure that bleeding has stopped.

REFERRAL
» Unsafe miscarriage.
» Miscarriage > 12 weeks gestation.
» Anaemia.
» Haemodynamic instability.
» Failed medical evacuation.

6.1.3 ANTEPARTUM HAEMORRHAGE
O46.9

DESCRIPTION
Vaginal bleeding in pregnancy after 22 weeks gestation.
Important causes include the following:
» abruptio placentae,
» placenta praevia, and
utere rupture (particularly when misoprostol was used).

**MEDICINE TREATMENT**
- Sodium chloride 0.9%, IV.
- Treat for shock if necessary.
- Avoid vaginal examination, unless placenta praevia excluded.

**REFERRAL**
Urgent
All patients.

### 6.2 ANTENATAL CARE
Z35.9

#### 6.2.1 CARE OF HIV-INFECTED PREGNANT WOMEN
O98.7

**DESCRIPTION**
HIV is currently the most common cause of maternal deaths in South Africa. Transmission of HIV from mother to infant may occur during pregnancy, delivery and/or breastfeeding. Without intervention, 25–40% of infants born to HIV-infected women may become infected. With appropriate interventions, maternal mortality as well as perinatal transmission of HIV can be substantially reduced. For comprehensive information on the care of HIV-infected pregnant women refer to the current National prevention of mother-to-child transmission of HIV (PMTCT) Guidelines.

**GENERAL MEASURES**
- Provide routine counselling and voluntary HIV testing to all pregnant women at their very first antenatal visit, in addition to Hb, Rh and syphilis test.
- Provide counselling on the benefits of PMTCT to all HIV-infected women.
- Offer repeat testing from 32 weeks’ gestation onwards to all women who test HIV negative.
- On diagnosis, HIV-infected pregnant women should be clinically staged, assessed for TB and have a blood sample taken for CD4 cell count and creatinine, on the same day. The results must be obtained within a week.
- Those with symptoms of TB must be investigated before antiretroviral therapy (ART) initiation. If TB treatment commences, ART should be deferred for 2 weeks.
- Fast-track all HIV-infected pregnant women for ART regardless of CD4 count.
- Provide counselling to all asymptomatic well women and commence ART on the same day.
- Decisions about postpartum contraceptive use should be made in the antenatal period.
- Women with unwanted pregnancies < 20 weeks’ gestation should be assisted with access to termination of pregnancy (TOP) services.
» Perform a viral load (VL) at booking for all HIV-infected women who have been on ART for at least 6 months, unless a recent result (within the last 6 months) is available. If they are not suppressed refer for expert advice.

MEDICINE TREATMENT

**Opportunistic infection prophylaxis for HIV-infected pregnant women**

See Section 11.2.2: Isoniazid preventive therapy (IPT).

**Women on ART with no symptoms of TB:**
- Isoniazid, oral, 300 mg daily for 12 months.
- Pyridoxine, oral, 25 mg daily for 12 months.

**Women with CD4 ≤ 200 or WHO clinical stage 2, 3 or 4:**
- Cotrimoxazole, oral, 160/800 mg daily, until CD4 > 200.

**Women with CD4 < 100, do a serum cryptococcal antigen (CrAg) test.**
  » If CrAg-positive and asymptomatic:
    - Start fluconazole, oral, 800 mg daily for 2 weeks, then 400 mg daily for 8 weeks, then 200 mg daily until CD4 > 200.
  » If CrAg-positive and symptomatic (e.g. headache, vomiting, confusion, fever), refer immediately for lumbar puncture.

**Antiretroviral therapy**
- Tenofovir 300 mg oral, daily.
- Emtricitabine 200 mg, oral daily (OR lamivudine 300 mg, oral, daily).
- Efavirenz 600 mg, oral at night.

**If active psychiatric conditions present (in consultation with doctor):**

**CD4 ≤ 250**
- Replace efavirenz with nevirapine, oral 200 mg daily for 2 weeks, then 200 mg 12 hourly.
  - Do an ALT test before starting nevirapine. Nevirapine should not be used in women with elevated ALT.
  - If ALT elevated, replace efavirenz with lopinavir/ritonavir, oral, 400/100 mg 12 hourly.

**CD4 > 250**
- Replace efavirenz with lopinavir/ritonavir, oral, 400/100 mg 12 hourly.

**If renal dysfunction i.e. serum creatinine > 85 micromol/L (in consultation with doctor):**
  » Replace tenofovir+emtricitabine with abacavir+lamivudine.
  » Abacavir, oral, 600 mg daily.
• Lamivudine, oral, 150 mg 12 hourly.

**Note:** Monitor response to ART within 6 months of initiation with a plasma VL. If VL is not suppressed refer for expert advice.

**For unbooked women diagnosed in labour**
• Nevirapine, oral, 200 mg single dose as early as possible in labour.
AND
• Zidovudine, oral, 300 mg intrapartum, every 3 hours until delivery.
AND
• Tenofovir 300 mg and emtricitabine 200 mg, oral, as a single dose.

**Breastfeeding**
The mother should start ART within 24 hours of delivery to protect the baby during breastfeeding (See Antiretroviral therapy, above).

**Baby**
See Section 11.5: The HIV-exposed infant.

**REFERRAL**
» Refer mothers suspected of non-adherence early.
» Creatinine > 85 mmol/L.
» ALT > 100 IU/L.

**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 occurring for the first time at ≥ 20 weeks’ gestation (gestational hypertension) is characterised by:
» BP ≥ 140/90 mmHg measured on 2 occasions 4 hours apart.
OR
» BP > 160/110 mmHg measured on a single occasion.
(Always measure BP in the left lateral, and not supine, position).

Hypertensive disorders of pregnancy can be classified as:
» Gestational hypertension:
  – Hypertension without proteinuria, detected > 20 weeks of pregnancy.
» Pre-eclampsia:
  – Hypertension with proteinuria > 20 weeks of pregnancy (risk factors include chronic hypertension, pre-existing kidney disease, diabetes, pre-eclampsia in a previous pregnancy, etc).
» Eclampsia:
  – Generalised tonic-clonic seizures in women with pre-eclampsia.
» Chronic hypertension:
Hypertension without proteinuria diagnosed before pregnancy or < 20 weeks of pregnancy.

- Chronic kidney disease:
  - proteinuria with/without hypertension < 20 weeks of pregnancy.

### Levels of Severity of Hypertension

<table>
<thead>
<tr>
<th>Level of Hypertension</th>
<th>BP Level mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Systolic</td>
</tr>
<tr>
<td>mild</td>
<td>140–149</td>
</tr>
<tr>
<td>moderate</td>
<td>150–159</td>
</tr>
<tr>
<td>severe</td>
<td>≥160</td>
</tr>
</tbody>
</table>

### Referral
- Severe hypertension.
- Pre-eclampsia (all levels of severity).
- Chronic kidney disease.

### Mild to Moderate Hypertension

#### Description
Hypertension occurring for the first time at ≥ 20 weeks’ gestation with no proteinuria. Characterised by:

- BP ≥ 140/90 mmHg measured on 2 occasions 4 hours apart.
- BP >160/110 mmHg measured on a single occasion.

(Always measure BP in the left lateral and not supine, position).

#### General Measures
- May be managed without admission before 38 weeks of gestation, provided no proteinuria.
- Review the following on a weekly basis:
  - BP
  - weight
  - height of fundus
  - fetal heart rate and movements
  - urine analysis
- Educate on signs requiring urgent follow-up (headache, epigastric pain, vaginal bleeding etc).
- Refer to hospital if proteinuria develops, or at 38 weeks for delivery.

#### Medicine Treatment
- Methyldopa, oral, 250 mg 8 hourly.
  - Titrate to a maximum dose: 750 mg 8 hourly.
  - When using iron together with methyldopa, ensure that iron and methyldopa are taken at least 4 hours apart from one another.

### Referral
- Severe hypertension.
- Pre-eclampsia (all levels of severity).

LOE: III
» Poor control of hypertension.

**SEVERE HYPERTENSION**

**DESCRIPTION**
BP ≥ 160/110 mmHg, with no proteinuria. (Always measure BP in the left lateral and not supine position).

**MEDICINE TREATMENT**
Aim to reduce BP to 140/100 mmHg.
Preload with:
- Sodium chloride 0.9%, IV, 200 mL unless in cardiac failure.
**AND**
- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after an hour if diastolic BP remains > 110 mmHg.

**REFERRAL**
All cases.

**CHRONIC HYPERTENSION**
Stop ACE-inhibitors when pregnancy is planned or as soon as pregnancy is established.

**MEDICINE TREATMENT**
**Prevention of pre-eclampsia**
From 14 weeks gestation onwards:
- Calcium, oral.
  - For high-risk patients: Calcium carbonate, oral, 500 mg 12 hourly (equivalent to 1 g elemental calcium daily).
  - Although the benefit is greatest in high-risk women, consider use of this agent in all pregnant women.
  - Note: Calcium reduces iron absorption from the gastro-intestinal tract. These supplements should be taken 4 hours apart from one another.
- Aspirin, oral, 75–100 mg daily with food (Doctor initiated).
  - Recommended dose is 100 mg, and in the absence of appropriate formulation use 150 mg.

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

**REFERRAL**
» Poor control of hypertension.
» Chronic hypertension with superimposed pre-eclampsia.
» All women with pre-eclampsia.
ECLEPSIA
O15

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

MEDICINE 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
  o Then IM, 5 g every 4 hours in alternate buttocks.

REFERRAL
Urgent
» Severe eclampsia and pre-eclampsia:
  − stabilise the patient,
  − initiate magnesium sulphate loading dose before referral,
  − monitor vital signs while awaiting transport.
» Severe hypertension.

Non urgent
All women with pre-eclampsia.

6.2.3 ANAEMIA IN PREGNANCY
O99.0

DESCRIPTION
Anaemia in pregnancy is Hb < 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
» A balanced diet to prevent nutritional deficiency.
» Reduce intake of tea.
» Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT
Prevention:
» All pregnant women: routine iron and folic acid supplementation.
» Continue with iron and folic acid supplementation during lactation.

• Ferrous sulphate compound BPC, oral, 170 mg once daily with food.

OR

LOE:III
Ferrous fumarate, oral, 200 mg once daily with food.
  o Do not take iron tablets within 4 hours of taking calcium tablets.

AND

• Folic acid, oral, 5 mg daily.

**Established anaemia with Hb < 11 g/dL:**

• Ferrous sulphate compound BPC, oral, 170 mg 8 hourly with food.

OR

Ferrous fumarate, oral, 200 mg 8 hourly with food.
  o Continue for 3 months after the Hb normalises in order to replenish body iron stores.
  o Do not take iron tablets within 4 hours of taking calcium tablets.

AND

• Folic acid, oral, 5 mg daily.

**REFERRAL**

**Urgent**

» Symptomatic anaemia (tachycardia > 100 heartbeats/minute, dizziness, shortness of breath).
» Signs or symptoms of acute or chronic blood loss.
» Evidence of cardiac failure.

**Non urgent**

» Hb < 7 g/dL in women who have not responded to oral therapy, after a month.
» Women > 34 weeks gestation with Hb < 7 g/dL.
» Any low Hb with an obstetric complication.
» Pallor (anaemia) plus signs of chronic disease, e.g. suspicion of TB, or the presence of hepatosplenomegaly.
» 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 foetus 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, preferably with on-site rapid testing. The Rapid Plasmin Reagin (RPR) is one of the serological tests that measure disease activity, but is not specific for syphilis. False RPR positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre < 1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test (if available), e.g.:

» *Treponema pallidum* haemagglutination assay (TPHA).
» Treponema pallidum particle agglutination assay (TPPA).
» Treponema pallidum antibody (TPAB).
» Fluorescent Treponemal Antibody (FTA) test.
» Treponema pallidum ELISA.
» Rapid treponemal antibody test.

Once positive, specific treponemal tests generally remain positive for life.

The RPR can be used:
» to determine if the patient’s syphilis disease is active or not,
» to measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» to determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤ 1:8), which does not change by more than one dilution difference over time (so-called serofast patients).

All pregnant women should have a syphilis serology test at the first visit. Women who booked in the first trimester and tested negative should have a repeat test done at 32 weeks gestation.

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

MEDICINE TREATMENT

Pregnant woman
- Benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 weeks.
  o Reconstitute with 6 mL of lidocaine1% without epinephrine (adrenaline).
  o Follow up at 3 months after the last injection to confirm a fourfold (i.e. 2 dilution) reduction in RPR titres, provided the initial titre was ≥ 1:8. If initial titre < 1:8, further reductions may not occur (serofast reaction).

Penicillin allergy
Refer for penicillin desensitisation.

Newborn baby
» Refer all symptomatic babies.
  - Hepatosplenomegaly.
  - Pseudoparesis.
  - Snuffles.
  - Oedema.
  - Jaundice.
  - Anaemia.
  - Purpura.
  - Desquamative rash (especially involving palms and soles).

» Asymptomatic, well baby:
  - Mother was not treated, or
  - If the mother has received < 3 doses of benzathine benzylpenicillin, or
  - If the mother delivers within 4 weeks of commencing treatment.

LOE:III\textsuperscript{xv}

LOE:III\textsuperscript{XVI}
• Benzathine benzylpenicillin (depot formulation), IM, 50 000 units/kg as a single dose into the lateral thigh.

CAUTION
Benzathine benzylpenicillin (depot formulation) must never be given intravenously.

REFERRAL
» Symptomatic babies of mothers with syphilis.
» Penicillin allergy in the pregnant woman.

6.3 PRETERM LABOUR (PTL) AND PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

6.3.1 PRETERM LABOUR (PTL)

DESCRIPTION
Regular painful contractions: 3 per 10 minutes, occurring < 37 weeks of gestation.

GENERAL MEASURES
< 26 weeks
» Refer without tocolysis (medicines to inhibit uterine contractions).

26–34 weeks of gestation:
» Refer with initial tocolysis and corticosteroids.

>34 weeks gestation:
» Allow labour to continue at midwife obstetric unit.

MEDICINE TREATMENT
26–34 weeks gestation
• Betamethasone, IM, 12 mg two doses 24 hours apart.

Tocolysis:
Preload with:
• Sodium chloride 0.9%, IV, 200 mL.

THEN
• Nifedipine, oral, 20 mg as a single dose.
  o Follow with 10 mg after 30 minutes, if contractions persist.
  o Then 10 mg every 4 hours until patient is transferred.
  o Maximum duration: 24 hours.

LOE:III

REFERRAL
All cases before 34 weeks.
6.3.2 PRETERM PRELABOUR RUPTURE OF MEMBRANES
(PPROM)

DESCRIPTION
Rupture of the membranes before 37 weeks of gestation. Confirmed with a sterile speculum examination demonstrating leakage of amniotic fluid. If there is clinical uncertainty test for pH – liquor is alkaline. Avoid digital vaginal examination.

MEDICINE TREATMENT
26–34 weeks gestation
• Betamethasone, IM, 12 mg two doses 24 hours apart.

REFERRAL
All cases.

6.4 PRELABOUR RUPTURE OF MEMBRANES AT TERM
(PROM)

DESCRIPTION
Rupture of membranes before the onset of labour at term (> 37 weeks). A sterile speculum examination is required to visually confirm amniotic fluid draining through the cervical os.

GENERAL MEASURES
If PROM is followed by uterine contractions at > 34 weeks’ gestation, allow labour to proceed. If the woman does not develop uterine contractions within 12 hours of PROM, commence antibiotics and transfer for induction of labour.

MEDICINE TREATMENT
• Ampicillin IV, 1 g as a single dose.
  AND
• Metronidazole oral, 400 mg as a single dose.

REFERRAL
» Suspected chorio-amnionitis (refer after starting antibiotics).
  » Prolonged rupture of membranes (> 12 hours).

6.5 INTRAPARTUM CARE

For the comprehensive management of women in labour refer to the most recent National Maternity Care Guidelines.
DESCRIPTION
Labour is divided into 4 stages:
» **First stage**
  – onset of regular uterine contractions at term to full dilatation of cervix.
» **Second stage**
  – full dilatation to delivery of the baby.
» **Third stage**
  – delivery of the baby to delivery of the placenta.
» **Fourth stage**
  – 1 hour post delivery of the placenta.

GENERAL MEASURES
» Encourage companion support.
» Ensure that the mother is adequately hydrated (can be done orally).
» Monitor progress of labour on partogram.

MEDICINE TREATMENT
First stage with cervical dilatation < 10 cm:
**Analgesia:**
- Pethidine, IM, 100 mg 4 hourly.
**OR**
- Morphine, IM, 10 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:
- Lidocaine 1%.
  - Do not exceed 20 mL.

Fetal distress during labour
» Place the woman in the left lateral position.
- Salbutamol 0.5 mg/mL, IV, 250 mcg administered slowly over 2 minutes and refer.
» Reconstitute the tocolytic as follows:
  - Salbutamol 1 mL (0.5 mg/mL) added to 9 mL of water for injection, to make a 50 mcg/mL solution. Monitor pulse.
  - Inject 5 mL (250 mcg) over at least 2 minutes. Monitor pulse.
  - If pulse increases to more than 120 beats/minute, discontinue the injection.
  - Do not administer if mother has cardiac disease.

Prevention of post-partum haemorrhage (PPH):
» Check for twins.
- Oxytocin, IM, 10 units.
» Early cord clamping and cutting (wait one minute before clamping).
» Controlled cord traction of the placenta.

Treatment of PPH (blood loss > 500 mL within 24 hours of birth):
» The most common cause is an atonic uterus
» Bimanually compress the uterus to expel clots from vagina.
» Empty the bladder.
» Two intravenous lines (wide bore if possible).
» Oxytocin, IV, 20 units in 1 000 mL sodium chloride 0.9% infused at 250 mL/hour in one line.

As fluid replacement:
» Sodium chloride 0.9%, IV, infused as fast as possible in the 2nd line.

If no response:
» Ergometrine, IM, 0.5 mg.
OR
» Oxytocin/ergometrine, IM, 5 units/0.5 mg, 1 mL.
  o Avoid ergometrine in hypertensive women and those with heart disease, unless haemorrhage is life threatening.
  o Repeat after 10–15 minutes if no response to 1st dose, while arranging referral.

Only in settings where oxytocin is not available:
» Misoprostol, sublingual, or rectal, 600 mcg as a single dose.

Rh-negative mother
Administer to Rh-negative mother, if baby is Rh-positive or baby’s Rh group is unknown:
» Anti-D immunoglobulin, IM, 100 mcg, preferably within 72 hours but can be given up to 7 days after delivery.

Baby
See Section 6.6: Care of the neonate. Observe mother and neonate for 1–2 hours before transfer to the postnatal ward.

REFERRAL
» Prolonged labour according to charting on partogram.
» Post-partum haemorrhage.
» Retained placenta.
» Other complications of mother or baby.

6.6 CARE OF THE NEONATE

6.6.1 ROUTINE CARE OF THE NEONATE

GENERAL MEASURES
Immediately after birth:
» Check if the baby needs resuscitation:
  Is the baby breathing?
6.16

Is the heart rate > 100?
Is the baby centrally pink?
If NO to any question, resuscitate immediately. See Section 6.6.3 Neonatal resuscitation.

Then
» Dry the baby with a warm towel immediately.
» If there are excess secretions, turn the baby onto the side. Avoid suctioning.
» Check and record the Apgar score:

<table>
<thead>
<tr>
<th>Apgar score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>Absent</td>
<td>&lt; 100/min</td>
<td>&gt; 100/min</td>
</tr>
<tr>
<td>Respiration</td>
<td>Absent</td>
<td>Slow or irregular</td>
<td>Good, crying</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Limp</td>
<td>Slight flexion</td>
<td>Active, moves</td>
</tr>
<tr>
<td>Response to stimulation</td>
<td>No response</td>
<td>Grimace</td>
<td>Vigorous cry</td>
</tr>
<tr>
<td>Colour</td>
<td>Blue or pale</td>
<td>Body pink, limbs blue</td>
<td>Pink all over</td>
</tr>
</tbody>
</table>

» Clamp the cord after the first few cries.
» Replace forceps with disposable clamp or sterile cord tie 3–4 cm from the abdomen.

Refer to a neonatal unit if the baby required resuscitation or if the Apgar score at 5 minutes is ≤ 7.

Check risk factors
» Membranes ruptured for > 18 hours.
» Mother diabetic.
» Smelly liquor or baby.
  – If any of the above, refer to a neonatal unit for observation and care.
» Mother HIV-infected.
  – Check the feeding choice. See Section 11.5: The HIV exposed infant.

Check baby from head to toe and the back
» Check the weight.
» Check the head circumference.
» Check for:
  – Central cyanosis.
  – Floppy.
  – Grunting.
  – Less than normal movements.
  – Fast breathing.
  – Major congenital abnormality.
  – Chest indrawing.
  – Weight (> 4 kg or < 2 kg)

If any of the above present, assess need for urgent care and refer to a neonatal unit.

Initiate bonding and feeding
» Place the baby on the mother’s chest.
» Initiate breastfeeding.

Identify and record
» Formally identify the baby with the mother.
» Place a label with the mother’s name and folder number, baby’s sex, time and date of birth on the baby’s wrist and ankle.
» After giving vitamin K and chloramphenicol eye ointment, give the baby back to the mother, unless there is a reason for the baby to be transferred to a neonatal unit.
MEDICINE TREATMENT

Bleeding prophylaxis
- Vitamin K, IM, 1 mg immediately after birth routinely.
  - Administer in the anterolateral aspect of the mid-thigh.

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

Routine EPI immunisation:
- BCG vaccination, intradermal, once neonate is stable.
- Polio vaccine, oral, once neonate is stable.
No baby must be sent home without immunisation.

6.6.2 SICK NEONATE AND NEONATAL EMERGENCIES

DESCRIPTION
Neonates can become ill very rapidly and signs of disease are often not readily appreciated unless specifically looked for. All of these conditions in neonates should be referred urgently.
The most common serious conditions are:
- septicaemia or infections
- congenital abnormalities
- respiratory conditions
- 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 (> 60 breaths/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.
6.18

» 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.

**MEDICINE 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, 80 mg/kg/dose immediately as a *single dose*.
  - Administer into the lateral thigh.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

Monitor blood glucose and exclude hypoglycaemia. If < 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 cases.
- All neonates with jaundice on the first day of life, with pallor or with poor feeding.
- All other neonates with increasing, deep or persistent (> 10 days) jaundice should be referred as soon as possible.

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

**6.6.3 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) > 100 beats/minute?
3. Is the baby centrally pink, i.e. no central cyanosis?
» If the answer to all 3 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 baby using the above 3 questions every 30 seconds during resuscitation.

» If the baby is improving, then the interventions, e.g. bagging, can be stopped.

» Only if the baby is not responding or getting worse, is further intervention needed e.g. chest compressions (see algorithm).

Check that each step has been effectively applied before proceeding to the next step. The algorithm follows the assumption that the previous step was unsuccessful and the baby is deteriorating.

Use the lowest inspiratory oxygen concentration that alleviates central cyanosis. Obtain target pulse oximetry readings, if pulse oximeter is available, and restore a heart rate > 100 beats/minute. (There is evidence that routine resuscitation with 100% oxygen is potentially harmful to the baby).

An unsatisfactory response to resuscitation includes:

» A sustained slow heart rate, usually ≤ 60 beats/minute or a progressive decrease in heart rate until cardiac arrest occurs.

» Episodes of cardiac arrest, with a progressively weaker response to chest compressions, positive pressure ventilation and medicines.

» A decreasing blood pressure, increasing acidosis, severe hypotonia with central cyanosis or intense pallor.

» Apnoea or weak, irregular and inefficient respiratory efforts.

If the baby’s response to resuscitation is inadequate once the ventilation and circulation are adequately supported, then the following steps should be carried out:

If the mother is known or suspected to have had narcotic pain relief and the baby has normal heart rate and colour response to bag-mask ventilation, but has not initiated sustained regular respiratory effort:

• Naloxone, IV, 0.1 mg/kg.

Check the blood glucose of the baby. If hypoglycaemia is present:

• Glucose (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 baby transferred with ongoing resuscitation to a higher level of care:

Discontinue resuscitation if the unsatisfactory response to resuscitation persists for > 20 minutes and underlying conditions e.g. pneumothorax, diaphragmatic hernia has been excluded or > 10 minutes of unresponsive cardiac arrest (asystole) and/or > 20 minutes of unsustained respiration.

Babies requiring minimal resuscitation with prompt and complete response may be watched with their mothers. Babies with a favourable response to resuscitation should be referred to a neonatal high or intensive care unit, if available, for post resuscitation care. Babies, who, after resuscitation, are not completely normal, should be referred to a higher level for care using transport with necessary support, e.g. oxygen and temperature control.
Medicines used during neonatal resuscitation

<table>
<thead>
<tr>
<th>Medicine and dose</th>
<th>Indications</th>
<th>Effect</th>
</tr>
</thead>
</table>
| **Epinephrine (Adrenaline).**  
  o 0.1 mL/kg of a 1:10 000 dilution IV, (0.01 mg/kg/dose).  
  o *ET, up to 1 mL/kg of a 1:10 000 dilution (0.1 mg/kg/dose). | » Asystole.  
  » Heart rate <60/minute. | » ↑Heart rate.  
  » ↑Myocardial contractility.  
  » ↑Arterial pressure. |
| **Naloxone**  
  o IV/IM, 0.1 mg/kg  
  o May need repeating after 2 hours. | Maternal administration of opiates with apnoeic infant. | Corrects apnoea and/or hypoventilation. |
| **Dextrose.**  
  o IV, 2.5–5 mL/kg of 10% dextrose water (250–500 mg/kg)  
  o 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 (usually only occurs after acute resuscitation). | Corrects hypoglycaemia. |
| **Fluid for volume expansion.**  
  • IV, sodium chloride 0.9%, 10–20mL/kg, slow IV (5–10 minutes). | Hypovolaemia (usually history of blood loss, child pale shocked with poor pulses and perfusion). | ↑Blood Pressure and improve tissue perfusion. |

*ET = Endotracheal tube

LOE:III

xxv
Newborn Resuscitation Algorithm

The algorithm follows the assumption that the previous step was unsuccessful and the newborn is deteriorating.

Birth
- Provide warmth
  (Wrap preterm baby’s body in plastic bag)
- Clear airway if necessary
- Dry and stimulate
- Note the time

30 seconds
- Gasping, apnoeic or HR < 100
- Crying/breathing well and good tone

Assess breathing / crying and/or heart rate
- Start ventilating with room air (Rate: 30 - 40/min)
  Connect to pulse oximenter, if available.
  Give oxygen as necessary.
  Ensure slight chest rise with each breath.

30 seconds
- Assess breathing and heart rate and sats/colour
  HR < 100

Continue ventilating with 100% oxygen.
(Bag connected to oxygen with flow at 5-10 L/minute)

30 seconds
- Assess breathing and heart rate and sats/colour
  HR < 60

Continue ventilating with 100% oxygen.
Start chest compressions (3 compressions: 1 breath)
Consider intubation or LMA

30 seconds
- Assess breathing and heart rate and sats/colour
  HR < 80

Continue compressions and ventilations (3:1 ratio)
Give 0.1-0.3 mL/kg adrenaline (epinephrine) IV (1:10 000 dilution)
(1 mL/kg epinephrine ET (1:10 000 dilution) only if no IV access)
May repeat epinephrine IV after 3 – 5 min
Correct hypovolaemia if necessary (10 mL/kg IV over 5-10 min)
Consider pneumothorax

Routine Care
- Maintain warmth
- Keep airway clear
- Ongoing evaluation

If chest NOT moving:
- M – Mask seal adequate?
- O – Obstruction?
  (Secretions/Positional)
- V – Ventilate more firmly?
- I – Intubate if necessary?
- N - Nasal choanal atresia?
- G – Gastric distension?

Oxygen Administration
- Use blended O₂ if available to achieve targeted pre-ductal sats
  (see below)

  Alternatively:
  - Bag with no O₂ = ±21%
  - Bag with O₂ = ±40%
  - Bag with O₂ + reservoir = ± 100%

Targeted pre-ductal sats after birth (right hand or ear)
  - 1 minute: > 60%
  - 2 minutes: > 65%
  - 3 minutes: > 70%
  - 4 minutes: > 75%
  - 5 minutes: > 80%
  - ≥ 10 minutes: 85–95%

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6.6.4 CARE OF THE HIV-EXPOSED INFANT

098.7
See Section 11.5: The HIV exposed infant.

6.7 POST PARTUM CARE

Z39.2

6.7.1 CRACKED NIPPLES DURING BREASTFEEDING

O92.1

DESCRIPTION

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

Causes of cracked nipples include:
» poor positioning of the baby and incorrect attachment to the breast
» removing the baby from the breast before suction is broken

The four signs of good attachment are:
» chin touching breast (or very close)
» mouth wide open
» lower lip turned outward
» more areola visible above than below the mouth

GENERAL MEASURES

» Apply expressed breast milk to the nipples between feeds and air dry.
» If too painful, express the milk and nurse the baby on the other breast until improvement.
» Keep areola and nipple clean and dry.
» Avoid use of soap, creams and lotions on the nipples.

MEDICINE TREATMENT

• Zinc and castor oil ointment
  o Apply between feeds.

If oral thrush is present, treat neonate with:
• Nystatin solution. See Section 1.2: Candidiasis, oral (thrush).

REFERRAL

No improvement after 2 days.

6.7.2 MASTITIS

O91.23

DESCRIPTION

Inflammation of the breast tissue surrounding the milk ducts. Retrograde infection from a fissured nipple and milk stasis are known risk factors.
Commonly isolated pathogens include *S. aureus* and *S. epidermidis*. Presentation includes painful breast(s), fever, erythema and malaise.

**GENERAL MEASURES**
Compresses.
Regular expressing of breast milk.
Do not stop breastfeeding, unless a breast abscess has developed.
If breast abscess present, refer for incision and drainage.

**MEDICINE TREATMENT**
- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.
- **Penicillin allergy**
  - Macrolide, e.g.:
  - Azithromycin, oral, 500 mg daily for 3 days.

**Pain**
- Paracetamol, oral, 1 g 6 hourly when required.

**REFERRAL**
Breast abscess.
No improvement after 2 days.

---

**GYNAECOLOGY**

**6.8 PREGNANCY, ECTOPIC**

**DESCRIPTION**
Pregnancy outside the uterus, usually presenting with the combination of:
- amenorrhoea (missed menstrual period)
- sudden lower abdominal pain
- dizziness
- shock
- anaemia
- urine pregnancy test usually positive
- shoulder tip pain

**Note:** Consider ectopic pregnancy in young women, complaining of lower abdominal pain.

**REFERRAL**
- All suspected cases of ectopic pregnancy.
- Treat shock if indicated.

**LOE: III**
6.9 VAGINAL BLEEDING
N93.9

Note: Women should receive regular screening for cervical cancer after the age of 30 years. Any opportunity to perform screening should be taken; this includes taking pap smears during pregnancy.

6.9.1 ABNORMAL VAGINAL BLEEDING DURING FERTILE YEARS
N92.0

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. cervical cancer, fibroids.

MEDICINE TREATMENT
• Combined oral contraceptive pill (ethinylestradiol/levonorgestrel) for 3–6 months.
• Ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days.
  o Ibuprofen may reduce blood loss in menorrhagia associated with intrauterine device (IUD) or chronic salpingitis (See Chapter 12: Sexually transmitted infections).

If blood loss has been severe or there are signs of anaemia:
• Ferrous sulphate compound BPC, oral, 170 mg 8 hourly with food.
  OR
  Ferrous fumarate, oral, 200 mg 8 hourly with food.
  o Continue for 3 months after the Hb normalises in order to replenish body iron stores.
  o Do not take iron tablets within 4 hours of taking calcium tablets.

REFERRAL
» No improvement.
» Girls < 12 years of age with vaginal bleeding before the development of their secondary sexual characteristics.
» For investigation of other causes such as:
  – sexual abuse
  – foreign bodies
  – tumours of the genital tract
» Severe anaemia.
6.9.2 BLEEDING, POST-MENOPAUSAL
N95.0

DESCRIPTION
Vaginal bleeding 6 months following the complete cessation of menstruation.
Note: If bleeding is profuse, stabilise before referral.

REFERRAL
All cases, to exclude underlying malignancy and other pathology.

6.10 DYSMENORRHOEA
N94.6

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

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

MEDICINE TREATMENT
- Ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days.
  ADD
- Combined oral contraceptive pill, if symptoms still problematic, and if pregnancy is not planned.

Treat for pelvic infection when present.

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

6.11 HORMONE THERAPY (HT)
Z79.89

Indications:
Short term symptomatic relief for severe menopausal symptoms.
For menopausal women, treatment should be ≤ 5 years.
A risk-benefit assessment should be individualised in all patients.

Contra-indications include:
» endometrial cancer  » coronary heart disease
» breast cancer  » women ≥ 60 years of age
» thrombo-embolism  » acute liver disease
» porphyria cutaneatarda
MEDICINE TREATMENT (Doctor initiated)

Uterus present (no hysterectomy)

HT can be offered as sequentially opposed or continuous combined preparations. Continuous combined preparations are often preferred if the woman had her last menstrual period (menopause) over a year ago, as they will not usually cause bleeding then. For women who are still menstruating or have recently stopped, sequentially opposed preparations are preferred and will result in regular menstrual periods, whereas continuous combined may result in irregular bleeding.

Sequentially opposed therapy:
- Estradiol valerate, oral, 1–2 mg daily for 21 days.
  ADD
  - Cyproterone acetate, oral, 1 mg daily from day 12–21.
  or
  - Norethisterone acetate, oral, 1 mg daily from day 12–21.
  or
  - Medroxyprogesterone acetate, oral, 10 mg daily from day 12–21.
    o Followed by no therapy from day 22–28.

OR
- Conjugated equine estrogens, oral, 0.3–0.625 mg daily for 21 days.
  ADD
  - Medroxyprogesterone acetate, oral, 5–10 mg daily from day 12–21.
    o Followed by no therapy from day 22–28.

Continuous combined therapy, e.g.:
- Conjugated equine estrogens, oral, 0.3–0.625 mg plus medroxyprogesterone acetate, oral, 2.5–5 mg daily.

OR
- Estradiol valerate, oral, 0.5–1 mg plus norethisterone acetate, oral, 0.5–1 mg daily.

Note: Start at the lowest possible dose to alleviate symptoms. The need to continue HT should be reviewed annually. A mammogram should be done at commencement of HT, and then once a year, if available. Abnormal vaginal bleeding requires specialist referral.

Women with no uterus (post-hysterectomy)

HT is given as estrogen only.
- Estradiol valerate, oral, 1–2 mg daily.

OR
- Conjugated equine estrogens, oral, 0.3 mg daily up to a maximum of 1.25 mg daily.

REFERRAL
Annually, for re-evaluation.
6.12 ULCERS, VAGINAL
A60.9
See Chapter 12: Sexually transmitted infections.

6.13 VAGINAL DISCHARGE/LOWER ABDOMINAL PAIN IN WOMEN
A54.9/ N73.9
See Chapter 12: Sexually transmitted infections.

Benzathine benzylpenicillin: Section 4.9 Rheumatic fever, acute. PHC STG, 2014.
Lidocaine 1%: Section 4.9 Rheumatic fever, acute. PHC STG, 2014.


Sodium chloride 0.9%: Essential Steps in Managing Obstetric Emergencies (ESMOE), facilitator’s guide.

Misoprostol: Essential Steps in Managing Obstetric Emergencies (ESMOE), facilitator’s guide.


Routine care of the neonate: Updated South African Handbook of Resuscitation of the Newborn under the auspices of the South African Paediatric Association.


Chapter 7: Family planning

7.1 Intrauterine device/contraception (IUD)
7.2 Contraception, hormonal
    7.2.1 Subdermal implant
    7.2.2 Injectable
    7.2.3 Oral
    7.2.4 Missed pills
7.3 Contraception, barrier methods
7.4 Contraception, emergency
INTRODUCTION TO CONTRACEPTION

Consult the most recent National Contraception Clinical Guidelines. 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.

Contraceptive methods

<table>
<thead>
<tr>
<th>Contraceptive method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Copper IUD (see Section 7.1) | » Can be used in most women, including nulliparous women.  
» Provides long-term protection i.e. 10 years.  
» Convenient, does not require regular follow up.  
» Works immediately on insertion.  
» Fertility returns on removal of IUD in women of child-bearing age.  
» Medicine interactions do not lower contraceptive effect. | » Pain during and following insertion of IUD.  
» IUD must be inserted or removed by a trained health care professional.  
» Not indicated in women with dysmenorrhea and abnormal uterine bleeding. |
| Hormonal subdermal: progestin-only implant (see Section 7.2.1) | » Provides long-term protection i.e. 3 years (etonogestrel) or 5 years (levonorgestrel).  
» Convenient, does not require regular follow up.  
» Fertility returns on removal of implant in women of child-bearing age.  
» Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of ovary cysts. | » Frequent bleeding irregularities.  
» Ovarian cysts  
» Implant must be inserted or removed by a trained health care professional under aseptic conditions to prevent infection.  
» An incision is required to insert the implant under the skin in the woman's upper arm. |

CAUTION

Hormonal contraception and IUDs do not prevent sexually transmitted infections (STIs), including HIV. Dual contraception use i.e. the use of a condom in combination with another contraceptive method is recommended to reduce the risk of STIs, including HIV. IUDs are the preferred primary contraceptive method.
### CHAPTER 7

#### FAMILY PLANNING

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| **Hormonal injectable:** progestin-only (see Section 7.2.2) | - Daily patient adherence is not required.  
- Long-acting i.e. given every 12 weeks.  
- Interactions with other medicines do not lower contraceptive effect.  
- Can be used postpartum.  
- Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of venous thromboembolism. | - Delayed return of fertility, of up to \( \geq 9 \) months, after last injection.  
- Weight gain in some women.  
- Headaches. |
| **Hormonal oral:** progestin-only (see Section 7.2.3) | - Fertility returns 1-3 months on discontinuing the pill.  
- Can be used postpartum.  
- Can be used in women >35 years who are obese, who smoke, have diabetes, hypertension, or a history of venous thromboembolism. | - Daily adherence is required.  
- Interactions with other medicines can lower contraceptive effect.  
- Lower efficacy compared with COC.  
- Frequent bleeding irregularities.  
- Ovarian cysts. |
| **Hormonal oral:** combined oral contraceptive (COC) (see Section 7.2.3) | - Non-contraceptive benefits, e.g.: alleviation of dysmenorrhoea, premenstrual syndrome and menorrhagia.  
- Fertility returns 1–3 months of discontinuing COC.  
- Long-term use protects against ovarian, endometrial cancer and improves bone mineral density. | - Daily patient adherence is required.  
- Interactions with other medicines can lower contraceptive effect.  
- Cannot be used in women with heart disease, stroke and a history of active venous thromboembolism. |
| **Barrier:** male and female condoms (see Section 7.3) | - Protects against STIs, including HIV. | - Possibility of breakage or slipping off.  
- Possible allergic reaction to latex. |

(Refer to the package inserts for detailed information).
Effectiveness of family planning methods
Rates of unintended pregnancies per 100 women:

<table>
<thead>
<tr>
<th>Contraceptive method</th>
<th>Failure rate in 1st year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consistent and correct use</td>
</tr>
<tr>
<td>Copper IUD</td>
<td>0.6</td>
</tr>
<tr>
<td>Progestin-only subdermal implant</td>
<td>0.05</td>
</tr>
<tr>
<td>Progestin-only injectable</td>
<td>0.3</td>
</tr>
<tr>
<td>Progestin-only oral pill</td>
<td>0.3</td>
</tr>
<tr>
<td>Combined oral contraceptive (COC) pill</td>
<td>0.3</td>
</tr>
<tr>
<td>Barrier: female condoms</td>
<td>5</td>
</tr>
<tr>
<td>Barrier: male condoms</td>
<td>2</td>
</tr>
<tr>
<td>No method</td>
<td>85</td>
</tr>
</tbody>
</table>

Key: 0-0.9: very effective 10-25: moderately effective 1-9: effective 26-32: less effective

Patient counselling
» Women may experience abnormal bleeding including:
  - Breakthrough bleeding or spotting between menstrual cycles.
  - Painful, heavy or prolonged bleeding during the menstrual cycle.
  - Amenorrhoea.
» Hormonal oral pills must be taken at the same time every day without interruption.
» Taking the hormonal oral pill with food or at bedtime may alleviate nausea.
» If the patient is not using the dual contraception method with hormonal oral contraceptives and vomits within 2 hours or has severe diarrhoea within 12 hours of taking the hormonal oral pill, repeat the dose as soon as possible. Recommend the use of condoms.
» Women who have persistent vomiting or severe diarrhoea resulting in two or more missed pills follow instructions for missed pills. Recommend the use of condoms.
» Discourage smoking with the use of the combined oral contraceptive.
» Encourage increased physical activity and healthy eating if there is weight gain.

Breastfeeding
» Women who are intending to breastfeed should delay initiation of COCs until cessation of breastfeeding or at 6 months postpartum, whichever occurs earlier.

7.1 INTRAUTERINE DEVICE/CONTRACEPTION (IUD)
Z30.1

Dual contraception with barrier methods, are preferred to reduce the risk of STIs. The IUD is an effective, safe, reversible long-term contraceptive method requiring minimal patient involvement, but is however under-utilised.

HIV infection is NOT a contra-indication to the use of IUD and may be the most suitable contraceptive for women on ARVs.

- Copper IUD, e.g.:
- Cu T380A, 380mm² copper device.
Devices with lower copper surface area are not recommended. The IUD can be inserted any time during the menstrual cycle once pregnancy or the possibility of pregnancy has been excluded. Insertion at menstruation may be easier for the patient resulting in less discomfort and spotting. Copper IUD is not recommended for women with menorrhagia, active pelvic inflammatory disease (PID) or uterine abnormalities.

For pain after insertion:
- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

REFERRAL
- Excessive bleeding after insertion.
- Abnormal bleeding for > 3 months.

7.2 CONTRACEPTION, HORMONAL

7.2.1 SUBDERMAL IMPLANT

Dual contraception with barrier methods, are preferred to reduce the risk of STIs. The subdermal implant is an effective, safe, reversible and convenient long-term contraceptive method requiring minimal patient involvement and no regular follow-up.

Progestin-only subdermal implant contraceptive, e.g.:
- Etonogestrel, subdermal, 68 mg, single-rod implant.
- OR
  - Levonorgestrel, subdermal, 150 mg, two-rod implant.

The progestin-only subdermal implant can be inserted any time during the menstrual cycle, once pregnancy has been excluded. If the implant is inserted within 7 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of insertion. Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding, active liver disease, and progestin-dependant tumours. Consult the package insert in this regard.

CAUTION

Do not use progestin-only subdermal implants in women on long term medicines that induce the metabolism of progestins, which could reduce contraceptive efficacy.

These medicines include efavirenz, nevirapine, rifampicin, phenytoin, carbamazepine and phenobarbital.

Women with implants on these medicines should be counseled to use additional contraceptive methods.

Insertion and removal procedures
- Participation in a training session is strongly recommended to become familiar with the use of the subdermal implants and techniques for insertion and removal.
Only health care professionals familiar with these procedures should insert and remove subdermal implants under aseptic conditions.

- Insert the implant subdermally just under the skin.
- Refer to the package inserts, for detailed information.

**Insertion of etonogestrel:**
- Insertion should only be performed with the preloaded applicator.
- Clean the insertion site with an antiseptic solution.
- Anaesthetise the insertion area.
- Mark the insertion site with a marker.
- Insert subdermally at inner side of the non-dominant upper arm about 8–10 cm above the medial epicondyle of the humerus.
- Remove the transparent protection cap by sliding it horizontally in the direction of the arrow away from the needle.
- Puncture the skin with the tip of the needle angled about $30^\circ$.
- Lower the applicator to a horizontal position. While lifting the skin with the tip of the needle, slide the needle to its full length.
- While keeping the applicator in the same position and the needle inserted to its full length, unlock the purple slider by pushing it slightly down. Move the slider fully back until it stops.
- The implant is now in its final subdermal position. Remove the applicator.
- Always verify the presence of the implant in the patients arm immediately after insertion by palpation.
- Apply sterile gauze with a pressure bandage to minimise bruising. The patient may remove the pressure bandage in 24 hours and the small bandage over the insertion site after 3–5 days.

**Insertion of levonorgestrel:**
- Clean the insertion site with an antiseptic solution.
- Anaesthetise the insertion area.
- Make an incision of 3 mm in the skin with the scalpel that is attached to the body protecting the inserter.
- Insert subdermally in the inner aspect of the upper left arm in right-handed women and in the right arm in left-handed women, approximately 8 cm above the fold in the elbow.
- Place the implants with the inserter subdermally, in the shape of a V opening towards the shoulder.
- After inserting the second implant, the edges of the incision are pressed together, closed with a skin closure and dressed.
- Advise the patient to keep the insertion area dry for 3 days.
- The gauze and the bandage may be removed as soon as the incision has healed, usually after 3–5 days.

**For pain after insertion:**
- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

LoE:III
Removal of progestin-only subdermal implants:
Remove etonogestrel implants at the end of 3 years and levonorgestrel implants at the end of 5 years.
» Locate the implant by palpation.
» Clean the removal site with an antiseptic solution.
» Anaesthetise the removal area.
» Make a 2–4 mm incision with the scalpel close to the end of the implant.
» Remove the implant very gently, using a small forceps.
» Close the incision and bandage.
» Advise the patient to keep the arm dry for a few days.
» Confirm that the entire implant has been removed by measuring its length.

REFERRAL
» Heavy or prolonged bleeding, despite treatment with COCs
» Infection at insertion site, inadequately responding to initial antibiotic treatment.

7.2.2 INJECTABLE
Z30.9
Dual contraception with barrier methods, are preferred to reduce the risk of STIs.

- **Progestin-only injectable contraceptive**, e.g.:
  - Medroxyprogesterone acetate (long-acting), IM, 150 mg, 12 weekly.

Progestin-only hormonal contraceptives are contraindicated in certain conditions e.g. unexplained vaginal bleeding. Consult the package insert in this regard.

**When to start the injection**
» The injection can be started anytime within the menstrual cycle but it is advisable to start during menses.
» If the first injection is given within 5 days of the onset of the menstrual cycle the contraceptive effect is achieved on the day of the first injection.
» Recommend dual contraceptive method i.e. condom in combination with the injection, irrespective of when the injection is started within the cycle.

**Note:** It is not necessary to shorten the dose interval when using rifampicin or any other enzyme inducing medicine.

**Late injection**
» If it has been < 2 weeks since the missed injection, the next injection can be given without loss of protection. Continue with dual contraceptive method i.e. condom in combination with the injection.
» If it has been > 2 weeks since the missed injection:
  - Exclude pregnancy.
  - If the patient is not pregnant, the next injection can be given. Recommend dual contraceptive method i.e. condom in combination with the injection.
  - If unable to exclude pregnancy consider emergency contraception if indicated. The next injection can be given. Recommend dual contraceptive method i.e. condom in combination with the injection.
For heavy or prolonged bleeding
- Give COCs for 3–6 months, thereafter refer.

For pain
- Ibuprofen, oral, 400 mg 8 hourly as needed for up to 5 days.

### REFERRAL

Heavy or prolonged bleeding despite treatment with combined oral contraceptives.

### 7.2.3 ORAL

Dual contraception with barrier methods, are preferred to reduce the risk of STIs.

**Monophasic: progestin only pills**
- Levonorgestrel, oral, 30 mcg daily.

**Combination of estrogen and progestin in each pill**

**Monophasic preparations: combination of estrogen and progestin in each pill, e.g.:**
- Ethinyloestradiol/levonorgestrel, oral, 30 mcg/150 mcg:
  - 21 tablets ethinyloestradiol/levonorgestrel, 30 mcg/150 mcg and
  - 7 tablets placebo.

**Triphasic preparations: combination of estrogen and progestin, e.g.:**
- Ethinyloestradiol/levonorgestrel, oral:
  - 6 tablets ethinyloestradiol/levonorgestrel, 30 mcg/50 mcg
  - 5 tablets ethinyloestradiol/levonorgestrel, 40 mcg/75 mcg and
  - 10 tablets ethinyloestradiol/levonorgestrel, 30 mcg/125 mcg and
  - 7 tablets placebo.

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Progestin only preparations are contraindicated in certain conditions. (Consult the package insert in this regard).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contraindications include:</td>
</tr>
<tr>
<td></td>
<td>» Abnormal uterine bleeding of unknown cause</td>
</tr>
<tr>
<td></td>
<td>» Myocardial infarction or stroke</td>
</tr>
<tr>
<td></td>
<td>» Liver disease</td>
</tr>
<tr>
<td></td>
<td>» Cancer of the breast or genital tract</td>
</tr>
<tr>
<td></td>
<td>» Known or suspected pregnancy</td>
</tr>
</tbody>
</table>

| When to start the pill            | » Start anytime within the menstrual cycle, but it is advisable to start during menses.                     |

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Combination preparations contraindicated in certain conditions. (Consult the package insert in this regard).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contraindications include:</td>
</tr>
<tr>
<td></td>
<td>» Women &gt;35 years of age who smoke ≥ 15 cigarettes a day or have risk factors for cardiovascular disease:</td>
</tr>
<tr>
<td></td>
<td>» Heart disease</td>
</tr>
<tr>
<td></td>
<td>» Liver disease</td>
</tr>
<tr>
<td></td>
<td>» Thromboembolism</td>
</tr>
<tr>
<td></td>
<td>» Certain cancers</td>
</tr>
</tbody>
</table>

LoE:II

LoE:II

LoE:II

LoE:II
7. If the first pill is given between days 1 and 5 of the menstrual cycle the contraceptive effect is achieved immediately.

Dual contraception use is recommended irrespective of when the pill is started in the menstrual cycle.

### Medicine interactions

<table>
<thead>
<tr>
<th>Enzyme-inducing medicines interacting with oral contraceptives</th>
<th>Contraceptive effect (%)</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Therapeutic class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-tuberculosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Lowering of contraceptive effect expected. May reduce ethinylöestradiol (EE) by 66%.</td>
<td>Use dual contraception i.e. condoms in combination with COCs or, alternatively use IUD.</td>
</tr>
<tr>
<td><strong>Anti-epileptics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>Lowering of contraceptive effect expected. May reduce EE by 50%.</td>
<td>Use IUD or alternatively condoms in combination with oral contraceptives.</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Lowering of contraceptive effect expected. May reduce EE by 50%.</td>
<td>Same as above.</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>Lowering of contraceptive effect expected. May reduce EE by 66%.</td>
<td>Same as above.</td>
</tr>
<tr>
<td><strong>Antiretrovirals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nevirapine</td>
<td>Lowering of contraceptive effect expected. May reduce EE by 20%.</td>
<td>Use dual contraception i.e. condoms in combination with IUD or, alternatively use condoms in combination with COCs.</td>
</tr>
<tr>
<td>Lopinavir/ritonavir</td>
<td>Lowering of contraceptive effect expected. May reduce EE by 42%.</td>
<td></td>
</tr>
</tbody>
</table>

Non-liver enzyme inducing medicines

- Lamotrigine:
  - Lowering of contraceptive effect not expected.
  - Oral contraceptives may reduce lamotrigine concentration by 50%, increasing the risk of seizures. Consider alternate dual contraception method.

- Antibiotics:
  - Possible lowering of contraceptive effect. For the duration of the current menstrual cycle, use a condom as well.
CHAPTER 7

FAMILY PLANNING

REFERRAL
Abnormal bleeding for > 3 months.

7.2.4 MISSED PILLS

Progestin only pills
Efficacy is rapidly lost if one pill is forgotten or taken > 3 hours late. Recommend dual contraception for all scenarios.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>One pill forgotten or if pill taken &gt;3 hours late and unprotected sexual</td>
<td>Take pill as soon as remembered and continue taking one pill daily at the same hour.</td>
</tr>
<tr>
<td>intercourse has not occurred in the past 5 days.</td>
<td></td>
</tr>
<tr>
<td>One pill forgotten or if taken &gt;3 hours late and unprotected sexual</td>
<td>Give emergency contraception (see Section 7.4). Take one pill the next day and continue taking one pill daily at</td>
</tr>
<tr>
<td>intercourse has occurred in the past 5 days.</td>
<td>the same hour.</td>
</tr>
</tbody>
</table>

Combination of progestin and estrogen in each pill
Missing active pills and extending hormone free interval leads to decreased contraceptive efficacy. Recommend dual contraception for all scenarios.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>One active pill forgotten.</td>
<td>Take pill as soon as remembered and take next one at usual time.</td>
</tr>
<tr>
<td>≥ Two pills forgotten in the last 7 active pills of the pack.</td>
<td>Omit the inactive pill and immediately start the first active pill of the next pack.</td>
</tr>
<tr>
<td>≥ Two pills forgotten during the 1st 7 active pills of the pack and</td>
<td>Give emergency contraception (see Section 7.4). Restart active pills 12 hours later.</td>
</tr>
<tr>
<td>sexual intercourse has occurred.</td>
<td></td>
</tr>
</tbody>
</table>

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 is known to have a STI, including HIV.

- Condoms, male and female in combination with IUD (see Section 7.1: Intrauterine contraception).

7.4 CONTRACEPTION, EMERGENCY
Z30.9

Emergency contraception is indicated for patients not using contraception or dual contraception with IUDs to prevent pregnancy after unprotected intercourse e.g.
forgotten tablets, slipped or broken condom, progestin-only injectable contraceptive given > 2 weeks late.

- **Progestin-only tablets**, e.g.:
  - Levonorgestrel 1.5 mg, oral, as a single dose as soon as possible after unprotected intercourse.

### CAUTION

Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not more than 5 days later.

**OR**

- Copper IUD, e.g.:
  - Cu T 380A, within 5 days of unprotected intercourse.

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**LoE:**

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Chapter 8: Kidney and urological disorders

Kidney section
8.1 Chronic kidney disease
8.2 Acute kidney injury
8.3 Glomerular disease (GN)
  8.3.1 Nephritic syndrome
  8.3.2 Nephrotic syndrome
8.4 Urinary tract infection
8.5 Prostatitis

Urology section
8.6 Haematuria
8.7 Benign prostatic hyperplasia
8.8 Prostate cancer
8.9 Enuresis
8.10 Impotence/ Erectile dysfunction
8.11 Renal calculi
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 (eGFR).

Markers of kidney damage include:
» abnormalities in urine e.g. proteinuria or haematuria
» abnormalities in blood e.g. serum creatinine or low eGFR
» abnormalities in imaging tests e.g. small kidneys on ultrasound
» abnormalities on pathological specimens e.g. glomerular disease on renal biopsy

Common causes of chronic kidney disease include:
» hypertension
» polycystic kidney disease
» diabetes mellitus
» HIV/AIDS
» 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

<table>
<thead>
<tr>
<th>CKD Stage.</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>eGFR &gt; 90</td>
<td>At increased risk for CKD, e.g.: diabetes mellitus, hypertension, glomerular disease, and HIV</td>
<td>Screening for CKD and CVD disease, CKD risk reduction i.e. treat hypertension, diabetes and HIV</td>
</tr>
<tr>
<td>eGFR &gt; 90</td>
<td>Kidney damage with normal eGFR.</td>
<td>Diagnose and treat comorbid conditions, slow progression, CVD risk reduction. (Watch for stage 2).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes actions from preceding stages</td>
<td></td>
</tr>
</tbody>
</table>

8.2
## CHAPTER 8  KIDNEY AND UROLOGICAL DISORDERS

### 8.3 Stage 2 or eGFR 60–89
- Kidney damage with mild ↓ eGFR.
- » Refer to determine cause and develop care plan.
- » While on the care plan, monitor the eGFR in these patients and ensure kidney function is not worsening rapidly. (Watch for stage 3).

### 8.3 Stage 3 or eGFR 30–59
- Moderate ↓ eGFR.
- Refer.

### 8.3 Stage 4 or eGFR 15–29
- Severe ↓ eGFR.
- Refer.

### 8.3 Stage 5 or eGFR < 15
- Kidney failure requiring renal replacement therapy.
- End stage renal disease.
- Refer.

Send blood annually for measurement of creatinine in all patients at increased risk. (eGFR will be calculated by the laboratory, based on the serum creatinine).

### GENERAL MEASURES
- » Reduce salt intake.
- » Low protein diet is indicated in the presence of CKD stage 4 and 5.
- » Avoid nephrotoxic medicines e.g. NSAIDs.
- » Screen for proteinuria.
  - If urine dipstick 1+ or greater, repeat on a properly collected midstream urine specimen on another occasion. If proteinuria persists quantify protein with a spot urine protein creatinine ratio. Significant proteinuria = spot urine protein creatinine ratio of > 0.1 g/mmol.
  - **Note**: Proteinuria is screened for differently in diabetics. See Section 9.4.3: Diabetic nephropathy.

### MEDICINE TREATMENT
Treat underlying conditions.

#### Proteinuria
Measure serum potassium at baseline.

**Adults**
- ACE-inhibitor, e.g.:
  - Enalapril, oral, start with 5 mg 12 hourly.
    - Titrate up to 20 mg 12 hourly, if tolerated.
    - Start with low dosage of ACE-inhibitor and titrate up to the maximum dose or until the proteinuria disappears – whichever comes first. Ensure BP remains in normal range and no side effects are present.
  - Monitor creatinine and potassium:
1–2 weeks after treatment initiation, if eGFR < 60 mL/min and after 4 weeks, if eGFR > 60 mL/min.
- If creatinine increases by > 20% from the baseline, stop ACE-inhibitor and refer.
- If stable, monitor thereafter at regular clinic visits.

ACE-inhibitors are contraindicated in, amongst others:
- hyperkalaemia
- known hypersensitivity to an ACE-inhibitor or an ARB
- bilateral renal artery stenosis
- pregnancy
- severe renal impairment (eGFR < 30 mL/min)

Hyperlipidaemia
If hyperlipidaemia is a co-existent risk factor, manage according to Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Diabetes mellitus
» In diabetics, optimise control according to Section 9.2.2: Type 2 Diabetes mellitus, in adults.
» Replace oral sulphonylureas with insulin when eGFR < 60 mL/min, because of an increased risk of hypoglycaemia.
» Stop metformin when eGFR < 30 ml/min, because of the potential risk of lactic acidosis.
» Insulin is preferred to control blood glucose in patients with eGFR < 30 mL/min.

Hypertension
Treat if present. See Section 4.7: Hypertension.

Fluid overload
Treat fluid overload if present and refer.

Adults
- Furosemide, slow IV or oral, 40–80 mg, 12 hourly.
  o If poor response, repeat after 1 hour.
  o Do not give IV fluids – use heparin lock or similar IV access.

Children
- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4
  o Do not put up a drip or run in any IV fluids.

Note: Exclude heart failure in patients with persistent pedal oedema.

REFERRAL
» All cases of suspected chronic kidney disease stages 3–5 for assessment and planning.
» All children.
» All cases of CKD with:
  - haematuria,
  - significant proteinuria with urine protein creatinine ratio of > 0.1 g/mmol
CHAPTER 8
KIDNEY AND UROLOGICAL DISORDERS

8.5
- eGFR < 60 mL/min for initial assessment and planning
- eGFR < 30 mL/min
  » Uncontrolled hypertension/fluid overload.
  » CKD associated with hyperlipidaemia.
  » No resolution of proteinuria with ACE-inhibitor therapy.
  » If ACE-inhibitor is contra-indicated.
  » If ACE-inhibitor is not tolerated.

Patients who might qualify for dialysis and transplantation or who have complications should be referred early to ensure improved outcome and survival on dialysis, i.e. as soon as eGFR drops < 30 mL/min, or as soon as diagnosis is made/suspected.

8.2 ACUTE KIDNEY INJURY
N17.9

DESCRIPTION
This is (potentially) reversible kidney failure, commonly as a result of:
  » hypovolaemia and fluid loss
  » acute tubular necrosis
  » medicines/toxins
  » acute glomerulonephritis
  » urinary tract obstruction

It is often recognised by:
  » fluid overload (e.g. pulmonary oedema)
  » decreased or no urine output
  » abnormalities of serum urea, creatinine and/or electrolytes
  » convulsions in children

GENERAL MEASURES
  » Give oxygen, and nurse in semi-Fowlers’ position if patient has respiratory distress. Early referral is essential.
  » If fluid overloaded:
    - stop all IV fluids
  » If dehydrated or shocked:
    - treat immediately as in shock section.
  » Avoid any nephrotoxic medicines e.g. NSAIDs, aminoglycosides.

MEDICINE TREATMENT
Children
<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:
    10–25 kg: 2.5 mg
    25–50 kg: 5 mg
    > 50 kg: 10 mg
8.6 If there is respiratory distress (rapid respiration, chest indrawing):
- Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4.
  - Do not put up a drip or run in any IV fluids.

**Adults**
If diastolic blood pressure > 110 mmHg or systolic blood pressure > 180 mmHg:
- Amlodipine, oral, 5 mg as a single dose
  **AND**
  - Hydrochlorothiazide, oral, 25 mg (if eGFR ≥ 30 mL/min)
  **OR**
  - Furosemide, oral, 40–80 mg (if eGFR < 30 mL/min)

If there is respiratory distress (rapid respiration, orthopnoea):
- Furosemide, as an IV bolus, 80 mg.
  - 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 eGFR(and its effects)
» haematuria
» hypertension and oedema
Approach to care is outlined under the syndromes which follow.

**Diabetic nephropathy**
See Section 9.4.3 Diabetic nephropathy.

**REFERRAL**
» Unexplained haematuria on two to three consecutive visits.
» Proteinuria > 1 g/24 hours or PCR > 0.1 g/mmol.
» Nephritic syndrome.
» Nephrotic syndrome.
» Chronic Kidney Disease.

**Note:** Where facilities are available, investigation should be done e.g. urea, creatinine and electrolytes to calculate the eGFR or PCR.
8.3.1 NEPHRITIC SYNDROME
N00/N01/N03/N05

DESCRIPTION
Presents with a varied combination of:
» painless macroscopic turbid, bloody or brownish urine
» peripheral and periorbital oedema
» pulmonary oedema (circulatory overload)
» hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions
» little or no urine excretion
In children, this is commonly due to acute post streptococcal glomerulonephritis.

GENERAL MEASURES
» Give oxygen, and nurse in semi-Fowlers position if patient has respiratory distress.
» Early referral essential, especially if patient had a hypertensive episode or fluid overload.
» If dehydrated or shocked: Treat immediately. (See Section 21.17 Shock).

MEDICINE TREATMENT

Children
Fluid overload (rapid respiration, chest indrawing)
• Furosemide, IV, 1 mg/kg, over 5 minutes. See doing table, pg 22.4.
  o Do not put up a drip or run in any IV fluids.

If hypertension present:
<6 years of age:  > 120 mmHg systolic BP or > 90 mmHg diastolic BP
6–15 years:  > 130 mmHg systolic BP or > 95 mmHg diastolic BP
• Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  o Withdraw contents of 5 mg capsule with a 1 mL syringe:
    10–25 kg:  2.5 mg
    25–50 kg:  5 mg
    >50 kg:  10 mg

Adults
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 present:
Diastolic BP > 100 mmHg or systolic BP is > 150 mmHg:
• Amlodipine, oral, 5 mg as a single dose.
  AND
• Hydrochlorothiazide, oral, 25mg (if eGFR ≥ 30 mL/min).
  OR
  Furosemide, oral, 40–80mg (if eGFR < 30 mL/min).

REFERRAL
All cases.
The definitive treatment of nephritis depends on the cause – an assumption of acute post streptococcal nephritis or any other disease cannot be made without specific investigation which may include renal biopsy.

### 8.3.2 NEPHROTIC SYNDROME

**DESCRIPTION**

Glomerular disease characterised by:

- severe proteinuria defined as:
  - children: $\geq 3$ + proteinuria on dipstick test, or urine protein: creatinine ratio (PCR) $\geq 0.2$ g/mmol on spot urine sample
  - adults: $\geq 2.5$ g/day, as determined by a spot urine protein measurement, i.e. PCR $> 0.25$ g/mmol
- and resultant ‘classic’ clinical picture (not always present) which includes:
  - oedema and
  - hypoalbuminaemia and
  - hyperlipidaemia.

Accurate diagnosis requires a renal biopsy.

### MEDICINE TREATMENT

The management of glomerular disease depends on the type/cause of the disease and is individualized, guided by a specialist according to the biopsy result.

### REFERRAL

All cases.

### 8.4 URINARY TRACT INFECTION (UTI)

**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 $38^\circ$C or higher
- other features of sepsis, i.e.:
  - tachypnoea
  - tachycardia
  - confusion
  - hypotension
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
- hypothermia
- poor feeding
- sepsis
- vomiting
- prolonged jaundice
- failure to thrive
- renal failure

Infants and children may present with:
- failure to thrive
- frequency
- persisting fever
- dysuria
- abdominal pain
- enuresis or urgency
- diarrhoea

In any child with fever of unknown origin, the urine must be examined, to assess whether a urinary tract infection is present.

If a bag specimen reveals the following, a urine specimen must be collected aseptically for culture and sensitivity:
- positive leukocytes or nitrites on dipstix 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 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

MEDICINE 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.
CHAPTER 8  KIDNEY AND UROLOGICAL DISORDERS

Uncomplicated cystitis

Adults

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

Complicated cystitis

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 7 days.

For pregnant women and adolescents:

- Amoxicillin/clavulanic acid 875/125 mg, oral, 1 tablet 12 hourly for 7 days.

Children ≤ 35 kg who do not meet criteria for urgent referral:

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 7 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg (amoxicillin component)</th>
<th>Use one of the following</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;5–7 kg</td>
<td>100 mg</td>
<td>4 mL 2 mL 0 mL</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>150 mg</td>
<td>6 mL 3 mL 0 mL</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>200 mg</td>
<td>8 mL 4 mL 0 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>250 mg</td>
<td>10 mL 5 mL 1 tablet</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>300 mg</td>
<td>12 mL 6 mL 0 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>375 mg</td>
<td>15 mL 7.5 mL 0 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>500 mg</td>
<td>20 mL 10 mL 2 tablets</td>
<td>&gt;7–11 years</td>
</tr>
</tbody>
</table>

Children > 35 kg and adults who do not meet criteria for urgent referral:

- Amoxicillin clavulanic acid, oral, 875/125 mg, oral, 1 tablet 12 hourly for 5 days.

Acute pyelonephritis

Outpatient therapy is only indicated for women of reproductive age, who do not have any of the manifestations requiring referral (see referral criteria below). All other patients should be referred.

- Ciprofloxacin, oral, 500 mg 12 hourly for 7–10 days.
  - It is essential to give at least a 7 day course of therapy.

REFERRAL

Urgent

- Acute pyelonephritis with:
  - vomiting
  - sepsis
  - diabetes mellitus
- Acute pyelonephritis in:
  - pregnant women
  - women beyond reproductive age
  - men

LoE: I^v
LoE: III^v
LoE: III"
» Children > 3 months of age who appear ill.
» Children < 3 months of age with any UTI.
» Pregnant women and adolescents allergic to penicillin.

Ill patients awaiting transfer
» Ensure adequate hydration with intravenous fluids.
  • Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing tables, pg 22.2.
    o Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given.
After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.
   Annotate the dosage and route of administration in the referral letter.

Non-urgent
» All children for urinary tract investigations after completion of treatment.
» No response to treatment.
» UTI > 3 times within a one-year period in women, and > 1 time in 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.

MEDICINE TREATMENT
Acute bacterial prostatitis
In men ≤ 35 years of age or if there are features of associated urethritis (STI regimen):
• Ceftriaxone, IM, 250 mg as a single dose.
AND
  • Macrolide, e.g.:
    • Azithromycin, oral, 1 g as a single dose.
In men > 35 years of age or if there is associated cystitis:
- Ciprofloxacin, oral, 500 mg 12 hourly for 14 days.

**REFERRAL**
- No response to treatment.
- Urinary retention.
- High fever.
- Chronic/relapsing prostatitis.

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### UROLOGY SECTION

#### 8.6 HAEMATURIA

**DESCRIPTION**
Bleeding from the urinary tract, which can be from the kidneys, collecting system, bladder, prostate and urethra.
Glomerular disease is suggested if proteinuria, red blood cell casts and/or dysmorphic red blood cells are present on microscopy.
**Exclude schistosomiasis (bilharzia),** a common cause of haematuria.
When haematuria is accompanied by colicky pain a kidney stone should be excluded.
**Note:** The presence of blood on the urine test strips does not indicate infection and should be investigated as above.

**MEDICINE TREATMENT**
If evidence of schistosomiasis, treat as in Section 10.13: Schistosomiasis.
If symptoms of UTI; leucocytes and/or nitrite test positive in urine, treat as UTI.
If haematuria does not resolve rapidly after treatment referral for formal investigation will be required, i.e. next 48 hours.

**REFERRAL**
- All cases not associated with schistosomiasis or UTI.
- All cases not responding to specific medicine treatment.
- When glomerular disease is suspected.

#### 8.7 BENIGN PROSTATIC HYPERPLASIA (BPH)

**DESCRIPTION**
BPH is a noncancerous (benign) growth of the prostate gland.
May be associated with both obstructive (weak, intermittent stream and urinary hesitancy) and irritative (frequency, nocturia and urgency) voiding symptoms.
Digital rectal examination reveals a uniform enlargement of the prostate.
Urinary retention with a distended bladder may be present in the absence of severe symptoms, therefore it is important to palpate for an enlarged bladder during examination.
GENERAL MEASURES
Annual follow-up with digital rectal examination.
For patients presenting with urinary retention, insert a urethral catheter as a temporary measure while patient is transferred to hospital.
Remove medicines that prevent urinary outflow e.g. tricyclic antidepressants, neuroleptics.

REFERRAL
All patients with suspected BPH.

8.8 PROSTATE CANCER
D07.5

DESCRIPTION
Usually occurs in men > 50 years of age and is most often asymptomatic. Systemic symptoms, i.e. weight loss, bone pain, etc. occurs in 20% of patients. Obstructive voiding symptoms and urinary retention are uncommon. The prostate gland is hard and may be nodular on digital rectal examination. As the axial skeleton is the most common site of metastases, patients may present with back pain or pathological spinal fractures. Lymph node metastases can lead to lower limb lymphoedema. 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
F98.0

DESCRIPTION
Enuresis is bedwetting that occurs in children > 5 years of age. It is a benign condition which mostly resolves spontaneously. It is important, however, to differentiate between nocturnal enuresis and daytime wetting with associated bladder dysfunction. Secondary causes of enuresis include:
» diabetes mellitus
» urinary tract infection
» physical or emotional trauma

Note:
» Clinical evaluation should attempt to exclude the above conditions.
» Urine examination should be done on all patients.

GENERAL MEASURES
» Motivate, counsel and reassure child and parents.
» Advise against punishment and scolding.
» Spread fluid intake throughout the day.
» Diapers are not advised, as this will lower the child’s self-esteem.

REFERRAL
» Suspected underlying systemic illness or chronic kidney disease.
» Persistent enuresis in a child > 8 years of age.
» Diurnal enuresis.

8.10 IMPOTENCE/ERECTILE DYSFUNCTION
N48.4/F52.2

DESCRIPTION
The inability to attain and maintain an erect penis with sufficient rigidity for penetration. Organic causes include neurogenic, vasculogenic, endocrinological (e.g. diabetes mellitus) as well as many systemic diseases and medications.

GENERAL MEASURES
» Thorough medical and psychosexual history.
» Physical examination should rule out gynaecomastia, testicular atrophy or penile abnormalities.
» Consider the removal of medicines 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.

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.
CHAPTER 8  KIDNEY AND UROLOGICAL DISORDERS

MEDICINE TREATMENT

Adults:

Analgesia for pain, if needed:

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

REFERRAL

All patients.

Chapter 9: Endocrine conditions

9.1 Type 1 Diabetes mellitus
   9.1.1 Type 1 Diabetes mellitus, in children & adolescents
   9.1.2 Type 1 Diabetes mellitus, in adults

9.2 Type 2 Diabetes mellitus
   9.2.1 Type 2 Diabetes mellitus, in adolescents
   9.2.2 Type 2 Diabetes mellitus, in adults

9.3 Diabetes mellitus emergencies
   9.3.1 Hypoglycaemia
   9.3.2 Diabetic ketoacidosis

9.4 Microvascular complications of diabetes
   9.4.1 Diabetic neuropathy
   9.4.2 Diabetic foot ulcers
   9.4.3 Diabetic nephropathy

9.5 Cardiovascular risk in diabetes
   9.5.1 Obesity in diabetes
   9.5.2 Dyslipidaemia
   9.5.3 Hypertension
   9.5.4 Hyperglycaemia

9.6 Hypothyroidism
   9.6.1 Hypothyroidism in neonates
   9.6.2 Hypothyroidism children & adolescents
   9.6.3 Hypothyroidism in adults

9.7 Hyperthyroidism
   9.7.1 Hyperthyroidism in children & adolescents
   9.7.2 Hyperthyroidism in adults
9.1 TYPE 1 DIABETES MELLITUS

DESCRIPTION
Type 1 diabetes mellitus, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM) occurs because of a lack of insulin. The result is an increase in blood glucose concentration.

CLINICAL PRESENTATION
- hunger
- polyuria
- ketoacidosis
- thirst
- unexplained weight loss
- tiredness

DIAGNOSIS
Type 1 diabetes mellitus is diagnosed when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:
- Random plasma glucose ≥ 11.1 mmol/L
- Random is defined as any time of day without regard to time since last meal
OR
- Fasting plasma glucose ≥ 7.0 mmol/L
- Fasting is defined as no caloric intake for ≥ 8 hours

GENERAL MEASURES
- Lifestyle modification, including self-care practices.
- Education regarding diabetes and its complications.
- Even and regular meal consumption.
- Dietary emphasis should be on regulating carbohydrate, fibre and fat intake (See Section 9.2.2 Type 2 Diabetes mellitus, in adults for recommended diet plan).
- Increased physical activity, aim for 30 minutes 5 times a week.
- Appropriate weight loss if weight exceeds ideal weight.
- Education about foot care.
- Monitor for development of depression.
- All patients should wear a notification bracelet.

REFERRAL
All patients.

9.1.1 TYPE 1 DIABETES MELLITUS, IN CHILDREN AND ADOLESCENTS

MEDICINE TREATMENT
Oral anti-diabetic medicines should not be used to treat children with type 1 diabetes mellitus.

REFERRAL
All children with confirmed or suspected type 1 diabetes mellitus should be referred to a
hospital immediately for management.

9.1.2 TYPE 1 DIABETES MELLITUS, IN ADULTS

Type 1 diabetes mellitus is a rare condition and should be diagnosed and monitored at hospital level. Only stable patients may be down referred for chronic medicines.

MONITORING FOLLOWING DOWN REFERRAL

At every visit:
- Finger-prick blood glucose.
- Weight.
- Blood pressure.

Annually:
- HbA1c, one month before next hospital appointment.

Treatment targets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Optimal</th>
<th>Acceptable</th>
<th>Additional action suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finger-prick blood glucose values:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– fasting (mmol/L)</td>
<td>4–7</td>
<td>&lt;8</td>
<td>&gt;8</td>
</tr>
<tr>
<td>– 2-hour post-prandial (mmol/L)</td>
<td>5–8</td>
<td>8–10</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Glycosylated haemoglobin (HbA1c) (%)</td>
<td>&lt;7</td>
<td>7–8</td>
<td>&gt;8</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Systolic</td>
<td>&lt;140 mmHg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>&lt;90 mmHg</td>
<td></td>
</tr>
</tbody>
</table>

The increased risk of hypoglycaemia must always be weighed against the potential benefit of reducing microvascular and macrovascular complications.

MEDICINE TREATMENT

As type 1 diabetes mellitus usually presents with diabetic ketoacidosis, treatment is usually initiated with insulin and the patient is stabilised at hospital level. Oral antidiabetic medicines should not be used to treat type 1 diabetics.

Insulin dose requirements will decrease as kidney disease progresses.

Types of insulin
- Insulin, short acting, SC, three times daily, 30 minutes before meals.
  - Regular human insulin.
  - Onset of action: 30 minutes.
  - Peak action: 2–5 hours.
  - Duration of action: 5–8 hours.
- Insulin, intermediate acting, SC, once or twice daily usually at night at bedtime, approximately 8 hours before breakfast.
  - Neutral Protamine Hagedorn (NPH) insulin.
  - Onset of action: 1–3 hours.
Insulin regimens

Basal bolus regimen
All type 1 diabetics should preferentially be managed with the “basal bolus regimen” i.e. combined intermediate-acting (basal) and short-acting insulin (bolus). This consists of pre-meal, short-acting insulin and bedtime intermediate-acting insulin not later than 22h00.

The initial total daily insulin dose:
- 0.6 units/kg body weight.

The total dose is divided into:
- 40–50% basal insulin
- The rest as bolus insulin, split equally before each meal.

Adjust dose on an individual basis.

Pre-mixed insulin
Twice daily pre-mixed insulin, i.e. a mixture of intermediate- or short-acting insulin provides adequate control, when used with at least daily blood glucose monitoring. It is a practical option for patients who cannot monitor blood glucose frequently.

Education related to insulin therapy

» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.
» Diet:
  - Meal frequency, as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night, about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patient receiving fixed mealtime doses of insulin.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.

Drawing up insulin from vials

» Clean the top of the insulin bottle with an antiseptic swab.
» Draw air into the syringe to the number of marks of insulin required and inject this into the bottle; then draw the required dose of insulin into the syringe.
Before withdrawing the needle from the insulin bottle, expel the air bubble if one has formed.

**Injection technique**

- The skin need not be specially cleaned.
- Repeated application of antiseptics hardens the skin.
- Stretching the skin at the injection site is the best way to obtain a painless injection. In thin people it may be necessary to pinch the skin between thumb and forefinger of one hand.
- The needle should be inserted briskly at almost 90° to the skin to almost its whole length (needles are usually 0.6–1.2 cm long).
- Inject the insulin.
- To avoid insulin leakage, wait 5–10 seconds before withdrawing the needle.
- Injection sites must be rotated to avoid lipohypertrophy.

**Prefilled pens and cartridges**

In visually impaired patients and arthritic patients, prefilled pens and cartridges may be used.

**Home blood glucose monitoring**

Patients on basal/bolus insulin should initially measure glucose at least twice daily. Once patient is stable, reduce the frequency of monitoring.

**REFERRAL**

All type 1 diabetic patients.

---

### 9.2 TYPE 2 DIABETES MELLITUS

#### 9.2.1 TYPE 2 DIABETES MELLITUS, IN ADOLESCENTS

**E11.9**

**DESCRIPTION**

The majority of adolescent diabetics are of type 1. However, an increasing number of adolescents are being diagnosed with type 2 diabetes mellitus.

**Criteria for screening for diabetes in children**

- Body mass index > 85th percentile for age and sex.
- Family history of type 2 diabetes mellitus.
- Presence of hyperlipidaemia, hypertension or polycystic ovarian syndrome.

**AND**

- Physical signs of puberty or age > 10 years of age.

**DIAGNOSIS**

- Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
  - Random is defined as any time of day without regard to time since last meal.
  - The classic symptoms of diabetes mellitus include polyphagia, polyuria and polydipsia.
» Fasting plasma glucose ≥ 7.0 mmol/L.
  - Fasting is defined as no caloric intake for ≥ 8 hours.

It is difficult to distinguish type 2 from type 1 diabetes mellitus, as many type 1 diabetics may be overweight, or have a family history of type 2 diabetes mellitus, given the increasing prevalence of both obesity and type 2 diabetes mellitus. The diagnosis of type 2 diabetes mellitus in adolescents should be made in consultation with a specialist.

REFERRAL
All.

9.2.2 TYPE 2 DIABETES MELLITUS, ADULTS
E11.9

DESCRIPTION
Type 2 diabetes mellitus is a chronic debilitating metabolic disease characterised by hyperglycaemia with serious acute and chronic complications. It is an important component of the metabolic syndrome (see Section 9.5.1: Obesity in diabetes). Most adults with type 2 diabetes mellitus are overweight with a high waist to hip ratio. In adults the condition might be diagnosed only when presenting with complications, e.g.:
» ischaemic heart disease  » deteriorating eyesight
» peripheral artery disease  » foot ulcers
» stroke  » erectile dysfunction

CLINICAL PRESENTATION
Symptoms of hyperglycaemia are:
» thirst, especially noticed at night
» polyuria
» tiredness
» periodic changes in vision due to fluctuations in blood glucose concentration
» susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note: It is important to distinguish type 2 diabetes mellitus from type 1 diabetes mellitus. Suspect type 1 diabetes mellitus among younger patients with excessive weight loss and/or ketoacidosis.

DIAGNOSIS
» Symptoms of diabetes plus a random plasma glucose ≥ 11.1 mmol/L.
  - Random is defined as any time of day without regard to time since last meal.
» Fasting plasma glucose ≥ 7.0 mmol/L.
  - Fasting is defined as no caloric intake for ≥ 8 hours.

MONITORING
At every visit:
» Finger-prick blood glucose.
» Weight.
Blood pressure.

**Baseline:**
- Serum creatinine concentration (and calculate estimated glomerular filtration rate (eGFR)).
- Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
- Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy).
  - If dipstix positive, see Section 9.4.3: Diabetic nephropathy.
- Blood lipids (fasting total cholesterol, triglycerides, HDL and LDL cholesterol).
- Foot examination.
- Eye examination to look for retinopathy.
- Abdominal circumference.

**Annually:**
- Serum creatinine concentration (and calculate eGFR).
- Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
- Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy.)
- HbA1c, in patients who meet treatment goals (3–6 monthly in patients whose therapy has changed, until stable).
- Eye examination to look for retinopathy.
- Foot examination.

**Treatment targets**

<table>
<thead>
<tr>
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<td>&lt; 90 mmHg</td>
<td></td>
</tr>
</tbody>
</table>

LoE: IIIv

- In the elderly, the increased risk of hypoglycaemia must be weighed against the potential benefit of reducing microvascular and macrovascular complications.
- Prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma.
- Management of type 2 diabetes mellitus includes:
  - Treatment of hyperglycaemia.
  - Management of chronic conditions associated with diabetes. For treatment of hypertension and dyslipidaemia after risk-assessment, see Section 4.7: Hypertension and Section 4.1: Prevention of Ischaemic heart disease and...
atherosclerosis.
- Prevention and treatment of macrovascular complications. See Section 9.5: Cardiovascular risk in diabetes.

GENERAL MEASURES
» Lifestyle modification, including self-care practices.
» Education about diabetes and its complications.
» Increased physical activity, aim for 30 minutes 5 times a week.
» Appropriate weight loss if weight exceeds ideal weight.
» Discourage smoking.
» Moderate or no alcohol intake (≤ 2 standard drinks per day for males and ≤ 1 for females).
» Education about foot care.
» All patients should wear a notification bracelet.

Diet
» Consider the following for a person-centred approach to diet therapy:
  - Weight.
  - Lifestyle and physical activity.
  - Cultural, social and economic issues.
» Dietary emphasis for improved glycaemic control should be on:
  - Even and regular meal consumption.
  - Low-glycaemic and high fibre foods. These foods are digested slowly resulting in a slow and steady rise in blood glucose concentrations.
  - Reduced amounts of fat, sweets, sugary foods and sugar-containing beverages.

Fruit and vegetables
» Eat a variety of fruit and vegetables – 4 to 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.
  - 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.

Carbohydrate
» Make starchy foods the basis of most meals.
» At least half of the grain intake should be from wholegrain products e.g. whole wheat, brown or rye bread, oats, whole wheat cereals, brown rice, whole wheat pasta.
Fat and cholesterol

» Reduce total intake of fat, saturated and transfat.
  « Unhealthy fats include: animal fat, hard margarine, butter, cheese, and any type of oil heated to a high temperature.
  « Use healthy types of fat, e.g. avocado pear, nuts, canola oil, canola margarine, olive oil and olives.
  « 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.
  « Use low fat dairy products e.g. low fat/fat free milk, low fat cheese.
  « Limit the intake of cheese to a 30 g portion (a matchbox size or a third cup grated cheese) three times per week.
  « Grilled or steamed fish/chicken (without the skin) should be eaten in preference to red meat.
  « Eat at least 2 servings of fish per week.
  « Small amounts of red meat (lean portions) ≤ three times per week.
  « Protein source alternatives include legumes, e.g. peas and beans, lentils and soya products.

» Restrict food high in cholesterol, e.g. egg yolks, tripe, liver, processed meat (sausages), cheese, butter, fast food (fried chicken, hamburgers).

Salt

» Salt restriction may help to control blood pressure.
» Remove the salt from the table.
» Gradually reduce added salt in food preparation.
» Avoid processed foods.

MEDICINE TREATMENT

Oral blood glucose lowering agents

Stepwise approach:

» Add metformin to the combination of dietary modifications and physical activity/exercise.
» Combination therapy with metformin plus a sulphonylurea is indicated if therapy with metformin alone (together with dietary modifications and physical activity/exercise) has not achieved the HbA1c target.
» For persisting HbA1c above acceptable levels and despite adequate adherence to oral hypoglycaemic agents: add insulin and withdraw sulphonylurea.
» Ensure patient is adherent at each step.
» Oral agents should not be used in type 1 diabetes mellitus, renal impairment or clinical liver failure.
STEP 1
Lifestyle modification plus metformin

Entry to Step 1
- Typical symptoms - thirst, tiredness, polyuria.

AND
- Random plasma glucose > 11.1 mmol/L.

OR
- Fasting plasma glucose ≥ 7 mmol/L.

Treatment and duration
- Lifestyle modification for life.
- Appropriate diet.
- Weight loss until at ideal weight.

Target
- 2-hour post-prandial finger-prick blood glucose: 8–10 mmol/L.
- Fasting finger-prick blood glucose: 6–8 mmol/L.
- HbA1c: 7–8%.

Morning initiation of therapy:
- Metformin, oral, 500 mg daily with meals.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose concentrations to a maximum dose of 850 mg 8 hourly.
  - Contraindicated in:
    - uncontrolled congestive cardiac failure
    - severe liver disease
    - patients with significant respiratory compromise

In patients with renal impairment, adjust dose according to table:

<table>
<thead>
<tr>
<th>eGFR</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;30–60 mL/minute</td>
<td>Continue use</td>
</tr>
<tr>
<td></td>
<td>50% of dose (maximum 500 mg 12 hourly)</td>
</tr>
<tr>
<td></td>
<td>Increase frequency of renal function monitoring (3–6 monthly)</td>
</tr>
<tr>
<td>&lt;30 mL/minute</td>
<td>Stop metformin</td>
</tr>
</tbody>
</table>

STEP 2
Add sulphonylurea:

Entry to Step 2
- Failed step 1: HbA1c > 8 % or fasting finger-prick blood glucose > 8 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months.

OR
- 2-hour post-prandial finger-prick blood

Treatment and duration
- Lifestyle modification.
- Combination oral hypoglycaemic agents, i.e.:
  - Metformin.
  - Sulphonylurea.

Target
- 2-hour post-prandial finger-prick blood glucose < 8–10 mmol/L.
- Fasting finger prick blood glucose: 6–8 mmol/L.
- HbA1c: 7–8%.
glucose > 10 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months.

**Sulphonylurea derivatives: glimepiride or glibenclamide.**

- Glimepiride, oral with or before breakfast.
  - Initially 1 mg daily, adjusted according to response in 1 mg increments at 1 to 2 week intervals.
  - Maximum dose of 4 mg daily.
  - Preferred in the elderly.

**OR**

Glibenclamide, oral, 2.5 mg daily 30 minutes before breakfast.

- Titrate dose slowly depending on HbA1c and/or fasting blood glucose levels to a maximum of 15 mg daily.
- When ≥ 7.5 mg per day is needed, give $\frac{2}{3}$ of the total dose in the morning and $\frac{1}{3}$ at night.
- **Avoid in the elderly and patients with renal impairment**

**Both glimepiride and glibenclamide should be avoided in patients with renal impairment i.e. eGFR < 60 mL/minute.**

Sulphonylureas are contraindicated in:

- severe hepatic impairment
- pregnancy

Missing meals while taking sulphonylureas may lead to hypoglycaemia.

**STEP 3**

**Insulin therapy: See Section 9.1.2: Type 1 diabetes mellitus, in adults.**

- Insulin is indicated when oral combination therapy fails.
- Continue lifestyle modification.
- Insulin therapy must be initiated and titrated by a doctor, until stabilised.
- Stop sulphonylurea once insulin therapy is initiated but continue metformin.

Education for patients on insulin therapy:

- Types of insulin.
- Injection technique and sites of injection.
- Insulin storage.
- Self-monitoring of blood glucose and how to self-adjust insulin doses.
- Diet:
  - Meal frequency, this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patients receiving fixed mealtime doses of insulin.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.

<table>
<thead>
<tr>
<th>Insulin type</th>
<th>Starting dose</th>
<th>Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Add on therapy:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intermediate to long-acting</td>
<td>10 units in the evening before bedtime, but not after 22h00.</td>
<td>If 10 units not effective: increase gradually to 20 units (2–4 units increase each week).</td>
</tr>
<tr>
<td><strong>Substitution therapy:</strong></td>
<td>Twice daily. Total daily dose: 15 units divided as follows: 2/3 of total daily dose, i.e. 10 units, 30 minutes before breakfast. 1/3 of total daily dose, i.e. 5 units, 30 minutes before supper.</td>
<td>4 units weekly. First increment is added to dose before breakfast. Second increment is added to dose before supper.</td>
</tr>
</tbody>
</table>

**REFERRAL**

**Urgent (same day)**

» Acidotic breathing.
» Dehydration and hypotension.
» Nausea, vomiting and abdominal pain.
» Ketonuria (more than 1+).
» Hyperglycaemia > 25 mmol/L.
» Gangrene.
» Sudden deterioration of vision.
» Serious infections.

**Note:** Consider IV infusion with sodium chloride 0.9%, before transferring very ill patients.

**Non-urgent**

» Pregnancy.
» Failure of step 3 to control diabetes.
» eGFR < 30 mL/minute.
» Ischaemic heart disease.
» Cerebrovascular disease.
» Refractory hypertension.
» Progressive loss of vision.

**9.3 DIABETIC EMERGENCIES**

**DESCRIPTION**

Diabetics may present with a decreased level of consciousness owing to:
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ENDOCRINE SYSTEM

» hyperglycaemia diabetic ketoacidosis (DKA) or hyperosmolar hyperglycaemic state (HHS), or
» hypoglycaemia.

DIAGNOSIS

Check blood glucose concentration and test urine for ketones, immediately.

<table>
<thead>
<tr>
<th>Hyperglycaemia</th>
<th>Hypoglycaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>DKA</td>
<td>HHS</td>
</tr>
<tr>
<td>Blood glucose</td>
<td>≥ 11.1 mmol/L</td>
</tr>
<tr>
<td>Urine test for</td>
<td>Usually positive and &gt; 1+</td>
</tr>
<tr>
<td>ketones</td>
<td></td>
</tr>
</tbody>
</table>

If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently.

Low blood glucose presents the most immediate danger to life.

9.3.1 HYPOGLYCAEMIA IN DIABETICS

E10.0/E11.0

DESCRIPTION

Diabetic patients on therapy may experience hypoglycaemia for reasons such as intercurrent illness (e.g. diarrhoea); missed meals; inadvertent intramuscular injections of insulin or miscalculated doses of insulin or progressive renal failure leading to decreased insulin clearance; alcohol ingestion; and exercise without appropriate dietary preparation.

Risk factors include age < 6 years of age, low HbA1c and longer duration of diabetes.

Hypoglycaemia in diabetic patients can be graded according to the table below:

<table>
<thead>
<tr>
<th>Mild/moderate hypoglycaemia</th>
<th>Severe hypoglycaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Capable of self-treatment*</td>
<td>» Semi-conscious or Unconscious/comatose.</td>
</tr>
<tr>
<td>» Conscious, but requires help from someone else.</td>
<td>» Requires medical help.</td>
</tr>
</tbody>
</table>

*Except children < 6 years of age.

Autonomic symptoms/signs | Neurological symptoms/signs
-------------------------|---------------------------
» Tremors | » Headache
» Palpitations | » Mood changes
» Sweating | » Low attentiveness
» Hunger | » Slurred speech
» Fatigue | » Dizziness
» Pallor | » Unsteady gait
| » Depressed level of consciousness/ convulsions

*Note:
» Children, particularly < 6 years of age, generally are not capable of self-management and are reliant on supervision from an adult.
» Patients may fail to recognise that they are hypoglycaemic when neuroglycopenia (impaired thinking, mood changes, irritability, dizziness, tiredness) occurs before autonomic activation.
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DIAGNOSIS
» Blood glucose < 4 mmol/L with symptoms in a known diabetic patient.
» Blood glucose concentrations should be measured with a glucometer to confirm hypoglycaemia.

Hypoglycaemia must be managed as an emergency. If a diabetic patient presents with an altered level of consciousness and a glucometer is not available, treat as hypoglycaemia.

EMERGENCY TREATMENT
» Measure blood glucose concentration with glucometer/testing strip, immediately.

Conscious patient, able to feed
Breastfeeding child
- give breast milk
Older children
- A formula feed of 5 mL/kg
OR
- oral sugar solution
  o Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg
OR
- sweets, sugar, glucose by mouth
Adults
- sweets, sugar, glucose by mouth
OR
- oral sugar solution
  o 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 10%, 5 mL/kg
  o Add 1 part 50% dextrose water to 4 parts water to make a 10% solution.
OR
- milk
OR
- sugar solution
  o Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg.

Unconscious patient
Children
- Dextrose 10%, IV, 2–5 mL/kg.
  o 10% solution e.g. add 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.
IV administration of dextrose in children with hypoglycaemia:

» Establish an IV line. Do not give excessive volumes of fluid: usually can keep line open with 2mL/kg/hour.
» Take a blood sample for emergency investigations and blood glucose.
» Check blood glucose.
  - If low, i.e. < 2.5 mmol/L or if testing strips are not available, administer 2–5 mL/kg of 10% dextrose solution IV rapidly.
    In the majority of cases an immediate clinical response can be expected.
» Recheck the blood glucose after infusion.
  - If still low, repeat 2 mL/kg of 10% dextrose solution.
» After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.
» Feed the child as soon as conscious.

Adults

- Dextrose 50%, IV, 50 mL immediately and reassess.
  - If there is no clinical response, give a second 50% dextrose bolus.
  - 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, 100mg immediately.

**CAUTION**

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

**REFERRAL**

**Urgent**

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children with documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence.

**9.3.2 DIABETIC KETOACIDOSIS (DKA)**

**DESCRIPTION**

Clinical features of DKA include:

» dehydration
» abdominal pain
» vomiting
» deep sighing respiration

» drowsiness, confusion, coma
» acetone/fruity smelling breath
» elevated blood glucose
MEDICINE TREATMENT

**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: 10 mL/kg/hour with 20 mL/kg boluses if shocked.
  - Do not exceed 50 mL/kg in the first 4 hours.
  - Correct estimated deficits over 24 hours.

Refer urgently with drip in place and running at planned rate.
When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:
- Insulin, short acting, IM, 0.1 unit/kg.
  - When giving insulin IM, do not use insulin needle.

<table>
<thead>
<tr>
<th>Fluid rates of sodium chloride 0.9%, IV (if no shock) in children awaiting transfer.</th>
<th>Check regularly for shock or increasing dehydration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight range kg</strong></td>
<td><strong>Rate (mL/hr)</strong></td>
</tr>
<tr>
<td></td>
<td>(2–10 kg: 6 mL/kg/hr)</td>
</tr>
<tr>
<td></td>
<td>(&gt;10—20 kg: 5 mL/kg/hr)</td>
</tr>
<tr>
<td></td>
<td>(&gt;20–40 kg: 4 mL/kg/hr)</td>
</tr>
<tr>
<td>4</td>
<td>&lt;6</td>
</tr>
<tr>
<td>6</td>
<td>&lt;10</td>
</tr>
<tr>
<td>10</td>
<td>&lt;15</td>
</tr>
<tr>
<td>15</td>
<td>&lt;20</td>
</tr>
<tr>
<td>20</td>
<td>&lt;30</td>
</tr>
<tr>
<td>30</td>
<td>&lt;45</td>
</tr>
<tr>
<td>45</td>
<td>&lt;80</td>
</tr>
</tbody>
</table>

Refer urgently with drip in place and running at planned rate.

**Children**

**If in shock:**
- Sodium chloride 0.9%, IV, 20 mL/kg as a bolus.
  - If shock not corrected, repeat the bolus.
  - If a 3rd bolus is required, consult with paediatrician.

**If no shock or aftermath is corrected**
- Sodium chloride 0.9%, IV.

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 affect the patient, but hypokalaemia with resultant cardiac dysrhythmias definitely will.
See Section 21.12: Hyperglycaemia and ketoacidosis

LoE: III
When referral will take > 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed and provided glucose is monitored hourly:

- Insulin, short acting, IM, 0.1 units/kg after 1st hour of infusion of saline
  - When giving insulin IM, do not use insulin needle.

## 9.4 MICROVASCULAR COMPLICATIONS OF DIABETES

### 9.4.1 DIABETIC NEUROPATHY

**DESCRIPTION**
Neuropathies are a common complication of diabetes. They play an important role in the morbidity and mortality suffered by people with diabetes. There are three major categories:

- peripheral neuropathy
- autonomic neuropathy
- acute onset neuropathies

**GENERAL MEASURES**

- Educate patient regarding appropriate footwear and good foot care.
- Patients with neuropathy should have their feet examined at every visit.

**MEDICINE TREATMENT**

Ensure appropriate glycaemic control.
Exclude or treat other contributory factors e.g.:

- alcohol excess
- vitamin B₁₂ deficiency, if suspected,
- uraemia, and
- HIV infection.

**Pain:**

- Amitriptyline, oral, 10–25 mg at night increasing to 100 mg, if necessary.  
  - LoE: III

**AND/OR**

- Paracetamol, oral, 1 g 6 hourly as needed.

**Gastroparesis:**

- Metoclopramide, oral, 10 mg 8 hourly before meals.  
  - LoE: III

**REFERRAL**

For further treatment if the above measures do not control symptoms adequately.

### 9.4.2 DIABETIC FOOT ULCERS

**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.
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ENDOCRINE SYSTEM

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 cellulitis, 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
- Metabolic control.
- Treat underlying comorbidity.
- Relieve pressure: non-weight bearing is essential.
- Smoking cessation is essential.
- Frequent (e.g. weekly) removal of excess keratin by a chiropodist with a scalpel blade to expose the floor of the ulcer and allow efficient drainage of the lesion.
- Cleanse with sodium chloride 0.9% solution daily and apply non-adherent dressing.

MEDICINE TREATMENT
- Amoxicillin/clavulanic acid 875/125 mg oral 12 hourly for 10 days.

REFERRAL
Urgent
Threatened limb, i.e. if the ulcer is associated with:
- cellulitis,
- abscess,
- discolouration of surrounding skin, or
- crepitus.

Non-urgent
- Claudication.
- Ulcers not responding to adequate treatment.

9.4.3 DIABETIC NEPHROPATHY
E10.2/E11.2/N08.9

DESCRIPTION
Screening
- Check annually for proteinuria using dipstix.
- A diagnosis of nephropathy can be made on either a positive dipstix or, if dipstix negative, send urine to laboratory for albumin:creatinine ratio. If ratio > 3 mg/mmol, diagnose nephropathy.
- Measure serum creatinine annually, and estimate eGFR.

Diet and lifestyle
- Limit protein intake < 0.8 g/kg daily, if proteinuric.

LoE: III
LoE: III
LoE: III
» Advise smoking cessation.

MEDICINE TREATMENT
» Start treatment with an ACE-inhibitor and increase gradually to maximal dose if tolerated.
  ▪ ACE-inhibitor, e.g.:
  • Enalapril, oral, initiate with 5mg 12 hourly.
    o Increase to 20 mg 12 hourly, as tolerated.
    o Monitor potassium, at baseline, within 1 month, and annually.

Persistent proteinuria
See Chapter 9: Kidney and urological disorders.

Hypertension
Target BP: < 140/90 mmHg. See Section 4.7: Hypertension.

Diabetes mellitus
Target HbA1c < 7.5%.
  ▪ Intensify other renal and cardiovascular protection measures (not smoking, aspirin therapy, lipid lowering therapy).

REFERRAL
To specialist: When eGFR < 30 mL/minute or earlier if symptomatic.

9.5 CARDIOVASCULAR RISK IN DIABETES
E10.69/ E11.69

DESCRIPTION
The metabolic syndrome is a cluster of risk factors:
» impaired glucose metabolism
» central obesity
» dyslipidaemia
» hypertension

DIAGNOSIS
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.

MEDICINE TREATMENT
Aspirin therapy (Doctor initiated).
» Use aspirin therapy in adult Type 1 and Type 2 diabetic patients with a history of cardiovascular disease i.e.
  - ischaemic heart disease
  - peripheral vascular disease
  - previous thrombotic stroke
• Aspirin, orally, 150 mg (½ tablet) daily.
9.5.1 OBESITY IN DIABETES

E66.9

Abdominal obesity, i.e. waist circumference > 94 cm in men, and > 80 cm in women.

BMI: determined by weight in kg/height in m$^2$.

<table>
<thead>
<tr>
<th>BMI (kg/m$^2$)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5–24.9</td>
<td>normal</td>
</tr>
<tr>
<td>25.0–29.9</td>
<td>overweight</td>
</tr>
<tr>
<td>30.0–34.9</td>
<td>mildly obese</td>
</tr>
<tr>
<td>35.0–39.9</td>
<td>moderately obese</td>
</tr>
<tr>
<td>&gt;40</td>
<td>extremely obese</td>
</tr>
</tbody>
</table>

GENERAL MEASURES
A decrease in food intake together with an increase in physical activity is crucial to losing weight.

MEDICINE TREATMENT
Treat the metabolic risk factors, i.e. dyslipidaemia, hypertension, and hyperglycaemia.

9.5.2 DYSLIPIDAEMIA IN DIABETES
E78.5

DESCRIPTION
Dyslipidaemia in type 2 diabetes is usually characterised by increased fasting plasma triglycerides (> 1.7 mmol/L), decreased HDL cholesterol (< 1.0 mmol/L in men and < 1.30 mmol/L in women) and to a lesser extent, increased LDL cholesterol. In those with type 1 diabetes, triglycerides, and to a lesser extent cholesterol concentrations, are usually increased.

MONITORING
See Section 9.2.2: Type 2 diabetes mellitus, in adults.

MEDICINE TREATMENT
Dyslipidaemia may successfully be treated through lifestyle modifications alone.

- HMGCoA reductase inhibitor (statin) therapy should be added to lifestyle modifications, regardless of baseline lipid concentrations, for all type 2 diabetic patients, who:
  - are > 40 years of age
  - have had diabetes for > 10 years
  - have existing cardiovascular disease
  - have chronic kidney disease (eGFR < 60 mL/minute)
- e.g. Simvastatin, oral, 10 mg at night.

In patients < 40 years of age, risk assess as for dyslipidaemia. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

LoE: III$^{XX}$
CHAPTER 9 ENDOCRINE SYSTEM

REFERRAL
» Random cholesterol > 7.5 mmol/L.
» Fasting (14 hours) triglycerides > 10 mmol/L.

9.5.3 HYPERTENSION IN DIABETES
I15.2
BP lowering in hypertensive patients reduces cardiovascular risk. The diagnosis of hypertension is confirmed if the blood pressure remains > 140/90 mmHg on 2 separate days. See Section 4.7: Hypertension.

9.5.4 HYPERGLYCAEMIA
R73.9
See Sections 9.1.2: Type 1 diabetes mellitus, in adults and 9.2.2: Type 2 diabetes mellitus, in adults.

9.6 HYPOTHYROIDISM

9.6.1 HYPOTHYROIDISM IN NEONATES
E03.9
DESCRIPTION
Congenital deficiency of thyroid hormone due to aplasia/hypoplasia of the thyroid gland, defects in thyroid hormone biosynthesis or intrauterine exposure to antithyroid medicines. Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children. Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairment.

DIAGNOSIS
Clinical
» prolonged jaundice
» feeding difficulties
» lethargy
» constipation

» swollen hands, feet and genitals
» decreased muscle tone
» delayed achievement of milestones
» enlarged tongue

REFERRAL
All patients for investigation and initiation of therapy.

9.6.2 HYPOTHYROIDISM IN CHILDREN AND ADOLESCENTS
E03.9
DESCRIPTION
Hypothyroidism in children causes decreased growth, lethargy, cold intolerance and dry skin. Physical signs may include goitre, short stature, bradycardia and delayed deep tendon reflexes. Congenital hypothyroidism may present in childhood. Acquired hypothyroidism in children and adolescents may be caused by:
CHAPTER 9  

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» chronic lymphocytic thyroiditis  » radioactive iodine
» iodine deficiency  » infiltrations
» surgery

DIAGNOSIS
Elevated TSH and low T4 concentrations.

MEDICINE TREATMENT
- Levothyroxine, oral, 100 mcg/m² once daily, preferably on an empty stomach (Doctor initiated).

REFERRAL
All cases for investigation and initiation of therapy.

9.6.3 HYPOTHYROIDISM IN ADULTS
E03.9

DESCRIPTION
Hypothyroidism causes general slowing of metabolism, which results in symptoms that include fatigue, slow movement and speech, hoarse voice, weight gain, constipation, cold intolerance, depression and impaired memory. Physical signs may include bradycardia, dry, coarse skin, hair loss and delayed relaxation of deep tendon reflexes.

Common causes of primary hypothyroidism are:
» thyroiditis  » post surgery
» amiodarone  » radio-active iodine

Secondary hypothyroidism (< 1% of cases) may be due to any cause of anterior hypopituitarism.

DIAGNOSIS
» Check TSH concentration. If elevated, check T4 concentration.
» If TSH is elevated, and T4 is low, diagnose hypothyroidism.

MEDICINE TREATMENT
- Levothyroxine, oral, 100 mcg daily, preferably on an empty stomach.
  o If there is a risk of ischaemic heart disease, start at 25 mcg daily and increase by 25 mcg every 4 weeks.
  o In the elderly, start at 50 mcg daily, increased by 25 mcg at 4 week intervals, according to response.
  o Check TSH and T4 after 2–3 months and adjust dose if required.
  o Once stable, check TSH and T4 annually.

REFERRAL
» Suspected hypopituitarism.
» Hypothyroidism in pregnancy.

LoE: III²²
CHAPTER 9  ENDOCRINE SYSTEM

9.7 HYPERTHYROIDISM

9.7.1 HYPERTHYROIDISM IN CHILDREN AND ADOLESCENTS
E05.9

DESCRIPTION
Hyperthyroidism is a pathological syndrome in which tissue is exposed to excessive amounts of circulating thyroid hormones. The most common cause is Grave’s disease, although thyroiditis may also present with thyrotoxicosis.

DIAGNOSIS
Clinical
» fatigue
» nervousness or anxiety
» weight loss
» palpitations
» heat insensitivity

» tachycardia
» warm moist hands
» thyromegaly
» tremor

REFERRAL
Urgent
All patients.

9.7.2 HYPERTHYROIDISM IN ADULTS
E05.9

DESCRIPTION
Most common cause of hyperthyroidism is Graves’ disease, which is an autoimmune condition resulting from the presence of thyroid stimulating autoantibodies. Other common causes are toxic single or multinodular goitre and sub-acute thyroiditis.

DIAGNOSIS
Suppressed TSH and elevated T4

Note: T4 may be normal in hyperthyroidism.

REFERRAL
Urgent
All patients.


Sodium chloride 0.9%:


Chapter 10: Infections and related conditions

10.1 Fever
10.2 Antiseptics and disinfectants
10.3 Chickenpox
10.4 Cholera
10.5 Dysentery, amoebic
10.6 Dysentery, bacillary
10.7 Giardiasis
10.8 Malaria
   10.8.1 Malaria, uncomplicated
   10.8.2 Malaria, severe (complicated)
   10.8.3 Malaria, prophylaxis (self-provided care)
10.9 Measles
10.10 Meningitis
10.11 Mumps
10.12 Rubella (German measles)
10.13 Schistosomiasis (bilharzia)
10.14 Typhoid fever
10.15 Tuberculosis
10.16 Viral haemorrhagic fever (VHF)
10.1 FEVER

DESCRIPTION
Fever, i.e. temperature ≥ 38°C, is a natural and sometimes useful response to infection, inflammation or infarction.
Fever alone is not a diagnosis.
Fever may be associated with convulsions in children < 6 years of age, but is not a cause of the convulsions.

Note:
» Temperature > 40°C needs urgent lowering, in children.
» Fluid losses are increased with fever.
» Malaria must be considered in anyone with fever who lives in a malaria endemic area, or who has visited a malaria area in the past 12 weeks.

GENERAL MEASURES

Children
» Caregivers should offer the child regular fluids (where a baby or child is breastfed the most appropriate fluid is breast milk).
» Dress child appropriately for the weather.
» Following contact with a healthcare professional, parents and carers who are looking after their feverish child at home should seek further advice if:
   - the child has a convulsion
   - the child develops a non-blanching rash
   - the parent or carer feels that the child is less well than when they previously sought advice
   - the parent or carer is more concerned than when they previously sought advice
   - the fever lasts > 2 days
   - the parent or carer is distressed, or concerned that they are unable to look after their child

Note: Tepid sponging and evaporative cooling are not recommended.

Adults
Maintain hydration.

MEDICINE TREATMENT
Only febrile children who appear distressed should be treated with paracetamol.
Consider treatment with paracetamol in adults with associated tachycardia, possibility of worsening cardiac conditions, or who are in distress.

Antipyretic agents are not indicated with the sole aim of reducing body temperature in children and adults with fever.

Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
Adults
- Paracetamol, oral, 1 g 6 hourly when required.

**CAUTION**
Do not treat undiagnosed fever with antibiotics, except in children < 2 months of age who are classified as having POSSIBLE SERIOUS BACTERIAL INFECTION.
Do not give aspirin to children with fever.

Children < 2 months of age, fulfilling any criterion of possible serious bacterial infection (see referral criteria):
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.
Annotate the dosage and route of administration in the referral letter.

**REFERRAL**
» All children < 2 months of age with any one of the following criteria of possible serious bacterial infection:
  - axillary temperature > 37.5°C
  - bulging fontanelle, decreased movement/only moves when stimulated, convulsions with current illness, decreased level of consciousness
  - breathing difficulties, i.e. respiratory rate > 60, nasal flaring, chest indrawing or apnoea
  - pus forming conditions, i.e. umbilical redness extending to the skin or draining pus, many or severe skin pustules, pus draining from eye
» All children in whom a definite and easily managed cause is not found.
» Fever that lasts > 2 days without finding a treatable cause.
» Fever that recurs.
» Fever combined with:
  - signs of meningitis
  - toxic-looking patient
  - convulsion
  - coma or confusion
  - jaundice
  - failure to feed
10.2 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 reducing bacterial load on skin and mucous membranes.

Disinfecting surfaces
Guidelines for the use of disinfectants
» Cleansing (removal of visible soiling) is the first and most important step in chemical disinfection.
» The 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 must be rinsed with sterile water after immersion in a chemical disinfectant e.g. chlorhexidine solution, 0.5% in 70% alcohol.
» Avoid recontamination at this stage.
» Make sure that the rinsing water and all other apparatus are sterile.
» Equipment must not be stored in chemical disinfectants.
» The best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  – Solutions must be freshly prepared.
  – Discarded after 24 hours to disinfect properly.
  – Do not use on the skin.

Intact skin
» Use alcohol swabs before injections.
» Use antiseptics like povidone iodine or chlorhexidine for surgical scrubbing.

Wounds and mucous membranes
- Use chlorhexidine 0.05% aqueous solution to clean dirty wounds.
- Use sodium chloride 0.9% and sterile water on clean wounds.

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Indications</th>
<th>Directions for application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorhexidine solution:</td>
<td>Cleaning dirty wounds. Skin disinfection before surgery.</td>
<td>Remove all dirt, pus and blood before use. Clean dirty wounds with 0.05% aqueous solution. Do not use for normal cleaning. Use the correct concentration for a specific purpose.</td>
</tr>
<tr>
<td>o 0.05% aqueous solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o 0.5% in 70% alcohol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Povidone iodine: | Skin and wound infections | Use ointment for skin infection. Use solution for cleaning skin and wounds. Avoid using on large wounds because of danger of iodine absorption |
| o solution 10% | Contraindication: iodine allergy |
| o ointment 10% | |
| o cream 5% | |
Articles and instruments
Adhere to the appropriate cleansing and disinfection policy.

10.3 CHICKEN POX
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 from the start of the fever until 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting, with a duration of about 1 week.
Complications such as secondary bacterial infection, encephalitis, meningitis and pneumonia may occur (more common in adults and immunocompromised patients).

GENERAL MEASURES
» Isolate from immunocompromised people and pregnant women until all lesions have crusted.
» Ensure adequate hydration.
» Cut fingernails short and discourage scratching.

MEDICINE TREATMENT

For itch:
- Calamine lotion, applied as needed.

In severe cases
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

CAUTION
Avoid the use of aspirin in children and adolescents < 16 years of age because of risk of Reye’s syndrome.

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

For fever with distress:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required.
  See dosing table, pg 22.7.

LoE: III*
Adults
- Paracetamol, oral, 1 g 6 hourly when required.
If skin infection is present due to scratching, treat as for bacterial skin infection. See Section 5.4: Bacterial infections of the skin.

Treatments with antiviral agents are recommended for:
» Immunocompromised patients.
» All patients with severe chickenpox (irrespective of duration of rash).
  - Extensive rash.
  - Visceral involvement.
  - Haemorrhagic rash.
  - Presence of complications.
» Adults and adolescents presenting within 48 hours of the onset of the rash.

Children
- Aciclovir, oral, 20 mg/kg/dose 6 hourly for 7 days (Doctor initiated).

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Susp 200 mg /5 mL Tablet 200 mg 400 mg</td>
<td></td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>100 mg</td>
<td>2.5 mL – –</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>140 mg</td>
<td>3.5 mL – –</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>160 mg</td>
<td>4 mL – –</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>200 mg</td>
<td>5 mL 1 tablet ½ tablet</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>240 mg</td>
<td>6 mL – –</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–25 kg</td>
<td>300 mg</td>
<td>7.5 mL 1½ tablet –</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>500 mg</td>
<td>15 mL 2 ½ tablets –</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35–55 kg</td>
<td>700 mg</td>
<td>– 3 ½ tablets –</td>
<td>&gt;11–15 years</td>
</tr>
</tbody>
</table>

Adults
- Aciclovir, oral, 800 mg 6 hourly for 7 days (Doctor initiated).

REFERRAL
» Complications such as:
  - meningoencephalitis
  - pneumonia
» Severely ill patients.
» Pregnant women.
» Asymptomatic neonates whose mothers had chicken pox 7 days before or 7 days after delivery.
» Neonates with clinical chicken pox.

10.4 CHOLERA
See Chapter 2: Gastrointestinal conditions.

10.5 DYSENTERY, AMOEBC
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.

Refer to the most recent Malaria Treatment Guidelines from the Department of Health for the most suitable management in the various endemic areas.

DESCRIPTION
Malaria is an infection of red blood cells by a parasite micro-organism called Plasmodium. Four species of Plasmodium are known to cause malaria in humans in Africa. The four species are:
» Plasmodium falciparum (P. falciparum)
» Plasmodium vivax (P. vivax)
» Plasmodium ovale (P. ovale)
» Plasmodium malariae (P. malariae).
The parasites are usually transmitted to humans by the bite of a vector mosquito. In South Africa, P. falciparum is the most common and the most dangerous of the malaria species. Malaria caused by P. falciparum is an acute febrile illness that may progress rapidly to severe disease if not diagnosed early and treated adequately.
Symptoms and signs of malaria are non-specific.
The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Any person resident in or returning from a malaria area and who presents with fever (usually within 3 months of possible exposure to vector mosquito bites) should be tested for malaria. The progression of P. falciparum malaria to severe disease is rapid and early diagnosis and effective treatment is crucial. Pregnant women, young children ≤ 5 years of age and people living with HIV/AIDS are at particularly high risk of developing severe malaria.
Symptoms and signs of malaria may include:
» severe headache
» fever > 38°C
» muscle and joint pains
» shivering episodes
» nausea and vomiting
» flu-like symptoms
Severe disease may present with one or more of the following additional clinical features:
» prostration (severe general body weakness)
» sleepiness, unconsciousness or coma, convulsions
» respiratory distress and/or cyanosis
» jaundice
» renal failure
» repeated vomiting
» shock
» hypoglycaemia
» severe anaemia (Hb < 7 g/dL)  » haemoglobinuria/black urine
» abnormal bleeding

**DIAGNOSIS**
Microscopic examination of thick and thin blood smears. Thick films are more sensitive than thin films in the detection of malaria parasites. Where rapid diagnostic tests, e.g. HRP2 antigen dipsticks are available, these can be used to diagnose malaria within 10–15 minutes.

**Note:** One negative malaria test does not exclude the diagnosis of malaria. Request a 2nd test.

**GENERAL MEASURES**
» Provide supportive and symptomatic relief.
» Monitor for complications.
» Ensure adequate hydration.
» Carefully observe all patients with *P. falciparum* malaria for the 1st 24 hours for features of severe malaria.

**MEDICINE TREATMENT**
All first doses of antimalarial medicines must be given under supervision and patients must be observed for at least an hour as vomiting is common in patients with malaria. Treatment must be repeated if the patient vomits within the first hour. Vomiting oral treatment is one of the commonest reasons for treatment failure.

In areas with high incidence of malaria (whether locally transmitted or imported) it should be definitively diagnosed and treated at PHC level. In other areas, patients should be referred for treatment.

### 10.8.1 MALARIA, UNCOMPLICATED

**Note:** notifiable condition.

**MEDICINE TREATMENT**
- Artemether/lumefantrine 20/120 mg, oral, with fat-containing food/milk to ensure adequate absorption.
  - Give the first dose immediately.
  - Follow with second dose 8 hours later.
  - Then 12 hourly for another 2 days (total number of doses in 3 days = 6).

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Tablet Artemether/lumefantrine 20/120 mg</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;5–15 kg</td>
<td>1 tablet</td>
<td>6 months–3 years</td>
</tr>
<tr>
<td>&gt;15–25 kg</td>
<td>2 tablets</td>
<td>&gt;3–8 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>3 tablets</td>
<td>&gt;8–12 years</td>
</tr>
<tr>
<td>&gt;35 kg</td>
<td>4 tablets</td>
<td>&gt;12 years and adults</td>
</tr>
</tbody>
</table>

LoE:III*
For fever in children < 5 years of age:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

REFERRAL

Urgent
- All patients in areas that do not stock antimalarials.
- Patients not responding to oral treatment within 48 hours.
- After 1st dose of artemether/lumefantrine 20/120 mg:
  - All patients with any sign of severe (complicated) malaria.
  - All children < 2 years of age.
  - Pregnant women.
  - Patients with co-morbidities such as HIV, diabetes etc.
  - Patients > 65 years of age.

10.8.2 MALARIA, SEVERE (COMPLICATED)

B50.9

Note: notifiable condition.

DESCRIPTION

Any one of the following is a sign of severe (complicated) malaria, is associated with a higher mortality, and requires urgent referral (after initial quinine dose as below):
- prostration (severe general body weakness)
- sleepiness, unconsciousness or coma, convulsions
- respiratory distress and/or cyanosis
- jaundice
- renal failure
- shock
- repeated vomiting
- hypoglycaemia
- severe anaemia (Hb < 7 g/dL)
- haemoglobinuria/black urine
- abnormal bleeding

MEDICINE TREATMENT

Treatment may be commenced before referral in clinics designated by the regional malaria control programme provided they have facilities to diagnose malaria (either microscopy or rapid antigen point of care tests) and healthcare workers trained in the management of severe malaria.

The preferred agent is parenteral artesunate:
- Artesunate IM, 2.4 mg/kg IM immediately as a single dose and refer urgently.
  - If transferral to referral hospital is delayed, administer second dose at 12 hours and third dose at 24 hours.
If parenteral artesunate is not available:

- Quinine dihydrochloride, IV or IM, 15–20 mg/kg immediately as a single dose and refer urgently. See dosing table pg 22.8.
  - IM: dilute quinine dihydrochloride in sodium chloride 0.9% to between 60 and 100 mg/mL. Inject half the volume immediately as a single dose in each thigh (anterolateral) to reduce pain and prevent sterile abscess formation.
  - IV: dilute with 5–10 mL/kg of dextrose 5% and administer over 4 hours.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all patients requiring referral, the patient must be transferred to reach the referral hospital within 6 hours of being seen at the PHC facility.</td>
</tr>
</tbody>
</table>

**REFERRAL**

Urgent
All patients.

**10.8.3 MALARIA, PROPHYLAXIS (SELF-PROVIDED CARE)**

Z79.89

In South Africa, malaria prophylaxis should be used, together with preventive measures against mosquito bites, from September to May in high-risk areas. State facilities do not provide prophylactic therapy. It is recommended that persons intending to travel to high-risk areas take the relevant prophylactic therapy.

**Preventative measures** against mosquito bites between dusk and dawn include:

- Use of insecticide impregnated mosquito nets, insecticide coils or pads.
- Application of insect repellent to exposed skin and clothing.
- Wearing long sleeves, long trousers and socks, if outside, as mosquitoes are most active at this time.
- Visiting endemic areas only during the dry season.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunocompromised patients, pregnant women and children &lt; 5 years of age should avoid visiting malaria-endemic areas, as they are more prone to the serious complications of malaria.</td>
</tr>
</tbody>
</table>

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 throat swabs to confirm (or exclude) a diagnosis of measles.

DESCRIPTION
A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.

Initial clinical features, that occur 7–14 days after contact with an infected individual, include:

» coryza
» conjunctivitis which may be purulent
» fever
» cough
» diarrhoea

After 2–3 days of the initial clinical features, a few tiny white spots, like salt grains appear in the mouth (Koplik spots).

The skin rash appears 1–2 days later, lasting about 5 days and:

» usually starts behind the ears and on the neck
» then on the face and body
» thereafter, on the arms and legs

Secondary bacterial infection (bronchitis, bronchopneumonia, otitis media) may occur, especially in children with poor nutrition or other concomitant conditions.

GENERAL MEASURES
Isolate the patient to prevent spread.

MEDICINE TREATMENT
All children < 5 years of age with measles should be given an extra dose of vitamin A, unless the last dose was received within a month:

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

<table>
<thead>
<tr>
<th>Age range</th>
<th>Dose units</th>
<th>Capsule 100 000 u</th>
<th>Capsule 200 000 u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 6–11 months</td>
<td>100 000</td>
<td>1 capsule</td>
<td>–</td>
</tr>
<tr>
<td>Children 12 months–5 years</td>
<td>200 000</td>
<td>2 capsules</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

In children < 5 years of age, give the 1st dose immediately. If the child is sent home, the caregiver should be given a 2nd dose to take home, which should be given the following day.

Administration of a vitamin A capsule
- Cut the narrow end of the capsule with scissors.
- Open the child’s mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child’s mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.

For fever with distress:

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

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Adults
- Paracetamol, oral, 1 g 6 hourly when required.

**Children with diarrhoea:**
Treat according to Section 2.9.1: Acute diarrhoea in children.

**Children with pneumonia (1st dose before referral):**
- Amoxicillin, oral, 30 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.1.

**Children with otitis media:**
**Children ≤ 3 years of age**
- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Syrup mg/5mL</strong></td>
<td><strong>Capsule mg</strong></td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>500</td>
<td>–</td>
<td>10 mL</td>
</tr>
</tbody>
</table>

**Children > 3 years of age**
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

**Penicillin allergy**

**Children**
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children: 18–35 kg (able to take tablets)**
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

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

**Purulent conjunctivitis:**
- Chloramphenicol, 1%, opthalmic ointment 8 hourly into lower conjunctival sac.

**REFERRAL**
- All adults.
- Children < 6 months of age.
- Children who are malnourished or immunocompromised, or who have TB.
- Where serious complications are present. These include:
  - stridor/croup
  - pneumonia
  - dehydration
  - neurological complications
  - severe mouth and eye complications

Provide emergency treatment, if needed, before referral.
10.10 MENINGITIS
See Chapter 15: Central nervous system.

10.11 MUMPS
B29.9

DESCRIPTION
Incubation period: 14–21 days.
A viral infection primarily involving the salivary glands.
Signs and symptoms:
» Fever.
» Pain on opening the mouth or eating.
» About two days later a tender swelling appears below the ears at the angle of
   the jaw. Often first on one side and later on the other.
» The swelling disappears in about 10 days.

GENERAL MEASURES
» Bed rest during febrile period.
» Advise on oral hygiene.
» Recommend plenty of fluids and soft food during acute stage.
» Patient is infectious from 3 days before parotid swelling to 7 days after it started.
   Isolate until swelling subsides.
» Children may return to school 1 week after initial swelling.

MEDICINE TREATMENT
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table,
  pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
» Abdominal pain (to exclude pancreatitis).
» Painful swollen testes (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 red rash starts on the face spreading to the trunk, arms and legs.
It usually fades as it spreads.
Note: If cough, coryza or conjunctivitis are also present, it is essential to exclude
measles. See case definition of measles (Section: 10.9 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. All pregnant women should be referred for confirmation of diagnosis of rubella and counselling.

**GENERAL MEASURES**
» Bed rest, if needed.
» Isolate from pregnant women for 7 days after onset of the rash.

**MEDICINE TREATMENT**

**Children**
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

**Adults**
- Paracetamol, oral, 1 g, 6 hourly when required.

**REFERRAL**
**Urgent**
» Pregnant women with rubella.
» Pregnant women who have been in contact with a patient with rubella.

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### 10.13 SCHISTOSOMIASIS (BILHARZIA)

**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-immune people several weeks after 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.
### CHAPTER 10  
**INFECTIONS AND RELATED CONDITIONS**

<table>
<thead>
<tr>
<th>Clinical features</th>
<th><em>Schistosoma haematobium</em></th>
<th><em>Schistosoma mansoni</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>» blood in the urine</td>
<td>» diarrhoea with blood and mucus in the stools</td>
<td></td>
</tr>
<tr>
<td>» recurrent cystitis</td>
<td>» colicky abdominal pain</td>
<td></td>
</tr>
<tr>
<td>» other urinary symptoms</td>
<td>» enlarged liver and spleen</td>
<td></td>
</tr>
</tbody>
</table>

| 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 risk of infestation is lowest.
   - Boil all water before use.

### MEDICINE TREATMENT

In endemic areas where urine microscopy cannot be done patients should be treated empirically after first excluding possible glomerulonephritis, i.e. no raised blood pressure, no oedema, and no shortness of breath. See Section 8.3: Glomerular diseases (GN).

In non-endemic areas treatment should be given only if eggs of *S. Haematobium* or *S. mansoni* are found in the urine/faeces.

**Children**
- Praziquantel, oral, 40 mg/kg as a single dose. See dosing table pg 22.7.

**Adults**
- Praziquantel, oral, 3 g as a single dose.

### REFERRAL

» Children < 2 years of age.
» Ongoing urinary tract symptoms.
» Signs of bleeding disorders or glomerulonephritis.

### 10.14 TYPHOID FEVER

See Chapter 2: Gastrointestinal conditions.

### 10.15 TUBERCULOSIS

See Chapter 17: Respiratory conditions.
10.16 VIRAL HAEMORRHAGIC FEVER (VHF)

A98.0/A98.1/A98.2/A98.3/A98.4/A98.4/A98.5/A98.8/A99/A91

Consult the most recent Viral Haemorrhagic Fever Guidelines from the National Department of Health.

DESCRIPTION

Viral haemorrhagic fevers (VHF) are uncommon conditions in South Africa. They may present with non-specific signs (fever, headache, conjunctivitis, pharyngitis, myalgia (especially lower back pain), diarrhea, vomiting, abdominal pain) or with signs strongly suggestive of VHF (petechial rash, ecchymoses, other haemorrhagic signs e.g. epistaxis, haematemesis and melaena). Other symptoms and organ involvement may be variable.

More than 90% of suspected cases of VHF in South Africa prove to be severe forms of common diseases. Many of the diseases mistaken for VHF are treatable if diagnosed early. These include:

» Severe tick bite fever.
» Fulminant hepatitis.
» Severe falciparum malaria.
» Leptospirosis.
» Severe bacterial infections, particularly *N. meningitidis*.

Endemic causes of VHF in South Africa are Crimean-Congo fever and Rift Valley Fever, both of which may be transmitted between humans by means of blood and body fluids. Imported conditions include Lassa, Ebola and Marburg Fever amongst others.

Obtaining a history of possible exposure to infection (including a detailed travel history) is crucial to diagnosing VHF. Relatives and friends often provide more reliable information than severely ill patients.

GENERAL MEASURES

All suspected, probable VHF cases and contacts of VHF cases must be discussed and managed in consultation with the Regional Virologist or Infectious Diseases Consultant at the referral centre.

Cases should also be discussed with the Special Pathogens Unit of the National Institute for Communicable Diseases (NICD):

**Tel: 011 386 6000, Outbreak hotline: 082 883 9920**

Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potentially contagious and life threatening agent.

Viral haemorrhagic fevers (VHF) are readily transmitted to healthcare workers, so it is essential to apply strict contact precautions.

**ISOLATE ALL SUSPECTED SYMPTOMATIC CASES AT ALL TIMES**

If VHF is considered, isolate patient in a single room and take proper precautions to limit further exposure. These include where available:

» long sleeved disposable gown,
» waterproof apron if the patient is bleeding,
» two pairs of latex gloves, one underneath the gown and one with the wrist of the glove pulled over the gown wrist,
» disposable face mask (preferably with a visor),
» goggles if a mask without the visor is used,
» waterproof boots or 2 pairs of overshoes, one over the other.

**Note:** Do not touch your own skin with your gloved hands.

**MANAGEMENT**

<table>
<thead>
<tr>
<th>Signs strongly suggesting VHF</th>
<th>Non-specific signs that may occur with VHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Petechial rash.</td>
<td>» Fever.</td>
</tr>
<tr>
<td>» Ecchymoses.</td>
<td>» Headache.</td>
</tr>
<tr>
<td>» Other haemorrhagic signs (e.g. epistaxis, haematemesis, melaena).</td>
<td>» Conjunctivitis.</td>
</tr>
<tr>
<td>» Non-specific signs of infection.</td>
<td>» Pharyngitis.</td>
</tr>
<tr>
<td></td>
<td>» Myalgia (especially lower back pain).</td>
</tr>
<tr>
<td></td>
<td>» Vomiting.</td>
</tr>
<tr>
<td></td>
<td>» Abdominal pain.</td>
</tr>
<tr>
<td></td>
<td>» Diarrhoea.</td>
</tr>
</tbody>
</table>

Management of VHF contact

» Consult clinician, discuss with NICD and isolate patient (See above).
» Record and follow up all patient contacts.

Management of suspected/possible/probable VHF

» Non-specific signs:
Consult with clinician, discuss with NICD, isolate patient, initiate ceftriaxone and record and follow up all patient contacts.

Signs strongly suggestive of VHF:
- Consult with a clinician, discuss with NICD, isolate patient, initiate ceftriaxone and arrange transfer with EMS (providing patient’s VHF status, and names, addresses and telephone numbers of patient contacts).

**Adults**
- Ceftriaxone, IV, 2 g immediately.

**CAUTION: USE OF CEFTRIAXONE**
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

**Children**
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.

Annotate the dosage and route of administration in the referral letter.

**REFERRAL**
- All cases, after consultation with clinician, discussion with NICD, isolation of patient and management of acute condition.

Manage all contacts of VHF cases according to the current national guidelines. Ensure that contact details are obtained and that there is a plan to manage contacts.

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CHAPTER 10  INFECTIONS AND RELATED CONDITIONS


Chapter 11: Human immunodeficiency virus and acquired immunodeficiency syndrome (HIV AND AIDS)

HIV infection in adults

11.1 Antiretroviral therapy, adults
11.2 Opportunistic infections, prophylaxis in adults
   11.2.1 Cotrimoxazole prophylaxis
   11.2.2 Isoniazid preventive therapy (IPT)
11.3 Opportunistic infections, treatment in adults
   11.3.1 Aphthous ulcers in HIV infection
   11.3.2 Candidiasis, oral
   11.3.3 Candida, oesophagitis
   11.3.4 Cryptococcal infection, pre-emptive therapy
   11.3.5 Cryptococcal meningitis
   11.3.6 Diarrhoea, HIV associated
   11.3.7 Eczema, seborrhoeic
   11.3.8 Fungal nail infections
   11.3.9 Fungal skin infections
   11.3.10 Gingivitis, acute, necrotising, ulcerative
   11.3.11 Herpes simplex ulcers, chronic
   11.3.12 Herpes zoster (Shingles)
   11.3.13 Papular pruritic eruption
   11.3.14 Pneumonia, bacterial
   11.3.15 Pneumonia, pneumocystis
   11.3.16 Toxoplasmosis
   11.3.17 Tuberculosis (TB)
11.4 HIV and kidney disease
HIV infection in children

11.5 The HIV exposed infant
11.6 Management of HIV infected children
11.7 Opportunistic infections, prophylaxis in children
11.8 Opportunistic infections, treatment in children
  11.8.1 Candidiasis, oral (thrush), recurrent
  11.8.2 Candidiasis, oesophageal
  11.8.3 Diarrhoea. HIV associated
  11.8.4 Pneumonia
  11.8.5 Measles and chickenpox
  11.8.6 Skin conditions
  11.8.7 Tuberculosis (TB)
11.9 Developmental delay or deterioration
11.10 Anaemia
11.11 Complications of ART
  11.11.1 Lactic acidosis
  11.11.2 Lipodystrophy
  11.11.3 Immune Reconstitution Inflammatory Syndrome (IRIS)
**DESCRIPTION**

HIV replicates in CD4+ lymphocytes and monocytes, leading to progressive destruction of CD4+ lymphocytes and impaired immunity.

Primary infection is characterised by:
- glandular fever-type illness
- maculopapular rash
- small orogenital ulcers

After primary infection patients have generalised lymphadenopathy and are usually asymptomatic for several years. Subsequently inflammatory skin conditions and an increased frequency of minor infections occur, followed by more severe infections (especially tuberculosis), weight loss or chronic diarrhoea. Eventually severe opportunistic infections, HIV-associated cancers or other severe HIV manifestations develop, known as the **Acquired Immune Deficiency Syndrome** (AIDS).

**DIAGNOSIS**

- Adequate pre- and post-test counselling must be provided.
- Ensure patient confidentiality.
- HIV in adults must be confirmed with a 2nd test. This can either be 2 rapid tests, using kits from different manufacturers, or with 1 rapid test and 1 laboratory test, usually ELISA.
- HIV antibodies are not detected during the 1st few weeks in primary infection. This is known as the window period.

**PROGNOSIS**

Progression of HIV diseases is variable. The CD4+ lymphocyte count and clinical features of immune suppression (see WHO staging below) both provide independent information on prognosis. Patients may be asymptomatic with very low CD4 counts or have severe clinical features with well-preserved CD4 counts. CD4 counts < 200 indicate severe immune suppression. All HIV-infected patients must have a CD4 count requested and WHO clinical staging done. The CD4 count should be repeated every 6 months in patients not yet eligible for ART. Patients should be counselled about ART.

**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 (< 10% of presumed or measured body weight).
- Recurrent respiratory tract infections (sinusitis, otitis media and pharyngitis).
» Herpes zoster (shingles).
» Angular stomatitis.
» Recurrent oral ulceration.
» Papular pruritic eruption.
» Seborrheic dermatitis.
» Fungal nail infections.

**Clinical stage III**
» Unexplained severe weight loss (> 10% of presumed or measured body weight).
» Unexplained chronic diarrhoea for > 1 month.
» Unexplained persistent fever (> 37.5°C intermittent or constant for > 1 month).
» Persistent oral candidiasis (thrush).
» Oral hairy leukoplakia.
» Pulmonary TB.
» Severe bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis or bacteraemia).
» Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis.
» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5 × 10⁹/L) and/or chronic thrombocytopenia (< 50 × 10⁹/L).

**Clinical stage IV**
» HIV wasting syndrome.
» Extrapulmonary tuberculosis.
» Pneumocystis pneumonia.
» Recurrent severe bacterial pneumonia.
» Chronic herpes simplex infection (orolabial, genital or anorectal of >1month 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 coccidioidomycosis).
» 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.
CHAPTER 11  HIV AND AIDS

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

11.1 ANTIRETROVIRAL THERAPY, ADULTS

Antiretroviral therapy (ART) suppresses viral replication (measured with the viral load test), increases the CD4 count and reduces HIV-associated diseases and death. ART guidelines are regularly updated, so it is important to consult the current National Guidelines.

The criteria for starting ART in adults are:
» All patients with stage 3 or 4 disease irrespective of CD4 count.
OR
» All patients with CD4 < 500.
OR
» All pregnant and breastfeeding women, irrespective of CD4 count.
OR
» Other severe HIV-related conditions or co-morbidity. This group of conditions requires specialist diagnosis and recommendation for ART. Examples of conditions in this category includes but is not limited to:
  - Immune Thrombocytopenic Purpura and Thrombotic Thrombocytopenic Purpura.
  - Severe manifestations of the diffuse infiltrative lymphocytic syndrome (e.g. lymphocytic interstitial pneumonitis, polymyositis).
  - Chronic liver disease due to hepatitis B.
  - Patients being treated for non-HIV-related malignancies.

ART should be initiated immediately in pregnancy and during breastfeeding. Unless contra-indicated (see table below), ART should be initiated within 1 week in the following cases:
» CD4 count < 200 (except TB patients and cryptococcal meningitis).
» WHO stage 4 (except TB meningitis and cryptococcal meningitis).

In patients with cryptococcal meningitis, ART should be deferred until 4–6 weeks after starting antifungal treatment (earlier initiation has been shown to increase the risk of death).
In TB patients with CD4 count > 50, ART should be deferred until 8 weeks after initiating TB treatment, which has shown to be safe and reduces the risk of deterioration due to the immune reconstitution inflammatory syndrome (IRIS).
In TB patients with CD4 counts < 50 (except TB meningitis), start ART at 2 weeks after starting TB therapy.
In patients with TB meningitis (irrespective of CD4 count), ART should be deferred until 8 weeks after initiating TB treatment.

**Antiretroviral medicines: Dose and common adverse drug reactions (life-threatening reactions in bold type)**

<table>
<thead>
<tr>
<th>MEDICINE</th>
<th>CLASS</th>
<th>DOSE</th>
<th>COMMON OR SEVERE ADVERSE DRUG REACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine (AZT)</td>
<td>NRTI</td>
<td>300 mg 12 hourly</td>
<td>Bone marrow suppression, gastro-intestinal (GI) upset, headache, lipoatrophy, <em>hyperlactataemia</em>/<em>steatohepatitis</em> (medium risk).</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>NRTI</td>
<td>150 mg 12 hourly or 300 mg daily</td>
<td>Anaemia (pure red cell aplasia, rare), <em>hyperlactataemia</em>/<em>steatohepatitis</em> (low risk).</td>
</tr>
<tr>
<td>Abacavir (ABC)</td>
<td>NRTI</td>
<td>600 mg daily</td>
<td>Hypersensitivity reaction, <em>hyperlactataemia</em>/<em>steatohepatitis</em> (low risk).</td>
</tr>
<tr>
<td>Tenofovir (TDF)</td>
<td>NRTI</td>
<td>300 mg daily</td>
<td>Renal failure, tubular wasting syndrome, reduced bone mineral density, <em>hyperlactataemia</em>/<em>steatohepatitis</em> (low risk).</td>
</tr>
<tr>
<td>Emtricitabine (FTC)</td>
<td>NRTI</td>
<td>200 mg daily</td>
<td>Palmar hyperpigmentation, <em>hyperlactataemia</em>/<em>steatohepatitis</em> (low risk).</td>
</tr>
<tr>
<td>Nevirapine (NVP)</td>
<td>NNRTI</td>
<td>200 mg daily for 14 days then 200 mg 12 hourly</td>
<td>Rash (high risk), hepatitis (high risk). Not to be used in women with CD4 &gt; 250 or men with CD4 &gt; 400.</td>
</tr>
<tr>
<td>Efavirenz (EFV)</td>
<td>NNRTI</td>
<td>600 mg at night</td>
<td>Rash (medium risk), central nervous system symptoms (vivid dreams, problems with concentration, confusion, mood disturbance, psychosis), hepatitis (medium risk).</td>
</tr>
<tr>
<td>Atazanavir (ATV)</td>
<td>PI</td>
<td>300 mg and ritonavir 100 mg daily</td>
<td>Dyslipidaemia (low risk), unconjugated jaundice, hepatitis.</td>
</tr>
<tr>
<td>Lopinavir/ritonavir (LPV/r)</td>
<td>PI</td>
<td>400/100 mg 12 hourly</td>
<td>GI upset, dyslipidaemia (high risk), hepatitis.</td>
</tr>
</tbody>
</table>

NRTI = nucleoside reverse transcriptase inhibitor  
NNRTI = non-nucleoside reverse transcriptase inhibitor  
PI = protease inhibitor
# Standardised national ART regimens for adults and adolescents

## 1st line

<table>
<thead>
<tr>
<th>Condition</th>
<th>Regimen</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>All new patients needing treatment, including pregnant women</td>
<td>TDF + FTC (or 3TC) + EFV ± FDC preferred</td>
<td>Replace EFV with NVP in patients with significant psychiatric co-morbidity or intolerance to EFV and where the neuro-psychiatric toxicity of EFV may impair daily functioning, e.g. shift workers.</td>
</tr>
<tr>
<td>Contraindication to EFV</td>
<td>TDF + FTC (or 3TC) + NVP</td>
<td>Renal disease or use of nephrotoxic medicines e.g. aminoglycosides.</td>
</tr>
<tr>
<td>Contraindication to TDF</td>
<td>ABC + 3TC + EFV or NVP</td>
<td>Renal disease or the use of other nephrotoxic medicines, e.g. aminoglycosides and rash.</td>
</tr>
</tbody>
</table>

## 2nd line

<table>
<thead>
<tr>
<th>Condition</th>
<th>Regimen</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of virological failure</td>
<td>If plasma HIV RNA &gt; 1000 copies: Check for adherence, tolerability and medicine interactions and assess psychological issues. Repeat VL test 2 months later. If plasma VL confirmed &gt; 1000: Change regimen to 2nd line therapy.</td>
<td></td>
</tr>
<tr>
<td>Failing on a TDF-based 1st line regimen</td>
<td>AZT+3TC+ LPV/r</td>
<td>Check hepatitis B surface antigen – if positive continue TDF+3TC (or FTC) and add AZT +LPV/r.</td>
</tr>
<tr>
<td>Failing on an ABC-based 1st line regimen</td>
<td>AZT+3TC (or FTC) and LPV/r</td>
<td></td>
</tr>
<tr>
<td>Dyslipidaemia or diarrhoea associated with LPV/r</td>
<td>Switch LPV/r to ATV/r</td>
<td></td>
</tr>
</tbody>
</table>

## 3rd line

<table>
<thead>
<tr>
<th>Condition</th>
<th>Regimen</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failing 2nd line regimen for &gt; 1 year and good adherence documented (e.g. by pharmacy refills on time for the last 6 months)</td>
<td>Genotype antiretroviral resistance test must be done. Only patients with resistance to LPV/r (or ATV/r) qualify for 3rd line. Application for 3rd line using the standard motivation form is required (available from <a href="mailto:TLART@health.gov.za">TLART@health.gov.za</a>) – the regimen will be determined by an expert committee based on the pattern of resistant mutations and the prior history of antiretroviral exposure.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** In patients who have defaulted ART:
- Recommence previous regimen and
- Do VL at 6 months.
Standardised national monitoring for adults and adolescents with HIV

**At initial diagnosis of HIV**

| Purpose |  
|---|---|
| Confirm HIV result with rapid antibody test. | Ensure that national testing algorithm has been followed. |
| If HIV-infected: Do CD4 count and WHO clinical staging. | To assess eligibility for ART. To assess eligibility for fast-tracking. |
| Screen for pregnancy or ask if planning to conceive. | See Section: 6.2.1 Care of HIV-infected pregnant woman. |
| Screen for TB symptoms (See Section 17.4: Pulmonary tuberculosis). | To identify TB/HIV co-infected. |
| Do CD4 count on the same day. | To identify eligibility for ART or ARVs for prophylaxis if pregnant. |
| If CD4 < 100: Do cryptococcal antigen test (CrAg). | To identify asymptomatic patients who need pre-emptive fluconazole treatment. |
| If AZT required: Do FBC. | To detect anaemia or neutropaenia. |
| If TDF required: Do Creatinine. | To detect renal insufficiency. |
| If NVP required: Do ALT. | To exclude liver disease. |

**On ART**

| Purpose |  
|---|---|
| CD4 at 1 year on ART. | To monitor immune response to ART. |
| VL at month 6, 1 year and then every 12 months. | To identify treatment failures and problems with adherence. |
| If on NVP and develops rash or symptoms of hepatitis: Do ALT. | To identify NVP toxicity. |
| If on AZT: Do FBC at month 1, 2, 3 and 6. | To identify AZT toxicity. |
| If on TDF: Do creatinine at month 3 and 6, 1 year and then every 12 months. | To identify TDF toxicity. |
| If on LPV/r: Do fasting cholesterol and triglycerides at month 3. | To identify LPV/r toxicity. |

**At routine follow-up visits for those not yet eligible for ART**

| Purpose |  
|---|---|
| Repeat CD4 count at 6 months. | To determine patient eligibility for ART. |
| WHO clinical staging at every visit. | To determine patient eligibility for ART. |
| Screen for TB symptoms. | To identify TB/HIV co-infection. |
| If no TB symptoms, consider IPT (See Section 11.2.2: Isoniazid preventive therapy (IPT)). | To prevent TB activation. |
| Offer advice on secondary prevention of HIV. | To prevent HIV transmission and re-infection and STIs. |

In patients treated for TB with rifampicin regimens there are some important
11.9 medicine interactions:
» Efavirenz is not affected and no dose adjustment is needed.
» Nevirapine concentrations are modestly reduced. If efavirenz is contra-indicated nevirapine can be used, but the lead-in dose of nevirapine must be omitted.
» Lopinavir concentrations are markedly reduced. The dose should be doubled slowly (increase to 3 tablets 12 hourly after 1 week, then 4 tablets 12 hourly after the 2nd week, with monthly ALT monitoring).
» Atazanavir cannot be used with rifampicin.

REFERRAL
Contra-indications to commencing ART.

11.2 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN ADULTS
Z29.2

11.2.1 COTRIMOXAZOLE PROPHYLAXIS
Z29.2

Primary prophylaxis with cotrimoxazole prevents many infections, e.g.:
» Pneumocystis pneumonia  » bacteraemia
» toxoplasmosis  » isosporiasis
» bacterial pneumonia

Indications for primary prophylaxis:
» WHO Clinical stage II, III or IV.
» CD4 count < 200.

Prophylaxis should be discontinued if the CD4 count increases on ART to > 200 for at least 6 months.
• Cotrimoxazole, oral, 160/800 daily.
(See Section 17.3.4.2.4: Pneumocystis pneumonia for secondary prophylaxis).

Note: Cotrimoxazole hypersensitivity is common and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of cotrimoxazole, the medicine must be immediately and permanently stopped and the patient referred to hospital.

11.2.2 ISONIAZID PREVENTIVE THERAPY (IPT)
Z29.2

Patients with HIV infection are more susceptible to TB infection than HIV-uninfected patients at any CD4 count.

It is essential to rule out active TB before IPT is given.
Do not start IPT if the patient has any of the following:
» Active cough (any duration).  » Night sweats.
» Fever.  » Weight loss.

The duration of IPT depends on the Mantoux status and whether the patient is on ART.
In patients not eligible for ART:

- IPT reduces the risk of TB in patients with a positive TST (Mantoux ≥ 5 mm).
- IPT does not significantly reduce the risk of TB in patients with a negative TST (Mantoux < 5 mm).
- Prolonged IPT (at least 36 months) has been shown to reduce the risk of TB by 92% in TST positive patients compared with 6 months of IPT, but caused harm in TST negative patients. Therefore, TST is strongly encouraged.
- If TST cannot be done there is a net population benefit with 6 months’ IPT.

In patients on ART:
IPT reduces the risk of TB, irrespective of TST status.

<table>
<thead>
<tr>
<th>Mantoux status</th>
<th>Patients not eligible for ART</th>
<th>Patients on ART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mantoux ≥ 5 mm</td>
<td>At least 36 months</td>
<td>At least 36 months</td>
</tr>
<tr>
<td>Mantoux &lt; 5 mm</td>
<td>No IPT</td>
<td>12 months</td>
</tr>
<tr>
<td>Mantoux not done</td>
<td>6 months</td>
<td>12 months</td>
</tr>
</tbody>
</table>

- Isoniazid, oral, 300 mg daily for 6 months.
  - Educate patients on the symptoms of hepatotoxicity (nausea, vomiting, yellow eyes, brown urine, pain in right upper quadrant).
  - Instruct patient to present early if these symptoms arise.
  - Patients should be followed up monthly for the 1<sup>st</sup> 3 months.
- Pyridoxine, oral, 25 mg once daily.

**11.3 OPPORTUNISTIC INFECTIONS, TREATMENT IN ADULTS**

**11.3.1 APHTHOUS ULCERS IN HIV INFECTION**
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. Major ulcers generally resolve rapidly on ART.
Herpes simplex, histoplasmosis and mycobacteria may also present with major mucosal ulcers.

**MEDICINE TREATMENT**
Minor aphthous ulcers:
- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.
REFERRAL
Major aphthous ulcers for further diagnostic evaluation.

11.3.2 CANDIDIASIS, ORAL
B20.4
See Section 1.2: Candidiasis, oral (thrush).
- Commence ART.

11.3.3 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.

MEDICINE TREATMENT
- Fluconazole, oral, 200 mg daily for 14 days.
- Commence ART.

REFERRAL
» Inability to swallow.
» Frequent relapses.
» Poor response to fluconazole.

11.3.4 CRYPTOCOCCAL INFECTION, PRE-EMPTIVE THERAPY
B45.1
All ART-naïve patients with CD4 < 100 should have cryptococcal antigen (CrAg) test done on serum (unless they had a diagnosis of cryptococcal infection).

If CrAg test is positive and the patient has any symptom of meningitis:
Refer patient immediately for lumbar puncture.

If CrAg test is positive and the patient is asymptomatic:
- Fluconazole, oral.
  - 800 mg daily for 2 weeks, then
  - 400 mg daily for 8 weeks.
  - Followed by 200 mg daily until the CD4 count increases on ART to > 200.

REFERRAL
Pregnant women with a positive CrAg test.
11.3.5 CRYPTOCOCCAL MENINGITIS
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.

MEDICINE TREATMENT
All patients should be treated for cryptococcal meningitis at hospital level. Patients
may be down referred for secondary prophylaxis.

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 CD4 count does not increase to > 200 on ART.
• Commence ART 4–6 weeks after starting antifungal therapy.

REFERRAL
All patients for initial management in hospital.

11.3.6 DIARRHOEA, HIV ASSOCIATED
A08.3

DESCRIPTION
Diarrhoea that persists for > 2 weeks.
Often associated with wasting.
Stool for ova, cysts and parasites should be requested in all cases.

MEDICINE TREATMENT
If stool is negative for parasites or shows Cryptosporidium:
• Loperamide, oral, 2 mg as required.
  o Maximum 8 mg daily.
• Commence ART.

If stool shows Isospora belli:
• Cotrimoxazole, oral, 320/1600 mg (4 tablets) 12 hourly for 10 days.
  o Followed by 160/800 mg (two tablets) daily until CD4 > 200 on ART.
• Commence ART.

Diarrhoea persisting for 4 weeks is a WHO stage 3 condition (if there is weight loss
or fever it is stage 4) and ART should be commenced.

REFERRAL
Stool contains blood or mucous.
### 11.3.7 ECZEMA, SEBORRHOEIC
L30.9
See section 5.8.3: Dermatitis, seborrhoeic.

### 11.3.8 FUNGAL NAIL INFECTIONS
B50.5

This is common in HIV-infected patients and can involve multiple nails. Treatment is not generally recommended because it is mostly of only cosmetic importance and therefore the risk of systemic therapy is not warranted. It generally resolves when patient is on ART.

### 11.3.9 FUNGAL SKIN INFECTIONS
B50.5
See Section 5.5: Fungal infections of the skin.

### 11.3.10 GINGIVITIS, ACUTE NECROTISING ULCERATIVE
K05.1
See Section 1.3.3: Necrotising periodontitis.

### 11.3.11 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.

**MEDICINE TREATMENT**
- Aciclovir, oral, 400 mg 8 hourly for 7 days.
- Commence ART.

**Pain:**
- Paracetamol, oral 1 g when needed up to 4 times a day.

**REFERRAL**
- No response to therapy.
- Frequent relapses.

### 11.3.12 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). Shingles is less infectious than varicella and isolation is not warranted.

**MEDICINE 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:
- Add Flucloxacillin, oral, 500 mg 6 hourly.

**Pain:**
- Paracetamol, oral, 1 g 6 hourly when needed.

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.
  - Increase dose to 50 mg after two weeks if needed.
  - Increase further to 75 mg after a further two weeks if needed.

**REFERRAL**
- Involvement of the eye.
- Disseminated disease (many vesicles extending beyond the main area).
- Features of meningitis (headache and neck stiffness).
- Severe post-herpetic neuralgia not responding to amitriptyline.

**11.3.13 PAPULAR PRURITIC ERUPTION**

**DESCRIPTION**
Itchy inflamed papules at different stages of evolution. Healed lesions are often hyperpigmented. The itch is difficult to manage. May flare after starting ART, but generally improves as the CD4 count increases. It is essential to exclude scabies.

**GENERAL MEASURES**
Minimise exposure to insect bites, e.g. by regularly dipping pets.

**MEDICINE TREATMENT**
- Cetirizine 10mg, oral daily.
• Hydrocortisone acetate 1% cream, applied twice daily for 7 days.
  o Apply sparingly to the face.

11.3.14 PNEUMONIA, BACTERIAL
J15.9
See Section 17.3: Respiratory tract infections.

11.3.15 PNEUMONIA, PNEUMOCYSTIS
B20.6
See Section 17.3: Respiratory tract infections.

11.3.16 TOXOPLASMOSIS
B58.9
Initial diagnosis can only be made at hospital level.

MEDICINE TREATMENT
• Cotrimoxazole, oral, 320/1600mg 12 hourly for 4 weeks.
  o Then 160/800 mg 12 hourly for 12 weeks.

Secondary prophylaxis
• Cotrimoxazole, oral 160/800 mg daily.
  o Continue until the CD4 count has risen to > 200 on ART.
• Commence ART.

11.3.17 TUBERCULOSIS (TB)
A15.0
See Section 17.3: Respiratory tract infections.

11.4 HIV AND KIDNEY DISEASE
B20/ N18

DESCRIPTION
Various forms of kidney disorders are described among patients who are HIV-infected. Early detection of HIV kidney disease may be beneficial in an attempt to protect the kidney from further disease progression.
Screening should include all patients at time of HIV diagnosis.
Patients at high risk or susceptible for HIV renal disease includes:
» CD4 count < 200.
» History of nephrotoxic medications.
» Comorbidity such as diabetes mellitus, hypertension, or hepatitis C virus co-infection.

Screening for renal disease in HIV
» Tests should include:
  – Urine dipstix for haematuria and proteinuria.
  – A measure of kidney function, i.e. creatinine to estimate eGFR.
If there is no evidence of kidney disease at the initial evaluation, screening should be repeated annually.

Monitor creatinine on initiation and at months 3, 6, 12 and then annually for patients receiving tenofovir.

REFERRAL

Patients with persistent significant proteinuria (1+ or more).

Estimated creatinine clearance < 60mL/minute.

HIV INFECTION IN CHILDREN

DESCRIPTION

HIV is a retrovirus affecting immune cells, especially CD4 T lymphocytes. In advanced HIV disease the body loses its ability to fight infections and this is characterised by organ damage, opportunistic infections, malignancies and very low CD4 counts.

In infants, most infection is transmitted from mother to child.

In adolescents and adults sexual spread is the usual cause.

Infants born of HIV-infected mothers may be:

- HIV-infected,
- HIV-uninfected, or
- HIV exposed (at risk of becoming HIV-infected).

To exclude HIV infection in HIV exposed infants/children, a HIV PCR test (if ≥ 18 months of age: a HIV rapid or ELISA test) performed ≥ 6 weeks following cessation of breast feeding should be negative and the infant should be ≥ 6 weeks of age.

If the positive HIV status of a child already initiated on ART is disputed, consult with the closest referral centre for additional HIV testing.

WHEN AND HOW TO TEST IN CHILDREN

Which Test

Child < 18 months of age

HIV PCR test: Always confirm with 2nd HIV PCR test if the 1st test is positive.

Child ≥ 18 months of age

HIV rapid or ELISA test: Always confirm with a 2nd HIV rapid or ELISA test if 1st test is positive.

- HIV rapid tests may be less reliable in children with advanced disease. If clinical findings suggest HIV infection but the rapid test is negative, send a further specimen of blood to the laboratory for HIV ELISA testing.

When to Test

- At 6 weeks (if the child received NVP for 12 weeks – repeat HIV PCR at 16 weeks.
- At any time clinical signs indicate possible HIV infection.
- At 6 weeks, after breastfeeding has stopped.
If the exposed infant has not been shown to be HIV-infected by 18 months, do an ELISA or HIV rapid test.

**AND**

**Perform PCR testing AT BIRTH on:**

- HIV exposed low birth weight infants (< 2.5 kg) or premature infants.
- Infants born to mothers who were on TB treatment for active TB during their pregnancy.
- Infants born to mother with a VL > 1000.
- Infants born to mothers with HIV drug resistance.
- Infants with congenital pneumonia.
- Infants who were symptomatic of HIV at birth.
- Infants of mothers, who were only diagnosed HIV-infected during or shortly after delivery.
- Infants born to mothers initiated on ART < 4 weeks before delivery.
- High risk infants requiring urgent HIV diagnosis.

*(Note: The standard 6 week HIV PCR test must still be done).*

If the HIV PCR result is not available at discharge, the mother should return within 1 week for the result.

If the HIV PCR result is negative, repeat at 6 weeks:

- If HIV PCR result at 6 weeks or an age-appropriate test 6 weeks after breastfeeding has stopped, is still negative, perform HIV rapid test at 18 months of age.
- If positive at any time, start infant ART.

**Also perform age-appropriate testing at any time on:**

- Parental request to test the child.
- HIV-infected father or sibling.
- Death of mother, father or sibling.
- Mothers HIV status and her whereabouts are unknown.
- Clinical features suggest HIV infection.
- Infant has acute severe illness.
- Breastfed infant of newly diagnosed HIV-infected breastfeeding mother.
- IMCI classification of SUSPECTED SYMPTOMATIC HIV INFECTION or POSSIBLE HIV INFECTION.
- TB diagnosis, history of TB treatment or new TB exposure.
- Suspicion of sexual assault.
- Wet nursed/breastfed infant fed by a woman of unknown or HIV-infected status (and repeat age-appropriate test 6 weeks later).
- Children considered for adoption or fostering.

**Newborn child whose mother is of unknown HIV status, has died or is not available due to abandonment or other reasons:**

Perform an infant HIV rapid test and if positive perform HIV PCR. Initiate PMTCT. Perform age-appropriate HIV testing in an HIV-uninfected child at any other time if
clinical symptoms suggest HIV infection.

**Clinical indications that HIV infection should be considered in a child are:**

» If the mother is HIV-infected or if the mother’s HIV status is not known.
» If the child was HIV PCR negative but was subsequently breastfed.
» If a child has any of the following features:
  - Rapid breathing or chest indrawing now (“Pneumonia”).
  - Persistent diarrhoea now or in the past.
  - Ear discharge now or in the past.
  - Low weight for age/height or unsatisfactory weight gain.
  - ≥ 2 enlarged glands of: neck, axilla or groin.
  - Oral thrush.
  - Parotid enlargement.

**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.
» Linear gingival erythema.
» Herpes zoster.
» Recurrent or chronic upper respiratory tract infections (otorrhoea, sinusitis, tonsillitis).
» Seborrhoeic dermatitis.

**Clinical Stage 3**

» Unexplained moderate malnutrition not adequately responding to standard therapy.
» Unexplained persistent diarrhoea (≥ 14 days).
» Unexplained persistent fever (> 37.5°C intermittent or constant, for > 1month).
» Persistent oral candidiasis (after the first 6 weeks of life).
» Oral hairy leukoplakia.
» Acute necrotising ulcerative gingivitis or periodontitis.
» Lymph node TB.
» Pulmonary TB.
» Severe recurrent presumed bacterial pneumonia.
» Symptomatic lymphoid interstitial pneumonitis.
» Chronic HIV-associated lung disease including bronchiectasis.
» Unexplained anaemia (< 8 g/dL), neutropaenia (< 0.5 x 10^9/L) and/or chronic thrombocytopaenia (< 50 x 10^9/L).

Clinical Stage 4
» Unexplained severe wasting/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 >1 months duration).
» Extrapulmonary TB.
» Kaposi sarcoma.
» Oesophageal candidiasis (or candida of trachea, bronchi or lungs).
» Central nervous system toxoplasmosis (after 1 month of life).
» HIV encephalopathy.
» Cytomegalovirus infection: retinitis or cytomegalovirus infection affecting another organ with onset at > 1 month of age.
» Extrapulmonary cryptococcosis (including meningitis).
» Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis).
» Chronic cryptosporidiosis.
» Chronic isosporiasis.
» Disseminated non-tuberculous mycobacterial infection.
» Cerebral or B cell non-Hodgkin lymphoma.
» Progressive multifocal leukoencephalopathy.
» Symptomatic HIV-associated nephropathy or HIV-associated cardiomyopathy.

DIAGNOSIS IN CHILDREN
Testing must be done with counselling of parent/legal guardian/primary caregiver and, where appropriate, the child/and the appropriate consent obtained.

Children < 18 months of age: (HIV PCR test)
» Do HIV PCR at 6 weeks of age in all HIV exposed infants.
» If positive confirm with a 2nd HIV PCR test. Initiate treatment while awaiting the 2nd HIV PCR test result.
» If the child is breast fed and the 6-week HIV PCR is negative, testing should be repeated 6 weeks after complete cessation of breastfeeding. (If the child is ≥ 18 months, an ELISA or rapid test can be done).
» If an exposed child reaches 18 months of age and has not had a positive HIV PCR test or positive HIV infection diagnosis, a rapid test should be done.
» If at any time the child has evidence suggesting HIV infection, even if this is < 6 weeks of age, the child should be tested for HIV infection. If the HIV PCR test was done before 6 weeks and is negative, it should be repeated at 6 weeks.

In children ≥ 18 months of age: (HIV rapid/ELISA tests)
» If 1st HIV rapid test is positive, confirm the result with a 2nd HIV rapid test using a kit from a different manufacturer (preferably on different blood specimens).
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» If 2nd HIV rapid test is not available, confirm diagnosis with an ELISA.

Note:
- Negative tests do not exclude infection until 6 weeks after birth and 6 weeks after exposure to other risk of HIV infection (including cessation of breastfeeding).
- Children with discordant HIV test results must be discussed with an expert.
- Do not repeat HIV rapid/Elisa tests in children on established ART.

11.5 THE HIV EXPOSED INFANT

DESCRIPTION
An infant whose mother is HIV-infected, or in whom HIV infection has not been confirmed or excluded.
Transmission of HIV infection from mother to child may occur during pregnancy, during delivery or via breastfeeding. Prevention of transmission of infection from mother to child can be effectively carried out with a very high success rate by means of suppressing the mother’s VL and giving ARVs to the infant.

Where the mother’s VL cannot be suppressed the risk of breast milk transmission remains significant.
The PMTCT care plan starts with the mother and may take one of the following routes once she is diagnosed as HIV-infected:
1. HIV-infected pregnant women receive combined ART to suppress the VL to undetectable levels after which the risk of breastfeeding transmission is negligible. ART may have been started before the woman became pregnant or may only be started during pregnancy as soon as the infection is detected.
   » If the mother is started on ART early in pregnancy (i.e. > 4 weeks before delivery), and continues while breastfeeding: Give ARV prophylaxis (NVP) to the infant until 6 weeks of age.
      - If 6 week infant PCR is positive: Start infant ART, stop NVP and continue breastfeeding. Start cotrimoxazole prophylaxis.
   » If the mother is started on ART late during pregnancy (i.e. ≤ 4 weeks before delivery) or at delivery: Give NVP to the infant until 12 weeks of age.
      - If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.
   » HIV-infected mother who has not received ART by delivery:
      - Initiate mother on ART, and give NVP to the infant until 12 weeks of age. If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.
   » Mother with previously unknown HIV status, newly diagnosed HIV-infection and presents within 72 hours of delivery:
      - Initiate mother on ART and initiate infant ARV prophylaxis:
         • NVP: Start immediately and then daily for 12 weeks.
   » If mother with previously unknown HIV status, newly diagnosed HIV-infected and presents > 72 hours after delivery:
- Infant is breastfed or stopped breastfeeding < 1 week previously:
  - Infant AZT + NVP started and mother to be initiated on ART. HIV PCR test done and obtain result within 7 days.
    - Negative HIV PCR: Stop AZT and give NVP for 12 weeks.
    - Positive HIV PCR: Initiate infant on ART and confirm with a 2\(^{nd}\) HIV PCR.
- Infant not breastfed and has not breast fed in the previous 1 week:
  - Initiate mother on ART. Do HIV PCR and get results within 7 days.
    - Negative HIV PCR: 2\(^{nd}\) HIV PCR at 6 weeks of age.
    - Positive HIV PCR: Initiate infant on ART and confirm with a 2\(^{nd}\) HIV PCR.

  » If the mother has been on lifelong ART before the pregnancy, she must have a VL at 1\(^{st}\) booking. If VL is not suppressed, this must be addressed and infant ARV prophylaxis appropriately adjusted.

- VL > 1000: Consider adherence problems or viral resistance. Seek expert advice for the management of the mother and the child.
- VL< 1000 and mother is breastfeeding: Give NVP to the infant until 6 weeks of age. If 6 week infant PCR is positive: Stop NVP, continue breastfeeding, start infant ART and cotrimoxazole prophylaxis.

Perform PCR testing on all HIV exposed infants at 6 weeks of age, and if negative, perform an ELISA/HIV rapid test at 18 months of age (or an age-appropriate test 6 weeks after cessation of breastfeeding).

**Note:** For recommendations on when to perform additional tests, refer to the guidance on “When to Test” (Section: HIV infection in children).

<table>
<thead>
<tr>
<th>Infant</th>
<th>Regimen</th>
<th>Comment</th>
</tr>
</thead>
</table>
| Mother starting ART in pregnancy (including TDF + EFV + 3TC or FTC) | 1. Mother starts ART > 4 weeks before delivery:  
   - NVP at birth and then daily for 6 weeks.  
   OR  
   2. Mother starts ART < 4 weeks before delivery, or at delivery:  
   - NVP at birth and then daily for 12 weeks. | PCR positive at any time including the 6 week test: Confirm with 2\(^{nd}\) HIV PCR test, stop PMTCT and start ART. |
| | | LoE:III<sup>null</sup> |
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<table>
<thead>
<tr>
<th>Situation</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother on lifelong ART, initiated before pregnancy (including TDF + EFV + 3TC or FTC)</strong></td>
<td><strong>Mother has VL at booking:</strong></td>
</tr>
</tbody>
</table>
|  | 1. Mother VL < 1000:  
|  | • NVP at birth and then daily for 6 weeks.  
|  | 2. Mother VL > 1000:  
|  | • NVP at birth and then daily for 6 weeks.  
|  | **Mother failing 1\(^{st}\) line and initiated on 2\(^{nd}\) line:**  
|  | » > 4 weeks before delivery  
|  | • AZT + NVP for 6 weeks.  
|  | » < 4 weeks before delivery  
|  | • AZT + NVP for 12 weeks.  
|  | **Mother failing 2\(^{nd}\) line ART:**  
|  | Refer for specialised management.  
| **Mother did not get any ART before or during delivery and diagnosed HIV-infected post delivery.** | **Presents ≤ 72 hours of delivery:** |
|  | Mother to be initiated on ART.  
|  | • NVP immediately and then daily for 12 weeks.  
| **Presents > 72 hours from delivery:** |  
|  | Infant is breastfed or stopped breast feeding < 1 week previously.  
|  | • AZT + NVP started and HIV PCR sent. Initiate mother on ART. Get HIV PCR result within 7 days:  
|  | o Negative: Stop AZT, and give NVP for 12 weeks.  
|  | o Positive: Initiate infant on ART and confirm with a 2\(^{nd}\) HIV PCR.  
|  | Infant not breastfed and has not breastfed in the previous 1 week.  
|  | • Initiate mother on ART. Do HIV PCR and get results within 7 days:  
|  | o Negative: Check PCR at 6 weeks of age.  
|  | o Positive: Initiate infant on ART and confirm with a 2\(^{nd}\) HIV PCR.  
| **Unknown maternal status because orphaned or abandoned.** |  
|  | Give NVP immediately* and test infant with rapid HIV test.  
|  | o Positive: If presents ≤ 72 hours of delivery, give NVP daily for 6 weeks. Check PCR at 6 weeks of age.  
|  | o Negative: Discontinue NVP.  

* If rapid HIV test can be done ≤ 2 hours, wait for HIV result before commencing NVP.

(If on NVP prophylaxis for 12 weeks and 2\(^{nd}\) HIV PCR confirmatory test was negative: Repeat HIV PCR at 16 weeks).
Infant PMTCT dosages:
Premature and low-birth weight newborns (< 2 kg) are treated in hospital.
Daily prophylaxis for 6 or 12 weeks administered to infants, as indicated above:
» Give 1st dose as soon as possible after birth.
» If baby vomits: Repeat dose once only.
» If infant HIV PCR is positive at any time, stop prophylactic ARV, confirm with 2nd PCR and initiate/refer for ART, while awaiting 2nd PCR result.
» Continue normal breastfeeding and start cotrimoxazole prophylaxis if > 6 weeks of age.

Nevirapine (NVP) dose for infant on PMTCT:
Newborns ≥ 2 kg and infants:
• Nevirapine, oral, daily.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 10 mg/mL</th>
<th>Age Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–2.5 kg</td>
<td>10 mg</td>
<td>1 mL</td>
<td>Birth–6 weeks</td>
</tr>
<tr>
<td>&gt;2.5 kg</td>
<td>15 mg</td>
<td>1.5 mL</td>
<td>&gt;6 weeks–6 months</td>
</tr>
<tr>
<td>&gt;2.5–7 kg</td>
<td>20 mg</td>
<td>2 mL</td>
<td></td>
</tr>
</tbody>
</table>

Zidovudine (AZT) dose for infant on PMTCT:
Newborns ≥ 2 kg and infants:
• Zidovudine, oral, 4 mg/kg/dose 12 hourly.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 10 mg/mL</th>
<th>Age Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–2.499 kg</td>
<td>10 mg</td>
<td>1 mL</td>
<td>Birth–6 weeks</td>
</tr>
<tr>
<td>≥2.5 kg</td>
<td>15 mg</td>
<td>1.5 mL</td>
<td>&gt;6 weeks</td>
</tr>
</tbody>
</table>

Feeding advice
» Exclusive breast feeding is strongly recommended for the 1st 6 months, after which the nutritional needs of the child will require the introduction of complementary foods, while breastfeeding continues.
» Mothers failing 2nd or 3rd line regimens should not breastfeed, provided the mother fulfils the AFASS (affordable, feasible, acceptable, sustainable and safe) criteria.
» If women are switched from 1st to 2nd line therapy during pregnancy or breastfeeding, consult with a practitioner experienced and knowledgeable of the factors informing the feeding option decision.
» The mother should be encouraged to breastfeed as the advantages of breast feeding exceed the risks of HIV transmission in a mother on effective ART.
» Use of flash pasteurisation or Pretoria pasteurisation to reduce HIV transmission is supported but may pose significant barriers to successful breast milk feeding due to the effort involved.

Cotrimoxazole prophylaxis
Initiation:
» All HIV exposed or infected infants, starting from 6 weeks of age.
» Any child 1–5 years of age with CD4 < 25%.
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- Any child > 5 years of age with CD4 < 350.
- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

Discontinuation:
- Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
- HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4 > 25% or > 5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
- Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

REFERRAL
Mother declines infant ARV prophylaxis.

11.6 MANAGEMENT OF HIV-INFECTED CHILDREN

DESCRIPTION
HIV-infected child: An infant/child in whom HIV infection has been confirmed with 2 age appropriate tests. See Section 11.5. The HIV exposed infant.

GENERAL AND SUPPORTIVE MEASURES
- Identify a caregiver who can supervise the child’s treatment.
- Link the HIV interventions to the regular well infant visits/nutritional care. Ensure the road to health booklet is correctly filled and used to reflect and guide care.

Counselling is a vital part of the successful care of children with HIV infection and their families. Specific matters requiring attention are:
- The implications of the disease to the family.
- Implications of treatment and understanding of the condition and its care.
- The disclosure process within the family and extended family should be encouraged. Besides the caregiver, help from the family is often useful.
- Disclosure to the child appropriate to age and maturity with the parents’ support.
  - Find out what the child understands of their illness and what they would like to know.
  - Disclosure should be child led in terms of information required, language used and educational/emotional readiness.
  - Anticipate the effects of disclosure on the child, family and other contacts such as friends and school colleagues.
  - Ensure that in disclosure the child is constantly reassured of the parents/caregivers love.

Treatment of mothers, caregivers and other family members:
- Always ask about the caregiver’s health, and the health of other family members.
- Ensure that mothers and other family members have timeous access to medical care including ART.
- Encourage breastfeeding in all mothers with HIV-infected children, with introduction of complementary foods from 6 months of age.
At every visit ask about TB contacts and TB symptoms in all children and their caregivers.

| Standardised national monitoring for infants and children with HIV |
|--------------------------|--------------------------|
| **At initial diagnosis of HIV** | **Purpose** |
| Verify HIV status. | To ensure that national testing algorithm has been followed. |
| Document weight, height, head circumference (< 2 years of age) and development. | To monitor growth and development. |
| Screen for TB symptoms. | To identify TB and HIV co-infection |
| Do CD4 count. | Children < 5 years: Baseline. Do **not** wait for CD4 count to start ART. Children ≥ 5 years: To assist in determining eligibility for ART. |
| Hb or FBC if available. | To detect anaemia or neutropenia. |

<table>
<thead>
<tr>
<th><strong>At routine follow-up visits (patients not yet on ART)</strong></th>
<th><strong>Purpose</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Document weight, height, head circumference (&lt; 2 years) and development.</td>
<td>To monitor growth and development.</td>
</tr>
<tr>
<td>If &gt; 5 years: Check that a CD4 count has been done in the last 6 months.</td>
<td>To determine eligibility for ART.</td>
</tr>
<tr>
<td>If &gt; 5 years: WHO clinical staging.</td>
<td>To determine eligibility for ART.</td>
</tr>
<tr>
<td>Screen for TB symptoms.</td>
<td>To identify TB/HIV co-infection.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>At initiation of ART (baseline)</strong></th>
<th><strong>Purpose</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb or FBC.</td>
<td>If &lt; 8 g/dL: Manage appropriately.</td>
</tr>
<tr>
<td>CD4 count (if not performed in last 6 months).</td>
<td>Baseline assessment.</td>
</tr>
<tr>
<td>If on PI-based regimen: Cholesterol + triglyceride.</td>
<td>Baseline assessment.</td>
</tr>
<tr>
<td>If considering TDF-based regimen: Serum creatinine + urine dipstick test.</td>
<td>If abnormal refer for specialist opinion.</td>
</tr>
<tr>
<td>If jaundiced or on TB treatment: ALT.</td>
<td>To detect liver dysfunction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>On ART</strong></th>
<th><strong>Purpose</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height, weight, head circumference (if child &lt; 2 years) and development.</td>
<td>To monitor growth and development. Adjust dosing at each visit according to weight gain.</td>
</tr>
<tr>
<td>Clinical assessment including medicine-related adverse events.</td>
<td>To monitor response to ART and detect adverse effects.</td>
</tr>
<tr>
<td>CD4: 1 year on ART, and then 12 monthly.</td>
<td>To monitor response to ART. Stop cotrimoxazole prophylaxis if indicated.</td>
</tr>
<tr>
<td>On ART</td>
<td>Purpose</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Viral load:</td>
<td>To monitor viral response to ART.</td>
</tr>
<tr>
<td>» &lt; 5 years: At month 6 and 12 on ART, then annually.</td>
<td>To identify treatment failure and adherence problems.</td>
</tr>
<tr>
<td>» 5–15 years: At month 6 on ART, and if suppressed - annually.</td>
<td></td>
</tr>
<tr>
<td>If on AZT: Hb or FBC: At month 1, 2, 3 and then annually.</td>
<td>To identify AZT-related anaemia.</td>
</tr>
<tr>
<td>If on PI-based regimen: LDL-cholesterol + triglyceride: At 1 year and then 12 monthly.</td>
<td>To monitor for PI-related metabolic side effects.</td>
</tr>
</tbody>
</table>

**MEDICINE TREATMENT**

**Cotrimoxazole prophylaxis**

**Initiation:**
- All HIV exposed or infected infants, starting from 6 weeks of age.
- Any child 1–5 years of age with CD4 < 25%.
- Any child >5 years of age with CD4 < 350.
- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

**Discontinuation:**
- Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
- HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4 > 25% or > 5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
- Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

**Immunisation, deworming and vitamin A program**
- Continue deworming and vitamin A programme as in the HIV-uninfected child.
- Continue immunisation as in the HIV-uninfected child except:
  - Do not give BCG to children with symptomatic HIV unless the child has immune reconstituted on ART.
  - Give an additional dose of measles vaccine at 6 months.
  - See Chapter 13: Immunisation.

**Nutritional support**
Specific nutritional conditions should be treated appropriately.

**Antiretroviral therapy**
Initiation of ART in well, uncomplicated infants shown to be PCR positive should be carried out at PHC level.

The preparation of the child and family to start ART is critical to the success of the treatment. Failure to achieve adherence and understanding may lead to resistance and adversely affect the prognosis of the child.
Eligibility for ART

Clinical criteria

» Confirmation of diagnosis of HIV infection.

AND

» Child < 5 years of age irrespective of CD4 count or staging.
» Child ≥ 5 years with CD4 < 500 or WHO clinical stage III or IV.

AND

» No medical contraindication (e.g. major organ dysfunction). If medical contraindications are present refer to hospital for rapid review and planning.

Children requiring fast track (i.e. start ART within 7 days of being eligible if safe to do so):

» Children < 1 year of age.
» WHO Clinical stage 4.
» MDR or XDR-TB.
» CD4 count < 200 or < 15%.

Social issues that must be addressed to ensure successful treatment

These are extremely important for success and impact on adherence. Social challenges should be overcome and not be barriers to care. Adherence to treatment must at least be considered probable. Disclosure to another adult living in the same house is encouraged so that there is someone else who can assist with the child’s treatment. However, absence of disclosure should not preclude ART initiation.

» Mandatory component: At least one identifiable caregiver able to supervise the child and/or administer medication. All efforts should be made to ensure that the social circumstances of vulnerable children (e.g. orphans) be addressed to facilitate treatment.

» Adherence:
  - High levels of adherence are required for adequate virological response and prevention of viral resistance. This can be achieved with regular education and support.
  - All efforts to encourage this level of adherence should be made.
  - Viral load measurements are useful for monitoring adherence.
  - Sensitive, age-appropriate disclosure facilitates adherence.

» Mother and other family members should be assessed and treated.

Requirements before ART is initiated:

The child’s family (parents, caregivers) should understand:

» ART is life-long.
» The prognosis of the condition (treated and untreated).
» Medicines’ adverse effects and modes of action, and the risk and implications of developing resistance, if incorrectly used.
» That all medicines should be given. If ≥ 1 antiretroviral is missing from the medicine regimen, treatment should be stopped until they are all available again.
ART regimens
» Are chosen according to age, weight, expected adverse effects, efficacy and prior antiretroviral exposure.
» Adjust the dosage of ART according to weight, during follow up visits.
» Do not change regimens or move to 2\textsuperscript{nd} line therapy without clear guidance from a practitioner experienced in child ARV medicine, as unnecessary loss of effective regimens can shorten life expectancy. Adherence problems need to be addressed thoroughly before switching to a 2\textsuperscript{nd} or 3\textsuperscript{rd} line regimen.
» Single medicine substitutions may only be made when medicine-specific adverse effects are encountered, on condition that virological suppression is documented and the matter is discussed with a practitioner experienced in child ARV medicine.

<table>
<thead>
<tr>
<th>First Line Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>All infants and children &lt; 3 years or Older children &lt; 10 kg.</td>
</tr>
<tr>
<td>Infants &lt; 3 months or &lt; 3 kg: Seek advice on treatment regimen and dosage.</td>
</tr>
<tr>
<td>All children &gt; 3 years and &gt; 10 kg.</td>
</tr>
<tr>
<td>Adolescents &gt; 15 years and &gt; 40 kg.</td>
</tr>
<tr>
<td>Children &lt; 6 weeks or &lt; 3 kg, who are positive at birth.</td>
</tr>
</tbody>
</table>

Adjustment of previous 1\textsuperscript{st} line regimens
- d4T-containing 1\textsuperscript{st} line regimens
  - If VL is suppressed: Change d4T to ABC.
  - If VL is > 1000: Manage as virological failure. If VL remains high after enhanced adherence, refer for consideration of a change in regimen.
  - If VL is 50–1000: Consult or refer.

- Change 1\textsuperscript{st} line children regimen to adult treatment, if > 15 years and > 40kg.
  - If VL is > 1000: Manage as virological failure. If VL remains high after enhanced adherence, refer for consideration of a change in regimen.
  - If VL is 50–1000: Consult or refer.
  - If VL is suppressed and on 1\textsuperscript{st} line:
    1. ABC + 3TC + EFV.
    2. Change to TDF + 3TC (or FTC) + EFV.
    3. ABC + 3TC + LPV/r.
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<table>
<thead>
<tr>
<th>dl-containing 1st line regimens</th>
<th>Change dl to ABC, irrespective of VL.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Change to TDF + 3TC (or FTC) + EFV.</td>
<td></td>
</tr>
<tr>
<td>Changing from a 2nd child regimen requires consultation or referral.</td>
<td></td>
</tr>
</tbody>
</table>

Initiating ART in children (the 6 steps/IMCI child NIMART)
(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STG, 2013).
1. Decide if the child has confirmed HIV infection (see testing above).
2. Decide if the child is eligible to receive ART (see criteria above).
3. Decide if the caregiver is able to give ART (If not, refer to appropriate level to ensure ability to take ART effectively and safely).
4. Decide if a nurse should initiate ART (i.e. NIMART suited patient).
   a. If any of the following are present refer:
      - Fast breathing.
      - TB.
      - Weight < 3 kg.
      - General danger signs or severe disease evident.
5. Assess and record baseline information.
   a. Record the following information:
      - Weight and height.
      - Head circumference in children < 2 years of age.
      - Assess for malnutrition and anaemia.
      - Feeding assessment and feeding problems.
      - Development.
      - Consider and screen for TB.
      - WHO clinical stage.
      - Laboratory results: Hb, VL, CD4 count and percentage.
   b. If SEVERE MALNUTRITION, SEVERE ANAEMIA or TB refer to next level of care.
   c. If POSSIBLE TB provide appropriate follow up.
   d. If Hb < 10 g/dL (but not severe anaemia) treat as per IMCI. Do not delay ART. Send appropriate laboratory tests but do not wait for results to start ART.
6. Start ART:
   a. If < 3 years of age OR < 10 kg: ABC+3TC+LPV/r.
   b. If > 3 years of age AND ≥ 10 kg: ABC+3TC+EFV.
   c. Continue (or start) cotrimoxazole prophylaxis.
   d. Follow up after 1 week:
      - To check ability to adhere.
      - To check outstanding laboratory results.
      - To resolve any problems that may have arisen.

Then proceed to long term follow up (the 7 steps/IMCI child NIMART).
(These steps are taken from the IMCI nursing protocol. Doctors may obtain further guidance from the Paediatric Hospital Level EML and STG, 2013).
1. Assess for problems:
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a. Ask if there are any problems.
b. Check for any danger signs.
c. Check for ART dangers signs:
   - Severe Skin Rash.
   - Difficulty breathing or severe abdominal pain.
   - Yellow eyes.
   - Fever, vomiting, rash.
d. Check for any other symptoms.
e. Consider TB/ask if there has been TB contact and examine at each visit.

2. Monitor progress on ART:
   a. Record weight (and height every 3 months).
   b. Assess development every 6 months.
   c. Assess adherence and record (ask mother, self-assessment, record correct number of pills remain, watch body language).
   d. Assess for side effects. If present manage according to guidelines or refer:
      - yellow eyes
      - nausea and vomiting
      - fever
      - sleep disturbances
      - anxiety
      - lipo-atrophy
      - rash
      - diarrhoea
      - headache
      - nightmares
      - tingling or numbness
   e. Assess clinical progress.
   f. Monitor blood results.
   g. Indications for referral to a doctor include:
      Not gaining weight for 3 months.
      Regression of milestones.
      Failure to attain milestones.
      Poor adherence after adherence counselling.
      Significant side effects despite appropriate management.
      Deterioration of clinical stage.
      CD4 count significantly dropping.
      VL > 400 despite adherence counselling.
      Fasting total cholesterol > 4.43 mmol/L.
      Fasting TG > 5.6 mmol/L.

3. Provide further ART:
   a. Continue treatment if stable and no significant side effects.

   Note: Check dose is correct for current weight and adjust accordingly.

4. Provide other treatments:
   a. Continue cotrimoxazole prophylaxis till: 1–5 year: CD4 > 25%; or if > 5 years: CD4 > 350; on 2 tests at least 3–6 months apart.

5. Provide routine care:
   a. Check immunisations, vitamin A, de-worming etc. have all been done.

6. Counsel the mother/caregiver:
   a. Use the visit to check mother’s knowledge and need for support.
b. Check if family and mother are receiving own necessary care.

7. Arrange further follow up:
   a. Arrange follow up in 1 month (more frequently if other problems are present).

### Treatment failure

» VL is the most sensitive method to detect failure of response to ART.

» Virological failure can be defined as a measurable viral load, despite optimal adherence and optimal dosing over a four month period. Clinical and immunological deterioration are late features of ART failure.

» The most common cause of treatment failure is poor adherence. Adherence has to be addressed, before switching to 2nd line therapy.

<table>
<thead>
<tr>
<th>Viral load (VL)</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower than detectable limits</td>
<td>» Praise the patient and caregiver(s) and continue 12 monthly VL monitoring.</td>
</tr>
<tr>
<td>&lt; 50 copies/mL</td>
<td>» 12 monthly VL monitoring and adherence support.</td>
</tr>
<tr>
<td>50–1 000 copies/mL</td>
<td>» Begin step up adherence package.</td>
</tr>
<tr>
<td>&gt;1 000 copies/mL</td>
<td>» Begin step-up adherence package.</td>
</tr>
<tr>
<td></td>
<td>» Repeat VL in 3 months:</td>
</tr>
<tr>
<td></td>
<td>» VL &lt; 400: Return to routine 6–12 monthly monitoring.</td>
</tr>
<tr>
<td></td>
<td>» VL 400–1000: Continue step up adherence and repeat VL after 6 months.</td>
</tr>
<tr>
<td></td>
<td>» VL &gt; 1 000 despite stepped up adherence, and child is on NNRTI based regimen: Consult or refer for switch to 2nd line therapy after adherence ensured.</td>
</tr>
<tr>
<td></td>
<td>» Child is on a PI-based regimen and VL &gt; 1000, despite stepped up adherence:</td>
</tr>
<tr>
<td></td>
<td>» VL &lt; 30 000: Continue with same regimen while monitoring VL 3-monthly. Continue stepping up adherence and consult an expert.</td>
</tr>
<tr>
<td></td>
<td>» VL &gt; 30 000: Refer.</td>
</tr>
</tbody>
</table>

*If laboratory does not test VL of 50 copies/mL, use cut-off of < 400 copies/mL.

### General ART comments

» Switch to tablets or capsules from syrups or solutions as soon as possible.

» Fixed dose combinations are preferred to single agents.

» If available, use daily dose regimens.

### Side effects:

<table>
<thead>
<tr>
<th>Symptomatic hyperlactataemia/ lactic acidosis</th>
<th>Continue ART with careful monitoring. Get expert advice.</th>
<th>Consider stopping treatment URGENTLY. Consult expert urgently.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate: 2–5 mmol/L with no signs or symptoms</td>
<td>Lactate &gt; 5 mmol/L, or acidosis,</td>
<td></td>
</tr>
<tr>
<td><strong>Anaemia</strong></td>
<td>Hb: 7.0–9.9 g/dL</td>
<td>Hb &lt; 7 g/dL, or cardiac failure.</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td><strong>Neutropenia</strong></td>
<td>0.4–1.2 $\times$ 10^9/L</td>
<td>&lt; 0.4 $\times$ 10^9/L</td>
</tr>
<tr>
<td><strong>Increased liver enzymes and hepatitis</strong></td>
<td>≤ 9.9 $\times$ upper normal limit</td>
<td>≥ 10.0 $\times$ upper normal limit</td>
</tr>
<tr>
<td><strong>Increased serum triglycerides</strong></td>
<td>1.54–8.46 mmol/L</td>
<td>≥ 8.47 mmol/L</td>
</tr>
<tr>
<td><strong>Increased LDL cholesterol</strong></td>
<td>4.43–12.92 mmol/L</td>
<td>≥ 12.93 mmol/L</td>
</tr>
<tr>
<td><strong>Skin reactions</strong></td>
<td>- diffuse maculo-papular rash, or - dry desquamation</td>
<td>Vesiculation, or ulcers, or exfoliative dermatitis, or Stevens-Johnson syndrome, or erythema multiforme, or moist desquamation, or elevated ALT, or elevated AST.</td>
</tr>
<tr>
<td><strong>Other side effects:</strong></td>
<td>Clinical evaluation.</td>
<td>Discuss all cases with an HIV clinician, before interrupting therapy.</td>
</tr>
<tr>
<td>- peripheral neuropathy</td>
<td>- myopathy</td>
<td>- abdominal pain</td>
</tr>
<tr>
<td>- nausea and vomiting</td>
<td>- pancreatitis</td>
<td>- headache</td>
</tr>
<tr>
<td>- fatigue</td>
<td>- sedative effect</td>
<td>- sleep disturbance</td>
</tr>
<tr>
<td>- confusion</td>
<td>- abnormal thinking</td>
<td>- probably teratogenic</td>
</tr>
<tr>
<td>Weight Kg</td>
<td>Abacavir (ABC)</td>
<td>Lamivudine (3TC)</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>&lt;3</td>
<td>8 mg/kg 12 hourly OR ~10kg: 16 mg/kg once daily</td>
<td>4 mg/kg 12 hourly OR ~10kg: 8 mg/kg once daily</td>
</tr>
<tr>
<td>3-4.9</td>
<td>2 mL 12 hourly</td>
<td>2 mL 12 hourly</td>
</tr>
<tr>
<td>5-6.9</td>
<td>3 mL 12 hourly</td>
<td>3 mL 12 hourly</td>
</tr>
<tr>
<td>7-9.9</td>
<td>4 mL 12 hourly</td>
<td>4 mL 12 hourly</td>
</tr>
<tr>
<td>10-13.9</td>
<td>6 mL 12 hourly OR 2x60* tabs 12 hourly</td>
<td>12 mL daily OR 4x60* tabs daily</td>
</tr>
<tr>
<td>14-19.9</td>
<td>8mL 12 hourly OR 2.5x60* tabs 12 hourly</td>
<td>1x300* tab daily OR 15 mL daily</td>
</tr>
<tr>
<td>20-24.9</td>
<td>10 mL 12 hourly OR 3x60* tabs 12 hourly</td>
<td>20 mL daily OR 1x300*+ 1x60* tab D</td>
</tr>
<tr>
<td>25-29.9</td>
<td>1x300* tab 12 hourly</td>
<td>2x300 tabs daily OR 1 x ABC/3TC 600/300* tab daily</td>
</tr>
<tr>
<td>30-34.9</td>
<td>4 mL 12 hourly</td>
<td>4 mL 12 hourly</td>
</tr>
<tr>
<td>35-39.9</td>
<td>5 mL 12 hourly</td>
<td>5 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;40</td>
<td>600 tab at night</td>
<td>600 tab at night</td>
</tr>
</tbody>
</table>

*dosage in mg  Sol: solution  Tab: tablet  Cap: capsule
11.7 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN CHILDREN

Cotrimoxazole prophylaxis

**Indications:**
- All HIV exposed or infected infants, starting from 6 weeks of age.
- Any child 1–5 years of age with CD4 < 25%.
- Any child > 5 years of age with CD4 < 350.
- Cotrimoxazole, oral, once daily (everyday). See dosing table, pg 22.3.

**Discontinuation:**
- Child is HIV-uninfected and has not been breastfed for the last 6 weeks.
- HIV-infected child > 1 year of age whose immune system is fully reconstituted on ART (i.e. 1–5 year: CD4 > 25% or >5 years: CD4 > 350 on 2 tests at least 3–6 months apart).
- Child is HIV-infected with PCP infection: after treatment, continue cotrimoxazole prophylaxis till 5 years of age.

**TB prophylaxis**

See Section 11.8.7: Tuberculosis: TB prophylaxis.

**Immunisation**

Continue immunisation as in the HIV-uninfected child except:
- Give an additional measles vaccination at 6 months of age.
- Do not give BCG to children with symptomatic HIV unless the child has immune reconstituted on ART.
- See Chapter 13: Immunisation.

11.8 OPPORTUNISTIC INFECTIONS, TREATMENT IN CHILDREN

11.8.1 CANDIDIASIS, ORAL (THRUSH), RECURRENT

**MEDICINE TREATMENT**
- Nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
  - In the older child, ask child to swirl in the mouth, prior to swallowing.
  - In the infant, advise mom to apply to front of the mouth and spread over the oral mucosa with a clean finger.
  - Continue for 48 hours after resolution of symptoms.

If there is oral candidiasis and the child cannot swallow, this
indicates the presence of oesophageal candidiasis. See Section 11.8.2: Candidiasis, oesophageal.

### 11.8.2 CANDIDIASIS, OESOPHAGEAL

**MEDICINE TREATMENT**
- Fluconazole, oral, 6 mg/kg once daily for 21 days. See dosing table, pg 22.4.

### 11.8.3 DIARRHOEA, HIV ASSOCIATED

See Section 2.9: Diarrhoea.

### 11.8.4 PNEUMONIA

See Section 17.3: Respiratory tract infections.

### 11.8.5 MEASLES AND CHICKENPOX

Refer all patients.

### 11.8.6 SKIN CONDITIONS

These are common and include scabies, seborrhoeic eczema and others. See Chapter 5: Skin conditions.

If no response to care as directed in the chapter, refer.

### 11.8.7 TUBERCULOSIS (TB)

**DESCRIPTION**

TB and HIV are often co-morbid conditions. Exclude TB in all patients before starting ART. See Section 17.4.2: Pulmonary tuberculosis, in children.

Re-evaluate the risk for TB and TB contact at each visit on history (including contact history) and clinical examination.

TB should be considered early in non-resolving pneumonias. Tuberculin tests are often not reliable and a negative test does not exclude TB. If TB is suspected but cannot be proven, refer early for diagnostic evaluation.

**MEDICINE TREATMENT**

**TB prophylaxis**

Give TB prophylaxis to all children in whom no evidence of TB disease is present and who are:
» Exposed to a close contact with infectious pulmonary TB or
» TST positive (only the 1\textsuperscript{st} time a positive TST is shown).

- Isoniazid, oral, 10 mg/kg/dose once daily for 6 months. See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Repeat course if an HIV-infected patient, irrespective of age, is re-exposed to a TB contact at any point after completing TB treatment or prophylaxis.

If patient has been exposed to a known MDR or XDR-TB source case or the contact case has failed standard TB treatment, refer.

**TB treatment**

**If the child is not yet on ART:**

» Commence TB treatment first. Follow with ART, usually after 2–8 weeks:
  - 2 weeks if CD4 < 50
  - 8 weeks if CD4 > 50

» Check ALT before commencing ART. If the ALT is raised, discuss this with an expert as it may not be an absolute contra-indication to treatment.

» Be aware of the possibility of Immune Reconstitution Inflammatory Syndrome (IRIS).

**If the child is already on ART:**

» Commence TB treatment taking into consideration possible medicine interactions.

**If the child needs to take concomitant ART and rifampicin:**

- Abacavir and lamivudine: no dose adjustment required.
- Lopinavir/ritonavir: Add additional ritonavir to ensure an equal dose in mg of lopinavir and ritonavir while on rifampicin. For example for each mL of LPV/r solution (80/20 mg/mL), add 0.75 mL of ritonavir solution (80 mg/mL).

» Give pyridoxine (vitamin B\textsubscript{6}) to all children on TB and ART, to avoid development of peripheral neuropathy.

**11.9 DEVELOPMENTAL DELAY OR DETERIORATION**

B23.8

Refer for assessment.

**11.10 ANAEMIA**

B23.8

See Section 3.1: Anaemia
11.11 COMPLICATIONS OF ART

11.11.1 LACTIC ACIDOSIS

DESCRIPTION
All nucleoside analogues have been associated with lactic acidosis, which is rare but life threatening. Initial symptoms vary and occur between 1–20 months (median 4 months) after starting therapy. The risk is highest with stavudine, followed by didanosine and then zidovudine.

DIAGNOSTIC CRITERIA
Clinical
Clinical prodromal syndrome:
» Generalised fatigue
» Weakness and myalgia
» Gastrointestinal symptoms:
  – nausea
  – vomiting
  – diarrhoea
  – vague abdominal pain
  – hepatomegaly
  – anorexia
  – unexplained weight loss
» Respiratory symptoms: tachypnoea and dyspnoea.
» Neurologic symptoms, including motor weakness.

Investigations
» Laboratory abnormalities:
  – Hyperlactataemia
    Raised: 2.1–5 mmol/L
    Severely raised: > 5 mmol/L
  – Lactic acidosis, defined by:
    Lactate > 5 mmol/L.
    Bicarbonate < 20 mmol/L.
    Severe acidosis i.e. pH < 7.3.
    Increased anion gap i.e. >15 mEq/L.

REFERRAL
All urgently.

11.11.2 LIPODYSTROPHY

DESCRIPTION
Stavudine and zidovudine, in decreasing order, are the main causes of lipoatrophy. Lipohypertrophy was thought to be an adverse drug reaction of certain ARVs, but is
no longer considered to be a consequence of ART, but rather a feature of HIV infection. 
Risk factors include pubertal development during protease inhibitor therapy. 
Lipodystrophy contributes to non-adherence to ART as patients may be embarrassed by their physical appearance.

The relationship between hypercholesterolaemia, insulin resistance with puberty, hypertriglyceridaemia, body habitus and ART (especially protease inhibitors), is less clear but an association has been described.

**DIAGNOSTIC CRITERIA**

» Lipoatrophy:
  - Subcutaneous fat loss (lipoatrophy) of the face, extremities or buttocks.
» Insulin resistance may be suspected if there is:
  - fasting hyperglycaemia,
  - frank diabetes or acanthosis nigricans,
» Abnormal lipid profile: See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.
  - Hypercholesterolaemia, i.e. total cholesterol level > 5 mmol/L

**REFERRAL**

» All with abnormal lipid profile.
» Significant lipodystrophy for consideration of surgical intervention.

**11.11.3 IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME (IRIS)**

**DESCRIPTION**

Clinical deterioration can occur after starting ART due an improvement in the immune system response to organisms already causing infection, e.g.

» *M. Bovis* (BCG)
» *M. tuberculosis* (MTB)

There are 2 types of IRIS:

1. Unmasking: when a previously unsuspected condition becomes manifest.
2. Paradoxical: known condition on appropriate treatment becomes worse.

**DIAGNOSTIC CRITERIA**

» Exclude other active or inadequately treated diseases (including DR-TB).
» Presentation:
  - Usually during the first 6 weeks after starting ART.
  - Depends on the causative organism and the organ-system involved, e.g. TB presents with fever, lymphadenopathy, worsening of the original tuberculous lesion, and/or deteriorating chest radiographic manifestations such as miliary pattern or pleural effusion.
CHAPTER 11

HIV AND AIDS

REFERRAL

All.


Chapter 12: Sexually transmitted infections

12.1 Vaginal discharge syndrome (VDS)
12.2 Lower abdominal pain (LAP)
12.3 Male urethritis syndrome (MUS)
12.4 Scrotal swelling (SSW)
12.5 Genital ulcer syndrome (GUS)
12.6 Bubo
12.7 Balanitis/balanoposthitis (BAL)
12.8 Syphilis serology and treatment
12.9 Treatment of more than one STI syndrome
12.10 Genital molluscum contagiosum (MC)
12.11 Genital warts (GW) Condylomata Accuminata
12.12 Pubic lice (PL)
The syndromic approach to Sexually Transmitted Infections (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.

It is important to take a good sexual history and undertake a thorough ano-genital examination in order to perform a proper clinical assessment. The history should include questions concerning symptoms, recent sexual history, sexual orientation, type of sexual activity (oral, vaginal, anal sex), the possibility of pregnancy (females), use of contraceptives including condoms, recent antibiotic history, antibiotic allergy and recent overseas travel.

Suspected STI in children should be referred to hospital for further management.

**GENERAL MEASURES**

- Counselling and education, including HIV testing.
- Condom promotion, provision and demonstration to reduce the risk of STIs.
- Compliance/ adherence with treatment.
- Contact treatment/ partner management.
- Circumcision promotion with appropriate counselling concerning condoms.
- Cervical cancer screening.

Promote HIV counselling and testing.

For negative test results repeat test after 6 weeks.

**12.1 VAGINAL DISCHARGE SYNDROME (VDS)**
**CHAPTER 12**

**SEXUALLY TRANSMITTED INFECTIONS**

Patient complains of:
- Abnormal vaginal discharge/ dysuria or vulval itching/ burning

**Age < 35 years OR Partner has MUS?**

**Y**

**Abnormal discharge confirmed?**

**Y**

**Lower abdominal pain (LAP) OR Pain on moving the cervix?**

**N**

**Consider vaginal candidiasis and/or bacterial vaginosis**

<table>
<thead>
<tr>
<th>TREATMENT</th>
</tr>
</thead>
</table>
| - Metronidazole, oral, 2 g as a single dose and  
  - Clotrimazole vaginal pessary 500mg inserted as a single dose at night or  
  - Clotrimazole vaginal cream, inserted with an applicator 12 hourly for 7 days |

**If no response:**
- Metronidazole, oral, 400 mg, 12 hourly for 7 days.

**If no response after 7 days, refer.**

<table>
<thead>
<tr>
<th>TREATMENT (All cases including pregnant women)</th>
</tr>
</thead>
</table>
| - Ceftriaxone, IM, 250 mg as a single dose* and  
  - Azithromycin, oral, 1 g, as a single dose and  
  - Metronidazole, oral, 2 g as a single dose |

- Clotrimazole vaginal pessary 500mg inserted as a single dose at night and
- Clotrimazole vaginal cream, applied thinly to vulva 12 hourly and continue for 3 days after symptoms resolve. (Maximum 2 weeks)

Ask patient to return if symptoms persist.
If no response:
- Metronidazole, oral, 400 mg, 12 hourly for 7 days.

If no response after 7 days, refer.

---

*People who are allergic to penicillin may also react to ceftriaxone. If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
- Azithromycin, oral, 2 g, as a single dose.  

For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

Take Pap smear after treatment, if indicated according to screening guidelines.

**Note:** Suspected STI in children should be referred to hospital for further management.
CHAPTER 12  
SEXUALLY TRANSMITTED INFECTIONS

12.2 LOWER ABDOMINAL PAIN (LAP)

N73.9

Sexually active patient complains of lower abdominal pain with/without vaginal discharge

Take history (including gynaecological) and examine (abdominal and vaginal) Emphasize HIV testing

Any of the following present:
» Pregnancy
» Missed period
» Recent delivery, TOP or miscarriage
» Abdominal guarding and/or rebound tenderness
» Abdominal vaginal bleeding
» Abdominal mass
» Fever > 38°C

Y

Refer all patients for gynaecological or surgical assessment.

SEVERELY ILL PATIENTS
Set up an IV line and treat shock if present.

If referral is delayed > 6 hours:
• Ceftriaxone, IV, 1g (Do not dilute with lidocaine 1%).

and
• Metronidazole, oral, 400 mg

For pain, add: Ibuprofen, oral 400 mg 8 hourly with food

LoE:III

Discharge patient

Y

Improved after 7 days

N

Refer

TREATMENT
• Ceftriaxone, IM, 250 mg single dose* LoE:III

and
• Azithromycin, oral, 1 g as a single dose LoE:II

and
• Metronidazole, oral, 400 mg 12 hourly for 7 days LoE:III

Pain not improving after 48 – 72 hours, refer urgently for gynaecological assessment

LoE:III

*If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
• Azithromycin, oral, 2 g as a single dose. LoE:I

For ceftriaxone IM injection: LoE:III

Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).
12.3 MALE URETHRITIS SYNDROME (MUS)

A64 + N34.1

Patient complains of urethral discharge or dysuria

Take history, including sexual orientation and examine. If no visible discharge; ask patient to milk urethra. Emphasise HIV testing and partner(s) tracing

Discharge

TREATMENT

- Ceftriaxone, IM, 250 mg single dose* \( \text{LoE:III}^{a} \)
- Azithromycin, oral, 1 g as a single dose \( \text{LoE:I}^{b} \)

If sexual partner has VDS, add:
- Metronidazole, oral, 2 g as a single dose

Urethral discharge persist after 7 days

Suspected ceftriaxone 250 mg treatment failure:
- Ceftriaxone, IM, 1 g single dose** \( \text{LoE:III}^{a} \)
- Azithromycin, oral, 2 g as a single dose
- Metronidazole, oral, 2 g as a single dose, if not already given

Refer all ceftriaxone treatment failures within 7 days for gentamicin, IM, 240 mg as a single dose \( \text{LoE:III}^{a} \)

If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm:
* omit ceftriaxone, IM, 250 mg and increase azithromycin dose to azithromycin, oral, 2 g as a single dose \( \text{LoE:I}^{b} \)
** omit ceftriaxone, IM, 1 g and refer to a centre for gentamicin, IM, 240 mg as a single dose plus azithromycin, oral, 2 g as a single dose \( \text{LoE:III}^{a,x} \)

For ceftriaxone IM injection:
- Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).
- Dissolve ceftriaxone 1 g in 3.6 mL lidocaine 1% without epinephrine (adrenaline) \( \text{LoE:III}^{a} \)
CHAPTER 12  SEXUALLY TRANSMITTED INFECTIONS

12.4 SCROTAL SWELLING (SSW)

N45.1

Sexually active patient complains of scrotal swelling/pain

- Take history and examine. Emphasize HIV testing.

Scrotal swelling or pain confirmed?

- Y

  - Testes rotated and elevated or History of trauma or Other non-tender swelling not thought to be due to sexual activity?

    - N

      - Improve?

        - Y

          - Complete treatment and discharge patient.

        - N

          - Refer urgently if suspected torsion

    - Y

      - Refer for surgical opinion

For pain add:
- Ibuprofen, oral, 400 mg 8 hourly with food  \( \text{LoE:III} \)

TREATMENT
- Ceftriaxone, IM, 250 mg as a single dose*  \( \text{LoE:III} \)
- Azithromycin, oral, 1 g as a single dose

Review after 7 days or earlier if necessary

*If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
- Azithromycin, oral, 2 g as a single dose  \( \text{LoE:I} \)

For ceftriaxone IM injection, dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).  \( \text{LoE:III} \)
12.5 GENITAL ULCER SYNDROME (GUS)

A60.9/A51.0

**TREATMENT** (If bubo present, use bubo flowchart)

- **Benzathine benzylpenicillin**, IM, 2.4 MU immediately as a single dose**

If HIV positive or unknown HIV status, add:
- **Aciclovir**, oral, 400 mg 8 hourly for 7 days

Pain relief if indicated.
Review all cases in 1 week.

**Ulcer(s) healed or clearly improving?**

- **Y**
  - Discharge patient
- **N**
  - Consider genital herpes.
  - Emphasise HIV testing.
  - If HIV positive or unknown HIV status: **LoE:III**
    - **Aciclovir**, oral, 400 mg 8 hourly for 7 days

**Emphasise HIV testing.**

If no improvement
- **Azithromycin**, oral, 1 g as a single dose **LoE:III**

If no response after 48 hours – refer.

---

*Penicillin allergic men and non-pregnant women:
  - Perform a baseline RPR and replace benzathine penicillin with:
  - **Doxycycline**, oral, 100 mg 12 hourly for 14 days.
  - Patient to return for a follow-up RPR 6 months later. **LoE:III**

*Penicillin allergic pregnant women/ breast feeding women, refer for confirmation of new syphilis infection and possible penicillin desensitisation. **LoE:III**

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve benzathine benzylpenicillin 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline). **LoE:III**
12.6 BUBO

Patient complains of hot tender inguinal swelling with surrounding erythema and/or oedema

Take history and examine. Emphasise HIV testing. Exclude hernia or femoral aneurysm.

Bubo confirmed?

Y

TREATMENT

• Azithromycin, oral, 1 g immediately and 1 g a week later

If bubo is fluctuant

Aspirate pus in sterile manner. Repeat every 72 hours, as necessary.

If no improvement after 14 days, refer.
12.7 BALANITIS/BALANOPOSTHITIS (BAL)

N48.1

Patient complains of soreness/itching of glans, inability to retract foreskin, malodour

Take history and examine. Emphasize HIV testing.

Foreskin cannot be retracted

Retract foreskin, clean with water filled syringe and dry if required

Complicated case: Refer

Re-examine

Symptoms confirmed

Y

TREATMENT

Instruct on retraction of foreskin when washing. Wash daily with water – avoid soap while inflamed.

- **Clotrimazole cream**, applied 12 hourly for 7 days

Perform analysis for glycosuria. If positive, refer.

If profuse collection of watery pus under the foreskin (not urethral in origin), add:

- **Benzathine penicillin**, IM, 2.4 MU immediately as a single dose

If patient returns after 7 days?

Poor adherence to clotrimazole?

N  Treatment failure: Refer

Y  Repeat treatment

**Penicillin allergic men:**
- replace benzathine penicillin with:
- **Doxycycline**, oral, 100 mg 12 hourly for 14 days.

For benzathine benzylpenicillin, IM, 2.4 MU: Dissolve benzathine benzylpenicillin 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).

LoE: III
12.8 SYPHILIS SEROLOGY AND TREATMENT
A53.9

Syphilis serology
The Rapid Plasmin Reagin (RPR) measures disease activity, but is not specific for syphilis. False RPR positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre < 1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test, e.g.:
» Treponema pallidum haemagglutination (TPHA) assay.
» Treponema pallidum particle agglutination (TPPA) assay.
» Fluorescent Treponemal Antibody (FTA) assay.
» Treponema pallidum ELISA.
» Rapid treponemal antibody test.

Screening can also be done the other way around starting with a specific treponemal test followed by a RPR in patients who have a positive specific treponemal test. This is sometimes referred to as the “reverse algorithm”.

Once positive, specific treponemal tests generally remain positive for life.

The RPR can be used:
» To determine if the patient’s syphilis disease is active or not,
» To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» To determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤1:8), which do not change by more than one dilution difference (up or down) over time (so-called serofast patients).

Note:
» Up to 30% of primary syphilis cases, i.e. those with genital ulcers may have a negative RPR.
» The RPR is always positive in the secondary syphilis stage and remains high during the first two (infectious) years of syphilis.

For syphilis treatment in pregnancy, see Section 6.2.4 Syphilis in pregnancy.

MEDICINE TREATMENT
Early syphilis treatment
Check if treated at initial visit.
- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).
Perform RPR if indicated:
- sexual assault case
- suspected secondary syphilis
- suspected tertiary syphilis
- 6 month follow-up of early syphilis cases treated with doxycycline

RPR results

positive

negative

» Rules out secondary/tertiary syphilis
» Repeat RPR in 3 months only in sexual assault cases
» Indicates cure in previously treated syphilis case

Previous RPR results available and previously treated for syphilis?

Y

N

Symptoms/signs of genital ulcer or secondary syphilis present?

Y

N

Treat as early syphilis
- Benzathine benzylpenicillin IM, 2.4 MU immediately as a single dose

Treat as late syphilis
- Benzathine benzylpenicillin IM, 2.4 MU once weekly for 3 weeks

What was the last RPR result?

Current RPR is 4 fold or more higher than the last RPR, e.g. was 1:8 and now 1:32 or higher

Current RPR is 4 fold lower, or, in a known “serofast patient, is the same, lower or no more than 2 fold higher than the last RPR e.g. was 1:4 and now no more than 1:8 (*Refer to text)

Discharge

Was there a negative RPR in the last 2 years?

N

Y

- Benzathine benzylpenicillin IM, 2.4 MU once weekly for 3 weeks
- Benzathine benzylpenicillin IM, 2.4 MU immediately as a single dose

Late and early syphilis:
- record titre on patient’s record
- issue a partner notification slip
and
- repeat RPR in 6 months if treated with doxycycline

For benzathine benzylpenicillin, IM, 2.4 MU: Dissolve benzathine benzylpenicillin 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).
In penicillin-allergic patients:
- Doxycycline, oral, 100 mg twice daily for 14 days.

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

**Late syphilis treatment**
Check if treatment was commenced at initial visit.
- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks.
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline).

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

**REFERRAL**
- Neurosyphilis.
- Clinical congenital syphilis.

### 12.9 TREATMENT OF MORE THAN ONE STI SYNDROME

<table>
<thead>
<tr>
<th>STI syndromes</th>
<th>Treatment (new episode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS + SSW</td>
<td>Treat according to SSW flow chart.</td>
</tr>
<tr>
<td>MUS + BAL</td>
<td>Treat according to MUS flow chart. AND Clotrimazole cream, 12 hourly for 7 days.</td>
</tr>
<tr>
<td>MUS + GUS</td>
<td>Ceftriaxone, IM, 250 mg immediately as a single dose. AND Azithromycin, oral, 1 g as a single dose. AND Aciclovir, oral, 400 mg 8 hourly for 7 days*.</td>
</tr>
<tr>
<td>VDS + LAP</td>
<td>Treat according to LAP flow chart. AND Treat for candidiasis, if required (see VDS flow chart).</td>
</tr>
<tr>
<td>VDS + GUS</td>
<td>Ceftriaxone, IM, 250 mg immediately as a single dose. AND Metronidazole, oral, 2 g immediately as a single dose. AND Azithromycin, oral, 1 g as a single dose. AND Aciclovir, oral, 400 mg 8 hourly for 7 days*. AND Treat for candidiasis, if required (see VDS flow chart).</td>
</tr>
<tr>
<td>LAP + GUS</td>
<td>Ceftriaxone, IM, 250 mg immediately as a single dose. AND</td>
</tr>
</tbody>
</table>
12.14 • Metronidazole, oral, 400 mg 12 hourly for 7 days.
  AND
  • Aciclovir, oral, 400 mg 8 hourly for 7 days*.

SSW + GUS • Ceftriaxone, IM, 250 mg immediately as a single dose.
  AND
  • Aciclovir, oral, 400 mg 8 hourly for 7 days*.

*Treat with aciclovir only if HIV status is positive or unknown.

**Penicillin allergic men and non-pregnant women avoid ceftriaxone and refer to relevant algorithms.

Penicillin allergic pregnant or breastfeeding women, refer for penicillin desensitisation.

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. The papules usually have a central dent (umbilicated papules).

MEDICINE TREATMENT
• Tincture of iodine BP.
  o Apply with an applicator to the core of the lesions.

12.11 GENITAL WARTS (GW): CONDYLOMATA ACCUMINATA
A63.0

DESCRIPTION
The clinical signs include:
» Warts on the ano-genital areas, vagina, cervix, meatus or urethra.
» Warts can be soft or hard.
In most cases, warts resolve without treatment after 2 years in non-immunosuppressed patients.

GENERAL MEASURES
» If warts do not look typical or are fleshy or wet, perform a RPR test to exclude secondary syphilis, which may present with similar lesions.
» Emphasise HIV testing.

REFERRAL
» All patients with:
  – warts > 10 mm
12.15 inaccessible warts, e.g. intra-vaginal or cervical warts
- numerous warts

12.12 PUBIC LICE (PL)

B85.3

DESCRIPTION
Infestation of lice mostly confined to pubic and peri-anal areas, and occasionally involves eyelashes. The bites cause intense itching, which often results in scratching with bacterial super-infection.

GENERAL MEASURES
Thoroughly wash clothing and bed linen that may have been contaminated by the patient in the 2 days prior to the start of treatment in hot water and then iron.

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

Pediculosis of the eyelashes or eyebrows
- 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 12

SEXUALLY TRANSMITTED INFECTIONS


vi: Lidocaine 1%: Contract circular HP02-2013AI (1August2013to31July2015): MCC registered package inserts of Kocef® 250 mg, 500 mg, 1 g; Rocicet® 500 mg, 1 g; Ofraxam® 250 mg, 1 g


ix: Ceftriaxone 1 g + Azithromycin 2 g (MUS): WHO. Global action plan to control the spread and impact of antimicrobial resistance in sexually transmitted infections treatment guidelines, 2010. 


www.emro.who.int/taidae/fweb79.pdf

http://www.health.gov.za


Chapter 13: Immunisation

13.1 Immunisation schedule
13.2 Childhood immunisation schedule
13.3 Vaccines for routine administration
13.4 The cold chain
13.5 Open multi-dose vial policy
13.6 Adverse Events Following Immunisation (AEFI)
13.7 Other vaccines
The contents of this chapter are based on the National Vaccinators Manual that contains recommendations from the National Advisory Group on Immunisation (NAGI).

13.1 IMMUNISATION SCHEDULE

Any medical incident that takes place after immunisation causes concern and if believed to be caused by immunisation should be reported.

- Every clinic day is an immunisation day.
- Never miss a chance to immunise – never turn a child away if an immunisation is needed, even if it means opening a multidose vial for just one child.
- Check the Road to Health Booklet every time the child visits the clinic, and give missed immunisations. These should be given according to the catch-up schedule which is shown in the table on page 4.
- Mild illnesses are not a contra-indication to immunisation – most children who are well enough to be sent home, are well enough to be immunised. Do not immunise a sick child if the mother seriously objects, but encourage her to bring the child for immunisation on recovery.
- Give an extra dose if in doubt whether a child has had a certain dose or not, as extra doses are not harmful.
- 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.

<table>
<thead>
<tr>
<th>Adverse events requiring reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local reactions</strong></td>
</tr>
<tr>
<td>» Severe local reaction (swelling extending &gt; 5 cm from the injection site or redness and swelling for &gt; 3 days).</td>
</tr>
<tr>
<td>» Lymphadenitis.</td>
</tr>
<tr>
<td>» Injection site abscess.</td>
</tr>
<tr>
<td><strong>Systemic reactions</strong></td>
</tr>
<tr>
<td>» All cases of hospitalisation (thought to be related to immunisation).</td>
</tr>
<tr>
<td>» Encephalopathy within 7 days.</td>
</tr>
<tr>
<td>» Collapse or shock-like state within 48 hours.</td>
</tr>
<tr>
<td>» Fever of more than 38°C within 48 hours.</td>
</tr>
<tr>
<td>» Seizures within 3 days.</td>
</tr>
<tr>
<td>» All deaths (thought to be related to immunisation).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions that are <em>not</em> contraindications to any of the standard EPI vaccines</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Family history of any adverse reactions following vaccination.</td>
</tr>
<tr>
<td>» Family history of convulsions.</td>
</tr>
<tr>
<td>» Previous convulsions.</td>
</tr>
<tr>
<td>» Previous measles, mumps, rubella or pertussis-like illness.</td>
</tr>
</tbody>
</table>
» 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 CHILDHOOD IMMUNISATION SCHEDULE

<table>
<thead>
<tr>
<th>Age of child</th>
<th>Vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>OPV0</td>
</tr>
<tr>
<td></td>
<td>BCG</td>
</tr>
<tr>
<td>6 weeks</td>
<td>OPV1</td>
</tr>
<tr>
<td></td>
<td>RV1</td>
</tr>
<tr>
<td></td>
<td>Hexavalent (DTaP-IPV-HB-Hib)1</td>
</tr>
<tr>
<td></td>
<td>PCV 1</td>
</tr>
<tr>
<td>10 weeks</td>
<td>Hexavalent (DTaP-IPV-HB-Hib)2</td>
</tr>
<tr>
<td>14 weeks</td>
<td>RV2</td>
</tr>
<tr>
<td></td>
<td>Hexavalent (DTaP-IPV-HB-Hib)3</td>
</tr>
<tr>
<td></td>
<td>PCV2</td>
</tr>
<tr>
<td>9 months</td>
<td>Measles1</td>
</tr>
<tr>
<td></td>
<td>PCV3</td>
</tr>
<tr>
<td>18 months</td>
<td>Hexavalent (DTaP-IPV-HB-Hib)4</td>
</tr>
<tr>
<td></td>
<td>Measles2</td>
</tr>
<tr>
<td>6 years</td>
<td>Td</td>
</tr>
<tr>
<td>12 years</td>
<td>Td</td>
</tr>
</tbody>
</table>

Note:
» Children with HIV should receive the full schedule of vaccines.
» Exception: Symptomatic HIV infected children (WHO Stage 3 or Stage 4) should not be administered BCG vaccine.
**Catch-up doses**

Any child who is unimmunised should be given a full schedule of immunisations.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age of child</th>
<th>First dose</th>
<th>Interval for subsequent doses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Second</td>
</tr>
<tr>
<td><strong>BCG</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>Give one dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 1 year</td>
<td>Do not give</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OPV</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 months</td>
<td>Give first dose</td>
<td>4 weeks</td>
<td></td>
</tr>
<tr>
<td>&gt;6 months</td>
<td>Do not give</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hexavalent (DTaP-IPV-HB-Hib)</strong></td>
<td>Up to 5 years</td>
<td>Give first dose</td>
<td>4 weeks</td>
</tr>
<tr>
<td><strong>Rotavirus</strong></td>
<td>&lt;20 weeks</td>
<td>Give first dose</td>
<td>4 weeks</td>
</tr>
<tr>
<td></td>
<td>20–24 weeks</td>
<td>Give one dose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;24 weeks</td>
<td>Do not give</td>
<td></td>
</tr>
<tr>
<td><strong>PCV</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 months</td>
<td>Give first dose</td>
<td>4 weeks</td>
<td></td>
</tr>
<tr>
<td>6–9 months</td>
<td>Give first dose</td>
<td>4 weeks</td>
<td>8 weeks</td>
</tr>
<tr>
<td>&gt;9–12 months</td>
<td>Give first dose</td>
<td>4 weeks</td>
<td>8 weeks</td>
</tr>
<tr>
<td>1–6 years</td>
<td>Give one dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measles</strong></td>
<td>17 months or younger</td>
<td>Give first dose</td>
<td>At 18 months</td>
</tr>
<tr>
<td>&gt;17 months</td>
<td>Give first dose</td>
<td>4 weeks</td>
<td></td>
</tr>
<tr>
<td><strong>Td</strong></td>
<td>&gt;6 years</td>
<td>Give first dose</td>
<td>At 12 years</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Form</td>
<td>Dose</td>
<td>Route</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>BCG</td>
<td>Powder</td>
<td>0.05 mL</td>
<td>Intra-dermal</td>
</tr>
<tr>
<td>OPV</td>
<td>Liquid</td>
<td>2 drops</td>
<td>Oral</td>
</tr>
<tr>
<td>RV</td>
<td>Liquid</td>
<td>1.5 mL</td>
<td>Oral</td>
</tr>
<tr>
<td>Hexavalent (DTaP-IPV-HB-Hib)</td>
<td>Liquid and Powder</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Measles</td>
<td>Powder</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>PCV</td>
<td>Liquid</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Td</td>
<td>Liquid</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
</tbody>
</table>

**BCG (Bacillus Calmette-Guérin)**

Protects against TB meningitis and miliary TB in children < 2 years of age.
- BCG, 0.05 mL of reconstituted intradermal BCG vaccine.
  - Administered into the skin (intradermally) on the right upper arm, at insertion of the deltoid.
  - **Storage:**
    - Fridge: diluent on middle shelf and vaccine on top shelf at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session, whichever comes first.
  - **Adverse events:**
    - Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar (visible in 40% of vaccinated infants).
    - In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a usual reaction and not a cause for alarm. Lymphadenopathy < 1.5 cm is not clinically significant.
    - Occasionally the papule becomes a pustule.
    - Refer all cases with significant lymphadenopathy or a draining sinus.
  - **Contraindications:**
    - Children with signs of symptomatic HIV infection (AIDS) should not get BCG vaccination.
    - Children > 12 months old should not get BCG vaccination.
    - Newborn infants: if the mother is on TB chemotherapy, the infant should be on chemoprophylaxis and receive BCG later.
Hexavalent (DTaP-IPV-HB-Hib) vaccine (Diptheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and Haemophilus influenzae type b vaccine). Protects against diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B infection and invasive infections caused by Haemophilus influenzae type b. 

- Hexavalent (DTaP-IPV-HB-Hib), IM, 0.5 mL.
  - <1 year of age: administer into outer side of left thigh.
  - >1 year of age: administer into upper left arm.

Hexavalent (DTaP-IPV-HB-Hib) vaccine is a combination of diphtheria toxoid, tetanus toxoid, acellular pertussis vaccine, inactivated polio vaccine, hepatitis B vaccine and Haemophilus influenzae type b vaccine with a freeze-dried powder conjugate. Hib conjugate vaccine is presented as a white, homogenous powder while the acellular component of pertussis vaccine is combined with diphtheria and tetanus toxoids and injectable polio vaccine is in a form of whitish turbid suspension for injection.

- Storage:
  - Fridge: middle shelf at 2–8°C.
  - Hexavalent (DTaP-IPV-HB-Hib) vaccine should never be frozen.
  - The vaccine must be injected immediately after reconstitution of the freeze-dried powder by the suspension.

- Adverse events:
  - Irritability.
  - Fever ≥ 38°C and acute illness.
  - Redness and induration at the site of the injection.

- Contra Indications:
  - Known hypersensitivity to any component of the vaccine or pertussis vaccine (acellular or whole cell pertussis) or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substance.

Td (Tetanus and diphtheria vaccine)
Protects against diphtheria and tetanus.

- Td, IM, 0.5 mL in upper arm.

- Storage:
  - Fridge: middle shelf at 2–8°C.
  - Easily damaged by freezing.
  - Keep opened vials for next session if kept at correct temperature and not contaminated.
  - Discard after 30 days.
  - Record date of reconstitution.

- Adverse events:
  - Mild fever.
  - Pain.
  - Local swelling occasionally.

- Contraindications:
  - Previous anaphylaxis.
Children < 6 years of age should not get Td.

**OPV (Oral polio vaccine)**
Protects against polio.
- OPV, oral, 2 drops given by mouth.
  - If spat out or vomited, repeat immediately.
  - 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 > 8°C.
  - Discard after 30 days.
  - Record date of opening.
- **Adverse events:**
  - May be associated with a flu-like illness and gastroenteritis.
  - Mild fever.
- **Contraindications:**
  - Previous anaphylaxis.
  - Children with congenital or acquired immunodeficiency.

**RV (Rotavirus Vaccine)**
Protects against gastro-enteritis caused by rotavirus.
- RV, oral, 1.5 mL given by mouth.
  - Squeeze the entire contents of the tube in the inner cheek.
- **Storage:**
  - Fridge: top shelf (in clinics) at temperature 2–8°C.
  - Easily damaged by freezing.
  - Protect the vaccine from light.
- **Adverse events:**
  - Mild fever.
  - Irritability.
- **Contra-indications:**
  - Previous anaphylaxis to rotavirus or any ingredients in the formulation.
  - Do not give Rotavirus vaccine if a child has a history of chronic gastrointestinal disease or severe diarrhoea including children with any history of uncorrected congenital malformation of the gastrointestinal tract. Refer the child for medical opinion.
  - A history of intussusception (severe abdominal pain, persistent vomiting, bloody stools, abdominal bloating and/or high fever).
  - Rotavirus vaccine should not be given after 24 weeks of age (see table above for catch-up schedule).

**PCV (Pneumococcal Conjugated Vaccine)**
Protects against invasive pneumococcal disease (meningitis, septicaemia), pneumonia and otitis media.
- PCV, IM, 0.5 mL
o < 1 year of age: administer into outer side of right thigh.
o > 1 year of age: administer into upper arm in the deltoid muscle.
o PCV and Hexavalent (DTaP-IPV-HB-Hib) can be administered at the same time, but at different sites.

» Storage:
  – Fridge: middle shelf at 2–8°C.
  – Easily damaged by freezing.
  – Do not freeze.
  – Do not mix PCV in the same syringe with other vaccines.
  – Shake the vaccine well before use.

» Contra-indications:
  – Previous anaphylaxis.

Measles

- Measles vaccine, IM, 0.5 mL.
  o < 1 year of age: administer into outer side of right thigh.
  o > 1 year of age: administer into upper arm in the deltoid muscle.

» Storage:
  – Fridge: diluent on middle shelf and vaccine on top shelf at 2–8°C.
  – 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.

» Contra-indications:
  – Previous anaphylaxis.
  – Give an additional dose to HIV-infected children at 6 months of age.

13.4 THE COLD CHAIN

Maintaining the cold chain means keeping vaccines at the right temperature throughout distribution, storage and use. The cold chain can be maintained by:

» Never exposing vaccines to heat or freezing conditions, especially during transportation from one point to another.

» Always using a cold box to keep the vaccines cold during transport and immunisation.

» All vaccines should be kept in a refrigerator at a temperature of 2–8°C.

» Defrosted OPV should not be kept in the freezer or be allowed to freeze again.

» Use a metal dial thermometer or a fridge-tag for all vaccines (Min-max thermometer not recommended).

» Do not let Hexavalent (DTaP-IPV-HB-Hib), HPV, PCV, RV, Td and TT vaccines touch the evaporator at the back of the fridge as they may freeze. Do not freeze these vaccines. Do not use frozen vaccines. Do shake test to check whether vaccines have frozen, if unsure.

» Monitor and record fridge temperature twice daily.

» Leave space between each tray to allow cold air to circulate.

» Do not keep food in the same fridge as the vaccines.
Correct packing of the cold box

- Fully conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top.
- If there are not enough ice packs, place available ice packs at the sides and on top of the vaccines.
- Td, TT, HPV, PCV, RV and 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 and a freeze tag in the cold box with the vaccines and the temperature at 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, Td, Hexavalent (DTaP-IPV-HB-Hib), HPV, RV, PCV and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles for 2 days.
- Do not let Td, Hexavalent (DTaP-IPV-HB-Hib), HPV, RV, PCV and TT vaccines touch the evaporator plate at the back of the fridge as they are destroyed by freezing.
- Do not keep vaccines in the fridge door.
- Store the same kind of vaccines together in one tray.
- Leave about 2cm space between each tray to allow the cold air to move around.
- Bottles filled with salt water stored in the bottom of the fridge will keep the fridge contents cold when the door is opened.
- Do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door.
- 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 – TT, Td, liquid Hib-Type b, RoTavirus, HepaTiTis B and even diluent.

13.5 OPEN MULTI-DOSE VIAL POLICY

Opened vials of TT, Td, HepB and OPV vaccines:

May be used in subsequent immunisation sessions for a maximum of one month, provided that each of the following conditions have been met:
- the expiry date has not passed
- each vial must be dated when opened
13.10

- 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.

**Opened vials of measles, BCG**

Check the VVM and expiration date prior to reconstitution. Reconstituted vials of measles and BCG vaccines must be discarded at the end of each immunisation session or at the end of 6 hours, whichever comes first. Always label the vials with the date and time when opening or reconstituting. All opened vials must be discarded immediately if:

» sterile procedures have not been fully observed,
» there is even a suspicion that the opened vial has been contaminated,
» there is visible evidence of contamination such as a change in appearance or floating particles, etc.

**INJECTION SAFETY**

» Always wash hands before and after giving the vaccine.
» Always keep a fully equipped emergency tray at the immunisation point.
» Use a sterile syringe and sterile needle for each immunisation.
» Clean the skin adequately with cotton wool and water, no alcohol swabs must be used.
» Check all vaccines for safety.
» Return all unsafe vaccines back to the pharmacist.
» Use the same needle for drawing up and administering the vaccine. “One Needle, One Syringe”.
» Diluents are not interchangeable. Different vaccines have different diluents.
» Always use the same diluent from the same manufacturer as the vaccine.
» Used needles and syringes must be disposed of safely.
» Discard all used empty vaccines in the sharps container.

**13.6 ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFI)**

Report all AEFIs to the local EPI Coordinator.

**13.7 OTHER VACCINES**

**TT** (Tetanus toxoid)
Protects against tetanus (neonatal and after wounds)
- TT, IM, 0.5 mL into arm
  » Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing.
- Keep opened vials for next session if kept at correct temperature and not contaminated.
- Discard after 30 days.
- Record date of reconstitution.

» Contraindications:
- Previous anaphylaxis.

**Pregnant women**
All pregnant women should routinely receive tetanus toxoid.

<table>
<thead>
<tr>
<th>Pregnant women with no previous immunisation (or unreliable immunisation information)</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
</tr>
</thead>
<tbody>
<tr>
<td>As early as possible in 1st pregnancy</td>
<td>At least 4 weeks later.</td>
<td>At least 6 months later, or in next pregnancy.</td>
<td>At least 1 year later, or in next pregnancy.</td>
<td>At least 1 year later, or in next pregnancy.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnant women with 3 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
</tr>
</thead>
<tbody>
<tr>
<td>As early as possible in 1st pregnancy</td>
<td>At least 4 weeks later.</td>
<td>At least 1 year later.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnant women with 4 childhood DTP, DTP-Hib or DTaP-IPV//Hib doses</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
<th>TT or Td</th>
</tr>
</thead>
<tbody>
<tr>
<td>As early as possible in 1st pregnancy</td>
<td>At least 1 year later.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trauma**
- Give booster dose of TT/Td after each trauma episode (unless given in previous 5 years).

**Human Papillomavirus (HPV) Vaccine**
Protects against infection with HPV serotypes 16 and 18. Persistent HPV infection is associated with the development a number of reproductive tract cancers, especially cancer of the cervix.

Two dose schedule (6 months apart) currently offered as part of the Integrated School Health programme to Grade 4 girls (≥ 9 years of age) in public schools.

HPV, IM, 0.5 mL
- Administered into the deltoid of the non-dominant arm.
- Storage:
  - Fridge: middle shelf at 2–8°C.
  - Easily damaged by freezing – do not freeze and discard any vaccine which has been frozen.
  - Store in original package and protect from light.
  - Use immediately once withdrawn into a syringe.

» Contraindications:
- Previous anaphylaxis.
- Febrile illness (≥ 38.5°C).
− Should not be administered to girls/women who are known to be pregnant.

» Adverse events:
− Injection site pain and swelling in the arm are common.
− Itching, rash, redness and urticaria may also occur.
− Nausea, diarrhoea, abdominal pain, headache, myalgia, fever (38°C) are not uncommon.
− Syncope, dizziness, lymphadenopathy, and anaphylaxis have been reported.

All personnel working in a health care facility (including support staff)
• Hepatitis B, 3 adult doses of 1 mL.
  − first dose administered immediately;
  − second dose 1 month after the first dose;
  − third dose 6 months after the first dose.

Influenza vaccine
• Influenza vaccine, IM, 0.5 mL

Should be given annually to:
» Elderly patients > 65 years of age.
» Medical and nursing personnel.
» HIV-infected people.
» All patients with chronic cardiac or pulmonary conditions.
Chapter 14: Musculoskeletal conditions

14.1 Arthralgia
14.2 Arthritis, rheumatoid
14.3 Arthritis, septic
14.4 Gout
   14.4.1 Gout, acute
   14.4.2 Gout, chronic
14.5 Osteoarthrosis (osteoarthritis)
CHAPTER 14  MUSCULOSKELETAL CONDITIONS

14.1 ARTHRALLGIA
M15.9

DESCRIPTION
Joint pain without swelling, warmth, redness or systemic manifestations such as fever. It is usually self-limiting. May be an early manifestation of degenerative joint conditions (osteoarthrosis) or local and systemic diseases. May follow injury to the joint, e.g. work, play and position during sleep. Suspect rheumatic fever in children, especially if arthralgia affects several joints in succession.

GENERAL MEASURES
» Advise patient to:
   – apply heat locally to the affected joint, taking precautions not to burn oneself
   – exercise after relief from pain
   – reduce weight, if overweight, to decrease stress on the joint
» Exclude other causes.
» Reassure patient.

MEDICINE TREATMENT
Treat for 1 week (maximum 2 weeks) provided no new signs develop.

Pain:
Children
   - Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
Adults
   - Paracetamol, oral, 1 g, 6 hourly when required.
   - Methyl salicylate ointment, topical, applied to affected areas may be considered in selected patients.

REFERRAL
» Pain for 1 week in children, and pain for > 2 weeks in adults.
» Recurrent pain.
» Severe pain.
» Backache with radiation to one or other lower limb.
» Neurological signs.
» Signs of arthritis (swelling, redness, tender on pressure, warmth).
» Fever.

14.2 ARTHRITIS, RHEUMATOID
M06.9/M05.9

DESCRIPTION
A chronic, inflammatory, systemic condition of fluctuating course. May affect many organs, predominantly joints with:
– Swelling or fluid, affecting at least 3 joint areas simultaneously.
– Rheumatoid nodules occur most frequently on extensor surfaces of the forearm.
14.3 – Pain.
– Limited movement with morning stiffness for longer than 30 minutes, which improves with activity. This distinguishes osteoarthritis from rheumatoid arthritis.
– Destruction of affected joints.
  – Mainly affects 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

**DESCRIPTION**
An acute infective condition involving one or more joints.
The joint is hot, swollen, very 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 bleeding into a joint and not due to infection.

**MEDICINE TREATMENT**

- Infants ≤ 2 months of age, who fulfill the IMCI criteria for “POSSIBLE SERIOUS BACTERIAL INFECTION” should receive a first dose of ceftriaxone and other IMCI urgent care while arranging transfer.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose.
  
  ![LoE: III](image)

  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

**REFERRAL**
**Urgent**
- All patients for confirmation of diagnosis and surgical drainage.
- Children with suspected septic arthritis should be assessed for evidence of
septicaemia and septicaemic shock, which should be treated accordingly.

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. Characterised by recurrent attacks of a characteristic acute arthritis that often affects one joint and is accompanied by extreme pain, tenderness, swelling, redness and is hot. The inflammation may extend beyond the joint. In many patients the 1st metatarso-phalangeal joint is initially involved. The instep, ankle, heel, and knee are also commonly involved. Bursae (such as the olecranon) may be involved.

Gout commonly occurs in men > 40 years of age and in postmenopausal women.

INVESTIGATIONS

Increased serum uric acid level. However, the serum uric acid level may be normal during acute attacks.

GENERAL MEASURES

» Immobilise the affected joint during the acute painful attack.
» Increase (high) fluid intake.
» Avoid alcohol.
» Avoid aspirin.

MEDICINE TREATMENT

Initiate treatment as early as possible in an acute attack.

- NSAIDs, e.g.:
  - Ibuprofen, oral, 800 mg 8 hourly with or after a meal for 24–48 hours.

Thereafter, if needed, reduce dose of NSAID, e.g.:
- 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 5 days (Doctor initiated).

REFERRAL

» No response to treatment.
» For confirmation of diagnosis, if in doubt.
» Patients with chronic kidney disease.
» Patients with suspected secondary gout (e.g. haematological malignancies).

Note:
- Patients with suspected metabolic syndrome often have impaired renal function and the use of NSAIDs has safety implications.

LoE: III
» 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 pharmacological 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 metatarso-phalangeal joint in the majority of patients
» involvement of the instep, ankle, heel and knee
» 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
» If possible, avoid known precipitants and medicines that may increase uric acid, e.g. low dose aspirin, ethambutol, pyrazinamide and diuretics, especially hydrochlorothiazide at a dose of ≥ 25 mg/day.
» Encourage weight loss.
» Avoid alcohol.

MEDICINE TREATMENT
Uric acid lowering therapy is required in all of the following:
» 2 acute attacks per year  » urate renal stones
» chronic tophaceous gout  » urate nephropathy

When the acute attack has settled completely, i.e. usually after 3 weeks:
- Allopurinol, oral, 100 mg daily (Doctor initiated).
  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.
  o Maximum dose: 400 mg daily.
  o The elderly and patients with renal impairment require lower doses.

REFERRAL
» Suspected secondary gout.
» No response to treatment.
» Non-resolving tophaceous gout.
14.5 OSTEOARTHRITIS (OSTEOARTHROSIS)
M19.9

DESCRIPTION
A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:
» pain
» morning stiffness, lasting < 30 minutes
» limited movement
» joint swelling

GENERAL MEASURES
Patient and family education on:
» weight reduction
» exercise
Rest during acute painful episodes.
Recommend use of a walking stick or crutch to alleviate stress on weight bearing joint.
Physiotherapy and/or occupational therapy.

MEDICINE TREATMENT
Pain:
• Paracetamol, oral, 1 g, 6 hourly when required.
• 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 when required.

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

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Chapter 15: Central nervous system conditions

15.1 Stroke
15.2 Seizures (convulsions/fits)
   15.2.1 Status epilepticus
   15.2.2 Epilepsy
   15.2.3 Febrile convulsions
15.3 Meningitis
   15.3.1 Meningitis, acute
   15.3.2 Meningitis, meningococcal, prophylaxis
15.4 Headache, mild, nonspecific
15.5 Neuropathy
   15.5.1 Post-herpes zoster neuropathy (Post herpetic neuralgia)
   15.5.2 Bells palsy
   15.5.3 Peripheral neuropathy
15.1 STROKE

DESCRIPTION
Stroke consists of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting > 24 hours or leading to death. Most strokes are ischaemic (embolism or thrombosis) whilst others may be caused by cerebral haemorrhage.

A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.

The diagnosis of stroke depends on the presentation of sudden onset of neurological loss, including:
- Weakness, numbness or paralysis of the face or a limb or limbs.
- Sudden onset of blurred or decreased vision in one or both eyes; or double vision.
- Difficulty speaking or understanding.
- Dizziness, loss of balance or any unexplained fall or unsteady gait.
- Headache (severe, abrupt).

GENERAL MEASURES
Acute management
- Assess airway, breathing, circulation and disability.
- Measure blood glucose and treat hypoglycaemia if present. See Section 21.13: Hypoglycaemia and hypoglycaemic coma.
- Do not treat blood pressure, unless systolic BP ≥ 220 mmHg and/or diastolic BP ≥ 120 mm Hg.
- Patients should be given nil by mouth until swallowing is formally assessed.

MEDICINE TREATMENT
Secondary prevention for adults
All patients, if not contraindicated (e.g. haemorrhagic stroke, peptic ulcer, etc):
- Aspirin, oral, 150 mg daily.

Lipid lowering medicine therapy, see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Hypertension
For blood pressure management, see Section 4.7: Hypertension.

Diabetes mellitus
See Chapter 9: Endocrine system.

REFERRAL
All patients including patients with TIA.
15.2 SEIZURES (CONVULSIONS/FITS)

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 and excessive neuronal discharge within the brain. Seizures may be secondary (where there is an underlying cause) or idiopathic (where no underlying cause is evident). When seizures are recurrent or typical of a specific syndrome, then the term epilepsy is used.

Seizures should be differentiated from:
» syncope
» hyperventilation
» transient ischaemic attack (TIA)
» pseudoseizure
» rigors

Important conditions that should be excluded include:
» meningitis
» encephalitis or encephalopathy (including hypertensive encephalopathy)
» metabolic conditions, e.g. hypoglycaemia
» brain lesions

GENERAL MEASURES
If convulsing:
Measure blood glucose and treat hypoglycaemia, if present.

MEDICINE TREATMENT
Treatment is indicated if the patient presents with a seizure that lasts > 5 minutes and the seizure is causing systemic compromise.

Children < 12 years of age
- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - Note: Buccal midazolam should not be used in infants < 6 months of age.

OR
- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.3.
  - Use diazepam for injection 10 mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
If no response after one dose of midazolam or two doses of diazepam, manage as Status epilepticus. See Section 21.20: 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 21.20: Status epilepticus.

Always check blood glucose concentrations to exclude hypoglycaemia.

For management of eclamptic convulsions in pregnancy, see Section 6.2.2: Hypertensive disorders of pregnancy – Eclampsia.

**After seizure**
- All patients presenting with a first seizure must be investigated to exclude underlying causes, including meningitis.
- A patient who presents with a first seizure should not automatically be 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 15.3: Meningitis.
  - All patients following a 1st seizure should be examined by a doctor to exclude underlying causes.

**Note:** Persons known to have epilepsy who recover fully following a seizure do not usually require referral. See criteria for referral under epilepsy.

### 15.2.1 STATUS EPILEPTICUS

G41.9
See Chapter 21: Trauma and emergencies.

### 15.2.2 EPILEPSY

G40.9

**DESCRIPTION**
Epilepsy is defined as recurrent unprovoked seizures. Epilepsy is associated with many psychological, social and legal problems, and cultural misperceptions.

**DIAGNOSIS**
- Is usually made clinically.
- Requires an accurate witness description of the seizure.
### Some different types of seizures

<table>
<thead>
<tr>
<th>Partial</th>
<th>Seizure on one side of the body with no loss of consciousness.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex partial</td>
<td>Partial seizure associated with loss of consciousness.</td>
</tr>
<tr>
<td>Generalised tonic clonic</td>
<td>Loss of consciousness preceded by:</td>
</tr>
<tr>
<td></td>
<td>» a brief stiff phase, followed by</td>
</tr>
<tr>
<td></td>
<td>» jerking of all of the limbs</td>
</tr>
<tr>
<td>Tonic</td>
<td>One or more limbs become stiff without any jerking.</td>
</tr>
<tr>
<td>Myoclonic</td>
<td>Brief, usually generalised jerks, with retained awareness.</td>
</tr>
<tr>
<td>Absence</td>
<td>» Occurs in childhood.</td>
</tr>
<tr>
<td></td>
<td>» Sudden cessation of activity followed by a blank stare.</td>
</tr>
<tr>
<td></td>
<td>» Usually no muscle twitching.</td>
</tr>
<tr>
<td></td>
<td>» Some children will smack their lips.</td>
</tr>
</tbody>
</table>

### 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,
  - the risks of discontinuing medicine treatment without advice of the doctor.

**Patient should be counselled about** driving, working at heights, swimming and operating machinery - the patient should sign in the notes that they have received this advice.

### MEDICINE TREATMENT

**Note:**

- General rule: a single medicine is best.
- Combination therapy should 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.

**Medicine interactions**

- Carbamazepine, phenytoin and phenobarbital are associated with many medicine interactions.
- Always check for possible interactions before prescribing concomitant medicines.
Oral contraceptives and subdermal implants may be less effective. Progestin-only injectable contraceptives or IUDs are preferred. See Chapter 7: Family planning.

**Generalised tonic clonic seizures**

**Adults**

The aim is to use monotherapy, i.e. a single anticonvulsant, progressively increasing the dose until the seizures are controlled or clinically important side effects occur.

- Lamotrigine, oral (Doctor initiated).
  - 25 mg daily for 2 weeks.
  - Then 50 mg daily for 2 weeks.
  - Thereafter, increase by 50 mg every 2 weeks according to response.
  - Usual maintenance dose: 100–200 mg daily as a single dose.

OR

- Carbamazepine, oral (Doctor initiated).
  - 100 mg 12 hourly for one week then, 200 mg 12 hourly.
  - Titrate upwards every 2 weeks according to response to a maximum dose of 600 mg 12 hourly.

If the initial medicine fails to achieve satisfactory control with optimal dosages, or causes unacceptable adverse effects, then a 2nd medicine may be started. The 1st medicine should be continued for 2 weeks and then gradually reduced over 6–8 weeks until stopped.

**Only if already well controlled on phenytoin, continue with:**

- Phenytoin, oral, 4.5–5 mg/kg daily on lean body mass, at night (Doctor initiated).
  - Phenytoin is a useful and effective agent. However, doses > 300 mg/day are potentially toxic, and increased dosages should be monitored carefully, both clinically and by medicine concentrations.

**Children**

The decision to initiate long-term therapy is generally made if the child has experienced ≥ 2 unprovoked convulsions (except febrile convulsions).

- Phenobarbital and carbamazepine are both effective in generalised tonic clonic seizures.
- Monitor the behaviour profile and academic performance of children on phenobarbital. Change treatment if any problems are identified.

- Phenobarbital, oral, 3.5–5 mg/kg at night (< 6 months of age) (Doctor prescribed).

OR

- Carbamazepine, oral, 5 mg/kg 12 hourly for 2 weeks, then 7.5–10 mg/kg 12 hourly (Doctor prescribed).
  - Maximum dose: 10 mg/kg 12 hourly.

**HIV-infected individuals on ART**

**Children**

For HIV-infected children on ART, valproate is preferred because of fewer medicine interactions. When switching to valproate, commence treatment with maintenance...
dose of the medicine as below and discontinue the other anticonvulsant after 7 days.

- **Valproate, oral, 5 mg/kg 12 hourly (Doctor prescribed).**
  - Titrate according to response over 4 weeks up to 15 mg/kg 12 hourly.
  - If poorly tolerated divide total daily dose into 3 equal doses.
  - Maximum daily dose 40 mg/kg/day.

**Adults**

For HIV-infected adults on ART, lamotrigine is preferred because of fewer medicine interactions. When switching to lamotrigine, commence treatment as below and discontinue the other anticonvulsant after 28 days.

- **Lamotrigine, oral (Doctor initiated)**
  - 25 mg daily for 2 weeks.
  - Then 50 mg daily for 2 weeks.
  - Thereafter, increase by 50 mg every 2 weeks according to response.
  - Usual maintenance dose: 100–200 mg/day as a single dose.

**Note:** The dose of lamotrigine will need to be doubled when patients are switched from efavirenz- or nevirapine-based ART to lopinavir/ritonavir-based ART because the metabolism of lamotrigine is induced by lopinavir/ritonavir.

**Poorly controlled epilepsy**

Ask about the following, as these factors can influence decisions regarding medicine therapy:

» Has the patient been adherent in taking the medication regularly for at least 2 weeks or more before the seizure? Ask about medicine dosage and frequency.

» Has the patient recently used some other medicine? (i.e. look for drug interactions).

» Is there a chance that alcohol is involved?

If ≥ 1 of the above are present, address the problem/s but leave anticonvulsant therapy unchanged (unless dose adjustment is necessary because of a drug interaction). Reassess the patient within 2 weeks.

**REFERRAL**

» 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 (to review therapy).

» Failure of lamotrigine and carbamazepine monotherapy in adults or phenobarbital and carbamazepine monotherapy in children.

» Pregnancy.

» Development of neurological signs and symptoms.

» Adverse medicine reactions or suspected toxicity in children.

**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 anti-epileptic medicines used to date?
» Does the person return regularly for repeat of medication?

### 15.2.3 FEBRILE CONVULSIONS

#### DESCRIPTION

A febrile convulsion is a seizure occurring in a child between the ages of 6 months and 5 years of age in association with a significant fever in the absence of an intracranial infection. These are the most common type of seizures in children of this age. However, the diagnosis requires the exclusion of other causes of seizures.

Febrile convulsions can be simple or complex.

Simple febrile convulsions:
- are generalised,
- occur once per illness,
- always last for < 15 minutes (typically lasting 1–2 minutes),
- are not associated with any neurological deficit,
- are self-limiting.

Complex febrile seizures:
- last > 15 minutes; or
- are recurrent within the same febrile illness; or
- have a focal onset.

Children with febrile convulsions have a good prognosis, and very rarely develop epilepsy.

#### If convulsing:

**Children**

- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note**: Buccal midazolam should not be used in infants < 6 months of age.

**OR**

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing
Use diazepam for injection 10 mg in 2 mL undiluted.
- Draw up the required volume in a 2 mL syringe.
- Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
- Remove syringe and hold buttocks together to minimise leakage.
- Maximum dose: 10 mg in 1 hour.
- May be repeated after 10 minutes if convulsions continue.
- Expect a response within 1–5 minutes.

If no response after the 2nd dose of diazepam, manage as Status epilepticus. See Section 21.20: Status epilepticus.

Note:
- Look for a cause of the fever.
- Always exclude meningitis. See Section 15.3.1. Meningitis, acute.

GENERAL MEASURES
- Reassure parents and caregivers.
- Symptomatic treatment of fever.

MEDICINE TREATMENT
Treat the underlying cause.

For symptomatic relief:
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
  - Paracetamol has no effect on seizure prevention.

REFERRAL
- All febrile convulsions except where:
  - the diagnosis of recurrent simple febrile seizures has been well established AND
  - the child regains full consciousness and function immediately after the seizure AND
  - meningitis has been excluded (See Section 15.3.1. Meningitis, acute).
- Complex convulsions.

15.3 MENINGITIS

15.3.1 MENINGITIS, ACUTE
G00.9/A39.0

DESCRIPTION
Infection of the membranes of the brain. Clinical signs and symptoms include:
- headache
- neck stiffness
- impaired level of consciousness
- photophobia
Neck stiffness is rare in young children, and especially neonates, and may be absent in adults, especially debilitated patients and the elderly.

Young children with fever, vomiting and convulsions or an impaired level of consciousness must be assumed to have meningitis. Signs may be even more subtle in newborns.

**Initial management**

- If safe, perform a lumbar puncture. Send cerebrospinal fluid (CSF) in separate sterile containers (for culture, microscopy, chemistry and 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.

**MEDICINE TREATMENT**

Initiate medicine treatment before transfer.

**Children**

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose before referral. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

**Adults**

- Ceftriaxone, IM, 2 g immediately before referral.
  - Do not inject more than 1 g at one injection site.

If convulsing, see Section 15.2 Seizures (convulsions/fits).

**REFERRAL**

All patients with meningitis, or suspected meningitis.
15.3.2 MENINGITIS MENINGOCOCCAL, PROPHYLAXIS

Z29.2

In cases of meningococcal infection, the following close contacts should receive prophylaxis. Close contacts include:
» household members,
» child-care centre contacts, and
» anyone directly exposed to the patient's oral secretions, e.g. kissing, mouth-to-mouth resuscitation, endotracheal intubation, or endotracheal tube management.
Chemoprophylaxis is only effective for the current exposure.

MEDICINE TREATMENT

Prophylaxis
Children < 6 years of age
• Ceftriaxone, IM, 125 mg, as a single dose.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given.
After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.
Annotate the dosage and route of administration in the referral letter.

Children 6–12 years of age
• Ciprofloxacin, oral, 250 mg, as a single dose.

Children > 12 years of age and adults
• Ciprofloxacin, oral, 500 mg, as a single dose.

Pregnant women
• Ceftriaxone, IM, 250 mg, as a single dose.

15.4 HEADACHE, MILD, NON-SPECIFIC

R51

DESCRIPTION

Headache can be benign or serious.
Headache can have serious underlying causes including:
» encephalitis         » hypertensive emergencies
» meningitis          » venous sinus thrombosis
» mastoiditis         » stroke
» benign intracranial hypertension » brain tumour

Headache due to a serious disease will often be associated with neurological symptoms and signs including:
15.12

» vomiting
» fever
» mood change
» cranial nerve fall-out
» convulsions
» confusion

» impaired consciousness
» pupillary changes and difference in size
» focal paralysis
» visual disturbances
» neck stiffness

Tension headache due to muscle spasm:
» May be worse in the afternoon, but often present all day.
» Is normally felt in the neck and the back of the head, but may be felt over the entire head.
» Is often associated with dizziness and/or blurring of vision.
» Is often described as a tight band around the head or pressure on the top of the head.
» Does not progress through stages like a migraine (no nausea, no visual symptoms).

GENERAL MEASURES
» Teach relaxation techniques where appropriate.
» Reassurance, where applicable.
» Exclude analgesia overuse headache.

MEDICINE TREATMENT

Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g, 6 hourly when required.

REFERRAL
» Suspected meningitis should be referred immediately after initial treatment. See Section 15.3: Meningitis.
» Headache in children lasting for 3 days.
» Recent headache of increasing severity.
» Headache with neurological manifestations.
» Analgesia overuse headache.
» Newly developed headache persisting for > 1 week in an adult.
» Chronic recurrent headaches in an otherwise healthy patient: refer if no improvement after 1 month of treatment.
» Tension headache due to muscle spasm: refer if no improvement after 1 month of treatment.

15.5 NEUROPATHY

G60.9

DESCRIPTION
Defective functioning of nerves, which may involve peripheral nerves (peripheral neuropathy) and/or cranial nerves.
Clinical features may be predominantly of a sensory, sensorimotor or motor nature.

**15.5.1 POST-HERPES ZOSTER NEUROPATHY (POST HERPETIC NEURALGIA)**

M79.2
See Section 11.3.12: Herpes zoster (Shingles)

**15.5.2 BELLS PALSY**

G51.0

**DESCRIPTION**
Unilateral paralysis of all the muscles of facial expression (the corner of the mouth drops, the forehead is unfurrowed, and the eyelids will not close).
Taste sensation may be lost unilaterally and hyperacusis (painful sensitivity to loud sounds) may be present.
Most patients recover within a few weeks or months.

**GENERAL MEASURES**

» HIV testing.
» Referral for facial muscle massage and exercises.
» Eye pad for protection of the eye during sleep.

**MEDICINE TREATMENT**

**Adults**

- Prednisone, oral, 60 mg daily for 7 days started within 3 days of onset (Doctor prescribed).

**Children**

- Prednisone, oral, 2 mg/kg daily for 7 days within 3 days of onset (Doctor prescribed).

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Tablet 5mg</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;17.5–25 kg</td>
<td>40 mg</td>
<td>8 tablets</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–40 kg</td>
<td>55 mg</td>
<td>11 tablets</td>
<td>&gt;7–12 years</td>
</tr>
</tbody>
</table>

**REFERRAL**

All cases for physiotherapy.

**15.5.3 PERIPHERAL NEUROPATHY**

G60.9/G62.9/G62.0 /G62.1/E10.21/E11.21

**DESCRIPTION**
Initially sensory symptoms consisting of tingling, prickling, burning in the balls of the feet or tips of the toes or in a general distribution over the soles. The symptoms are symmetrical and with progression spread proximally.
Later sensory loss over both feet and weakness of dorsiflexion of the toes may be present. Patients may experience difficulty in walking on their heels and foot drop becomes apparent. Common causes include HIV, diabetes mellitus, isoniazid, antiretrovirals ( stavudine and didanosine) and alcohol.

**GENERAL MEASURES**

- HIV testing.
- Avoid alcohol.
- A balanced diet to prevent nutritional deficiency.

**MEDICINE TREATMENT**

- Stop the offending medicine or give suitable substitute e.g. substitute stavudine or didanosine with tenofovir or lamivudine.
- Patients on isoniazid (TB treatment or prophylaxis): increase pyridoxine to 25–50 mg 8 hourly for 3 weeks, followed by 25–50 mg daily.
- Amitriptyline, oral, 25 mg at night (Doctor prescribed).
  - Titrate at 2 weekly intervals to a maximum of 75 mg at night.

**REFERRAL**

- All children.
- Difficulty in walking or foot drop.
- Unsteady/ataxic gait.
- Severe sensory loss.

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15.15
Chapter 16: Mental health conditions

16.1 Aggressive disruptive behaviour in adults
16.2 Anxiety and stress and related disorders in adults
16.3 Delirium with acute confusion and aggression
16.4 Mental health conditions in children and adolescents
   16.4.1 Acutely disturbed child or adolescent awaiting further evaluation
16.5 Acute dystonic reaction
16.6 Mood disorders
   16.6.1 Major depressive disorder
      16.6.1.1 Suicide risk assessment
   16.6.2 Bipolar mood disorder
16.7 Psychosis
   16.7.1 Acute psychosis
   16.7.2 Chronic psychosis
16.8 Substance related disorders
   16.8.1 Substance use disorders
   16.8.2 Substance-induced mood disorder
   16.8.3 Substance-induced psychosis
   16.8.4 Alcohol withdrawal (uncomplicated)
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 IN ADULTS
R45.1

DESCRIPTION
Agitated and acutely disturbed patients. May be known to suffer from a psychiatric condition or not.

Note: Many acute medical conditions and substance abuse can present with agitation and aggressive behaviour. See Section 21.7: Delirium with acute confusion and aggression in adults.

GENERAL MEASURES
» Ensure the safety of the patient and those caring for them.
» Be cautious when sedating medically ill or frail patients, especially with regards to respiratory depression.
» Elderly and frail patients may be vulnerable to falls and further injury if sedated.
» Mechanical restraint should be used only when necessary to protect the patient and others in an acute setting, and for as short a period of time as possible, at all times monitoring the safety of the patient.

MEDICINE TREATMENT
Always use non-pharmacological de-escalation techniques first:
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment
- Benzodiazepines, e.g.:
  - Diazepam, oral, 5 mg, immediately. LoE:II
  - Midazolam, buccal, 7.5–15 mg, immediately. LoE:II

If oral treatment fails after 30–60 minutes, OR
The patient is placing themselves and others at significant risk:
Consider IM treatment
- Benzodiazepines, e.g.:
- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

OR
- Haloperidol, IM, 5 mg, immediately.
  - Repeat after 30–60 minutes if needed.

AND
- Promethazine, IM, 25–50 mg.
  - In the elderly 25 mg.
Always monitor vital signs of sedated patient:
» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL
All cases.

16.2 ANXIETY AND STRESS RELATED DISORDERS IN ADULTS
F41.9

DESCRIPTION
A group of related disorders which manifest as a response to a threat in a situation (stress) or reaction to stress (anxiety) or spontaneously and include the following:
» Panic attack and panic disorder,
» Generalised anxiety disorder,
» Obsessive-compulsive disorder, and
» Acute stress disorder and post-traumatic stress disorder.

GENERAL MEASURES
» Reassurance/information and support of the patient and family.
» Always consider whether there is an underlying medical condition (e.g. cardiac, lung disease, thyrotoxicosis) or a substance-related condition (intoxication or withdrawal).
» All cases should preferably receive psychotherapy.

MEDICINE TREATMENT
For acute management of anxiety:
- Benzodiazepines, e.g.:
  - Diazepam, oral, 2–5 mg, daily for a maximum of 10 days.
    - If required give 12 hourly.
  - Citalopram, oral (Doctor initiated)
    - Initiate at 10 mg daily for the 1st week.
    - Then increase to 20 mg daily.

REFERRAL
» Poor response to treatment.
» Ongoing symptoms despite acute treatment.
» Co morbid conditions.

16.3 DELIRIUM WITH ACUTE CONFUSION AND AGGRESSION
F05.9

See Sections 16.1: Aggressive disruptive behaviour in adults and 21.7: Delirium with acute confusion and aggression.
16.4 MENTAL HEALTH CONDITIONS IN CHILDREN AND ADOLESCENTS

All children presenting with mental health conditions at a primary care setting should have any medical conditions identified and managed and then be referred.

16.4.1 ACUTELY DISTURBED CHILD OR ADOLESCENT AWAITING FURTHER EVALUATION

MEDICINE TREATMENT

Exclude medical causes, e.g. encephalopathy or other intracranial pathology, infection, seizures, metabolic disease, medication adverse effects and intoxication.

For children < 6 years of age:
Sedation with psychotropic agents should only be considered in extreme cases and only after consultation with a specialist.

For children > 6 years of age:
- Benzodiazepines, e.g.:
  - Midazolam, IM, 0.1–0.15 mg/kg/dose as a single dose (Doctor initiated).
    - Onset of action: within 5 minutes.

If sedation is inadequate:
- Haloperidol, IM, 0.025–0.05 mg/kg/day in 2–3 divided doses to a maximum of 0.15 mg/kg/day (Doctor initiated).

Extrapyramidal side effects
If extrapyramidal side effects occur (such as dystonia, rigidity or tremor) with the lowest effective dose of antipsychotic medication, co-prescribe an anticholinergic agent, e.g. orphenadrine or biperiden:
- Anticholinergic e.g.
- Orphenadrine, oral, 50 mg, 12 hourly (Doctor initiated).

For acute dystonic reaction: See Section 16.5: Acute dystonic reaction.

CAUTION
Always consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to children and adolescents.

16.5 ACUTE DYSTONIC REACTION

G24.02

DESCRIPTION
An acute dystonic reaction is sustained muscle contractions that cause twisting and repetitive movements, abnormal posture or abnormal eye position, or laryngospasm within a few minutes to days after receiving medicines such as haloperidol.
CHAPTER 16
MENTAL HEALTH CONDITIONS

MEDICINE TREATMENT
In case of an acute dystonic reaction:

Children
- Anticholinergic, e.g.:
  - Biperiden, IM/slow IV, 0.05–0.1 mg/kg, as a single dose and refer (Doctor initiated).
    - 6–10 years: 3 mg
    - >10 years: 5 mg
  - OR
    - Promethazine, IM, 0.125–0.5 mg/kg, as a single dose and refer (Doctor initiated).
      - 5–10 years: 12.5 mg
      - 10–16 years: 25 mg

Adults
- Anticholinergic, e.g.:
  - Biperiden, IM, 2 mg.
    - May be repeated every 30 minutes.
    - Maximum of 4 doses within 24 hours.
  - OR
    - Promethazine, IM, 50 mg.

REFERRAL
- Children and adolescents.
- No response to treatment.

16.6 MOOD DISORDERS

DESCRIPTION
Mood disorders include:
- Major depressive disorder: episodes of major depression, according to accepted diagnostic criteria.
- Dysthymia: not all the criteria for a major depressive episode are met – lasts at least 2 years.
- Bipolar disorder: ≥ 1 episode of mania with/without episodes of major depression.
- Mood disorder due to a general medical disorder: the mood disturbance is secondary to an underlying medical condition.
- Substance-induced mood disorder: 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 ≤ 6 months unless the stressor persists.
16.6.1 MAJOR DEPRESSIVE DISORDER
F32.9

DESCRIPTION
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. sadness, feeling of worthlessness, guilt, diminished concentration and memory, thoughts of death and suicide

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
Supportive measures should be provided.
Broader stressors may need to be addressed:
 » stress management/coping skills
 » marital and family issues
 » accommodation and vocational issues

Ask for suicidal ideation in all patients, before initiating a SSRI. See Section 16.6.1.1: Suicide risk assessment.

MEDICINE TREATMENT
Major depressive disorder

Adults
  SSRI, e.g.:
   • Fluoxetine, oral.
     o Initial dose: 20 mg.
     o Increase to 40 mg if there is only a partial response after 4 weeks.
     o If no response after 4 weeks, refer.

OR
If a sedating antidepressant is required:
  Tricyclic antidepressants, e.g.:
   • Amitriptyline, oral, at bedtime.
     o Initial dose: 25 mg per day.
     o Increase by 25 mg per day at 3–5 day intervals.
     o Maximum dose: 150 mg per day.
CHAPTER 16
MENTAL HEALTH CONDITIONS

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 tricyclic antidepressants should be used with caution.
» Avoid tricyclic antidepressants in patients with heart disease, urinary retention, glaucoma and epilepsy.

Note:
» In cases of 1st episode of major depressive disorder, continue SSRI treatment for 6 months after symptoms have resolved.
» In cases where there have been multiple episodes, or where other complications exist, longer treatment is indicated which should be reviewed at least annually.
» 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 antidepressants may precipitate a manic episode.
» Be careful of interactions between antidepressants and any other agents that the patient might be taking (e.g. St John’s Wort or traditional African medicine).

REFERRAL

» Suicidal ideation.
» Major depression with psychotic features.
» Bipolar disorder.
» Failure to respond to antidepressants.
» Patients with concomitant medical illness, e.g. heart disease, epilepsy.
» Poor social support systems.
» Pregnancy and lactation.
» Children and adolescents.

16.6.1.1 SUICIDE RISK ASSESMENT

DESCRIPTION
Screen patients with mood and anxiety disorders, schizophrenia and other psychotic disorders, eating disorder and substance use disorders for suicidal ideation.

WARNING
These tools are useful to identify patients at risk of suicide, but does not replace clinical judgment.
CHAPTER 16
MENTAL HEALTH CONDITIONS

Use the suicidality subscale of the MINI INTERNATIONAL NEUROPSYCHIATRIC INTERVIEW (MINI), English Version 5.0.0 for ADULT patients:

<table>
<thead>
<tr>
<th>In the past month did you:</th>
<th>A</th>
<th>Think that you would be better off dead or wish you were dead?</th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Want to harm yourself?</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Think about suicide?</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Have a suicide plan?</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Attempt suicide</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>In your lifetime</td>
<td>F</td>
<td>Did you ever make a suicide attempt</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

CURRENT SUICIDE RISK

<table>
<thead>
<tr>
<th>A or B or F = YES</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>C = YES</td>
<td>MODERATE</td>
</tr>
<tr>
<td>D or E or (C AND F) = YES</td>
<td>HIGH</td>
</tr>
</tbody>
</table>


Use the Risk of Suicide Questionnaire (RSQ) 4 item subscale, English Version for children and adolescents

<table>
<thead>
<tr>
<th>Question</th>
<th>1. Are you here because you tried to hurt yourself?</th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>In the past week, have you been having thoughts about hurting yourself?</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>3.</td>
<td>Have you ever tried to hurt yourself in the past other than this time?</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>4.</td>
<td>Has something very stressful happened to you in the past few weeks?</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Refer if:
- Question 1 is YES.
- Two or three of questions 2, 3 and 4 are YES.


REFERRAL

» All patients with a high index of suspicion.
» For ADULTS: refer if risk according to the MINI tool is MODERATE TO HIGH.
» For CHILDREN AND ADOLESCENTS: refer if YES to Question 1 or ANY COMBINATION of questions in the RSQ tool.

16.6.2 BIPOLAR DISORDER
F31.9

DESCRIPTION

A lifelong illness which may have an episodic, variable course with the presenting episode being manic, hypomanic, mixed or depressive (according to accepted

16.8
diagnostic criteria). Diagnosis of bipolar disorder requires either a current or previous episode of mania. An episode of mania is typically characterised by an elevated mood where a patient may experience extreme happiness, lasting days to weeks, which might also be associated with an underlying irritability. Such mood is associated with increased energy/activity, talkativeness and a reduction in the need for sleep, and features may be accompanied by grandiose and/or religious delusions.

GENERAL MEASURES
Reassurance and support of the patient and family.

MEDICINE TREATMENT
For agitated and acutely disturbed patients:
Always use non-pharmacological de-escalation techniques first.
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment
- Benzodiazepines, e.g.:
  - Diazepam, oral, 5 mg, immediately.
  OR
  - Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes,
OR
The patient is placing themselves and others at significant risk:
Consider IM treatment
- Benzodiazepines, e.g.:
- Midazolam, IM, 7.5–15 mg immediately.
  o Repeat after 30–60 minutes if needed.

OR
- Haloperidol, IM, 5 mg, immediately.
  o Repeat after 30–60 minutes if needed.

AND
- Promethazine, IM, 25–50 mg.
  o In the elderly 25 mg.

Always monitor vital signs of sedated patient:
» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL
All patients.
16.7 PSYCHOSIS

DESCRIPTION
The patient may experience perceptual disturbances, e.g. hallucinations that are generally auditory, as well as disturbances of thought content, i.e. delusional thought process. Patients generally have no insight into their symptoms and may be resistant to intervention. The presentation may be acute (acute psychosis) or chronic (schizophrenia).

16.7.1 ACUTE PSYCHOSIS
F23.9

DESCRIPTION
Acute psychosis is a clinical state characterised by recent onset of psychotic symptoms such as: hallucinations, delusions, disorganised or illogical speech, agitation or bizarre behaviour and extreme and labile emotional states. These symptoms may be preceded by a period of deteriorating social, occupational and academic functioning.

GENERAL MEASURES
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT
Always use non-pharmacological de-escalation techniques first.
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment
- Benzodiazepines, e.g.:  
  • Diazepam, oral, 5 mg, immediately.

OR
  Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes,

OR
The patient is placing themselves and others at significant risk:
Consider IM treatment
- Benzodiazepines, e.g.:  
  • Midazolam, IM 7.5–15 mg immediately.
    o Repeat after 30–60 minutes if needed.

OR
  Haloperidol, IM, 5 mg, immediately.
    o Repeat after 30–60 minutes if needed.
AND
Promethazine, IM, 25–50 mg.
  o In the elderly 25 mg.

Always monitor vital signs of sedated patient:
» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the first hour, and then every 30 minutes until
  the patient is ambulatory.

OR
If known with schizophrenia, known to have used antipsychotics previously,
and non-aggressive:
  • Zuclopenthixol acetate, IM, 50 mg immediately. Do not repeat within 2 days.

Violent patients:
  • Zuclopenthixol acetate, IM, 50–150 mg immediately.
    o Do not repeat within 72 hours.
    o Vital signs must be monitored 8 hourly for 72 hours.
    o Refer where there is no or poor response.

CAUTION
Always monitor for acute dystonic reactions after administration of antipsychotic
agents (see Section 16.5: Acute dystonic reaction).

REFERRAL
All patients.

16.7.2 CHRONIC PSYCHOSIS (SCHIZOPHRENIA)
F20.9

DESCRIPTION
Schizophrenia is the most common chronic psychotic disorder and is characterised
by a loss of contact with reality. It is further characterised by:
» positive symptoms, delusions, hallucinations and thought process disorder
» negative symptoms, blunting of affect, social withdrawal
» mood symptoms such as depression may be present

Clinical features include:
» delusions: fixed, unshakeable false beliefs (not shared by society)
» hallucinations: perceptions without adequate corresponding external stimuli, e.g.
  hearing voices
» disorganised thoughts and speech: e.g. derailment or incoherence
» grossly disorganised or catatonic behaviour
» negative symptoms: affective flattening, social withdrawal
» social and/or occupational dysfunction

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 to patient and family
» supportive group therapy for patients with schizophrenia

Rehabilitation may be enhanced by:
» assertive community programs
» work assessment, occupational therapy and bridging programmes before return to the community
» appropriate placement and supported employment

**Note:** Consultation with a community psychiatrist is essential to confirm diagnosis and treatment in specific cases. See referral criteria.

**MEDICINE TREATMENT**

**Schizophrenia where a less sedating agent is required:**

**Adults**
- Haloperidol, oral.
  - Initial dose: 1 mg daily, increasing to 5 mg daily.
  - 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 5 mg daily, if tolerated, is reached.
  - Once stabilised, administer as a single dose at bedtime.

If extrapyramidal side effects: switch to risperidone rather than adding an anticholinergic medicine:
- Risperidone, oral.
  - Initial dose: 2 mg daily.
  - Increase to 4 mg daily, if poor response after 4 weeks.

**Note:** Anticholinergic medicines (e.g. orphenadrine) should not be added prophylactically to antipsychotics to prevent extrapyramidal side effects.

**Patients already stabilised on chlorpromazine:**
- Chlorpromazine, oral.
  - Maintenance dose: 75–300 mg at night, but may be as high as 800 mg.

**Only for health care workers with advanced psychiatric training**

**Long-term depot therapy where adherence problem, or patient preference:**
- Fluphenazine decanoate, IM, 12.5–50 mg every 4 weeks.
  - Initial dose: 12.5 mg.

**OR**
- Flupenthixol decanoate, IM, 20–80 mg every 4 weeks.
  - Initial dose: 20 mg.
CHAPTER 16
MENTAL HEALTH CONDITIONS

OR

• Zuclopenthixol decanoate, IM, 200–600 mg every 4 weeks.
  o Initial dose: 100 mg.

Note:

» Initially, patients should be stabilised on an oral antipsychotic agent before changing to a depot preparation. Administer an initial test dose and observe the patient for 1 week before administering higher doses. Reduce the oral antipsychotic formulation, stopping once patient is stabilised on the long-term depot therapy.

» For breakthrough episodes, consider short-term therapy of:
  • Risperidone, oral 2 mg daily (Doctor prescribed).

Long-acting antipsychotics are particularly useful in patients unable to adhere to their oral medication regimens.

» Long-term therapy should always be in consultation with a doctor or, if available, with a psychiatrist. Patients should be re-assessed every 6 months.

Extrapyramidal side effects

If extrapyramidal side effects occur (such as dystonia, rigidity or tremor) with the lowest effective dose of antipsychotic medication:

» an anticholinergic agent, e.g. orphenadrine or biperiden can be co-prescribed

» low potency agent, chlorpromazine, is less likely to cause dystonia extrapyramidal side effects

  • Anticholinergic, e.g.:
    • Orphenadrine, oral, 50–150 mg, daily or in divided doses according to individual response.
      o 50 mg twice daily is usually sufficient.
      o Do not prescribe more than 150 mg per day at primary care level.
      o Use with caution in the elderly as it may cause confusion and urinary retention.

For acute dystonic reaction: See Section 16.5: Acute dystonic reaction.

REFERRAL

» Poor social support.

» High suicidal risk or risk of harm to others.

» Children and adolescents.

» The elderly.

» Pregnant and lactating women.

» No response or intolerance to medicine treatment.

» Concurrent medical or other psychiatric illness.

» Epilepsy with psychosis.
16.8 SUBSTANCE RELATED DISORDERS

16.8.1 SUBSTANCE USE DISORDERS
F10.8, F11.1, F12.1, F13.1, F14.1, F15.1, F16.1

Consult the most recent National Policy guidelines on detoxification of psychoactive substances.

DESCRIPTION
Substance use disorder is mental and physical symptoms caused by the use of one or more substances despite significant substance-related problems (including abuse and dependence). Substance-induced disorders include intoxication, withdrawal and other substance/medication-induced mental disorder.

Alcohol withdrawal
See Section 16.8.4 Alcohol withdrawal (uncomplicated).

Methamphetamines (tik), cocaine (crack), methaqualone (mandrax), cannabis
These patients usually do not require hospitalisation.

GENERAL MEASURES
Reassurance and support of the patient and family.

MEDICINE TREATMENT
For severe anxiety, irritability and insomnia:
- Benzodiazepine, e.g.:
  - Diazepam, oral, 5–10 mg as a single dose or 12 hourly for 5–7 days.
For seizure control and/or sedation:
- Diazepam, slow IV, 10 mg

REFERRAL
- Severe alcohol dependence.
- Past history of withdrawal seizures or a history of epilepsy.
- Past history of Delirium Tremens.
- Younger (< 12 years of age) or older age (> 60 years of age).
- Pregnancy.
- Significant polydrug use.
- Cognitive impairment.
- Lack of support at home or homelessness.
- Previous failed community detoxification attempts.
- Opioid substance use disorder.

16.8.2 SUBSTANCE-INDUCED MOOD DISORDERS
F10.8, F11.1, F12.1, F13.1, F14.1, F15.1, F16.1

DESCRIPTION
Mood disorder secondary to substance use or withdrawal such as abuse of alcohol,
drugs e.g. cannabis.

GENERAL MEASURES
» Generally treated by removal of the causative substance.
» Requires acute detoxification followed by maintenance treatment.
» If symptoms of mood disorder persist after 2 weeks, consider treating the mood disorder. See Section 16.6: Mood disorders.

16.8.3 SUBSTANCE-INDUCED PSYCHOSIS
F19.15

DESCRIPTION
Psychosis secondary to a substance use or withdrawal such as abuse of alcohol, drugs e.g. cannabis.

GENERAL MEASURES
» Most patients with substance-induced psychosis can be managed without medication.
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT
Always use non-pharmacological de-escalation techniques first.
» Calm the patient.
» Manage in a safe environment.
» Ensure the safety of all staff members.

Offer oral treatment:
- Benzodiazepines, e.g.:
  • Diazepam, oral, 5 mg, immediately.
  OR
  Midazolam, buccal, 7.5–15 mg, immediately.

If oral treatment fails after 30–60 minutes,
OR
The patient is placing themselves and others at significant risk:
Consider IM treatment:
- Benzodiazepines, e.g.:
  • Midazolam, IM, 7.5–15 mg, immediately.
    o Repeat after 30–60 minutes if needed.
 OR
  Haloperidol, IM, 5 mg, immediately.
    o Repeat after 30–60 minutes if needed.
 AND
  Promethazine, IM, 25–50 mg.
    o In the elderly 25 mg.
Always monitor vital signs of sedated patient:

» Vital signs: pulse, respiratory rate, blood pressure, temperature.
» Monitor every 5–10 minutes for the 1st hour, and then every 30 minutes until the patient is ambulatory.

REFERRAL
All patients.

16.8.4 ALCOHOL WITHDRAWAL (UNCOMPLICATED)
F10.23

DESCRIPTION
A syndrome characterised by central nervous system hyperactivity that occurs when an alcohol dependent individual abruptly stops or significantly reduces alcohol consumption.
The symptoms of an uncomplicated Alcohol Withdrawal Syndrome include:

» Autonomic (sweating, tachycardia, hypertension, tremors, tonic-clonic seizures and low grade fever).
» Gastrointestinal (anorexia, nausea, vomiting, dyspepsia and diarrhoea).
» Cognitive and perceptual disturbances (poor concentration, anxiety, psychomotor agitation, disturbed sleep with vivid dreams, visual hallucinations and disorientation).

Although the typical delirium occurs 2–3 days following cessation of prolonged alcohol intake, some withdrawal symptoms such as the typical tremor, may start within 12 hours.

GENERAL MEASURES
Assess for comorbid infections.

MEDICINE TREATMENT
• Thiamine, oral, 300 mg daily for 14 days.

AND
bullet Diazepam, oral, 10 mg immediately.
  o Then 5 mg 6 hourly for 3 days.
  o Then 5 mg 12 hourly for 2 days.
  o Then 5 mg daily for 2 days.
  o Then stop.

REFERRAL
See referral criteria of Section 16.8.1: Substance use disorders.

LoE:III


Citalopram: NICE. NICE clinical guideline CG113: Generalised anxiety disorder and panic disorder (with or without agoraphobia) in adults: Management in primary, secondary and community care, January 2011. http://www.nice.org.uk/guidance/cg113


SSRI period of therapy for continuation phase: NICE clinical guideline 90. [Internet] Depression in adults.[Issued: October 2009; cited February 2014]. Available at: www.guideance.nice.org.uk/cg90


Chapter 17 - Respiratory conditions

17.1 Conditions with predominant wheeze
   17.1.1 Acute asthma and acute exacerbation of chronic obstructive pulmonary disease (COPD)
   17.1.2 Chronic asthma
   17.1.3 Acute bronchiolitis in children
   17.1.4 Chronic obstructive pulmonary disease (COPD)

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   17.3.2 Acute bronchitis in adults or adolescents
   17.3.3 Acute exacerbation of chronic obstructive pulmonary disease (COPD)
   17.3.4 Pneumonia
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      17.3.4.2 Pneumonia in adults
         17.3.4.2.1 Uncomplicated pneumonia
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      17.4.1.1 TB chemoprophylaxis/isoniazid preventive therapy (IPT), in adults
      17.4.1.2 TB control programme: medicine regimens in adults
   17.4.2 Pulmonary tuberculosis, in children
      17.4.2.1 TB chemoprophylaxis/isoniazid preventive therapy (IPT), in children
17.4.2.2 TB control programme: medicine regimens, in children

17.4.3 TB, HIV and AIDS

17.4.4 Multidrug-resistant tuberculosis (MDR TB)
   17.4.4.1 Multidrug-resistant tuberculosis (MDR TB), in adults
   17.4.4.2 Multidrug-resistant tuberculosis (MDR TB) in children
17.1 CONDITIONS WITH PREDOMINANT WHEEZE

17.1.1 ACUTE ASTHMA & ACUTE EXACERBATION OF COPD

**DESCRIPTION**

This is an emergency situation recognised by various combinations of:

- wheeze
- breathlessness
- tightness of the chest
- respiratory distress
- chest indrawing in children
- cough
- use of accessory muscles of respiration

In adults bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).

The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. If patients > 50 years of age present with asthma for the first time, consider pulmonary oedema due to left ventricular heart failure.

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Consider foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation, especially if the wheeze is unilateral.

All PHC facilities must have peak expiratory flow rate (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

### Recognition and assessment of severity of attacks in children

<table>
<thead>
<tr>
<th></th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory rate</td>
<td>&gt; 40 breaths/minute</td>
<td>&gt; 40 breaths/minute</td>
</tr>
<tr>
<td>Chest indrawing/recession</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>PEF (if &gt; 5 years of age)</td>
<td>50–70% of predicted</td>
<td>&lt; 50% of predicted</td>
</tr>
<tr>
<td>Speech</td>
<td>normal or difficult</td>
<td>unable to speak</td>
</tr>
<tr>
<td>Feeding</td>
<td>difficulty with feeding</td>
<td>unable to feed</td>
</tr>
<tr>
<td>Wheeze</td>
<td>present</td>
<td>absent</td>
</tr>
<tr>
<td>Consciousness</td>
<td>normal</td>
<td>impaired</td>
</tr>
</tbody>
</table>

### Recognition and assessment of severity of attacks in adults

<table>
<thead>
<tr>
<th></th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talks in</td>
<td>phrases</td>
<td>words</td>
</tr>
<tr>
<td>Alertness</td>
<td>usually agitated</td>
<td>agitated, drowsy or confused</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>20–30 breaths/minute</td>
<td>often &gt; 30 breaths/minute</td>
</tr>
<tr>
<td>Wheeze</td>
<td>loud</td>
<td>loud or absent</td>
</tr>
<tr>
<td>Heart rate</td>
<td>100–120 beats/minute</td>
<td>&gt; 120 beats/minute</td>
</tr>
<tr>
<td>PEF after initial nebulisation</td>
<td>± 50–75%</td>
<td>&lt; 50%; may be too short of breath to blow in PEF meter</td>
</tr>
</tbody>
</table>
Note: PEFR is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment.

**MEDICINE TREATMENT**

- **Oxygen, 40% or higher, using highest concentration facemask.**
  
  **Note:** In chronic obstructive pulmonary disease:
  Give oxygen with care (preferably by 24% or 28% facemask, if available).
  Observe patients closely, as a small number of patients' condition may deteriorate.

- **Salbutamol 0.5%, solution, nebulised, preferably delivered at a flow rate of 8 L/min with oxygen.**
  - 1 mL salbutamol 0.5%, solution in 2 mL of sodium chloride 0.9%.
  - If no relief, repeat every 20–30 minutes in the first hour.
  - Thereafter, repeat every 2–4 hours if needed.

  **AND**

  - **Ipratropium bromide, solution, added to salbutamol solution.**
    - Children: 0.5–1 mL (0.125–0.25 mg)
    - Adults: 2 mL (0.5 mg)

  **If no nebuliser available:**

  - **Salbutamol, inhalation, 4–8 puffs, using a spacer.**
    - Inhale one puff at a time. Allow for 4 breaths through the spacer between puffs.
    - A mask should be used with a spacer, until an infant can co-ordinate using an inhaler with a spacer only. Apply the mask to the face to create a seal so that the child breathes through the spacer.

  If there is no immediate response:

  **ADD**

  - **Ipratropium bromide, inhalation, 4 puffs, using a spacer.**

  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 and cheaper than using a nebuliser.

  **Children with asthma**
  If reversal of bronchospasm is incomplete after the first nebulisation:
  - **Prednisone, oral, 1–2 mg/kg immediately then once daily for 7 days**

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Tablet 5 mg</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;11–14</td>
<td>20 mg</td>
<td>4 tablets</td>
<td>&gt;2–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5</td>
<td>30 mg</td>
<td>6 tablets</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5</td>
<td>40 mg</td>
<td>8 tablets</td>
<td>&gt;5 years and adult</td>
</tr>
</tbody>
</table>

LoE: II$^f$

LoE: III$^e$

LoE: III$^v$
If oral prednisone cannot be taken:
- Hydrocortisone IM/slow IV, immediately.
  - Children: Hydrocortisone, slow IV, 4–6 mg/kg immediately. See dosing table, pg 22.5.
  - Adults: IM/slow IV, 100 mg immediately.
Follow with:
- Prednisone, oral, 1–2 mg/kg once daily for 7 days.

Adults with asthma or COPD
- Prednisone, oral, 40 mg immediately then 40 mg once daily for 7 days.

If oral prednisone cannot be taken:
- Hydrocortisone, IV, 100 mg immediately.
Follow with:
- Prednisone, oral, 40 mg once daily for 7 days.

Note: Patients needing repeated courses of oral corticosteroids (more than twice over 6 months) should be assessed by a doctor for maintenance therapy. (See Section 17.1.2: Chronic asthma).

CAUTION
Avoid sedation of any kind.

Assessment of response in children

<table>
<thead>
<tr>
<th></th>
<th>Response</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEFR (if possible)</td>
<td>improvement by &gt; 20%</td>
<td>improvement by &lt; 20%</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt; 40 breaths/ minute</td>
<td>&gt; 40 breaths/ minute</td>
</tr>
<tr>
<td>Chest indrawing or recession</td>
<td>absent</td>
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</tr>
<tr>
<td>Speech</td>
<td>normal</td>
<td>impaired</td>
</tr>
<tr>
<td>Feeding</td>
<td>normal</td>
<td>impaired</td>
</tr>
</tbody>
</table>

Assessment of response in adults

<table>
<thead>
<tr>
<th></th>
<th>Response</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEFR (if possible)</td>
<td>improvement by &gt; 20%</td>
<td>improvement by &lt; 20%</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>&lt; 20 breaths/ minute</td>
<td>&gt; 20 breaths/ minute</td>
</tr>
<tr>
<td>Speech</td>
<td>normal</td>
<td>impaired</td>
</tr>
</tbody>
</table>

Patients responding to treatment:
» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.
» Advise patient/caregiver on further care at home, danger signs and that follow up is required.
» Caution patient on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.
» Ask about smoking: if yes, urge patient to stop.

REFERRAL
» Urgent
» Chest indrawing and distress not responding to nebulisation.
» Difficulty in feeding.
» Any general danger sign and life-threatening features:
  – drowsiness
  – confusion
  – silent chest
  – cyanosis
  – collapse
  – inability to complete a sentence in one breath
  – measured hypoxia
» No response to initial treatment.
» PEFR < 75% of the predicted normal or of personal best value 15–30 minutes after nebulisation.
» A lower threshold to admission is appropriate in patients when:
  – seen in the afternoon or evening, rather than earlier in the day
  – recent onset of nocturnal symptoms or aggravation of symptoms
  – previous severe attacks, especially if the onset was rapid

17.1.2 CHRONIC ASTHMA
J45.9

DESCRIPTION
A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections results in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and, if not controlled, eventual bronchial muscle hypertrophy of the airways’ smooth muscle. All these factors contribute to airways obstruction.

Asthma varies in intensity and is characterised by recurrent attacks of:
» wheezing,
» dyspnoea or shortness of breath,
» cough, especially nocturnal, and
» periods of no airways obstruction between attacks.

Acute attacks may be caused by:
» exposure to allergens,
» respiratory viral infections,
» non-specific irritating substances, and
» exercise.

Asthma must be distinguished from chronic obstructive pulmonary disease, which is often mistaken for asthma. (See Section 17.1.4: COPD). The history is a reliable diagnostic guideline and may be of value in assessing treatment response.
### Asthma

- Young age onset, usually < 20 years.
- History of hay fever, eczema and/or allergies.
- Family history of asthma.
- Symptoms are intermittent with periods of normal breathing in between.
- Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes or when upset.
- Marked improvement with beta$_2$ agonist.

### COPD

- Older age onset, usually > 40 years.
- Symptoms slowly worsen over a long period of time.
- Long history of daily or frequent cough before the onset of shortness of breath.
- Symptoms are persistent rather than only at night or during the early morning.
- History of heavy smoking (> 20 cigarettes/day for ≥ 15 years), heavy cannabis use or previous TB.
- Little improvement with beta$_2$ agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.

**Note:** The diagnosis of asthma can be difficult in children < 6 years of age. If the diagnosis of asthma is uncertain, refer the patient.

#### Asthma Diagnosis and Severity

**Peak Expiratory Flow Rate (PEFR)**

See PEF charts on pg xliv.

The PEFR may provide additional information for diagnosis and assessing response to therapy.

- PEFR is best assessed in the morning and evening.
  - Instruct the patient to blow forcibly into the device after a deep inspiratory effort.
  - The patient must perform three blows at each testing point.
  - Take the highest value as the true value.
- The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
  - An improvement of 60L/min or ≥ 20% of the pre-bronchodilator PEFR, 10–20 minutes after inhalation of a beta$_2$ agonist e.g. salbutamol, inhalation, 200mcg, confirms a diagnosis of asthma.
  - A normal PEFR excludes the possibility of moderate and severe COPD.
- PEFR may be useful in assessing response to therapy.
  - Any value > 80% of the personal best before the use of a bronchodilator is regarded as adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

**Note:** Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma should always be done with the use of a peak flow meter to assess severity and treatment response of asthma.

#### Mild Intermittent Asthma

- ≤ 2 episodes of daytime cough and/or wheeze per week
- ≤ 1 night-time cough and/or wheeze per month
» no recent (within the last year) admission to hospital for asthma
» PEFR ≥ 80% predicted between attacks

**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 ≥ 80% predicted between attacks

**MODERATE PERSISTENT ASTHMA**
» > 4 episodes of day time wheeze, tightness or cough per week
» > 4 night time awakenings per month
» PEFR 60–80% predicted

**SEVERE PERSISTENT ASTHMA**
» continuous day time wheeze, tightness or cough
» frequent night time awakenings
» PEFR < 60%

**GENERAL MEASURES**
» No smoking by an asthmatic or in the living area of an asthmatic.
» Avoid contact with household pets.
» Avoid exposure to known allergens and stimulants or irritants.
» Education on early recognition and management of acute attacks.
» Patient and caregiver education:
  – emphasise the diagnosis and explain the nature and natural course of the condition;
  – teach and monitor inhaler technique; and
  – reassure parents and patients of the safety and efficacy of continuous regular controller therapy.

**MEDICINE TREATMENT**
Medicine treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

**Reliever medicines in asthma:**
- Beta₂ agonists, e.g.:
  - Salbutamol (short acting)
    o Indicated for the immediate relief of the symptoms of acute attacks, i.e. cough, wheeze and shortness of breath.
    o Can be used as needed.
    o Increasing need for reliever medicine indicates poor asthma control.

**Controller medicines in asthma:**
- Inhaled corticosteroids, e.g.:
  - Beclomethasone.
    o Must be used twice daily, even when the patient feels well.
Inhalation therapy:
Inhaled therapy is preferable to oral therapy.

Spacer devices
» Spacers are vital for an adequate therapeutic effect of inhaled therapy.
» Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of medicine delivery and limit adverse effects.
» Use the spacer appropriate for the age of the patient.

<table>
<thead>
<tr>
<th>Spacing volume</th>
<th>Face mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants</td>
<td>150–250 mL</td>
</tr>
<tr>
<td>Children</td>
<td>500 mL</td>
</tr>
<tr>
<td>Adolescents and adults</td>
<td>750 mL</td>
</tr>
</tbody>
</table>

» Inhalation spacer devices enable parents to administer inhaled therapy even to small children.
» Children < 3 years of age should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly.
» Demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure.

Patient and caregiver education on inhaler and spacer techniques:
» A mask attachment should be used with the spacer for children < 3 years of age.

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 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 each puff prescribed
9. rinse mouth after inhalation of corticosteroids

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

MILD INTERMITTENT ASTHMA
Adults and children:
- \( \text{Beta}_2 \) agonist e.g.:
  - Salbutamol, inhalation, 100–200 mcg (2 puffs), 6–8hourly as needed (until symptoms are controlled).

EXERCISE-INDUCED ASTHMA
Patient must use bronchodilator/reliever inhaler before exercise.

PERSISTENT ASTHMA
Adults and children
- \( \text{Beta}_2 \) agonist e.g.:
  - Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 6–8hourly as needed (until symptoms are controlled).

AND
Children
- Inhaled corticosteroids e.g.:
  - Beclomethasone, inhalation, 100 mcg 12 hourly.

Adults
- Inhaled corticosteroids e.g.:
  - Beclomethasone, inhalation, 200 mcg 12 hourly.

Review treatment every 3 months. Adequate control is defined as:
- \( \leq 2 \) episodes of daytime cough and/or wheeze per week.
- No night-time cough and/or wheeze.
- No recent (within the last year) admission to hospital for asthma.
- PEFR \( \geq 80\% \) predicted between attacks.

If control is inadequate:
- check adherence and inhaler technique, and
- exclude on-going exposure to allergens.
After excluding those causes, refer to a doctor to confirm the diagnosis of asthma,
and to exclude TB and heart failure. Once the diagnosis is confirmed, step-up treatment as follows:

**Children**
- Inhaled corticosteroids, e.g.:
  - Beclomethasone, inhalation, 200 mcg 12 hourly.

**Adults**
- Inhaled corticosteroids, e.g.:
  - Beclomethasone, inhalation, 400 mcg 12 hourly.

If control is still inadequate in adults, stop beclomethasone and replace with:
- Inhaled long-acting beta agonist (LABA)/corticosteroid combination, e.g.:
  - Salmeterol/fluticasone, inhalation, 50/250 mcg 12 hourly (Doctor initiated).

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.

**REFERRAL TO DOCTOR**
» All children < 6 years of age for assessment and confirmation of diagnosis.
» Any patient, who has received > 2 courses of oral prednisone within 6 months.
» Brittle asthma (very sudden, very severe attacks).
» All patients with inadequate control of their symptoms.

**REFERRAL TO HOSPITAL**
Uncontrolled asthma.

**17.1.3 ACUTE BRONCHIOLITIS IN CHILDREN**
J21.9

**DESCRIPTION**
Acute bronchiolitis is a common cause of wheezing and cough in 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     » decreased breath sounds
» chest indrawing    » an audible wheeze

**GENERAL MEASURES**
» Minimise contact with other children.
» Avoid use of antibiotics and corticosteroids.
» Do not sedate child.
MEDICINE TREATMENT

- Oxygen, humidified, using nasal prongs or nasal cannula, at 1–2 L/minute.

AND

- Salbutamol 0.5%, solution, 0.5–1 mL diluted to 2–4 mL with sodium chloride 0.9%, nebulised over 3 minutes (single dose).
  - Bronchiolitis does not usually respond to salbutamol. If there is a good response, consider asthma as a cause of the symptoms. See Section 17.1.1: Acute asthma and acute exacerbation of chronic obstructive pulmonary disease (COPD).

If no response

- Epinephrine (adrenaline) 1:1000, 1 mL diluted in 2–4 mL of 3–5% sodium chloride, nebulised over at least 3 minutes, single dose (Doctor initiated).
  - Mix 3 mL of 3–5% sodium chloride with 2 mL water to make 3% sodium chloride solution.
  - Evaluate the response to the nebulisation.
  - If there is a good response which is maintained for at least 2 hours, send patient home. Warn the caregiver that there may be a relapse and advise them to return the patient promptly.

REFERRAL

- Chest indrawing and distress not responding to nebulisation.
- Difficulty in feeding.
- Previous admission for same problem.
- Oxygen saturation < 90% in room air.

17.1.4 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

DESCRIPTION

Also referred to as chronic obstructive airways disease (COAD), and comprises chronic bronchitis and emphysema which are characterised by:

- chronic cough with/without sputum production on most days of ≥ 3 months for ≥ 2 consecutive years;
- dyspnoea or shortness of breath; and
- wheezing.

The onset is very gradual with progressively worsening symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. In addition to the symptoms listed above, patients may present with symptoms or signs of right heart failure. The airways obstruction is not fully reversible (in contrast to asthma). The main causes of COPD are chronic irritation of the airways caused by smoking, air pollution, previous TB, and previous cannabis (dagga) smoking, although there are many other causes.
Note: Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long term if benefit can be proven by lung function testing.

GENERAL MEASURES
» Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
» Chest physiotherapy where available.
» Exercise.

MEDICINE TREATMENT
Acute lower airways obstruction: Treat as for acute asthma.

Chronic management:
» In a stable patient, check PEFR.
» Then give a test dose of salbutamol – 2 puffs.
» Repeat PEFR 15 minutes later.
» If there is ≥ 20% improvement in peak flow, treat as for asthma. See Section 17.1.2: Chronic asthma.

Patients failing to respond to the test dose of salbutamol:
- Beta_2 agonist (SABA) e.g.:
- Salbutamol, inhalation, 100–200 mcg (1–2 puffs), 3–4 times daily as needed for relief of wheeze.

If not controlled or frequent exacerbations:
- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg 12 hourly (Doctor initiated).

Acute infective exacerbation of chronic bronchitis:
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Penicillin allergy
- Doxycycline, oral, 100 mg 12 hourly for 5 days.

Prophylaxis against respiratory tract infections:
- Influenza vaccination, annually.

REFERRAL
Poor response to above therapy, for further investigations and adjustment of treatment.

17.2 STRIDOR (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 » drooling saliva » high fever » unable to swallow » sitting upright with head held erect

Assessment of the severity of airway obstruction and management in croup

<table>
<thead>
<tr>
<th>Grade 1</th>
<th>Inspiratory stridor only</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Prednisone, oral, 1–2 mg/kg, single dose.</td>
<td></td>
</tr>
<tr>
<td>o Do not give if measles or herpes infection present.</td>
<td></td>
</tr>
<tr>
<td>» Refer.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade 2</th>
<th>Inspiratory and expiratory stridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Prednisone, oral, 1–2 mg/kg, immediately as a single dose.</td>
<td></td>
</tr>
<tr>
<td>• Epinephrine, 1:1 000 diluted in sodium chloride 0.9%, nebulised, immediately.</td>
<td></td>
</tr>
<tr>
<td>o Dilute 1 mL of 1:1 000 epinephrine with 1 mL sodium chloride 0.9%.</td>
<td></td>
</tr>
<tr>
<td>o Repeat every 15–30 minutes until expiratory stridor disappears.</td>
<td></td>
</tr>
<tr>
<td>» Refer.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade 3</th>
<th>Inspiratory and expiratory stridor with active expiration, using abdominal muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Treat as above.</td>
<td></td>
</tr>
<tr>
<td>» If no improvement within one hour, refer urgently (intubate before referral if possible).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade 4</th>
<th>Cyanosis, apathy, marked retractions, impending apnoea</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Intubate (if not possible give treatment as above).</td>
<td></td>
</tr>
<tr>
<td>» Refer urgently.</td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL MEASURES**
» Keep child comfortable.
» Continue oral fluids.
» Encourage parent or caregiver to remain with the child.

**MEDICINE TREATMENT**
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
Children grade 2 or more stridor - while awaiting transfer:
- Epinephrine (adrenaline), 1:1000, nebulised, immediately using a nebuliser.
  - If there is no improvement, repeat every 15 minutes, until the child is transferred.
  - Dilute 1 mL of 1:1000 epinephrine (adrenaline) with 1 mL sodium chloride 0.9%.
  - Nebulise the entire volume with oxygen at a flow rate of 6–8 L/minute.
- Prednisone, oral, 1–2 mg/kg immediately as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Tablet 5 mg</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;11–14 kg</td>
<td>20 mg</td>
<td>4 tablets</td>
<td>&gt;2–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>30 mg</td>
<td>6 tablets</td>
<td>&gt;3–5 years</td>
</tr>
</tbody>
</table>

If epiglottitis suspected
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose and refer. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.

Annotate the dosage and route of administration in the referral letter.

Management during transfer:
- Give the child oxygen.
- Continue nebulisations with epinephrine (adrenaline).
- If grade 3, contact ambulance or nearest doctor.
- If grade 4, intubate and transfer.

**REFERRAL**

**Urgent**
- Children with:
  - chest indrawing
  - rapid breathing
  - altered consciousness
  - inability to drink or feed
- For confirmation of diagnosis.
- Suspected foreign body.
- Suspected epiglottitis.

**Non Urgent**
- All children grade 2 or more stridor.
17.3 RESPIRATORY TRACT INFECTIONS

17.3.1 INFLUENZA

DESCRIPTION
Influenza is a self-limiting viral condition that may last up to 14 days. It presents with headache, muscular pain and fever, and begins to clear within 7 days. Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION
Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» sinusitis
» otitis media

GENERAL MEASURES
» Bed rest if feverish.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and/or cough or fever persists for longer than a week.

MEDICINE TREATMENT
Note: Antibiotics are of no value for the treatment of influenza.

Pain and fever with distress:

Children
• Paracetamol, oral, 10–15 mg/kg/dose 4–6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required.

Infants
• Sodium chloride 0.9%, instilled into each nostril.

REFERRAL
Severe complications.

17.3.2 ACUTE BRONCHITIS IN ADULTS OR ADOLESCENTS

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-infected patients because of the higher incidence of bacterial lower respiratory tract infections in this subgroup.

HIV-infected patients:
- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

In penicillin-allergic HIV-infected patients:
- Macrolide, e.g.:
  - Azithromycin, oral, 500 mg daily for 3 days.

For symptomatic relief
- Cough syrup, oral.

### 17.3.3 ACUTE EXACERBATION OF COPD
See Sections 17.1.1: Acute asthma and acute exacerbation of COPD and 17.1.4: Chronic COPD.

### 17.3.4 PNEUMONIA
J18.9

**DESCRIPTION**
Acute infection of the lung parenchyma, usually caused by bacteria, especially *Streptococcus pneumonia* (pneumococcus).

Management is guided by:
» age » co-morbidity
» severity of the pneumonia

Manifestations include:
» malaise
» fever, often with sudden onset and with rigors
» cough, which becomes productive of rusty brown or yellow-green sputum
» pleuritic type chest pain
» shortness of breath
» in severe cases, shock and respiratory failure

On examination there is:
» fever » crackles or crepitations
» tachypnoea » bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.
Predisposing conditions include:
» very young or old age
» malnutrition
» other concomitant diseases
» HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults. Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4.1 PNEUMONIA IN CHILDREN

DESCRIPTION
Pneumonia should be distinguished from viral upper respiratory infections. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia
Classify children according to the severity of the illness:
» Pneumonia: fever, cough and rapid breathing, but no chest indrawing (of the lower chest wall) and no flaring of nostrils.
» Severe pneumonia: fever, cough, rapid breathing, chest indrawing and flaring nostrils.

Note: Children < 2 months of age with rapid breathing should be classified as having severe pneumonia.

Rapid breathing is defined as:
» infants birth–2 months    ≥ 60 breaths/minute
» infants 2 months–1 year  ≥ 50 breaths/minute
» children 1–5 years       ≥ 40 breaths/minute

Danger signs indicating urgent and immediate referral include:
» oxygen saturation of < 90% in room air    » cyanosis
» inability to drink               » < 2 months of age
» impaired consciousness         » grunting

GENERAL MEASURES
» Ensure adequate hydration.
» Continue feeding.

MEDICINE TREATMENT
For pneumonia:
- Amoxicillin, oral, 30mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.1.

Penicillin allergy
Children < 18 kg
- Macrolide, e.g:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)
- Macrolide, e.g:
- Azithromycin, oral, 250 mg daily for 3 days.
Children > 35 kg
- Macrolide, e.g:
  - Azithromycin, oral, 500 mg daily for 3 days.

Severe pneumonia:
- Oxygen, using nasal cannula at 1–2 L/minute before and during transfer.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, page 22.2.
  - Do not inject more than 1 g at one injection site.

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.
Annotate the dosage and route of administration in the referral letter.

**REFERRAL**
**Urgent**
- All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis.
- All children < 2 months of age.

**Non urgent**
- Inadequate response to treatment.
- Children coughing for > 3 weeks to exclude other causes such as TB, foreign body aspiration or pertussis.

**17.3.4.2 PNEUMONIA IN ADULTS**
J15.9

**17.3.4.2.1 UNCOMPLICATED PNEUMONIA**
J15.9

**DIAGNOSIS**
A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

**MEDICINE TREATMENT**
If not severely ill (see referral criteria below):
- Amoxicillin, oral, 1 g 8 hourly for 5 days.

Penicillin allergy:
- Moxifloxacin, oral, 400 mg daily for 5 days.
CHAPTER 17

REFERRAL

Any of the following:
- Confusion or decreased level of consciousness.
- Cyanosis.
- Respiratory rate of ≥ 30 breaths/minute.
- Systolic BP < 90 mmHg.
- Diastolic BP < 60 mmHg.
- Deterioration at any point.
- No response to treatment after 48 hours.

Patients with pneumonia:
- from a poor socio-economic background
- who are unlikely to comply with treatment
- living a considerable distance from health centres
- who have no access to immediate transport

17.3.4.2.2 PNEUMONIA IN ADULTS WITH UNDERLYING MEDICAL CONDITIONS OR > 65 YEARS OF AGE

J15.9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert MTB/RIF) to exclude pulmonary tuberculosis.

Common underlying conditions include:
- Diabetes mellitus.
- Alcoholism.
- HIV infection.
- Chronic liver disease.
- Cardiac failure.
- Chronic kidney disease.
- COPD.

Most of these patients will require referral to a doctor.

MEDICINE TREATMENT

Mild pneumonia:
- Amoxicillin/clavulanic acid 875/125 mg, oral, 12 hourly for 5 days.

Penicillin allergy:
- Moxifloxacin, oral, 400 mg daily for 5 days.

17.3.4.2.3 SEVERE PNEUMONIA

J15.9

DESCRIPTION

Severe pneumonia is defined as ≥ 2 of the following:
- confusion or decreased level of consciousness
- respiratory rate of ≥ 30 breaths/ minute
- systolic BP < 90 mmHg
- diastolic BP < 60 mmHg
- > 65 years of age
MEDICINE TREATMENT
While awaiting transfer:
- Oxygen, to achieve a saturation of 92%.
- Ceftriaxone, IV/IM, 1 g, as a single dose before referral.

CAUTION
Do not administer calcium containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

REFERRAL
Urgent
All patients.

17.3.4.2.4 PNEUMOCYSTIS PNEUMONIA
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. Chest X-ray may be normal in the early stages, but typically shows bilateral interstitial or ground glass pattern.

GENERAL MEASURES
Ensure adequate hydration.

MEDICINE TREATMENT
Adults
- Cotrimoxazole, oral, 6 hourly for 3 weeks.

<table>
<thead>
<tr>
<th>Approx. weight kg</th>
<th>Use one of the following tablets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80/400 mg</td>
</tr>
<tr>
<td>&lt;40 kg</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;40–56 kg</td>
<td>3 tablets</td>
</tr>
<tr>
<td>&gt;56 kg</td>
<td>4 tablets</td>
</tr>
</tbody>
</table>

For secondary prophylaxis
- Cotrimoxazole, oral, daily.

<table>
<thead>
<tr>
<th>Use one of the following tablets</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/400 mg</td>
</tr>
<tr>
<td>2 tablets</td>
</tr>
</tbody>
</table>

REFERRAL
» All children.
» Breathing rate > 24 breaths/minute.
» Shortness of breath with mild effort.
» Cyanosed patients.
» For antiretroviral treatment, if not available at clinic.
17.4 PULMONARY TUBERCULOSIS (TB)
A15.0

Note: TB is a notifiable disease.

TB guidelines are updated regularly. Consult the most recent National Tuberculosis Control Programme Guidelines.

DESCRIPTION
Tuberculosis is an infection caused by *Mycobacterium tuberculosis*. It is exacerbated and complicated by HIV, AIDS and multi drug-resistant mycobacteria.

17.4.1 PULMONARY TUBERCULOSIS (TB) IN ADULTS
A15.0

DIAGNOSIS
» Pulmonary TB is diagnosed on Xpert MTB/RIF testing, sputum smear or culture.
» Send 1 sputum specimen for Xpert MTB/RIF.
  - If Xpert MTB/RIF is positive: treat for TB and send a sputum specimen for smear microscopy. (The smear is used for reporting, not for diagnosis).
  - If Xpert MTB/RIF is positive and susceptible to RIF: treat for TB.
  - If Xpert MTB/RIF is positive and resistant to RIF: commence MDR treatment and send sputum for drug susceptibility testing to confirm MDR TB.
  - If Xpert MTB/RIF is negative and patient is HIV-infected: send sputum for culture.
  - If Xpert MTB/RIF is negative and patient is HIV negative: treat with antibiotics and consider further investigation only if symptoms persist.

Note: If the patient was recently treated for TB, the Xpert MTB/RIF test could be falsely positive. Send sputum for smear microscopy and culture instead.

» If Xpert MTB/RIF is not available, send 2 sputum specimens for smear microscopy.
  - If both smears are negative, send another sputum specimen for culture.
  - In all patients, with a history of TB, send a sputum specimen for culture and sensitivity.

GENERAL MEASURES
» Counsel patients about the disease. Explain the importance of completing treatment.
» Avoid the use of tobacco.
» Avoid excessive alcohol.
» If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have.

MEDICINE TREATMENT
Administer the total daily amount of each medicine in one dose and not as divided doses.

Important medicine interactions
Rifampicin may reduce the efficacy of low dose combined oral contraceptives,
resulting in possible unplanned pregnancies (See Chapter 7: Family planning)
» Alter the oral contraceptive to a high dose preparation for the duration of TB treatment or use an injectable contraception or IUD.
» Use additional contraception in patients using a progestin-only subdermal implant for the duration of TB therapy.
» In patients on injectable contraceptives, it is not necessary to shorten the dose interval when using rifampicin or any other enzyme inducing medicine.

Dose adjustment
Ethambutol should be given on alternative days in patients with impaired renal function (eGFR < 10 mL/min).

Adverse effects of TB medicines include:
» Nausea.
  – Taking medicines with meals can minimise nausea.
  – Hepatitis must be excluded if there is new onset nausea. Request serum alanine aminotransferase test urgently in these patients.
» Jaundice and suspected drug induced hepatitis.
  – Stop treatment and refer for management at hospital level.
» New onset skin rash.
  – Refer if suspected drug rash.
» Neuropathy.
  – Can be prevented by taking pyridoxine.
» Arthralgia.
  – Exclude gout, and treat symptomatically.

17.4.1.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN ADULTS
See Section 11.2.2: Isoniazid preventive therapy.

17.4.1.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN ADULTS
A15.0

Treatment should be given once daily **seven days per week** in both the intensive and continuation phases.

R – Rifampicin
H – Isoniazid
Z or PZA – Pyrazinamide
E or EMB – Ethambutol
17.24

Pre-treatment body weight kg

<table>
<thead>
<tr>
<th>Pre-treatment body weight kg</th>
<th>Two months initial phase</th>
<th>Four months continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RHZE (150/75/400/275)</td>
<td>RH (150/75)</td>
</tr>
<tr>
<td></td>
<td>RH (300/150)</td>
<td></td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tablets</td>
<td></td>
</tr>
<tr>
<td>≥71 kg</td>
<td>5 tablets</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>

» Keep strictly to the correct dose and the duration of treatment.
» Weigh patient frequently and adjust the dose according to current weight.

17.4.2 PULMONARY TUBERCULOSIS (TB) IN CHILDREN
A15.0

Most children acquire tuberculosis from infected adults by inhalation. Malnourished, immunosuppressed (HIV and AIDS) children and children < 5 years of age are at increased risk for pulmonary tuberculosis.

**DIAGNOSIS**
Any child presenting with symptoms and signs suggestive of pulmonary TB is regarded as a case of TB if there is:
» A chest X-ray suggestive of TB,
AND/OR
» History of exposure to an infectious TB case and/or positive tuberculin skin test (TST) e.g. Mantoux.

A positive Xpert MTB/RIF and/or smear microscopy and/or culture, on early morning gastric aspirate or induced sputum, confirms TB disease.

**Signs and symptoms include:**
» unexplained weight loss or failure to thrive,
» unexplained fever for ≥ 2 weeks,
» chronic unremitting cough for > 14 days,
» lymphadenopathy (especially cervical, often matted),
» hepatosplenomegaly,
» consolidation and pleural effusion.

**Tuberculin skin test (TST), e.g. Mantoux.**
» A positive test: TST induration > 10 mm.
» A TST may be falsely negative in the presence of:
  – malnutrition
  – immunodeficiency, e.g. HIV and AIDS
  – immunosuppression, e.g. steroid therapy, cancer chemotherapy
  – following overwhelming viral infection, e.g. measles or post vaccination

In these circumstances a TST induration > 5 mm may be regarded as positive. Frequently, the TST will be non-reactive in these cases. TB treatment should be considered, despite a negative TST.
The following may be evident on chest X-ray:
» Direct or indirect evidence of hilar or mediastinal adenopathy with or without parenchymal opacification and/or bronchopneumonia.

GENERAL MEASURES
» Identify and treat the source case.
» Screen all contacts for TB infection.
» Monitor the nutritional status of the child to assess response to treatment.

17.4.2.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN CHILDREN

Consider TB chemoprophylaxis/isoniazid preventive therapy (IPT) in all children exposed to a pulmonary TB contact.

Exclude active TB (i.e. no signs or symptoms suggestive of TB).
» Refer to Section 17.4.2: Pulmonary tuberculosis in children.
» If any signs or symptoms of pulmonary TB are present, refer for chest X-ray.
» Never give IPT to children with active TB.

TB chemoprophylaxis/ IPT is only used in:
» Children < 5 years of age.
OR
» Children of any age, who are HIV-infected.

WITH EITHER
- Close contact with an infectious pulmonary TB case. If child is re-exposed to a close contact, TB chemoprophylaxis must be repeated. (Previous IPT does not protect the child against subsequent TB exposure/ infection).
- Positive TST (only applicable on the first occasion of a positive TST).

Note: Refer contacts of MDR or XDR TB for expert advice.

MEDICINE TREATMENT
- Isoniazid, oral, 10mg/kg daily for 6 months.
  o Maximum dose: 300 mg daily.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily isoniazid (INH) 100 mg tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2–3.4 kg</td>
<td>¼ tablet</td>
</tr>
<tr>
<td>&gt;3.5–6.9 kg</td>
<td>½ tablet</td>
</tr>
<tr>
<td>&gt;7–9.9 kg</td>
<td>1 tablet</td>
</tr>
<tr>
<td>&gt;10–14.9 kg</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>&gt;15–19.9 kg</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;20–24.9 kg</td>
<td>2½ tablets</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>3 tablets</td>
</tr>
</tbody>
</table>

LoE: I

17.25
17.26

Children with HIV or malnutrition or existing neuropathy

ADD
- Pyridoxine, oral, 12.5 mg daily for duration of prophylaxis.

17.4.2.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN CHILDREN

Directly observed therapy-short-course (DOTS), and using fixed medicine combinations are recommended. Treatment should be given daily in both the intensive (initial) and the continuation phases.

### Recommended dose ranges in mg/kg

<table>
<thead>
<tr>
<th></th>
<th>Daily (mg/kg)</th>
<th>Maximum daily dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>10–15</td>
<td>300 mg</td>
</tr>
<tr>
<td>R</td>
<td>10–20</td>
<td>600 mg</td>
</tr>
<tr>
<td>Z/ PZA</td>
<td>30–40</td>
<td>2 g</td>
</tr>
<tr>
<td>E</td>
<td>15–25</td>
<td>1200 mg</td>
</tr>
</tbody>
</table>

**UNCOMPLICATED PULMONARY TB**

Includes smear negative pulmonary TB with no more than mild to moderate lymph node enlargement and/or lung field opacification, or simple pleural effusion on chest x-ray.

Children ≤ 8 years of age

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>RH</th>
<th>PZA</th>
<th>2 months intensive phase given daily</th>
<th>4 months continuation phase given daily</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>60/60 150 mg* OR 150mg/3 mL 500mg RH</td>
<td>60/60 ½ tablet 1.5 mL expert advice on dose ½ tablet</td>
</tr>
<tr>
<td>2–2.9 kg</td>
<td>½ tablet</td>
<td>1.5 mL</td>
<td>⅛ tablet</td>
<td>⅛ tablet</td>
</tr>
<tr>
<td>3–3.9 kg</td>
<td>¾ tablet</td>
<td>2.5 mL</td>
<td>⅛ tablet</td>
<td>¾ tablet</td>
</tr>
<tr>
<td>4–5.9 kg</td>
<td>1 tablet</td>
<td>3 mL</td>
<td>¼ tablet</td>
<td>1 tablet</td>
</tr>
<tr>
<td>6–7.9 kg</td>
<td>1½ tablets</td>
<td>½ tablet</td>
<td>⅛ tablet</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>8–11.9 kg</td>
<td>2 tablets</td>
<td>½ tablet</td>
<td>½ tablet</td>
<td>2 tablets</td>
</tr>
<tr>
<td>12–14.9 kg</td>
<td>3 tablets</td>
<td>1 tablet</td>
<td>1 tablet</td>
<td>3 tablets</td>
</tr>
<tr>
<td>15–19.9 kg</td>
<td>3½ tablets</td>
<td>1 tablet</td>
<td>3½ tablets</td>
<td></td>
</tr>
<tr>
<td>20–24.9 kg</td>
<td>4½ tablets</td>
<td>1½ tablet</td>
<td>4½ tablets</td>
<td></td>
</tr>
<tr>
<td>25–29.9 kg</td>
<td>5 tablets</td>
<td>2 tablets</td>
<td>5 tablets</td>
<td></td>
</tr>
</tbody>
</table>

* For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3 mL)

**Note:** Give PZA 150 mg or 500 mg, and not both.
AND

- Pyridoxine, oral, 12.5 mg daily for 6 months if HIV-infected, malnourished or have existing neuropathy.

Children > 8 years and adolescents

<table>
<thead>
<tr>
<th>Pre-treatment body weight kg</th>
<th>2 months intensive phase given daily</th>
<th>4 months continuation phase given daily</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RHZE (150,75,400,275)</td>
<td>RH (150,75)</td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;71 kg</td>
<td>5 tablets</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>

AND

If HIV-infected, malnourished or have existing neuropathy:
- Pyridoxine, oral, 12.5 mg daily for 6 months.
  » Adjust treatment dosages to current body weight.
  » If calculating dosages, rather give ½ tablet more than ½ tablet less.

COMPLICATED PULMONARY TB

- Includes all other forms of pulmonary TB, such as smear positive TB, cavitating pulmonary TB, bronchopneumonic TB, large lesion pulmonary TB, tuberculous empyema.
  » Refer all cases of miliary TB for exclusion of TB meningitis.

Children ≤ 8 years of age

Intensive phase:
- Standard dose 4-drug therapy daily (RHZE) for 2 months.
**THEN**  
Continuation phase:

» Standard dose 2-drug therapy daily (INH+rifampicin) for 4–7 months.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>RH</th>
<th>PZA</th>
<th>EMB</th>
<th>RH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>60/60</strong></td>
<td>150 mg**</td>
<td>500mg</td>
<td>400 mg tablet OR 400 mg/8 mL* solution</td>
<td>60/60</td>
</tr>
<tr>
<td>2–2.9 kg</td>
<td>½ tablet</td>
<td>1.5 mL</td>
<td>Expert advice on dose</td>
<td>1 mL</td>
</tr>
<tr>
<td>3–3.9 kg</td>
<td>⅔ tablet</td>
<td>2.5 mL</td>
<td>¼ tablet</td>
<td>1.5 mL</td>
</tr>
<tr>
<td>4–5.9 kg</td>
<td>1 tablet</td>
<td>3 mL</td>
<td>¼ tablet</td>
<td>2 mL</td>
</tr>
<tr>
<td>6–7.9 kg</td>
<td>1½ tablet</td>
<td>½ tablet</td>
<td>3 mL</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>8–11.9 kg</td>
<td>2 tablets</td>
<td>½ tablet</td>
<td>½ tablet</td>
<td>2 tablets</td>
</tr>
<tr>
<td>12–14.9 kg</td>
<td>3 tablets</td>
<td>1 tablet</td>
<td>¾ tablet</td>
<td>3 tablets</td>
</tr>
<tr>
<td>15–19.9 kg</td>
<td>3½ tablets</td>
<td>1 tablet</td>
<td>1 tablet</td>
<td>3½ tablets</td>
</tr>
<tr>
<td>20–24.9 kg</td>
<td>4½ tablets</td>
<td>1½ tablet</td>
<td>1 tablet</td>
<td>4½ tablets</td>
</tr>
<tr>
<td>25–29.9 kg</td>
<td>5 tablets</td>
<td>2 tablets</td>
<td>1½ tablets</td>
<td>5 tablets</td>
</tr>
</tbody>
</table>

*EMB: For each dose, crush 400 mg (1 tablet) to a fine powder and dissolve in 8 mL of water to prepare a concentration of 400mg/8mL. Discard unused solution.

**PZA: For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3mL)

**Note:** Give PZA 150 mg or 500 mg, and not both.

***Continuation phase may be prolonged to 7 months in slow responders and children with HIV.

**AND**

If HIV-infected, malnourished or have existing neuropathy:
- Pyridoxine, oral, 12.5 mg daily for 6–9 months.

Children > 8 years and adolescents

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>2 months intensive phase given daily</th>
<th>4 months continuation phase given daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHZE (150/75/400/275) mg</td>
<td>RH (150/75) mg</td>
<td>RH (300/150) mg</td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;71 kg</td>
<td>5 tablets</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>
AND
If HIV-infected, malnourished or have existing neuropathy:
• Pyridoxine, oral, 12.5 mg daily for 6–9 months.
  » Weigh at each visit and adjust treatment dosages to body weight. If calculating dosages, rather give ½ tablet more than ½ tablet less.
  » Keep strictly to the correct dose and the duration of treatment.
  » The patient should be weighed regularly and the dose adjusted according to the current weight.

REFERRAL
» Disseminated forms of TB.
» All patients who cannot be managed on an ambulatory basis.
» Children < 12 years of age for a chest X-ray for diagnostic purposes.
» Retreatment cases of children.
» Children who are contacts of patients with open MDR or XDR TB.

17.4.3 TB, HIV AND AIDS
A15.0, B20
HIV and AIDS patients with suspected TB should have one negative sputum TB DNA PCR test (Xpert MTB/RIF) or two negative sputum smears, before sputum is sent for culture.

Standard treatment regimens are also effective in patients with HIV and AIDS. Advise HIV and AIDS patients to present to a clinic if they develop common TB symptoms:
» active cough (any duration)
» fever
» night sweats
» loss of weight

HIV-infected patients with TB should be treated according to the standard TB treatment protocol.

Medicine interactions may occur with ART. (See Sections 11.1: Antiretroviral therapy, adults; 11.7: Opportunistic infections, treatment in children and 11.8.7: Tuberculosis).

17.4.4 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB)
U50.0

DESCRIPTION
MDR TB is diagnosed when there is resistance to rifampicin and isoniazid.
XDR TB is diagnosed when there is resistance to rifampicin and isoniazid plus resistance to fluoroquinolones and an injectable medicine e.g. kanamycin.
17.4.4.1 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB, IN ADULTS)

GENERAL MEASURES
Counsel and educate patients about the disease and its treatment, including treatment duration. Screen all close contacts for signs and symptoms of MDR TB and by sputum sampling to detect early disease. Infection control and cough etiquette is important to limit spread.

MONITORING
Monitor adherence and check for adverse drug reactions at every visit.
» Monitor patients as follows every month:
  — sputum microscopy and culture,
  — weight and vital signs,
  — vision test,
  — urea and electrolytes (while on injectable phase only), and
  — audiometry (while on injectable phase only).

MEDICINE TREATMENT
All patients with MDR TB require prolonged treatment, usually for at least 18 months after sputum culture conversion. The treatment of MDR TB should be co-ordinated and monitored by the provincial DR-TB units.

Standardised regimen for treatment of MDR TB in South Africa.
Intensive phase:
» At least 6 months, guided by TB culture conversion.

<table>
<thead>
<tr>
<th></th>
<th>&lt;33kg</th>
<th>33–50 kg</th>
<th>51–70 kg</th>
<th>&gt;70 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanamycin*</td>
<td>15mg/kg</td>
<td>15 mg/kg</td>
<td>15 mg/kg (max: 1 g)</td>
<td>1g</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>400 mg</td>
<td>400 mg</td>
<td>400 mg</td>
<td>400 mg</td>
</tr>
<tr>
<td>Ethionamide</td>
<td>15–20 mg/kg</td>
<td>500 mg</td>
<td>750 mg</td>
<td>750 mg–1 g</td>
</tr>
<tr>
<td>Terizidone</td>
<td>15–20 mg/kg</td>
<td>750 mg</td>
<td>750 mg</td>
<td>750 mg–1 g</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td>30–40 mg/kg</td>
<td>1 g–1750 mg</td>
<td>1750 mg–2 g</td>
<td>2 g–2 500 mg</td>
</tr>
</tbody>
</table>

*Consider capreomycin in patients with renal insufficiency, hearing loss, or peripheral neuropathy.

Continuation phase:
» At least 18 months after TB culture conversion.

<table>
<thead>
<tr>
<th></th>
<th>&lt;33kg</th>
<th>33–50 kg</th>
<th>51–70 kg</th>
<th>&gt;70 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxifloxacin</td>
<td>400 mg</td>
<td>400 mg</td>
<td>400 mg</td>
<td>400 mg</td>
</tr>
<tr>
<td>Ethionamide</td>
<td>15–20 mg/kg</td>
<td>500 mg</td>
<td>750 mg</td>
<td>750 mg–1 g</td>
</tr>
<tr>
<td>Terizidone</td>
<td>15–20 mg/kg</td>
<td>750 mg</td>
<td>750 mg</td>
<td>750 mg–1 g</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td>30–40 mg/kg</td>
<td>1 g–1750 mg</td>
<td>1750 mg–2 g</td>
<td>2 g–2 500 mg</td>
</tr>
</tbody>
</table>
CHAPTER 17 RESPIRATORY CONDITIONS

Note: Give family planning to all women of childbearing potential as the medicines are teratogenic. In pregnant women, the benefits of MDR management outweigh the teratogenicity risks.

REFERRAL
» All MDR patients who require hospitalisation.
» All XDR patients.
» Patients with impaired renal function.
» If medication is not tolerated, consult with MDR TB units.
» All children diagnosed with TB, who are close contacts of MDR TB patients should be referred to exclude MDR TB.
» All pregnant women with MDR TB.
» Patients with impaired hearing loss at baseline.

17.4.4.2 MULTIDRUG-RESISTANT TUBERCULOSIS (MDR TB), IN CHILDREN

GENERAL MEASURES
Suspect DR-TB when any of the features listed below is present:
» A known source case (or contact) with drug resistant TB or high-risk source case, e.g. on TB therapy who was recently released from prison.
» A smear positive case after 2 months of TB treatment who failed (or deteriorated on) 1st line antituberculosis treatment to which they were adherent (treatment failure or relapse within 6 months of treatment).
» Any severely ill child with TB who failed or got worse on TB treatment.
» Patients who defaulted TB treatment (> 2 months).
» Treatment interruptions (< 1 month) or who relapsed while on TB treatment or at the end of treatment.
» With recurrent TB disease after completion of TB treatment (retreatment case).

Manage confirmed DR-TB in a dedicated MDR-TB centre with appropriate infection control measures to prevent nosocomial transmission. Initiate treatment in consultation with a designated expert while awaiting referral to the designated MDR-TB centre. An uninterrupted medicine supply, direct supervision with proper education and counselling is necessary.

REFERRAL
All children.

LoE:III

CHAPTER 17

RESPIRATORY CONDITIONS


Chapter 18: Eye conditions

18.1 Conjunctivitis
   18.1.1 Conjunctivitis, allergic
   18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)
   18.1.3 Conjunctivitis of the newborn
   18.1.4 Conjunctivitis, viral (pink eye)

18.2 Eye injuries
   18.2.1 Eye injury, chemical burn
   18.2.2 Eye injury (blunt or penetrating)

18.3 Glaucoma, acute and closed angle

18.4 Painful red eye

18.5 Structural anomalies of the eye

18.6 Visual problems
18.1 CONJUNCTIVITIS
H10.9

An inflammatory condition of the conjunctiva, possibly caused by:
» allergies
» bacterial or viral (pink eye) infections

18.1.1 CONJUNCTIVITIS, ALLERGIC
H10.1

DESCRIPTION
An inflammatory condition of the conjunctivae caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. Often associated with allergic rhinitis or hay fever. Common features include:
» itching, watery eyes and photophobia
» slightly red or normal conjunctiva
» conjunctival swelling in severe cases
» normal cornea, iris and pupil
» normal visual acuity

In chronic cases, there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae (vernal conjunctivitis).

GENERAL MEASURES
Relieve symptoms with cold compresses, i.e. a clean moistened cloth over the eyes for 10 minutes.

MEDICINE TREATMENT
Adults and children > 6 years of age
• Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

If no response within 7 days:
• Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  o Use may be seasonal (1–3 months) or long term.

Children: 2–6 years of age
• Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

If no response within 7 days:
• Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  o Use may be seasonal (1–3 months) or long term.

Persistent allergic conjunctivitis in adults and children >2 years:
For long term use:
Children: 2–6 years of age
• Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.
  o Use may be seasonal (1–3 months) or long term.
Children > 6 years of age and adults
- Cetirizine, oral, 10 mg once daily.
  - Use may be seasonal (1–3 months) or long term.

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

**REFERRAL**
- No response to treatment.
- Persons wearing contact lenses.
- Children < 2 years of age.

**18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)**

**DESCRIPTION**
An inflammatory purulent condition of the conjunctivae caused by bacterial infection and characterised by:
- sore, gritty or scratchy eyes and swollen lids
- mucopurulent discharge from one or both eyes
- redness especially of conjunctival angles (fornices)

**GENERAL MEASURES**
- Educate patient on personal hygiene to avoid spread e.g. do not use the same face-cloth or towels as others.
- Educate patient on correct application of ophthalmic ointment.
- Advise patient:
  - to wash hands thoroughly before applying ophthalmic ointment
  - not to share ophthalmic ointments or drops
  - not to rub eyes
  - never to use urine or milk to wash the eyes

**MEDICINE TREATMENT**
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

**Pain:**
- **Children**
  - Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7
- **Adults**
  - Paracetamol, oral, 1 g 6 hourly when required.

**REFERRAL**
- No response after 5 days.
» All cases of unilateral conjunctivitis, as this may be caused by a foreign body.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

DESCRIPTION
Inflammation of the conjunctiva in the neonatal period, presenting with a picture that may range from mildly sticky eyes to an abundant purulent discharge and eyelid oedema.
Common infectious agents include N. gonorrhoeae, S. aureus, and Chlamydia.

Generally, conjunctivitis of the newborn is either mild (small amount of sticky exudates) or severe (profuse pus and swollen eyelids).
The latter is often N. gonorrhoeae and threatens damage to the cornea, while the former is often S. aureus or undefined.

CAUTION
Treat conjunctivitis with abundant pus immediately to prevent damage to the cornea that may lead to blindness.
This is often caused by gonorrhoeae.
Treat parents of a neonate with purulent discharge, appropriately.

GENERAL MEASURES
» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab, taking care not to touch or injure the eye.

MEDICINE TREATMENT
Prevention
Routine administration for every newborn baby:
• Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth.

Treatment
Sticky eye(s) without purulent discharge:
• Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Purulent discharge
Mild discharge without swollen eyelids and no corneal haziness:
• Sodium chloride 0.9%, eye washes, immediately then 2–3 hourly, until discharge clears.
AND

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

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following injections mixed with water for injection (WFI):</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2–2.5 kg</td>
<td>100 mg</td>
<td>250 mg/2 mL (250 mg diluted in 2 mL WFI)</td>
<td>&gt;34–36 weeks</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>150 mg</td>
<td>500 mg/2 mL (500 mg diluted in 2 mL WFI)</td>
<td>&gt;36 weeks–1 month</td>
</tr>
<tr>
<td>&gt;3.5–5.5 kg</td>
<td>200 mg</td>
<td>&gt;1–3 months</td>
<td></td>
</tr>
</tbody>
</table>

Review daily.

**Abundant purulent discharge and/or swollen eyelids and/or corneal haziness:**

- Sodium chloride 0.9%, eye washes, immediately then hourly until referral.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose, and refer.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following injections mixed with water for injection (WFI):</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2–2.5 kg</td>
<td>100 mg</td>
<td>250 mg/2 mL (250 mg diluted in 2 mL WFI)</td>
<td>&gt;34–36 weeks</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>150 mg</td>
<td>500 mg/2 mL (500 mg diluted in 2 mL WFI)</td>
<td>&gt;36 weeks–1 month</td>
</tr>
<tr>
<td>&gt;3.5–5.5 kg</td>
<td>200 mg</td>
<td>&gt;1–3 months</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN**

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given.

After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.

Annotate the dosage and route of administration in the referral letter.

Treat both parents of newborns who develop purulent conjunctivitis after 24 hours of birth for *N. gonorrhoeae* and *Chlamydia*.

Parents:

- Ceftriaxone, IM, 250 mg as a single dose.
For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND
• Azithromycin, oral, 1 g as a single dose.

REFERRAL
Urgent
» All neonates with abundant purulent discharge and/or swollen eyelids and/or corneal haziness.
» Neonate unresponsive to treatment within 2 days.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)
B30.9

DESCRIPTION
A highly contagious, viral infection, which is spread by contact with:
» hands
» face cloths
» towels
It may start in one eye, spreading to the other. More commonly both eyes are infected.

Common symptoms include:
» sore eyes, feeling of itching or burning, often described as being painful
» photophobia
» watery discharge (a yellow discharge indicates a secondary bacterial infection)
» diffuse pink or red conjunctivae, which may become haemorrhagic
» enlarged pre-auricular lymph node
The cornea, iris and pupil are completely normal with normal visual acuity.

GENERAL MEASURES
» Advise on correct cleansing or rinsing of eyes with clean water.
» Cold compresses for symptomatic relief.

MEDICINE TREATMENT
Children > 6 years of age and adults
• Oxymetazoline 0.025%, eye drops, instil 1–2 drops 6 hourly for a maximum of 7 days.

Pain:
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g, 6 hourly when required.

REFERRAL
» No response after 5 days.
» A unilateral red eye for more than one day.
Suspected herpes conjunctivitis.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.2 EYE INJURIES

18.2.1 EYE INJURY, CHEMICAL BURN

This is a medical emergency.

DESCRIPTION
Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid.

Presents with:
» pain
» inability to open eye

blurred vision
excessive teary and watery eye

GENERAL MEASURES
» Irrigate or wash the eye immediately and continuously with clean water or sodium chloride 0.9% for at least 20 minutes.
» In severe alkaline burn cases, irrigation should be prolonged further.

MEDICINE TREATMENT

Local anaesthetic if needed:
• Tetracaine 1% eye drops, instil 1 drop in the affected eye(s).
  o Repeat irrigation of the eye.
  o Evert upper eyelid and remove debris with cotton bud.
  o Never give anaesthetic drops to the patient to take home as they can cause blindness if used too often.

• Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly.

Pain:
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
All cases within 12 hours.
18.2.2 EYE INJURY (BLUNT OR PENETRATING)
S05.9/S05.5

DESCRIPTION
Eye injury may be associated with a foreign body, which may cause:
» corneal abrasion or perforation
» disturbance of vision
» complaints of foreign body in the eye that may not be visible
» pain

GENERAL MEASURES
» Establish the cause, to determine likelihood of penetrating trauma.
» If no penetrating injury, irrigate eye with clean water or sodium chloride 0.9%.
» Remove any foreign body if visible on sclera or conjunctivae with cotton 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.
» Cover injured eye with eye pad, provided there is no pressure on the eye.
» Consider X-ray of orbit to exclude intra-ocular metallic foreign body.

MEDICINE TREATMENT
Deep corneal or scleral injuries:
Cover with an eye shield and refer immediately.

If immediate referral is not possible, while awaiting transfer:
• Atropine, 1%, drops, instilled immediately.
• Chloramphenicol 1%, ophthalmic ointment applied immediately.

Pain:
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required

CAUTION
Review the problem daily.
Do not use an eye pad if there is ecchymosis, lid oedema or bleeding.

REFERRAL
Immediately:
» If the foreign body cannot be removed or an intraocular foreign body is suspected.
» Laceration, perforation or diffuse damage to the cornea or sclera.
» Damage to other structures of the eye, including the eyelid edge.
» Visual abnormalities or limitation of movement of the eye.
18.3 GLAUCOMA, ACUTE AND CLOSED ANGLE

H40.9

DESCRIPTION
Acute closed angle glaucoma is damage to the optic nerve caused by raised intra-ocular pressure. This may result in loss of vision usually in one eye.

Clinical features:
» pupil is moderately dilated and may be oval in shape
» corneal haziness
» pericorneal conjunctival inflammation
» sudden onset of extremely severe, bursting pain and eye redness
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. in a cinema
» coloured haloes around lights (bright rings)
» eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
» severe pain in eye (acute)
» nausea and vomiting in severe cases

Note: The more common chronic open angle glaucoma is usually without symptoms.

Emergency drug treatment before referral (Doctor prescribed)
• Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly until referred.

REFERRAL
Urgent
All patients to an ophthalmologist within 12 hours.

18.4 PAINFUL RED EYE

H57.1

DESCRIPTION
Pain and redness in one eye only, indicates inflammation of the anterior structures of the eye.

Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain).

Consider acute closed angle glaucoma and manage appropriately. See Section 18.3: Glaucoma, acute and closed angle.

REFERRAL
Urgent within 12–24 hours:
» All patients (excluding those with conjunctivitis):
  – Single painful red eye.
  – Corneal ulceration including herpes infection.
  – Sudden loss or change in vision, including blurred or reduced vision.
18.10 Sudden onset of visual problems, associated with dizziness, weakness on either one or both sides, difficulty speaking or swallowing (possible stroke; see Section 15.1: Stroke).
- Foreign body associated with welding or grinding.
- Chemical burn (see Section 18.2.1: Eye injury, chemical burn).
- Whole eyelid swollen, red and painful (consider orbital cellulitis).
- Coloured haloes around light, dilated oval pupil, headache, nausea, vomiting (possible glaucoma; see Section 18.3: Glaucoma, acute and closed angle).

18.5 STRUCTURAL ABNORMALITIES OF THE EYE
Q10

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, damage to the eye or optic nerve. This may be an indication of underlying disease such as diabetes or hypertension.

Assessment
Look for abnormalities of the eye.
Determine visual acuity accurately in both eyes by Snellen chart.
If vision is diminished (less than 6/12) perform the following tests:

» Pin hole test
  - Make a hole of about 1 mm wide in a piece of dark/black paper– you can push a hole in paper or card with a pen tip.
  - Ask the patient to look through this hole at the Snellen chart.
  - If vision improves, this means that the patient has a refractive error.

» Red reflex test
  The patient looks past the examiner’s head focussing on a distant target.
  - With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
  - The examiner stands about 60 cm away from the patient.
In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex.

If there is a history of trauma or diabetes the absence of a red reflex is probably due to:
- retinal detachment
- a vitreous or internal haemorrhage
- mature cataract

If there are cataracts one usually sees:
- black shadows against the red reflex in immature cataracts, or
- absence of red reflex in mature cataracts.

In a patient > 50 years of age with no history of trauma, diabetes or previous eye disease, an absent red reflex is oftendue to cataract formation, especially with decreased visual acuity.

**Note:** Associated diabetes or hypertension should be adequately managed with referral, as surgery can only be considered with appropriately managed disease.

**REFERRAL**

**Urgent: within 12–24 hours**
- Sudden visual loss in one or both eyes.
- Pain or redness in one eye only especially with visual and pupil abnormalities.
- Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos/glaucoma) in children.
- Hazy cornea in children.
- Unilateral watery eye

**Within days**
- Squint of recent onset.
- Suspected or previously diagnosed glaucoma.
- Double vision following recent injury might indicate orbital fracture.
- Leucokoria (white reflex from the pupil).
- Squint at any age if not previously investigated by ophthalmologist.
- Visual loss in patients with systemic disease such as diabetes.

**Non-urgent referral**
- Cataracts.
- Refractive errors.
- Long-standing blindness – first visit to health facility.

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Oxymetazoline: Allergan Pharmaceuticals Ireland_Oxylin® PSUR SPC, March 2010


Oxymetazoline: Allergan Pharmaceuticals Ireland_Oxylin® PSUR SPC, March 2010

Chapter 19: Ear, nose and throat conditions

19.1 Allergic rhinitis
19.2 Viral rhinitis (Common cold)
19.3 Epistaxis
19.4 Otitis
  19.4.1 Otitis externa
  19.4.2 Otitis media, acute
  19.4.3 Otitis media, chronic, suppurative
19.5 Sinusitis, acute, bacterial
19.6 Tonsillitis and pharyngitis
19.1 ALLERGIC RHINITIS

DESCRIPTION
Inflammation of the mucous membranes of the nose and paranasal sinuses in response to an allergen e.g. pollen, house dust, grasses and animal hair. Allergic rhinitis is characterised by recurrent episodes of:
» blocked stuffy nose
» watery nasal discharge
» frequent sneezing, often accompanied by nasal itching and irritation
» conjunctival itching and watering
» oedematous palenusal 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.

MEDICINE TREATMENT
- Corticosteroid, e.g.:
  - Budesonide, aqueous nasal solution, 1 spray of 100 mcg in each nostril 12 hourly. 
    - Aim the nozzle laterally and upwards (aim for the eye) and not to the back of the throat.
    - Do not sniff vigorously.
    - Review 3 monthly.

For short term symptomatic use:
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

For relief of nocturnal nasal blockage:
Topical nasal decongestant e.g.:
- Oxymetazoline 0.05%, intranasal, administered at night for a maximum of 5 days.

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy.

For long-term use in adults and school going children
Children: 2–6 years of age
- Cetirizine, oral, 5 mg once daily. See dosing table, pg 22.2.

Children > 6 years of age and adults
- Cetirizine, oral, 10 mg once daily.
CHAPTER 19
EAR, NOSE AND THROAT CONDITIONS

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

REFERRAL
» Chronic persistent symptoms.
» Severe symptoms.

19.2 VIRAL RHINITIS (COMMON COLD)
J11.1

DESCRIPTION
Colds are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days. Colds present with nasal stuffiness and throat irritation. Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION
Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» otitis media
» sinusitis

GENERAL MEASURES
» Limit strenuous activity.
» Ensure adequate hydration.
» Advise patient to return to clinic if ear ache, tenderness or pain over sinuses develops or symptoms persist for > 14 days.

MEDICINE TREATMENT
Antibiotics are of no value for the treatment of the common cold and influenza.

Infants
• Sodium chloride 0.9%, instilled into each nostril.

Pain and fever with distress:
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL
Severe complications.
19.3 EPISTAXIS
(See Chapter 21.15: Trauma and emergencies)

19.4 OTITIS

19.4.1 OTITIS EXTERNA
H60.9

DESCRIPTION
Inflammation of the external ear may be one of the following:
» Diffuse: An infection of the ear canal, often due to Gram negative bacilli
  (especially \textit{P. aeruginosa}). Pain is increased when chewing and the lining of
  the canal may be either inflamed or swollen with dry or moist debris or even a white
  or clear discharge.
» Furuncular: Usually caused by \textit{Staphylococcus aureus}. A painful localized
  swelling present at the entrance to the ear canal. May be precipitated by trauma
  caused by scratching, e.g. matchsticks, ear buds.

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 (dry mopping).
» Do not leave pieces of cotton wool, etc. in the ear.
» Do not instil anything into the ear unless prescribed.

MEDICINE TREATMENT
Diffuse
» Does not usually require an antibiotic.
» Make a wick where possible, using ribbon gauze or other suitable absorbent
  cloth, e.g. paper towel to clean and dry the ear.
» Acetic acid 2\% in alcohol, topical, instilled into the ear every 6 hours for 5 days.
  o Instill 3–4 drops after cleaning and drying the ear.

Furuncular
Children
• Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.2.
  OR
  Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children > 7 years of age and adults
• Cephalexin, oral, 500 mg 6 hourly for 5 days.
  OR
  Flucloxacillin, oral, 500 mg 6 hourly for 5 days.
Penicillin allergy:
Children
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

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

REFERRAL
No response to treatment.

19.4.2 OTITIS MEDIA, ACUTE
H66.9

DESCRIPTION
Inflammation of the middle ear characterised by:
- pain
- drum perforation
- loss of hearing
- fever in about half of the cases
- red bulging eardrum
- loss of the normal light reflex of the eardrum

Mild redness of the eardrum and rubbing the ear are not reliable signs.

GENERAL MEASURES
- Do not instil anything into the ear.
- Avoid getting the inside of the ear wet (dry mopping).
- Do not plug the ear with cotton wool, etc.
- Exclude HIV infection as a contributing factor for recurrent ear infection.

MEDICINE TREATMENT
Children ≤ 3 years of age
- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Syrup mg/ 5mL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>125</td>
</tr>
<tr>
<td>&gt;2–2.5 kg</td>
<td>100</td>
<td>4 mL</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>125</td>
<td>5 mL</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>175</td>
<td>7 mL</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>250</td>
<td>10 mL</td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>375</td>
<td>15 mL</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>500</td>
<td>–</td>
</tr>
</tbody>
</table>

Age Months/years
- 34–36 weeks
- Birth–1 month
- >1–3 months
- >3–6 months
- >6–18 months
- >18 months–3 years
CHAPTER 19 

CHILDREN > 3 YEARS OF AGE

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

ADULTS

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

PENICILLIN ALLERGY:

CHILDREN

- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

CHILDREN: 18–35 KG (ABLE TO TAKE TABLETS)

- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

CHILDREN > 35 KG AND ADULTS

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

PAIN:

CHILDREN

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

ADULTS

- Paracetamol, oral, 1 g 6 hourly when required.

REFERRAL

- Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
- Recurrent otitis media.
- Painful swelling behind the ear or tenderness on percussion of the mastoid.
- Suspected meningitis.

19.4.3 OTITIS MEDIA, CHRONIC, SUPPURATIVE

DESCRIPTION

A purulent discharge from the ear for > 2 weeks. If the eardrum has been ruptured for ≥ 2 weeks, a secondary infection with multiple organisms usually occurs. Oral antibiotic treatment is generally ineffective.

TB is an important cause of a chronically discharging ear in South Africa.

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.
- HIV status should be established in chronic otitis media.

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.
» Consider TB as a cause.

REFERRAL
» All sick children, vomiting, drowsy, etc.
» Painful swelling behind the ear.
» Ear discharge still present for ≥ 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.

19.5 SINUSITIS, ACUTE, BACTERIAL
J01.9

DESCRIPTION
Bacterial infection of one or more paranasal sinuses that occurs most often after a viral nasal infection or allergic rhinitis.
Bacterial sinusitis is characterised by:
» Deterioration of a common cold after 5–7 days.
» Purulent nasal discharge, especially if unilateral.
» Pain and tenderness over one or more sinuses.
» Nasal obstruction.
» Occasional fever.
Note: Sinusitis is uncommon in children < 5 years of age, as sinuses are not fully developed.

GENERAL MEASURES
Consider HIV in recurrent sinusitis.
MEDICINE TREATMENT

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Syrup mg/5mL Capsule mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>125 250 250 500</td>
<td></td>
</tr>
<tr>
<td>&gt;2–2.5 kg</td>
<td>100</td>
<td>4 mL 2 mL – –</td>
<td>34–36 weeks</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>125</td>
<td>5 mL 2.5 mL – –</td>
<td>Birth–1 month</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>175</td>
<td>7 mL 3.5 mL – –</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>250</td>
<td>10 mL 5 mL – –</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>375</td>
<td>15 mL 7.5 mL – –</td>
<td>&gt;6–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>500</td>
<td>– 10 mL 2 1</td>
<td>&gt;18 months–3 years</td>
</tr>
</tbody>
</table>

Children > 3 years of age

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

Adults

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

Penicillin allergy

Children

- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

Children: 18–35 kg (able to take tablets)

- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily for 3 days.

Children > 35 kg and adults

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

AND

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not > 5 days continuously.
  - Children: 0.025%
  - Adults: 0.05%

AND/OR

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.
CHAPTER 19  EAR, NOSE AND THROAT CONDITIONS

REFERRAL
» Fever lasting > 48 hours.
» Poor response > 5 days.
» Complications, e.g. periorbital cellulitis with periorbital swelling.
» Oedema over a sinus.
» Recurrent sinusitis.
» Meningeal irritation.

19.6 TONSILLITIS AND PHARYNGITIS
J03

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 (3–21 years of age) unless one of the following features of viral infection is present (do not give antibiotics if these are present):
» runny nose
» cough
» characteristic viral rash
Note: A scarlatiniform (i.e. rough, diffuse, papular) rash suggests streptococcal infection and should be treated with antibiotics.

GENERAL MEASURES
» Homemade salt mouthwash, gargle for 1 minute twice daily:
  – 2.5 mL (½ medicine measure) of table salt in 200 mL lukewarm water.
  – Do not give to children unable to gargle.
» Advise adequate hydration.
» Avoid irritants e.g. vaporubs inserted into nostrils.

MEDICINE TREATMENT
- Benzathine benzylpenicillin, IM, single dose.
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without epinephrine (adrenaline).
OR
Children: 18 months–11 years of age
Phenoxythemethylpenicillin, oral, 250 mg 12 hourly for 10 days.
Children > 11 years of age and adults
Phenoxythemethylpenicillin, oral, 500 mg 12 hourly for 10 days.
**Penicillin allergy:**

**Children > 3 years of age**

- Macrolide, e.g.:
  - Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 10 days. See dosing table, pg 22.4.

**Children: 18–35 kg (able to take tablets)**

- Macrolide, e.g.:
  - Azithromycin, oral, 250 mg daily for 3 days.

**Children > 35 kg and adults**

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

**Pain:**

**Children**

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.6.

**Adults**

- Paracetamol, oral, 1 g 6 hourly when required.

**For children < 6 years of age**

- Soothe the throat, relieve the cough with a safe remedy:
  - Breastmilk. If not exclusively breastfed, give warm water or weak tea: add sugar or honey and lemon if available.

**REFERRAL**

- Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
- Tonsilitis accompanied by difficulty in opening the mouth (trismus).
- Recurrent tonsillitis (≥ 6 documented episodes/year) for possible tonsillectomy.
- Suspected acute rheumatic fever.
- Suspected acute glomerulonephritis.
- Heart murmurs not previously diagnosed.

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Chapter 20: Pain

20.1 Pain control
20.2 Chronic non-cancer pain
20.3 Chronic cancer pain
20.1 PAIN CONTROL

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. Active pain assessment and self-report is the key to effective pain management. Different pain assessment scales should be used for different ages and intellectual categories of patients.

FLACC SCALE:
For babies and intellectually impaired children the FLACC (face, legs, activity, cry, consolability) scale is easy to use. For use in children < 3 years of age, or older non-verbal children. A score of ≥ 4 needs active pain management. Evaluate each item and arrive at a total score/10.

<table>
<thead>
<tr>
<th>Item</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>No particular expression or smile</td>
<td>Occasional grimace or frown, withdrawn disinterested</td>
<td>Frequent to constant frown, clenched jaw, quivering chin</td>
</tr>
<tr>
<td>Legs</td>
<td>Normal position or relaxed</td>
<td>Uneasy, restless, tense</td>
<td>Kicking, or legs drawn up</td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, normal position, moves easily</td>
<td>Squirming, shifting back and forth, tense</td>
<td>Arched, rigid or jerking</td>
</tr>
<tr>
<td>Cry</td>
<td>No cry (awake or asleep)</td>
<td>Moans or whimpers, occasional complaint</td>
<td>Crying steadily, screams or sobs, frequent complaints</td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed, no need to console</td>
<td>Reassured by occasional touching, hugging or “talking to”, distractible</td>
<td>Difficult to console or comfort</td>
</tr>
</tbody>
</table>

REVISED FACES PAIN SCALE
» Use in children >4 years of age.
» Ask them to point to the face that best depicts their level of pain.

Pain should be assessed by:
» duration
» severity, e.g. does the patient wake up because of the pain
» site
CHAPTER 20

20.3

» character, e.g. stabbing, throbbing, crushing, cramp like
» persistent or intermittent
» relieving or aggravating factors
» accompanying symptoms e.g. nausea and vomiting, visual disturbances
» distribution of pain
» referred pain

GENERAL MEASURES
» Patient counselling.
» Lifestyle adjustment.

MEDICINE TREATMENT

Mild pain:
Non-opioid treatment.

Non-inflammatory or post trauma:

Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
• Paracetamol, oral, 1 g, 6 hourly when required.

Pain associated with trauma or inflammation:

Adults

• NSAIDs,
• e.g. 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 2 or 3 doses, combine paracetamol and ibuprofen at the above dosages.

Moderate pain:
If no relief to paracetamol:

ADD

Children
• NSAIDs, e.g.:
• Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food. See dosing table, pg 22.5.
  o Discontinue if not effective after 2–3 days.

If no response to paracetamol or ibuprofen, refer.

Adults
• NSAIDs, e.g.:
• 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.
Discontinue if not effective after 2–3 days.

If still no relief to simple analgesics (paracetamol or ibuprofen):

**ADD**
- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose. (Doctor initiated)
  - May be increased to a maximum of 400 mg daily.

**Acute severe pain:**

**Children**
Refer.

**Adults**
If no response to therapy options for moderate pain, initiate one of the following:
- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor initiated).
  - May be increased to a maximum of 400 mg daily.

**AND**
- Paracetamol, oral, 1 g, 6 hourly when required.
**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).
  - Dilute in 10 mL water for injection or sodium chloride 0.9%.
  - Administer slowly over 4–5 minutes. A dose of 5 mg may provide adequate pain relief in smaller patients.
  - 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. See Section 21.8: 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

» 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:

**Adults**
- Morphine, IV, 10–15 mg 4–6 hours as required (Doctor initiated).
Dilute IV morphine to 10 mL with water for injection or sodium chloride 0.9%.
- Start with 2-5 mg, thereafter slowly increase by 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 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

DESCRIPTION
Pain that is present for more than 4–6 weeks.
It can arise from:
- tissue damage (nociceptive pain), e.g. arthritis, fibromyalgia, 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/somatoform pain disorders.

GENERAL MEASURES
- Lifestyle adjustments.
- Occupational therapy and physiotherapy as appropriate.
- Address psycho-social problems e.g. stress, anxiety, sleep disturbances.

MEDICINE TREATMENT
The principles are the same as with cancer pain relief. Analgesics should be given by mouth, regularly, in a stepwise manner to ensure adequate relief. Neuropathic pain is best treated with analgesics in addition to tricyclic antidepressants.
It is useful to combine different classes of analgesics for the additive effects, depending on pain severity.

Mild pain:
Adults
- Paracetamol, oral, 1 g, 6 hourly when required.
Pain associated with trauma or inflammation:

**Adults**
- **NSAIDs**, e.g.:
  - Ibuprofen, oral, 400–800 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 (paracetamol and/or ibuprofen), 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**

**DESCRIPTION**
Cancer pain is usually persistent and progressive. Pain assessment requires training in:
- psycho-social assessment
- assessment of need of type and dose of analgesics
- pain severity assessment
Pain severity and not the presence of pain determine the need for treatment. Medicinal treatment for pain should never be withheld.
Pain is what the patient says it is.
Under-recognition of pain and under-dosing with analgesics is common in chronic cancer pain. Analgesics should be given regularly rather than only when required in patients with ongoing pain.

GENERAL MEASURES
» Counselling/hospice care.
» Occupational therapy may be required.
» Management of psycho-social factors.
Note:
» Appropriate care is provided from the time of diagnosis.
» Home palliative care is provided by the family or caregiver with the support of health care professionals: 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

MEDICINE 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
Adults

<table>
<thead>
<tr>
<th>Mild pain</th>
<th>Moderate pain</th>
<th>Severe pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: non-opioid, e.g. paracetamol and/or ibuprofen where anti-inflammatory effect is required</td>
<td>Step 2: weak opioid e.g. tramadol + non opioid ± adjuvant therapy</td>
<td>Step 3: strong opioid e.g. morphine ± non opioid ± adjuvant therapy</td>
</tr>
</tbody>
</table>

20.7
CHAPTER 20

PAIN

20.8

Step 1a
Non-opioid

- Paracetamol, oral, 1 g, 6 hourly.

OR

- NSAIDs, e.g.:
  - Ibuprofen, oral, 400 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.

Step 1b
Combine paracetamol and NSAID.

Step 2
Add weak opioid to Step 1

- Tramadol, oral, 50 mg, 4–6 hourly as a starting dose (Doctor initiated).
  - May be increased to a maximum of 400 mg daily.

Step 3
Paracetamol and/or ibuprofen can be used with morphine in step 3

- Morphine, oral, 4 hourly (Doctor initiated).
  - Start with 5–10 mg.

If dosage is established and patient is able to swallow:

- Morphine, long-acting, oral, 12 hourly (Doctor initiated).
  - Start with 10–20 mg.

Elderly adults or severe liver impairment:

- Morphine solution, oral, 4 hourly. (Doctor initiated)
  - Start with 2.5–5 mg.

Titrates 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 21.8: Exposure to poisonous substances.
Children
Stepwise approach to pain management is recommended:

<table>
<thead>
<tr>
<th>Mild pain</th>
<th>Moderate to Severe pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: non-opioid, e.g. paracetamol and/or ibuprofen where anti-inflammatory effect is required</td>
<td>Step 2: strong opioid e.g. morphine ± non opioid ± adjuvant therapy</td>
</tr>
</tbody>
</table>

**Non-opioid**
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
- NSAIDs, e.g.:
  - Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food. See dosing table, pg 22.5.
    - Where anti-inflammatory effect is required.
    - Can be used in combination with paracetamol or opioids.
    - Discontinue if not effective after 2–3 days.

**Opioid**
- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly according to severity of the pain. See dosing table, pg 22.6.

**Adjuvant therapy:**

**Adults**
In addition to analgesia as above:
- Amitriptyline, oral, 25 mg at night. (Doctor initiated)
  - Titrate up to a maximum of 75 mg at night.

**Significant nausea and vomiting:**

**Adults**
- Metoclopramide oral, 10 mg, 8 hourly as needed.

**Constipation:**
A common problem due to long-term use of opioids, which can be prevented and should always be treated.

**Children**
- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing table, pg 22.5.
  - If poor response, increase frequency to 12 hourly.

**Adult**
- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.
For pruritus or nausea:

**Children**
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

<table>
<thead>
<tr>
<th><strong>Weight kg</strong></th>
<th><strong>Dose mg</strong></th>
<th><strong>Tablet 2 mg</strong></th>
<th><strong>Age months/years</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–17.5</td>
<td>0.5</td>
<td>¼ tablet</td>
<td>&gt;12 months–3 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>1</td>
<td>½ tablet</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>1.5</td>
<td>¾ tablet</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35</td>
<td>2</td>
<td>1 tablet</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>

- May be increased to 0.2 mg/kg/dose 8–12 hourly.
- Beware of respiratory depression if given with morphine.

For anxiety:

**Children**
- Diazepam, oral, 0.04 mg/kg/dose 8–12 hourly (Doctor initiated).

<table>
<thead>
<tr>
<th><strong>Weight kg</strong></th>
<th><strong>Dose mg</strong></th>
<th><strong>Use one of the following tablets:</strong></th>
<th><strong>Age months/years</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–11</td>
<td>2</td>
<td>1 tablet</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>2.5</td>
<td>½ tablet</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5</td>
<td>3</td>
<td>1½ tablets</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>4</td>
<td>2 tablets</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25</td>
<td>5</td>
<td>1 tablet</td>
<td>&gt;7 years</td>
</tr>
</tbody>
</table>

**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 analgesics. 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.

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Chapter 21: Trauma and emergencies

21.1 Paediatric emergencies
   21.1.1 Rapid triage of the child presenting with acute conditions in clinics and CHCs

21.2 Angina pectoris, unstable

21.3 Myocardial infarction, acute (AMI)

21.4 Bites and stings
   21.4.1 Animal and human bites
   21.4.2 Insect stings and spider bites
   21.4.3 Snakebites

21.5 Burns

21.6 Cardiopulmonary arrest– cardiopulmonary resuscitation
   21.6.1 Cardiac arrest, adults
   21.6.2 Cardiopulmonary arrest, children
   21.6.3 Management of suspected choking/foreign body aspiration in children

21.7 Delirium with acute confusion and aggression in adults

21.8 Exposure to poisonous substances

21.9 Eye injury, chemical burns

21.10 Eye injury, foreign body

21.11 HIV prophylaxis, post exposure (PEP)
   21.11.1 Rape and sexual violation
   21.11.2 Occupational post-exposure HIV prophylaxis for healthcare workers (HCW)
   21.11.3 Inadvertent (non-occupational) post exposure HIV prophylaxis

21.12 Hyperglycaemia and ketoacidosis

21.13 Hypoglycaemia and hypoglycaemic coma

21.14 Injuries

21.15 Nose bleeds (epistaxis)

21.16 Pulmonary oedema, acute

21.17 Shock
21.18 Anaphylaxis
21.19 Sprains and strains
21.20 Status epilepticus
The following conditions are emergencies and must be treated as such. Medicines used for treatment must be properly secured and recorded (time, dosage, route of administration) on the patient’s notes and on the referral letter.

### 21.1 PAEDIATRIC EMERGENCIES

Certain emergencies of the airway, breathing, circulation and neurological system are dealt with in the respiratory, cardiac and nervous system chapters. This section describes the approach to the severely ill child and selected conditions such as cardiorespiratory arrest, anaphylaxis, shock, foreign body inhalation and burns. All doctors should ensure that they have received appropriate training in at least providing basic (and preferably advanced) life support to children.

The most experienced clinician present should take control of the resuscitation.

### 21.1.1 RAPID TRIAGE OF CHILDREN PRESENTING WITH ACUTE CONDITIONS IN CLINICS AND CHCs

Triage is the process of rapidly examining all sick children when they first arrive at clinics in order to place them in one of 3 categories (Emergency, Priority, Non-urgent):

**EMERGENCIES (conditions which require immediate treatment)**

If any emergency sign is present, give emergency treatment(s), call for help, and draw blood for emergency laboratory investigations.

(A&B) **Airway and breathing**

- Not breathing
  - or
  - Obstructed breathing
  - or
  - Central cyanosis
  - or
  - Severe respiratory distress

(C) **Circulation**

- Cold hands
  - and
  - Capillary refill ≥3 seconds
  - and
  - Weak and fast pulse

(C) **Coma/convulsing**

- Coma
  - or
  - Convulsing (now)

(D) **Severe dehydration** (e.g. in child with diarrhoea)

- Diarrhoea
  - plus
  - Any two of:
21.4 Lethargy
- Sunken eyes
- Very slow skin pinch

PRIORIT Y
Priority signs
These children need prompt assessment and treatment
- Tiny baby (< 3 months of age)
- High Temperature
- Trauma or other urgent surgical condition
- Pallor (severe)
- Poisoning (history of)
- Pain (severe)
- Respiratory distress
- Restless, continuously irritable, or lethargic
- Referred for urgent attention
- Malnutrition: visible severe wasting
- Oedema of both feet
- Burns (major)

NON-URGENT (queue)
Proceed with assessment and further treatment according to the child’s priority.

The Emergency Triage Assessment and Treatment (ETAT) tool, presented above should be a minimum standard of triage in community health centres, district and/or regional hospitals – additional items may be added, suitable to local conditions and resources.

21.2 ANGINA PECTORIS, UNSTABLE
I20.0
See Chapter 4: Cardiovascular conditions.

21.3 MYOCARDIAL INFARCTION, ACUTE (AMI)
I21.9
See Section 4.4 Myocardial infarction, acute (AMI)/ST elevation myocardial infarction (STEMI).

21.4 BITES AND STINGS

21.4.1 ANIMAL AND HUMAN BITES
T14.1
Note: Rabies and tetanus are notifiable conditions.

DESCRIPTION
Animal bites may be caused by:
- domestic animals e.g. horses, cows, dogs, cats
- wild animals e.g. jackals, mongooses (meerkats), bats
Animal or human bites may result in:
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 healthy for 10 days, rabies is unlikely.

**Note:** If the animal has to be put down, care should be taken to preserve the brain, as the brain is required by the state veterinarian for confirmation of diagnosis. The animal must not be killed by shooting it in the head, as this will damage the brain.

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of exposure</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>» Touching/feeding of animal.</td>
<td>» No treatment if history is reliable.</td>
</tr>
<tr>
<td></td>
<td>» Licking of intact skin.</td>
<td>» If history not reliable, treat as category 2.</td>
</tr>
<tr>
<td>2</td>
<td>» Nibbling of uncovered skin.</td>
<td>» Wound management.</td>
</tr>
<tr>
<td></td>
<td>» Superficial scratch without bleeding.</td>
<td>» Administer full course vaccine. Only stop if animal tested negative for rabies or is still healthy after 10 days observation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Don’t give immunoglobulin, except in immunocompromised patients.</td>
</tr>
<tr>
<td>3</td>
<td>» Bites/scratches that penetrate the skin and with any visible blood.</td>
<td>» Wound management.</td>
</tr>
<tr>
<td></td>
<td>» Licking of broken skin or mucous membranes e.g. eyes and mouth.</td>
<td>» Administer full course vaccine.</td>
</tr>
<tr>
<td></td>
<td>» Bat bites:</td>
<td>» Only stop if animal tested negative for rabies or is still healthy after 10 days observation.</td>
</tr>
<tr>
<td></td>
<td>– Any close contact with a bat: single or multiple bites or scratches and bruising (even with minor bites or unapparent skin penetration).</td>
<td>» Administer rabies immunoglobulin.</td>
</tr>
<tr>
<td></td>
<td>– Direct physical contact with bat saliva or neural tissue; contact of mucous membranes with bat saliva, droppings or urine.</td>
<td>» Administer tetanus vaccine.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Prescribe antibiotics.</td>
</tr>
</tbody>
</table>

**MEDICINE TREATMENT**

**Emergency management**

**Wound management:**
Wash wound thoroughly with soap under running water for 5–10 minutes.
- Chlorhexidine 0.05%, solution.

Apply disinfectant if available:

LoE: III
• Povidone-iodine 10%, solution.

CAUTION
Do not suture puncture wounds.
Suture lacerations after thorough cleaning and debridement.
Do not apply compressive dressings.

The following treatment may be commenced in facilities designated by Provincial/Regional Pharmaceutical Therapeutics Committees. If access to rabies vaccine and immunoglobulin is not immediately available refer urgently.

Note: Rabies PEP (post exposure prophylaxis) schedule varies for immunocompromised patients. The degree to which a patient is immunocompromised should preferably be verified by a physician and includes congenital immunodeficiency, HIV infection, leukemia, lymphoma, generalized malignancy, radiation, immunosuppressant medicines e.g. long-term therapy of corticosteroids, etc.

Rabies immunoglobulin:
» Only indicated for:
  – Category 3, immunocompetent patients.
  – Category 2 and 3 immunocompromised patients.
  – All bat exposures.
» Available from the nearest district hospital.
» If not immediately available, source and give as soon as possible.
• Rabies immunoglobulin 20 IU/kg.
  o Infiltrate as much as possible in and around the wound and inject the rest IM (not buttock, unless the wound is on the buttock).
  o Follow with a complete course of vaccine.

Rabies vaccination:
» Only indicated for category 2 and 3 exposure.
» Available from the nearest district hospital.

Children
• Rabies vaccine, 1 amp, IM anterolateral thigh.
  Day 0 – single dose
  Day 3 – single dose
  Day 7 – single dose
  Day 14 – single dose
  Day 28 – single dose (only if immunocompromised).

Adults
• Rabies vaccine, 1 amp, IM deltoid.
  Day 0 – single dose
  Day 3 – single dose
  Day 7 – single dose
  Day 14 – single dose
  Day 28 – single dose (only if immunocompromised).
CAUTION
Do not administer rabies vaccine into buttocks (gluteus maximus).

Tetanus prophylaxis if not previously immunised within the last 5 years:
- Tetanus toxoid vaccine (TT), IM, 0.5 mL.

**Note:** In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin may produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Antibiotic treatment (only for category 3 exposure, hand wounds, human bites):
**Children**
- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg (amoxicillin component)</th>
<th>Use one of the following</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5 kg</td>
<td>75 mg</td>
<td>3 mL 1.5 mL –</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>100 mg</td>
<td>4 mL 2 mL –</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>150 mg</td>
<td>6 mL 3 mL –</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>200 mg</td>
<td>8 mL 4 mL –</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>250 mg</td>
<td>10 mL 5 mL 1 tablet</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>300 mg</td>
<td>12 mL 6 mL –</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>375 mg</td>
<td>15 mL 7.5 mL –</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>500 mg</td>
<td>20 mL 10 mL 2 tablets</td>
<td>&gt;7–11 years</td>
</tr>
</tbody>
</table>

**Children > 35 kg and adults**
- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days.

**Penicillin allergy**
**Children < 18 kg**
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose 6 hourly for 5 days. See dosing table, pg 22.4.

**Children 18–35 kg (able to take tablets)**
- Macrolide, e.g.:
- Azithromycin, oral, 250mg daily for 3 days.

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

**AND**
**Children**
- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. See dosing table, pg 22.4.
22.6.

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

**PREVENTION**
- Regular vaccination of domestic cats and dogs.
- Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

**REFERRAL**
- Deep and large wounds requiring suturing.
- Shock and bleeding.
- Non-immunised or not fully immunised patients for tetanus immunoglobulin.
- Possible rabies exposure (for immunoglobulin and vaccination).

### 21.4.2 INSECT STINGS AND SPIDER BITES

**DESCRIPTION**
Injury from spider bites and stings by bees, wasps, scorpions and other insects. Symptoms are usually local such as pain, redness swelling and itching.

**Bees and wasps**
- Venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylaxis (see Section 21.18: Anaphylaxis).

**Spiders and scorpions**
- Most are non-venomous or mildly venomous.

**MEDICINE TREATMENT**

**Emergency treatment:**
Treat anaphylaxis. See Section 21.18: Anaphylaxis.

**Severe local symptoms:**

**Children**
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 22.3.

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

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

**AND**
- Calamine lotion, applied when needed.

**Pain:**

**Children**
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
Adults
• Paracetamol, oral, 1 g 6 hourly when required.

Very painful scorpion stings:
• Lidocaine 2%, 2 mL injected around the bite as a local anaesthetic.

REFERRAL
For possible antivenom, if applicable, and intensive care, if necessary.
» 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.

21.4.3 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 the 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.
» Bite is painful and symptoms usually start within 10–30 minutes after the bite.
» Examples include:
  – Puff adder
  – Gaboon 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
  – Black spitting cobra
  – Green mamba
  – Rinkhals
  – Berg adder (Berg adder and rinkhals venom: neurotoxic and cytotoxic)

Haemotoxic venoms
» Venom affects the clotting of blood causing bleeding tendency which may present up to a few days after the bite.
Symptoms and signs of snakebite envenomation include:

Local
» Bite marks with or without pain.
» Swelling around the bite, which may be severe with discoloration 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, immediately apply a wide crepe bandage firmly from just above the bite site up to 10–15 cm proximal to the bite site. Apply no tighter than for a sprained ankle.
» Immobilise the affected limb with a splint or sling.
» Try to obtain an accurate history e.g. time of the bite, type of snake.
» If no signs 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.
» Observation for 24 hours is recommended.

MEDICINE TREATMENT
Venom in the eyes:
Irrigate the eye thoroughly for 15–20 minutes with water.
• Tetracaine 1%, drops (if available), instill 1 drop into the affected eye(s) before irrigation.
Refer patient.
Pain:
• Non-opioid analgesics according to severity. See Section 20.2: Chronic non-cancer pain.

Shock:
Treat if present. See Section 21.17: Shock.

Tetanus prophylaxis:
If not previously immunised within the last 5 years:
• Tetanus toxoid (TT), IM, 0.5 mL.

Note:
» The majority of patients do not need and should not be given antivenom.
» All patients with suspected black mamba bites should receive antivenom, even before onset of symptoms.
» Patients with bites due to other species should receive antivenom only 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 should receive antivenom.
» signs of systemic poisoning (see signs, above)
» spreading local damage
  – swelling of hand/foot within 1 hour of bite (80% of bites are on hands/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

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.
» If the patient presents at the clinic with their own antivenom, contact the secondary level hospital for advice.

21.5 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

<table>
<thead>
<tr>
<th>Depth of burn wound</th>
<th>Surface /colour</th>
<th>Pain sensation/healing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superficial or epidermal</td>
<td>Dry, minor blisters, erythema</td>
<td>» Painful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Heals within 7 days</td>
</tr>
<tr>
<td>Partial thickness superficial or superficial dermal</td>
<td>Blisters, moist</td>
<td>» Painful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Heals within 10–14 days</td>
</tr>
<tr>
<td>Partial thickness deep or deep dermal</td>
<td>Moist white or yellow slough, red mottled</td>
<td>» Less painful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Heals within a month or more Generally needs surgical debridement and skin graft</td>
</tr>
<tr>
<td>Full thickness (complete loss of skin)</td>
<td>Dry, charred whitish, brown or black</td>
<td>» Painless, firm to touch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Healing by contraction of the margins (generally needs surgical debridement and skin graft)</td>
</tr>
</tbody>
</table>

The figures below are used to calculate body surface area %.

These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not just the front or back.

In children the palm of the hand is 1%.

### Children 8 years and adults

![Diagram showing body surface area percentages for children and adults](image)

Children < 8 years of age

<table>
<thead>
<tr>
<th>Age years</th>
<th>Head + neck</th>
<th>Torso Front</th>
<th>Torso Back</th>
<th>Leg + foot Front + back</th>
<th>Arm+ hand Front+ back</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>14%</td>
<td>9%</td>
</tr>
<tr>
<td>1-&lt;2</td>
<td>17%</td>
<td>18%</td>
<td>18%</td>
<td>14.5%</td>
<td>9%</td>
</tr>
<tr>
<td>2-&lt;3</td>
<td>16%</td>
<td>18%</td>
<td>18%</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>3-&lt;4</td>
<td>15%</td>
<td>18%</td>
<td>18%</td>
<td>15.5%</td>
<td>9%</td>
</tr>
<tr>
<td>4-&lt;5</td>
<td>14%</td>
<td>18%</td>
<td>18%</td>
<td>16%</td>
<td>9%</td>
</tr>
<tr>
<td>5-&lt;6</td>
<td>13%</td>
<td>18%</td>
<td>18%</td>
<td>16.5%</td>
<td>9%</td>
</tr>
<tr>
<td>6-&lt;7</td>
<td>12%</td>
<td>18%</td>
<td>18%</td>
<td>17%</td>
<td>9%</td>
</tr>
<tr>
<td>7-&lt;8</td>
<td>11%</td>
<td>18%</td>
<td>18%</td>
<td>17.5%</td>
<td>9%</td>
</tr>
<tr>
<td>≥ 8</td>
<td>10%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>9%</td>
</tr>
</tbody>
</table>

**EMERGENCY TREATMENT**

» Remove smouldering or hot clothing.
» Remove constrictive clothing/rings.
» To limit the extent of the burn, run cold tap water over the area for 30 minutes after the burn.
» In all burns > 10% or where carbon monoxide poisoning is suspected (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/soot inhalation, production of black coloured sputum, shortness of breath, hoarse voice and stridor are serious signals.

**MEDICINE TREATMENT**

**Fluid replacement**

Burns ≤ 10% Total Body Surface Area (TBSA):
- Oral fluids.

Burns >10% of TBSA:
- IV fluid for resuscitation.
Calculation of fluid replacement

Fluids in adults
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 1st 8 hours.
    o Administer remaining fluid volume in next 16 hours.

Note: If urine output is not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Fluids in children
Replacement fluids for burns
» First 8 hours:

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Fluid volume (mL per hour) for the 1st 8 hours in burns of &gt; 10% seen in PHC clinics while awaiting transfer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10mL of 50% dextrose added to each 100mL.</td>
</tr>
<tr>
<td>Burns percentage of total body area</td>
<td>10–20%</td>
</tr>
<tr>
<td>&gt;2–2.5 kg</td>
<td>15</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>20</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>28</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>40</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>53</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>67</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>82</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>95</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>115</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>147</td>
</tr>
</tbody>
</table>

Avoid circumferential taping when securing infusion lines, as oedema under the eschar may decrease the venous return.
CHAPTER 21

TRAUMA AND EMERGENCIES

» Next 16 hours:

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Fluid volume (mL per hour) for the 2nd (next) 16 hours in burns of &gt; 10% seen in PHC clinics if transfer has not been accomplished in the 1st 8 hours:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2–2.5 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>0.9% Sodium Chloride with 100mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.</td>
</tr>
</tbody>
</table>

Burns percentage of total body area

<table>
<thead>
<tr>
<th>Burns percentage of total body area</th>
<th>10–20%</th>
<th>&gt;20–30%</th>
<th>&gt;30–40%</th>
<th>&gt;40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2–2.5 kg</td>
<td>12</td>
<td>14</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>16</td>
<td>19</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>23</td>
<td>27</td>
<td>31</td>
<td>35</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>33</td>
<td>38</td>
<td>44</td>
<td>49</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>43</td>
<td>50</td>
<td>58</td>
<td>65</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>54</td>
<td>64</td>
<td>72</td>
<td>82</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>64</td>
<td>76</td>
<td>86</td>
<td>97</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>75</td>
<td>91</td>
<td>104</td>
<td>118</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>91</td>
<td>110</td>
<td>129</td>
<td>148</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>110</td>
<td>138</td>
<td>165</td>
<td>190</td>
</tr>
</tbody>
</table>

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults

- Paracetamol, oral, 1 g 6 hourly when required.

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:

For patients requiring referral:

» If within 12 hours, transfer patient wrapped in clean dry sheet and blankets.

» If delayed by > 12 hours, paraffin gauze dressing and dry gauze on top.

» For full thickness and extensive burns cover with a paraffin gauze occlusive dressing. Cover the dressing with plastic wrap (e.g. cling film).

For patients not requiring transfer (burns that can be treated at home):

» Paraffin gauze dressing.

If infected burn:

- Povidone-iodine 5%, cream, applied daily.

Tetanus prophylaxis:

If not vaccinated within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL.

See Section 21.4.1: Animal and human bites, for detailed indications and
management principles.

REFERRAL
» All children < 1 year of age.
» All burns > 5% in children 1–2 years of age.
» Full thickness burns of any size in any age group.
» Partial thickness burns > 10% TBSA.
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints.
» Electrical burns, including lightning injury.
» Chemical burns.
» Inhalation injury – fire or scald injury.
» Circumferential burns of the limbs or chest.
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality.
» Any patient with burns and concomitant trauma.
» Suspected child abuse.
» Burns exceeding the capabilities of the referring centre.
» Septic burn wounds.
21.6 CARDIOPULMONARY ARREST – CARDIOPULMONARY RESUSCITATION

BASIC LIFE SUPPORT FOR HEALTH PROVIDERS (ADULT AND CHILD)

Hazards?
Ensure scene is safe

Hello?
Check for responsiveness and normal breathing

Responsive

Help!
Call for assistance and Defibrillator/Automated external defibrillator (AED)

Check for pulse for 5-10 seconds
Is a definite pulse present?

Yes and breathing adequately

Press in recovery position
Check for continued breathing
Reassess continuously

No or not sure

Yes but not breathing

Compressions
Compress chest at a rate of > 100/min (almost 2 compressions/second)
Push hard / Push fast / Ensure full chest recoil / Minimise interruptions

Give rescue breaths
- Adult: 10/min (every 6 seconds)
- Child: 12-20/min (every 3-5 seconds)
Reassess continuously

Breathe
Give 2 effective (chest rising) breaths at 1 breath/second
(with O₂ if available) after every 30 compressions
CPR ratios: 1-Rescuer = 30:2 and 2-Rescuers (Child) = 15:2
Continue until Defibrillator / AED available and ready

Shockable
(Ventricular Fibrillation / Pulseless Ventricular Tachycardia)

Give 1 Shock
Biphasic: 120–360 J (4 J/kg)
Monophasic: 360 J (4 J/kg)
Immediately resume CPR for 2 minutes

Non-Shockable
(Pulseless Electrical Activity/Asystole)

Analyse Rhythm

After 2 min of CPR, if organised electrical activity returns, check pulse:
- If present – provide post resuscitation care
- If absent – continue CPR

Immediately resume CPR for 2 minutes

Do not interrupt chest compressions until absolutely necessary

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21.6.1 CARDIAC ARREST, ADULTS

**DESCRIPTION**

Described as the loss of a heart beat and a palpable pulse, irrespective of the electrical activity captured on ECG tracing. Irreversible brain damage can occur within 2–4 minutes.

Clinical features include:
- sudden loss of consciousness
- absent carotid and all other pulses
- loss of spontaneous respiration

**EMERGENCY TREATMENT**

- Diagnose rapidly.
- Make a note of the time of starting resuscitation.
- Place the patient on a firm flat surface and commence resuscitation immediately.
- Call for skilled help and an automated external defibrillator (AED) or defibrillator.
- Initiate CAB (Circulation Airways Breathing) 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 after the resuscitation.

**Cardiopulmonary resuscitation**

**Circulation**

- Check for carotid pulse.
- If there is no pulse or you are not sure, start with 30 chest compressions at a rate of at least 100 compressions per minute.

**Airway and Breathing**

- 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 correctly-sized oropharyngeal 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 “Jaw thrust”.
- If there is no normal breathing, give 2 respirations with bag-valve-mask resuscitator and face mask.
  - The administered breaths must cause visible chest rising in patient. If not, reposition and try again.

Repeat the cycle of 30 compressions followed by 2 respirations for 5 cycles and then re-assess for a pulse.
- Oxygenate with 100% oxygen.
- Initiate IV fluids, if able.
- Sodium chloride 0.9%, IV.
In pulseless tachydysrhythmias defibrillate, as indicated.
Call a doctor, if available, without stopping CPR.
Continue until spontaneous breathing and/or heart beat returns.

**Immediate emergency medicine treatment:**
Epinephrine (adrenaline) is the mainstay of treatment and should be given immediately, IV or endotracheal, when there is no response to initial resuscitation or defibrillation.
- Epinephrine (adrenaline), 1:1 000, 1 mL, IV immediately as a single dose.
  - Flush with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

If no IV line is available
- Epinephrine (adrenaline), endotracheal, 1:1 000, 2 mL through endotracheal tube.
  - Flush 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, or
- no success after all the above procedures have been carried out for ≥ 30 minutes and no reversible cause detected.
Consider carrying on for longer especially when:
- hypothermia and drowning
- poisoning or medicine overdose or carbon monoxide poisoning

**21.6.2 CARDIOPULMONARY ARREST, CHILDREN**

For advanced resuscitation training should be undertaken.

**SEE FLOW DIAGRAM** (Section 21.6: Cardiopulmonary arrest–cardiopulmonary resuscitation).

**DESCRIPTION**
Cardiopulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a critical illness. Resuscitation from cardiac arrest is less often successful in children and it is better to prevent cardiopulmonary arrest by recognising serious illness and managing it appropriately.

The effective treatment of cardiorespiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease. Bradycardia in children is a pre-terminal event and needs to be treated with resuscitation.
Cardiorespiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (e.g. prolonged seizures, poisoning, neuromuscular weakness etc.) If any of the following are present this is evidence of serious disease/impending failure and needs urgent effective management.

<table>
<thead>
<tr>
<th>Signs of impending failure/severe disease</th>
<th>Neurological</th>
<th>Respiratory</th>
<th>Circulatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased level of consciousness or extreme weakness</td>
<td>Increased respiratory rate: &gt; 60</td>
<td>Increased heart rate: &gt; 160 in infants &gt; 120 in children</td>
<td></td>
</tr>
<tr>
<td>Abnormal posture</td>
<td>Marked chest indrawing</td>
<td>Decreased pulse volume</td>
<td></td>
</tr>
<tr>
<td>Pupils –unequal or abnormal size</td>
<td>Grunting</td>
<td>Capillary refill time &gt; 3 seconds</td>
<td></td>
</tr>
<tr>
<td>Presence of convulsions</td>
<td>Flaring nostrils, gasping, shallow or irregular breathing</td>
<td>Poor colour: bluish, grey or marked pallor</td>
<td></td>
</tr>
</tbody>
</table>

Order of resuscitation in Primary healthcare is CAB (Circulation Airway Breathing).

**EMERGENCY TREATMENT**

» Diagnose the need for resuscitation rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Call for skilled help and resuscitation equipment.
» Initiate CAB (Circulation Airways Breathing) sequence of CPR (Cardiopulmonary Resuscitation).
» Document timings of interventions, medication and any response to these. (Ideally, during resuscitation, one staff member should act as a ‘scribe’).
» Collect all ampoules used and total them at the end.

**Circulation**

» Check for signs of life and presence of central pulse for 5–10 seconds. In younger children check brachial or femoral pulse, in older children use brachial or carotid pulse).

» If there is no pulse and no signs of life give 30 chest compressions at a rate of at least 100 compressions/minute (compress over lower half of sternum and compress chest by approximately 1/3 of the anteroposterior diameter of the chest with each compression). Allow chest to recoil before next compression.

**Airway**

» Manually remove obvious visible obstruction from the mouth.

**CAUTION**

Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants: position the head in neutral position. In children: position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.
21.21

» Look, listen and feel for air movement (breathing) to see if the airway is patent.
» If the child is clearly in cardiac arrest – then proceed to artificially ventilate as quickly as possible.
» If not sure about air movement and/or it 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 the child coughs or gags they are probably too alert to tolerate the airway.
» 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 is suspected follow a choking protocol. See Section 21.6.3: Management of suspected choking/foreign body aspiration.
» If neck trauma possible/likely rather do “jaw thrust” manoeuvre: place two or three fingers under the angle of the mandible bilaterally and lift the jaw forwards. During this procedure keep the neck and head stable in the neutral position to protect from cervical spine damage.

**Breathing**

» If there is no breathing, apply artificial respiration:
  - preferably with bag-valve-mask resuscitator
  - mouth-to-nose (covering child’s mouth AND nose with your mouth)
  - mouth-to-mouth (occluding nose by pinching child’s nostrils)

» Give 2 effective at one breath per second.

Then

» If 2 rescuers are present, carry out cycles of 15 chest compressions followed by 2 respirations.
» If only 1 rescuer present, carry out cycles of 30 compressions to 2 respirations.
» Review after 5 cycles - if pulse is not palpable continue until help arrives.

**CAUTION**

Cardiac massage is only effective if there is an open airway and the lungs are being filled with air.

- Oxygenate with 100% oxygen, if available.
- Keep patient covered and warm while resuscitating (although the patient should be fully exposed for short periods during examination).
- If there is a pulse but no breathing, ventilate at 12–20 breathes/minute (every 35 seconds).
- 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:
- Epinephrine (adrenaline), IV, 0.1 mL/kg of 1:10 000 solution.
  - Epinephrine (adrenaline) 1:10 000, (made by diluting 1mL ampoule of epinephrine (adrenaline) 1:1000 with 9mL of sodium chloride 0.9% to give 10mL of 1:10000 solution).
CHAPTER 21  TRAUMA AND EMERGENCIES

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, 2–5 mL/kg.
  - To make 20 mL of 10% dextrose solution: draw 4 mL of 50% dextrose in to a 20 mL syringe and add 16 mL of sodium chloride, 0.9% or water for injections.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected.
  - Do not give excessive volumes.
  - If low blood sugar is treated:
    - re-check blood glucose 10–15 minutes later;
    - if still low, give further bolus of dextrose 10%, IV, 2 mL/kg, and commence dextrose 5 or 10%, infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.

Medicine administration route:

- IV or intraosseous via a drip that flows well.

Initiate IV fluid

- Dextrose 5 or 10%, IV, 3–5 mL/kg/hour until a formal maintenance rate can be calculated.
  - Avoid administration of excessive IV fluid during resuscitation.
  - Use 60 drops per minute IV administration sets for all drips.
  - In arrest due to hypovolaemia, treat according shock protocol (See Section 21.17: Shock).

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; or
- 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 medicine overdose or carbon monoxide poisoning

**REFERRAL**

Transfer all patients on supportive treatment and with an accompanying skilled worker until taken over by doctor at receiving institution.
21.6.3 MANAGEMENT OF SUSPECTED CHOKING/FOREIGN BODY ASPIRATION IN CHILDREN

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 infant with apparently complete obstruction
  - 5 back blows
  ↓
  - 5 chest/abdominal thrusts
  ↓
  - Reassess and repeat if necessary

» In unconscious child
  - Perform standard CPR as outlined above.
  - Visually check for oral/pharyngeal foreign body before first breaths and intermittently during CPR.

If the child is still able to breathe
Transfer urgently to hospital for treatment and accompanied with someone able to treat acute complete choking.

If the child is able to talk and breathe
Encourage the child 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 5 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.
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Apply 5 chest thrusts – use the lower ½ of the sternum – compress at least \( \frac{1}{3} \) of the anteroposterior diameter of the chest. 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.

### 21.7 DELIRIUM WITH ACUTE CONFUSION AND AGGRESSION IN ADULTS

**F03.91**

**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)
- confusion
- impaired awareness
- disorientation

Other symptoms may also be present:

- restlessness and agitation
- hallucinations
- autonomic symptoms such as sweating, tachycardia and flushing
- patients may be hypo-active, with reduced responsiveness to the environment
- a fluctuating course and disturbances of the sleep-wake cycle are characteristic
- aggressiveness
- violent behaviour alone occurs in exceptional cases only
Risk factors for delirium include

- extremes of age
- pre-existing neurological disease e.g. epilepsy
- HIV infection
- medicines such as anticholinergics and hypnotics
- pre-existing dementia
- substance intoxication and withdrawal
- cerebrovascular disease

Checklist for diagnosis:

**D** – Drugs (Intoxication and withdrawal)

**I** – Infections, e.g. sepsis, pneumonia, urinary tract infections, peritonitis and meningitis

**M** – Metabolic, e.g. hypoglycaemia, electrolyte abnormalities (e.g. hyponatraemia); organ failure (e.g. liver failure, renal dysfunction), CO₂ narcosis.

**T** – Trauma

**O** – Oxygen deficit (including hypoxia, carbon monoxide poisoning)

**P** – Psychiatric or physical conditions, e.g. severe stressor pain

**EMERGENCY TREATMENT**

- Calm the patient.
- Manage in a safe environment.
- Treat underlying cause first, e.g. hypoglycaemia, hypoxia, pain etc.

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.
  - If no response give a 2nd dose.
  - Do not administer at a rate over 5 mg/minute.

**OR**

- Midazolam, IM, 7.5–15 mg immediately.
  - Repeat after 30–60 minutes if needed.

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.
  - In elderly: 2.5 mg, immediately.
  - If no response give a second dose.

**REFERRAL**

**Urgent**

All cases.
CHAPTER 21

21.8 EXPOSURE TO POISONOUS SUBSTANCES

T65.9

Note: Poisoning from agricultural stock remedies is notifiable.

<table>
<thead>
<tr>
<th>POISON INFORMATION CENTRES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Western Cape:</strong></td>
</tr>
<tr>
<td>(24-hours, every day)</td>
</tr>
<tr>
<td>Tygerberg Poison Information Centre</td>
</tr>
<tr>
<td>Red Cross War Memorial Children's Hospital Poisons Information Service</td>
</tr>
<tr>
<td><strong>Free State:</strong></td>
</tr>
<tr>
<td>(24-hours, every day)</td>
</tr>
<tr>
<td>University of the Free State Poison Control and Medicine Information Centre</td>
</tr>
</tbody>
</table>

Telephone numbers tested 31 December 2014

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 anti-diabetic 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, 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:
21.27

- pulse rate
- blood pressure
- respiratory rate
- level of consciousness
- pupillary size and reaction

**Ingested poisons**

- Activated charcoal.
  - **Children:** 1 g/kg mixed as a slurry with water. See dosing table, pg 22.1
  - **Adults:** 100 g mixed as a slurry with water.
  - Only if the patient is fully conscious and able to maintain their airway and if ingestion was within the previous hour prior to presentation.
  - Add water to charcoal and not vice versa.
  - Do not administer orally if the level of consciousness is reduced.

» 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
  - all alcohols
  - paracetamol overdose where oral N-acetylcysteine will be given

» Protect the airway:
  - Place in lateral position if decreased level of consciousness.

» Identify the poison and keep a sample of the poison or container.

» Contact the nearest hospital or poison centre for advice.

**EMERGENCY MANAGEMENT**

» If the patient is unconscious, perform resuscitation. See Section 21.6: 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:** Healthcare 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
  - bradycardia
  - muscle twitching
  - coma
  - hypersecretions (hypersalivation, sweating, lacrimation, rhinorrhoea)
  - brochospasm and bronchorrhoea, causing tightness in the chest, wheezing, cough and pulmonary oedema

LoE:III
CHAPTER 21  TRAUMA AND EMERGENCIES

» Protect airway if GCS < 8.
» Intubate and ventilate if hypoxia, hypercarbia or decreased respiratory effort.
» Consider inotropic support if resistant hypotension is present.

• Atropine, IV
  o Children: 0.05 mg/kg/dose. See dosing table, pg 22.2.
  o Adults: Initial doses 1 mg, repeat doses are 2–4 mg.
  o Repeat the dose every 10–15 minutes until there is control of bronchial secretions.
  o Refer all patients urgently.
  o Response to a first dose suggests organophosphate poisoning.

Opioid overdose in adults
» Supportive care is the mainstay of treatment.
  – Protect airway if GCS < 8.
  – Intubate and ventilate if decreased respiratory effort.
  – Consider inotropic support if resistant hypotension is present.
  – Naloxone for severe poisoning only (i.e. patients requiring inotropic or ventilatory support) or as a single test dose for uncertain diagnosis.

• 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.
» In some patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
» Refer all patients.

Paracetamol poisoning
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)
21.29 iron tablets
If in doubt, consult the referral hospital or poison centre.
**Note:** Send the following to hospital with the patient:
- written information
- a sample of the poison or the empty poison container

### 21.9 EYE, CHEMICAL BURNS
T26.5
(See Chapter 18: Eye conditions)

### 21.10 EYE INJURY, FOREIGN BODY
S05.9 / S05.5
(See Chapter 18: Eye conditions)

### 21.11 HIV PROPHYLAXIS, POST EXPOSURE (PEP)
Z29.2

### 21.11.1 RAPE AND SEXUAL VIOLATION
T74.2

#### DESCRIPTION
Sexual offences are of grave concern and in particularly to the most vulnerable persons including women, children and disabled persons.
The definitions of sexual offences are within the Criminal Law (Sexual Offences and Related Matters) Amendment Act, No 32 of 2007. Sexual offences are physically and psychologically damaging to victims, and the ability to consent to a sexual act depends on the competence of the person to give consent and be knowledgeable of the consequences of that act - including the risk of contracting sexually transmitted diseases such as HIV.

#### GENERAL MEASURES
- Sexual offences victims must be regarded as emergencies but do not displace life-threatening management of other cases.
- Ensure appropriate management is in place for every case. So called “cold cases” (> 72 hours after the incident) may be managed medically and given an appointment for medico-legal investigation.
- If victim wants to open a case, the Family violence, Child protection and Sexual offences Unit (FCS) must be phoned and requested to come to the hospital.
- Cases must be opened in all cases of suspected or alleged rape/sexual abuse in children.

Offer 1st dose of antiretroviral PEP in all cases of suspected rape - the following matters can be resolved in due course:
- Obtain informed consent from the patient and written consent from parent in case of minors before HIV testing and giving treatment.
- Consent for HIV testing in children can be given by:
  - Children who are competent to give consent and are:
    (i) ≥ 12 years of age; or
(ii) < 12 years of age and of sufficient maturity to understand the benefits, risks and social implications of such a test.

- Parents or caregivers of children who are not competent to sign consent (but the child should have this explained to them so they understand what is happening, appropriate to their age and development).
- The clinical head of the institution, where a competent person is not available to give consent for HIV testing and PEP (alleged rape in children is a medical emergency).

» Determine the patient’s HIV status before initiating PEP.

- Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance. Provide counselling and manage accordingly.

» It is the patient’s choice to have immediate HIV testing.

- If the patient declines, give a 3–day starter pack of PEP and encourage the patient to reconsider testing within those 3 days.
- No further PEP will be given in the case of continued refusal of HIV testing in adults, in children where the parent unreasonably refuses PEP this may be taken further.
- If in doubt about the indications for HIV PEP, give PEP.

» A patient presenting after 72 hours since the alleged incident should not be given PEP, but should be counselled about the possible risk of transmission.

- HIV testing should still be offered at the time of presentation and 3 months later.

» Perform a pregnancy test in adult and pubertal girls to exclude pregnancy before initiating post exposure contraception and STI prophylaxis.

- Pregnant rape patients should be referred.

» If the HIV Elisa/Rapid test is positive in sexually abused children < 18 months of age, perform HIV PCR to confirm if HIV infection is truly present.

If HIV-uninfected or if the child has no access to immediate HIV PCR results, they should receive prophylaxis (until the HIV PCR result is obtained).

Initial Counselling
Counsel all cases of sexual offences patients and caregivers in the case of children

» Explain the side effects of ARVs, e.g. tiredness, nausea and flu-like symptoms.

» Use condoms for 3 months.

» Avoid blood or tissue donation for 6 months.

» Emphasise the importance of compliance with ARV PEP.

» Provide psychosocial support pertaining to:

- Restoring control of the victim by avoiding secondary traumatisation, and give choices and participation in treatment decisions.
- Medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis-B and C.
- Risk of pregnancy.
- Psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity.
Follow-up support
» Discuss issues relating to stress management at subsequent visits.
» Inform the patient of the signs and symptoms of post-traumatic stress, including:
  – general irritability
  – trembling
  – pain in neck and/or lower back
  – change in appetite
  – change in sleep pattern
  – post-traumatic stress syndrome (PTSD), that may eventually cause exhaustion and illness.

Medico-legal assessment of injuries
» Complete appropriate required forms and registers.

Blood tests
» The patient/parent 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 RPR test for syphilis and Hepatitis B serology.
» Blood should be taken at presentation and 4 months later for HIV, Hepatitis B and syphilis tests.
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Suspected or alleged sexual assault or rape

Route to Health System

Police  Health System  Social Work

Assess urgency
1. Is assault < 72 hours ago
2. Are there surgical / medical urgencies?
   e.g. Serious trauma/ bleeding/ pain/ distress.

Actions
<table>
<thead>
<tr>
<th>&lt; 72 hours or Urgency</th>
<th>≥ 72 hours or Urgency</th>
</tr>
</thead>
<tbody>
<tr>
<td>See urgently.</td>
<td>See as soon as possible</td>
</tr>
<tr>
<td>Don’t displace other life threatening emergencies</td>
<td></td>
</tr>
</tbody>
</table>

Immediate
- Assess life threatening injuries
- If HIV status unknown: give 1st dose PEP

Medical other
- Assess injuries
  ✓ refer appropriately
- Ascertain STD status
  ✓ get consent for tests including HIV
  ✓ determine HIV status, Syphilis status
- Prevent STDs
  ✓ give HIV PEP if not HIV positive and < 72 hours since assault
  ✓ give other STI prophylaxis including Hep B
- Prevent pregnancy
  ✓ confirm not pregnant
  ✓ if not pregnant and if Tanner III or more give emergency contraception within 5 days

Forensic other
- Examine / record J88
- Take specimens (ensure consent signed)

Mental Health
Appropriate counselling/ psychological support

Social Health
Ensure it is safe for victim to return home

Police
Ensure case opened (patient usually brought by police. If not call the police to the site)

Ensure follow up, safety and support
MEDICINE TREATMENT

Note:

» Obtain consent for HIV testing from all patients before initiating PEP.
» Offer PEP if the patient presents within 72 hours of being raped and is HIV-uninfected or HIV status is unknown.
» Initiate PEP as soon as possible. Testing can be done up to 3 days after the incident.
» It is important to manage the medical condition before medico-legal examination. Most of these will require referral.
» In children < 18 months of age: antiretroviral PEP should be initiated while awaiting transfer and HIV PCR results.
» Initiate therapy as early as possible after the exposure to maximize the chance of effective prophylaxis. Therapy may be given up to 72 hours after exposure.
» If, for practical reasons, a person cannot return for the 3 day follow up, a 28 day course of ART should be provided.
» Do a pregnancy test in all women and female adolescents prior to post exposure contraception and STI prophylaxis to exclude pregnancy.

HIV PEP

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: 180–240 mg/m². See dosing table, pg 22.8.
  o Maximum: 300 mg/dose.

AND

• Lamivudine, oral, 4 mg/kg 12 hourly or 8 mg/kg daily for 28 days.
  o Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See dosing table, pg 22.5.

AND

• Lopinavir/ritonavir, oral 12 hourly for 28 days.
  o Paediatric dose: 300/75 mg/m². See dosing table, pg 22.6.
  o Maximum: 400/100 mg/dose.

Dosages may vary by ± 1 mg/kg/dose, to allow a convenient volume of medication. Use the adult dosage regimen if children require more than the maximum dose.

Follow up visits should be at 6 weeks and 4 months after the rape. HIV testing should be performed at each of these visits with consent.

Adults

• Tenofovir, oral, 300 mg daily for 4 weeks
  and
• Emtricitabine, oral, 200 mg daily for 4 weeks
  or
  Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

OR

• Zidovudine, oral, 300 mg 12 hourly for 4 weeks.
and
- Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

AND
- Atazanavir/ritonavir, oral, 300/100 mg, daily.

OR
- Lopinavir/ritonavir, oral, 200/50, 2 tablets 12 hourly.

Tenofovir is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines e.g. aminoglycosides (check baseline creatinine clearance). Where tenofovir is contraindicated, switch to zidovudine. If zidovudine is not tolerated consult or refer for further management.

Lopinavir/ritonavir often causes diarrhoea. If lopinavir/ritonavir is not tolerated switch to atazanavir/ ritonavir.

PREVENTION OF HEPATITIS B

Hepatitis-B vaccination
See Section 13.7: Other vaccines.

EMERGENCY CONTRACEPTION AFTER PREGNANCY IS EXCLUDED

Do a pregnancy test in all women and female adolescents. Children must be tested and given Emergency contraception from Breast Tanner Stage III, if unsure of staging, give Emergency contraception when you detect any breast development (DO NOT REGARD MENARCHE AS AN INDICATION).

- Levonorgestrel oral, 1.5 mg as a single dose as soon as possible after unprotected intercourse.

CAUTION

Tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse and not > 5 days later.

An anti-emetic:

Adults
- Metoclopramide oral, 10 mg 8 hourly as needed.

STI PROPHYLAXIS

Adults
- Ceftriaxone, IM, 250 mg as a single dose.
  o For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND
- Azithromycin, oral, 1 g, as a single dose.

AND
- Metronidazole, oral, 2 g immediately as a single dose.

Children

Prior to hospital referral, administer:
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing
CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN

Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.

In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given.

After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV.

Annotate the dosage and route of administration in the referral letter.

AND

Children < 45 kg
- Macrolide, e.g.:
- Erythromycin, oral, 10–15 mg/kg/dose as a single dose, and refer. See dosing table, pg 22.4.
  - If transfer is delayed, administer additional doses at 6 hourly intervals.

Children ≥ 45 kg
- Macrolide, e.g.:
- Azithromycin, oral, 1g, as a single dose, and refer.
- Metronidazole, oral, as a single dose, and refer.
  - 1–3 years: 500 mg
  - 3–7 years: 600–800 mg
  - 7–10 years: 1 g
  - > 10 years: 2 g

REFERRAL
- All patients with severe physical or psychological injuries.
  - All Children: All for medico legal and general care assessment after initiation of PEP as outlined above at PHC.
    If uncertain, phone Childline 0800055555
  - Adults with:
    » Active bleeding » Multiple injuries
    » Abdominal pain » History of the use of a foreign object

Note: Refer if there are inadequate resources with regard to:
- counselling
- laboratory for testing
- medico-legal examination
- medicine treatment

21.11.2 OCCUPATIONAL POST-EXPOSURE HIV PROPHYLAXIS FOR HEALTH-CARE WORKERS (HCW)
Z29.2

DESCRIPTION
Exposure to infectious material from HIV sero-positive patients including:
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» blood
» semen
» CSF
» 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.

GENERAL MEASURES

Where the source patient is on ARVs or has been on ARVs, start normal prophylaxis and seek expert opinion. An extra blood sample (unclotted - EDTA) of the source patient should be stored in case of need for further viral testing.

Other blood borne infections that can be transmitted include hepatitis B, hepatitis C and syphilis and all source patients should be tested. Comprehensive and confidential pre-test counselling should be offered.

<table>
<thead>
<tr>
<th>Test</th>
<th>Source patient</th>
<th>Exposed health care worker* Only if source patient was positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Baseline</td>
</tr>
<tr>
<td>HIV</td>
<td>Rapid test</td>
<td>Rapid test PLUS</td>
</tr>
<tr>
<td></td>
<td>PLUS HIV ELISA (NHLS test)</td>
<td>HIV ELISA (NHLS test)</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Surface antigen</td>
<td>Surface antibody*</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>HCV antibody</td>
<td>HCV antibody*</td>
</tr>
<tr>
<td>Syphilis</td>
<td>RPR/TP antibody</td>
<td>RPR/TP antibody*</td>
</tr>
<tr>
<td>Serum creatinine</td>
<td>If TDF part of PEP</td>
<td>If TDF part of PEP</td>
</tr>
<tr>
<td>FBC</td>
<td>If AZT part of PEP</td>
<td>If AZT part of PEP</td>
</tr>
</tbody>
</table>

MEDICINE TREATMENT

» Initiate PEP immediately after the injury - within 72 hours.
  – Do not wait for the confirmatory test results on the source patient and health care worker.
» With very high risk exposures, consider initiation of treatment beyond 72 hours.
  – The risks of prophylaxis in this setting may outweigh the benefits.
» Do not consider initiating PEP beyond 7 days after exposure.
» Duration of prophylactic treatment is 4 weeks.
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21.37

- 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 sero-conversion 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 then at 6 weeks and 4 months.
- Advise about the need to take precautions, e.g. condom use, to prevent infection of their own sexual partners, should sero-conversion 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.

When PEP is indicated, the following regimen is recommended:

- Tenofovir, oral, 300 mg daily for 4 weeks
- Emtricitabine, oral, 200 mg daily for 4 weeks
- Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

OR

- Zidovudine, oral, 300 mg 12 hourly for 4 weeks.
- Lamivudine, oral, 150 mg 12 hourly for 4 weeks.

AND

- Atazanavir/ritonavir 300/100 mg, oral, daily
- Lopinavir/ritonavir 200/50 mg, oral, 2 tablets 12 hourly.

PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Nevirapine must never be used for PEP as there is a high risk of severe hepatitis, when given to people without HIV infection.

Tenofovir is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines e.g. aminoglycosides (check baseline creatinine clearance). Where tenofovir is contraindicated, switch to zidovudine. If zidovudine is not tolerated consult or refer for further management.

Lopinavir/ritonavir often causes diarrhoea. If lopinavir/ritonavir is not tolerated switch to atazanavir/ritonavir.

In cases of known antiretroviral resistance consult an expert.

Recommendations for PEP after occupational exposure to infectious material (includes blood, CSF, semen, vaginal secretions and synovial/pleural/pericardial/peritoneal/amniotic fluid) from HIV sero-positive patients.
When the source patient is known to be failing ART, modify the PEP regimen:
» If the patient is on zidovudine or stavudine then tenofovir should be used.
» If the patient is on tenofovir then zidovudine should be used.
» If the patient is on efavirenz or nevirapine then lopinavir/ritonavir should be used.
Patients failing second line ART almost always have no resistance to protease inhibitors, so lopinavir/ritonavir should still be effective.
Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP.

**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
» medicine treatment

### 21.11.3 INADVERTENT (NON-OCCUPATIONAL) POST EXPOSURE HIV PROPHYLAXIS

**DESCRIPTION**
Inadvertent (non-occupational) exposure to infectious material from HIV sero-positive persons often requires clinical judgement and includes:
» human bites
» sharing of needles during recreational drug use
» consensual sexual exposure, burst condoms
» contact sports with blood exposure

Management of inadvertent (non-occupational) HIV exposure is the same as for occupational HIV exposure. See Section: 21.11.2 Occupational post-exposure HIV prophylaxis for healthcare workers (HCW).

### 21.12 HYPERGLYCAEMIA AND KETOACIDOSIS

See Section 9.3: Diabetic emergencies
21.13 HYPOGLYCAEMIA AND HYPOGLYCAEMIC COMA

DESCRIPTION
Hypoglycaemia is a blood sugar < 3 mmol/L (< 2.6 mmol/L in neonate) and may rapidly cause irreversible brain damage and/or death.

Clinical features include:
» tremor
» sweating
» tachycardia
» dizziness
» hunger
» headache
» impaired concentration

There may be few or no symptoms in the following situations:
» chronically low blood sugar
» patients with impaired autonomic nervous system response, e.g.
  – the elderly
  – very ill
  – those with long-standing diabetes mellitus

People at risk of hypoglycaemia:
» neonates with low birth weight or ill or not feeding well
» malnourished or sick children
» shocked, unconscious or convulsing patients
» alcohol binge
» liver disease
» diabetics on treatment

Hypoglycaemia may be a marker of deteriorating renal function.

EMERGENCY TREATMENT
» Obtain blood for glucose determination immediately.
» Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to feed

Adult
– Sweets, sugar, glucose by mouth.
  or
– Oral sugar solution.
  o Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water.

Breastfeeding child
– administer breast milk

Older children
– A formula feed of 5 mL/kg.
  or
– Oral sugar solution.
Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg

or

- Sweets, sugar, glucose by mouth.

**Conscious patient, not able to feed without danger of aspiration**
Administer via nasogastric tube:
- Dextrose 10%, 5 mL/kg.
  (add 1 part 50% dextrose water to 4 parts water to make 10% solution)
  or
  - Milk.
  or
  - Sugar solution.
- Dissolve 3 teaspoons of sugar (15 g) in a 200 mL cup of water – administer 5 mL/kg.

**Unconscious patient**

**Children**
- Dextrose 10%, IV, 2–5 mL/kg.
  - 10% solution, e.g. add 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.

**IV administration of dextrose in children with hypoglycaemia:**
  » Establish an IV line - do not give excessive volumes of fluid - usually can keep line open with 2 mL/kg/hour.
  » Take a blood sample for emergency investigations and blood glucose.
  » Check blood glucose.
    - If low, i.e. < 2.5 mmol/L or if blood glucose testing strips are not available, administer 2 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 2 mL/kg of 10% dextrose solution.
    - Continue maintenance at 3–5 mL/kg of 5% or 10% dextrose, IV.
  » After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.
  » Feed the child as soon as conscious.
  » Investigate the cause e.g. infection.

**Adults**
- Dextrose 50%, IV, 1mL/kg 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.
  - Investigate the cause e.g. infection.

**Alcoholics/Malnourished**
- Thiamine, IV/IM, 100 mg immediately.
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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).

21.14 INJURIES

T14

DESCRIPTION

Soft tissue injury may present as follows:
» pain only » abrasions
» traumatic swelling » puncture wounds
» bruises with intact skin » underlying crush injury
» lacerations » 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 21.4.1: 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.
» Monitor and document neurovascular status, i.e. circulation (capillary refill time) and pin prick sensation at and distal to the injury site.

Wound care
» Remove foreign bodies and clean the wound with normal saline.
» Suture or splint when needed.
» Avoid primary suture if the wound is infected:
dirty or contaminated  projectile inflicted
crushed  caused by bites
in need of debridement

MEDICINE TREATMENT
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.

Adults
- Paracetamol, oral, 1 g 6 hourly when required.

Tetanus prophylaxis
If not previously immunised within the last 5 years
- Tetanus toxoid (TT), IM, 0.5 mL.
(See Section 21.4.1: Animal and human bites for detailed indications and management principles for tetanus and rabies post exposure prophylaxis).

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.
» Suspected underlying fracture.
» Sepsis.
» Shock.
» Anaemia.
» Blood in the urine.
» Infants and young children except when the injury is minor.
» Enlarging and/or pulsating swelling.

21.15 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), if available. Identify the cause.
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REFERRAL
» Recurrent nose bleeds.
» Failure to stop the bleeding.

21.16 PULMONARY OEDEMA, ACUTE
J81.0

DESCRIPTION
A life-threatening condition with abnormal accumulation of fluid in the lungs. Common causes include acute heart failure and acute renal failure (e.g. acute nephritis). Persons with pulmonary oedema may present similarly to acute bronchospasm. It is important to distinguish this condition from an acute attack of asthma.

EMERGENCY TREATMENT
Place the patient in a sitting or semi-Fowler's position.

Children
• Oxygen, using a 40% face mask or nasal cannula at 2–3 L per minute.
• Furosemide, IV, 1 mg/kg immediately administered slowly over 5 minutes. See dosing table, pg 22.4.
  o Do not put up a drip or run in any IV fluids

Adults
• Oxygen, using face mask to deliver 40% oxygen at a rate of 6–8 L per minute.
• Furosemide, IV, 40 mg.
If response is adequate follow with:
• Furosemide, IV, 40 mg over 2–4 hours.
If no response within 20–30 minutes:
• Furosemide, IV, 80 mg.
• Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (Doctor initiated).
  o Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10mg.
  o Can be repeated after 4–6 hours if necessary, for pain relief.
  o Beware of hypotension.

AND/OR
• Isosorbide dinitrate, sublingual, 5 mg 4 hourly.
  o Isosorbide dinitrate, sublingual, 5 mg immediately and then repeat once if necessary for pain relief.
  o Do not administer if hypotensive.

Pulmonary oedema due to a hypertensive crisis:
ADD
To treat hypertension
• ACE-inhibitor, e.g.
• Enalapril 10 mg, oral, as a single dose and refer.
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REFERRAL
Urgent
All cases. Continue oxygen during transfer.

21.17 SHOCK
R57.9

DESCRIPTION
Shock is a life-threatening condition characterised by any evidence of inadequate organ perfusion.

Signs and symptoms of shock in adults
» Low blood pressure (systolic BP < 80 mmHg) is the key sign of shock.
» Weak and rapid pulse
» Restlessness and altered mental state
» Rapid shallow breathing
» Weakness
» Low urine output

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 (> 3 seconds).
2. Decreased pulse volume (weak thready pulse).
3. Increased heart rate (> 160 beats/minute in infants, > 120 beats/minute in children).
4. Decreased level of consciousness (poor eye contact).
5. Rapid breathing.
6. Blood pressure. Decreased blood pressure and decreased urine output are late signs of shock and can be monitored. The other signs mentioned above are more sensitive in detecting shock, before irreversible.

Normotensive BP values in children:

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic 5% percentile* mm Hg</th>
<th>MAP 5% percentile** mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 weeks</td>
<td>–</td>
<td>28</td>
</tr>
<tr>
<td>30 weeks</td>
<td>–</td>
<td>30</td>
</tr>
<tr>
<td>32 weeks</td>
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<td>32</td>
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<td>34 weeks</td>
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<td>36 weeks</td>
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<td>38 weeks</td>
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<td>40 weeks</td>
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<tr>
<td>1–11 months</td>
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<td>2 years</td>
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<td>51</td>
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<tr>
<td>8 years</td>
<td>81</td>
<td>52</td>
</tr>
<tr>
<td>9 years</td>
<td>83</td>
<td>54</td>
</tr>
</tbody>
</table>
### Types of Shock

<table>
<thead>
<tr>
<th>Types of shock</th>
<th>Additional symptoms</th>
</tr>
</thead>
</table>
| » Hypovolaemic 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 or decreased 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 medicine.  
• Bronchospasm, angioedema and/or urticaria. |

### 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 and septic shock after fluid challenge. Prompt diagnosis of underlying cause is essential to ensure optimal treatment.

» Maintain open airway.
» Administer face mask oxygen and if needed after intubation with assisted ventilation.
» Check for and manage hypoglycaemia.
Fluid challenge in adults with suspected septic shock:
- Sodium chloride 0.9%, IV, 500 mL over 30 minutes.
  - Assess blood pressure and pulse rate response. Response is defined by a good urine output and adequate cerebral perfusion rather than an absolute blood pressure value.
  - If there is a positive response, then continue with intravenous fluid. Avoid over hydrating as this could exacerbate hypoxia associated with adult respiratory distress syndrome.
  - If no haemodynamic response to fluid challenge, suspect septic shock.

Fluid replacement (Not for cardiogenic shock):
Adults
- Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  - Repeat bolus until blood pressure is improved.
Children
- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus if no adequate response.

Note:
- 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 in addition to fluid resuscitation, receive antibiotic cover for probable septicaemia.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table, pg 22.2.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN SEVERELY ILL NEONATES AND CHILDREN
Ceftriaxone should be used in neonates that are seriously ill only, and must be given even if they are jaundiced.
In infants < 28 days of age, ceftriaxone should not be administered if a calcium containing intravenous infusion e.g. Ringer-Lactate, is given or is expected to be given. After 28 days of age, ceftriaxone and calcium containing fluids may be given but only sequentially with the giving set flushed well between the two products if given IV. Annotate the dosage and route of administration in the referral letter.

REFERRAL
Urgent
All patients, after resuscitation.
21.18 **ANAPHYLAXIS**  
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 can be short-lived, protracted or biphasic, i.e. acute with recurrence several hours later. Immediate reactions are usually the most severe and/or life-threatening.

Clinical features include:
» Acute onset of signs and symptoms.
» Urticaria (hives) or angioedema.
» Bronchospasm, wheezing, dyspnoea, chest tightness.
» Laryngeal oedema with upper airway obstruction or stridor.
» Gastrointestinal symptoms such as nausea, vomiting, diarrhoea.
» Hypotension and/or shock.
» Dizziness, paraesthesia, syncope, sweating, flushing, dysrhythmias.

**EMERGENCY TREATMENT**
» Resuscitate (CAB) immediately (See Section 21.6: Cardiac arrest – cardiopulmonary resuscitation).
» Place hypotensive or shocked patient in horizontal position. Do NOT sit the patient up.
» Severe anaphylaxis: administer oxygen by facemask at high flow rate of 15 L/min.

**MEDICINE TREATMENT**
Epinephrine (adrenaline) is the mainstay of treatment and should be given immediately.
- Epinephrine (adrenaline), 1:1000, IM, 0.01 mL/kg as a single dose.
  - Children: 1:1000, IM, 0.01 mL/kg as a single dose. See dosing table, pg 22.3.
  - Adults: 1:1000, **IM**, 1 mg (1 mL) as a single dose, into the lateral thigh.
  - Repeat in 5 minutes if no improvement.
- Hydrocortisone IM/slow IV, immediately.
  - Children: Hydrocortisone, slow IV, 4–6 mg/kg immediately. See dosing table, pg 22.5.
  - Adults: IM/slow IV, 100 mg immediately.
- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg. See dosing table, pg 22.7.
  - Adults: 25–50 mg.

**REFERRAL**
All patients.
**Note:** Epinephrine (adrenaline) administration may have to be repeated due to its short duration of action. Close observation during transport is essential.
21.19 SPRAINS AND STRAINS
T14.3

DESCRIPTION
Soft tissue injuries.
Clinical features include:
» pain, especially on movement    » limited movement
» tenderness on touch            » history of trauma
May be caused by:
» sport injuries                 » overuse of muscles
» slips and twists               » abnormal posture
Note: In children always bear non-accidental injuries (assault) in mind.

EMERGENCY TREATMENT
Immobilise with firm bandage and/or temporary splinting.
Children
• Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 22.7.
Adults
• Paracetamol, oral, 1 g 6 hourly when required.

AND
Children > 12 years of age and adults
• Ibuprofen, oral, 200–400 mg 8 hourly with or after a meal.

REFERRAL
» Severe progressive pain.
» Progressive swelling.
» Extensive bruising.
» Deformity.
» Joint tenderness on bone.
» No response to treatment.
» Severe limitation of movement.
» Suspected serious injury.
» Recurrence.
» Previous history of bleeding disorder.

21.20 STATUS EPILEPTICUS
G41.9
For initial treatment of seizures see Section 15.2: Seizures.

DESCRIPTION
This is a medical emergency and has the potential for causing high mortality. Status epilepticus is a series of seizures follow one another lasting > 30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.
Do not wait for established status epilepticus to terminate convulsions. Convulsions lasting > 5 minutes should be terminated.
GENERAL MEASURES
» Place the patient in a lateral (recovery) position.
» **Do not** place anything (spoon or spatula etc) in the patient’s mouth.
» Do not try to open the patient’s mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen.
» Prepare for intubation if sufficiently skilled in the procedure and relevant rescue devices are available.
» Check blood glucose (exclude hypoglycaemia).
» Monitor vital signs every 15 minutes.
» Establish an IV line.

MEDICINE TREATMENT

Children < 12 years of age
- Midazolam, buccal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.6.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - **Note**: Buccal midazolam should not be used in infants < 6 months of age.

OR
- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table, pg 22.3.
  - Use diazepam for injection 10mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1–5 minutes.

If no response after one dose of midazolam or two doses of diazepam, and if the convulsion has lasted more than 20 minutes:

**ADD**
- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose. See dosing table, pg 22.7.

Adults
- Midazolam, IM, 10 mg as a single dose.

**OR**
- Diazepam, slow IV, 10–20 mg.
  - Administer 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.
CAUTION
Avoid diazepam IM since absorption is slow and erratic.
Do not mix with other medicines.

REFERRAL
Urgent
Seizures that cannot be controlled.

Non-urgent
All patients once stabilised. Clinical notes including detail on medication given should accompany patients.


* Levonorgestrel 1.5 mg: Contract circular HP03-2013FP. http://www.health.gov.za/


**STANDARD PAEDIATRIC DOSING TABLES**

Different conditions require different dosaging of medication. In children most conditions can use standardised doses. The weight-band dosing tables below are standardised doses of a medicine for children for specific conditions (indicated above each table). Where a specific condition is not indicated below, see the main text of the book for the dosing specific to that condition.

### ACICLOVIR

1.4 *Herpes simplex infections of the mouth and lips.*

- Aciclovir, oral, 250 mg/m²/dose 8 hourly for 7 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age (Months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5 kg</td>
<td>50 mg</td>
<td>1.25 mL 200 mg/5mL</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>80 mg</td>
<td>2 mL 200 mg</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>100 mg</td>
<td>2.5 mL ½ tablet 200 mg</td>
<td>&gt;6–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>120 mg</td>
<td>3 mL – 400 mg</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–25 kg</td>
<td>160 mg</td>
<td>4 mL – 400 mg</td>
<td>&gt;3–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>200 mg</td>
<td>5 mL 1 tablet 400 mg</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35kg–55 kg</td>
<td>300 mg</td>
<td>7.5 mL 1½ tablets 400 mg</td>
<td>&gt;11–15 years</td>
</tr>
<tr>
<td>&gt;55 kg</td>
<td>400 mg</td>
<td>– 1 tablet 400 mg</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>

### ACTIVATED CHARCOAL

21.8 *Exposure to poisonous substances.*

- Activated charcoal, 1 g/kg mixed as a slurry with water.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (g)</th>
<th>Age (Months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–7 kg</td>
<td>5 g</td>
<td>&gt;1–6 months</td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>10 g</td>
<td>&gt;6–18 months</td>
</tr>
<tr>
<td>&gt;11–17.5 kg</td>
<td>15 g</td>
<td>&gt;18 months–5 years</td>
</tr>
<tr>
<td>&gt;17.5–35 kg</td>
<td>25 g</td>
<td>&gt;5–11 years</td>
</tr>
<tr>
<td>&gt;35–55 kg</td>
<td>50 g</td>
<td>&gt;11–15 years</td>
</tr>
<tr>
<td>&gt;55 kg</td>
<td>100 g</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>

### AMOXICILLIN

3.2.1.1 *Complicated severe acute malnutrition;* 10.9 *Measles (initial dose for measles with pneumonia, then refer);* 17.3.4.1 *Pneumonia in children.*

- Amoxicillin, oral, 30 mg/ kg/ dose, 8 hourly for 7 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age (Months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>75 mg</td>
<td>3 mL 125 mg/5mL 250 mg/5mL</td>
<td>Birth–1 month</td>
</tr>
<tr>
<td>&gt;3.5–5 kg</td>
<td>125 mg</td>
<td>5 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>175 mg</td>
<td>7 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–11 kg</td>
<td>250 mg</td>
<td>10 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;6–18 months</td>
</tr>
<tr>
<td>&gt;11–17.5 kg</td>
<td>375 mg</td>
<td>15 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;18 months–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>500 mg</td>
<td>10 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>750 mg</td>
<td>15 mL 125 mg/5mL 250 mg/5mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35kg</td>
<td>1000 mg</td>
<td>– 125 mg/5mL 250 mg/5mL</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>
### ATROPINE

21.8 Exposure to poisonous substances.
- Atropine, IV, 0.05 mg/kg/dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following injections (intravenously)</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5kg</td>
<td>0.2 mg</td>
<td>0.4 mL</td>
<td>0.2 mL</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>0.3 mg</td>
<td>0.6 mL</td>
<td>0.3 mL</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>0.4 mg</td>
<td>0.8 mL</td>
<td>0.4 mL</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>0.5 mg</td>
<td>1 mL</td>
<td>0.5 mL</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>0.6 mg</td>
<td>1.2 mL</td>
<td>0.6 mL</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>0.8 mg</td>
<td>1.6 mL</td>
<td>0.8 mL</td>
</tr>
<tr>
<td>&gt;17.5 kg</td>
<td>1 mg</td>
<td>2 mL</td>
<td>1 mL</td>
</tr>
</tbody>
</table>

### CEFTRIAXONE

2.9.1 Diarrhoea, acute in children; 2.10.1 Dysentery, bacillary; 3.2.1.1 Complicated severe acute malnutrition; 8.4 Urinary tract infection (UTI); 10.1 Fever; 10.16 Viral haemorrhagic fever; 14.3 Arthritis, septic; 15.3.1 Meningitis, acute; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.4.1 Pneumonia in children; 21.11.1 Rape and sexual violation; 21.17 Shock.
- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following injections mixed with water for injection (WFI):</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2.5–3.5 kg</td>
<td>225 mg</td>
<td>1.8 mL</td>
<td>0.9 mL</td>
</tr>
<tr>
<td>&gt;3.5–5.5 kg</td>
<td>310 mg</td>
<td>–</td>
<td>1.25 mL</td>
</tr>
<tr>
<td>&gt;5.5–7 kg</td>
<td>440 mg</td>
<td>–</td>
<td>1.75 mL</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>625 mg</td>
<td>–</td>
<td>2.5 mL</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>750 mg</td>
<td>–</td>
<td>3 mL</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>810 mg</td>
<td>–</td>
<td>3.25 mL</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>1 000 mg</td>
<td>–</td>
<td>4 mL</td>
</tr>
<tr>
<td>&gt;17.5 kg</td>
<td>1 500 mg</td>
<td>–</td>
<td>5.5 mL</td>
</tr>
</tbody>
</table>

### CEPHALEXIN

5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.7.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa.
- Cephalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 250 mg/5mL</th>
<th>Syrup 500 mg/5mL</th>
<th>Capsule 250 mg</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2.5–5 kg</td>
<td>62.5 mg</td>
<td>2.5 mL</td>
<td>–</td>
<td>–</td>
<td>Birth–3 months</td>
</tr>
<tr>
<td>&gt;5–11 kg</td>
<td>125 mg</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>–</td>
<td>&gt;3–18 months</td>
</tr>
<tr>
<td>&gt;11–25 kg</td>
<td>250 mg</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 capsule</td>
<td>&gt;18 months–7 years</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>500 mg</td>
<td>–</td>
<td>–</td>
<td>2 capsules</td>
<td>&gt;7 years</td>
</tr>
</tbody>
</table>

### CETIRIZINE

5.2 Itching (pruritus); 5.8.1 Eczema, atopic; 5.10.4 Papular urticaria; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis.
- Cetirizine, oral, once daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;12–21 kg</td>
<td>5 mg</td>
<td>Syrup 1 mg/mL</td>
<td>2–6 years</td>
</tr>
<tr>
<td>&gt;21 kg</td>
<td>10 mg</td>
<td>Tablet 10 mg</td>
<td>&gt;6 years</td>
</tr>
</tbody>
</table>
### CHLORPHENAMINE
5.2 Itching (pruritus); 5.7.3 Sandworm; 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.1 Urticaria; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 10.3 Chicken pox; 10.9 Measles; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis; 20.3 Chronic cancer pain; 21.4.2 Insect stings and spider bites.

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

<table>
<thead>
<tr>
<th>Weight Kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;12–14 kg</td>
<td>1.2 mg</td>
<td>3 mL</td>
<td>&gt;2–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>1.6 mg</td>
<td>4 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>2 mg</td>
<td>5 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>3 mg</td>
<td>7.5 mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35 kg</td>
<td>4 mg</td>
<td>–</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>

### CIPROFLOXACIN
2.10.1 Dysentery, bacillary.

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

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age Months / years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–11 kg</td>
<td>150mg</td>
<td>3 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>200 mg</td>
<td>4 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>250 mg</td>
<td>5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>300 mg</td>
<td>6 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>500 mg</td>
<td>10 mL</td>
<td>&gt;7 years</td>
</tr>
</tbody>
</table>

### COTRIMOXAZOLE (PROPHYLAXIS)
11.5 The HIV exposed infant; 11.6 Management of HIV infected children; 11.7 Opportunistic infections, prophylaxis in children.

- Cotrimoxazole, oral, once daily (everyday).

<table>
<thead>
<tr>
<th>Recommended daily by weight band</th>
<th>Dose sulfamethoxazole /trimethoprim</th>
<th>Susp 200/40 mg per 5 mL</th>
<th>Single strength tablet 400/80 mg</th>
<th>Double strength tablet 800/160 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–4.9 kg</td>
<td>100/20 mg</td>
<td>2.5 mL</td>
<td>¼ tablet</td>
<td>–</td>
</tr>
<tr>
<td>5–13.9 kg</td>
<td>200/40 mg</td>
<td>5 mL</td>
<td>½ tablet</td>
<td>–</td>
</tr>
<tr>
<td>14–29.9 kg</td>
<td>400/80 mg</td>
<td>10 mL</td>
<td>1 tablet</td>
<td>½ tablet</td>
</tr>
<tr>
<td>&gt;30 kg</td>
<td>800/160 mg</td>
<td>–</td>
<td>2 tablets</td>
<td>1 tablet</td>
</tr>
</tbody>
</table>

### DIAZEPAM
15.2 Seizures (convulsions/fits); 15.2.3 Febrile convulsions; 21.20 Status epilepticus.

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Ampoule 10 mg/2 mL</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3–6 kg</td>
<td>2 mg</td>
<td>0.4 mL</td>
<td>&lt;6 months</td>
</tr>
<tr>
<td>&gt;6–10 kg</td>
<td>2.5 mg</td>
<td>0.5 mL</td>
<td>&gt;6 months–1 year</td>
</tr>
<tr>
<td>&gt;10–18 kg</td>
<td>5 mg</td>
<td>1 mL</td>
<td>&gt;1–5 years</td>
</tr>
<tr>
<td>&gt;18–25 kg</td>
<td>7.5 mg</td>
<td>1.5 mL</td>
<td>&gt;5–8 years</td>
</tr>
<tr>
<td>&gt;25–40 kg</td>
<td>10 mg</td>
<td>2 mL</td>
<td>&gt;8–12 years</td>
</tr>
</tbody>
</table>

### EPINEPHRINE (ADRENALINE)
21.18 Anaphylaxis.

- Epinephrine (adrenaline), 1:1000, IM, 0.01 mL/kg as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Injection 1 mg/mL (1:1 000)</th>
<th>Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>9–12 kg</td>
<td>0.1 mg</td>
<td>0.1 mL</td>
<td>1–2 years</td>
</tr>
<tr>
<td>&gt;12–18 kg</td>
<td>0.2 mg</td>
<td>0.2 mL</td>
<td>&gt;2–5 years</td>
</tr>
<tr>
<td>&gt;18–40 kg</td>
<td>0.3 mg</td>
<td>0.3 mL</td>
<td>&gt;5–12 years</td>
</tr>
<tr>
<td>&gt;40–55 kg</td>
<td>0.5 mg</td>
<td>0.5 mL</td>
<td>&gt;12–15 years</td>
</tr>
<tr>
<td>&gt;55 kg</td>
<td>1 mg</td>
<td>1 mL</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>
### ERYTHROMYCIN

- Abscess, dental; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 10.9 Measles (otitis externa in children); 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 21.4.1 Animal and human bites; 21.11.1 Rape and sexual violation.

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

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (125 mg/5 mL)</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–11</td>
<td>125 mg</td>
<td>5 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>150 mg</td>
<td>6 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–18</td>
<td>200 mg</td>
<td>8 mL</td>
<td>&gt;3–5 years</td>
</tr>
</tbody>
</table>

### FLUCLOXACILLIN

- Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa.

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

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (125 mg/5 mL)</th>
<th>Capsule (250 mg)</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2.5–5</td>
<td>62.5 mg</td>
<td>2.5 mL</td>
<td>–</td>
<td>Birth–3 months</td>
</tr>
<tr>
<td>&gt;5–11</td>
<td>125 mg</td>
<td>5 mL</td>
<td>–</td>
<td>&gt;3–18 months</td>
</tr>
<tr>
<td>&gt;11–25</td>
<td>250 mg</td>
<td>10 mL</td>
<td>1 capsule</td>
<td>&gt;18 months–7 years</td>
</tr>
<tr>
<td>&gt;25</td>
<td>500 mg</td>
<td>–</td>
<td>2 capsules</td>
<td>&gt;7 years</td>
</tr>
</tbody>
</table>

### FLUCONAZOLE

- Scalp infections – tinea capitis (for 28 days); 11.8.2 Candidiasis, oesophageal (for 21 days).

- Fluconazole, oral, 6 mg/kg once daily.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5</td>
<td>25 mg</td>
<td>Susp 50 mg/5 mL</td>
<td>Capsule 50 mg</td>
</tr>
<tr>
<td>&gt;5–7</td>
<td>30 mg</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&gt;7–9</td>
<td>50 mg</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&gt;9–11</td>
<td>60 mg</td>
<td>5 mL</td>
<td>1 capsule</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>70 mg</td>
<td>7 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;14–17.5</td>
<td>100 mg</td>
<td>10 mL</td>
<td>2 capsules</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>125 mg</td>
<td>12.5 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>150 mg</td>
<td>15 mL</td>
<td>3 capsules</td>
</tr>
<tr>
<td>&gt;35</td>
<td>200 mg</td>
<td>–</td>
<td>1 capsule</td>
</tr>
</tbody>
</table>

### FUROSEMIDE

- Cardiac failure, Congestive children (CCF), children; 8.1 Chronic kidney disease (CKD); 8.2 Acute kidney injury; 8.3.1Nephritic syndrome; 21.16 Pulmonary oedema, acute.

- Furosemide, IV, 1 mg/kg, over 5 minutes.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Injection 10 mg/mL</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5</td>
<td>4 mg</td>
<td>0.4 mL</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7</td>
<td>6 mg</td>
<td>0.6 mL</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9</td>
<td>8 mg</td>
<td>0.8 mL</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11</td>
<td>10 mg</td>
<td>1 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>12 mg</td>
<td>1.2 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5</td>
<td>15 mg</td>
<td>1.5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>20 mg</td>
<td>2 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>30 mg</td>
<td>3 mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35</td>
<td>40 mg</td>
<td>4 mL</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>
### HYDROCORTISONE

17.1.1 Acute asthma & acute exacerbation of COPD; 21.18 Anaphylaxis.

- Hydrocortisone slow IV, 4–6 mg/kg immediately.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Injection 100 mg/2 mL</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;11–14 kg</td>
<td>50 mg</td>
<td>1 mL</td>
<td>&gt;2–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>75 mg</td>
<td>1.5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5 kg</td>
<td>100 mg</td>
<td>2 mL</td>
<td>&gt;5 years</td>
</tr>
</tbody>
</table>

### IBUPROFEN

20.1 Pain control; 20.3 Chronic cancer pain.

- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with food.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–11 kg</td>
<td>80 mg</td>
<td>Syrup 100 mg/5 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>100 mg</td>
<td>5 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>120 mg</td>
<td>6 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>150 mg</td>
<td>7.5 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–40 kg</td>
<td>200 mg</td>
<td>10 mL</td>
<td>&gt;7–12 years</td>
</tr>
<tr>
<td>&gt;40 kg</td>
<td>400 mg</td>
<td>1 tablet</td>
<td>&gt;12 years</td>
</tr>
</tbody>
</table>

### LACTULOSE

2.5.1 Anal fissures; 2.8 Constipation; 20.3 Chronic cancer pain.

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

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 3.3 g/5 mL</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;5–7 kg</td>
<td>8 mL</td>
<td>3 mL</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9 kg</td>
<td>10 mL</td>
<td>4 mL</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>12 mL</td>
<td>5 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>15 mL</td>
<td>6 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>20 mL</td>
<td>7.5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–35 kg</td>
<td>25 mL</td>
<td>10 mL</td>
<td>&gt;5–11 years</td>
</tr>
<tr>
<td>&gt;35 kg</td>
<td>30 mL</td>
<td>15 mL</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>

### LAMIVUDINE

21.11.1 Rape and sexual violation.

- Lamivudine, oral, 4 mg/kg 12 hourly or 8mg/kg daily for 28 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Use of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solution 10 mg/mL</td>
</tr>
<tr>
<td>&gt;3–5 kg</td>
<td>2 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;5–7 kg</td>
<td>3 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;7–10 kg</td>
<td>4 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;10–14 kg</td>
<td>6 mL 12 hourly or 12 mL daily</td>
</tr>
<tr>
<td>&gt;14–20 kg</td>
<td>8 mL 12 hourly or 15 mL daily</td>
</tr>
<tr>
<td>&gt;20–25 kg</td>
<td>15 mL 12 hourly or 30 mL daily</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>1 tablet 12 hourly or 2 tablets daily</td>
</tr>
</tbody>
</table>
## Lopinavir/Ritonavir

22.11.1 Rape and sexual violation.

- Lopinavir/ritonavir, oral 300/75mg/m² 12 hourly for 28 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Use one of the following</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solution 80/20 mg/mL</td>
</tr>
<tr>
<td>&gt;3–5 kg</td>
<td>1 mL</td>
</tr>
<tr>
<td>&gt;5–10 kg</td>
<td>1.5 mL</td>
</tr>
<tr>
<td>&gt;10–14 kg</td>
<td>2 mL</td>
</tr>
<tr>
<td>&gt;14–20 kg</td>
<td>2.5 mL</td>
</tr>
<tr>
<td>&gt;20–25 kg</td>
<td>3 mL</td>
</tr>
<tr>
<td>&gt;25–30 kg</td>
<td>3.5 mL</td>
</tr>
<tr>
<td>&gt;30–35 kg</td>
<td>4 mL</td>
</tr>
<tr>
<td>&gt;35 kg</td>
<td>5 mL</td>
</tr>
</tbody>
</table>

## Metronidazole

1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 21.4.1 Animal and human bites; 21.11.1 Rape and sexual violation (single dose, prior to referral).

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

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Suspension 200 mg/5mL</td>
<td>Tabs 200mg</td>
</tr>
<tr>
<td>&gt; 9–11 kg</td>
<td>80 mg</td>
<td>2 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>100 mg</td>
<td>2.5 mL</td>
<td>½ tablet</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>120 mg</td>
<td>3 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>160 mg</td>
<td>4 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>200 mg</td>
<td>5 mL</td>
<td>1 tablet</td>
</tr>
<tr>
<td>&gt;35–65 kg</td>
<td>300 mg</td>
<td>7.5mL</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>&gt;55 kg</td>
<td>400 mg</td>
<td>–</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>

## Midazolam

15.2 Seizures (convulsions/fits); 21.20 Status epilepticus.

- Midazolam, buccal, 0.5 mg/kg

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Injection (buccal administration) 5 mg/mL</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7–9 kg</td>
<td>4 mg</td>
<td>0.8 mL</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>5 mg</td>
<td>1 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>6 mg</td>
<td>1.2 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>7.5 mg</td>
<td>1.5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>10 mg</td>
<td>2 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>12.5 mg</td>
<td>3 mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35 kg</td>
<td>20 mg</td>
<td>4 mL</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>

## Morphine

20.3 Chronic cancer pain.

- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Use one of the following:</th>
<th>Age (months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;7–9 kg</td>
<td>2 mg</td>
<td>2 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;9–11 kg</td>
<td>2.5 mg</td>
<td>2.5 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>4 mg</td>
<td>4 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>5 mg</td>
<td>5 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>6 mg</td>
<td>6 mL</td>
<td>–</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>10 mg</td>
<td>10 mL</td>
<td>1 tablet</td>
</tr>
</tbody>
</table>
PARACETAMOL
1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 1.4 Herpes simplex infections of the mouth and lips; 10.1 Fever; 10.3 Chickenpox; 10.8.1 Malaria, uncomplicated (fever in children < 5 years of age); 10.9 Measles; 10.11 Mumps; 10.12 Rubella (German measles); 14.1 Arthralgia; 15.2.3 Febrile convulsions; 15.4 Headache, mild, non-specific; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.1 Influenza; 18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn); 18.1.4 Conjunctivitis, viral (pink eye); 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 20.1 Pain control; 20.3 Chronic cancer pain; 21.4.2 Insect stings and spider bites; 21.5 Burns; 21.14 Injuries; 21.19 Sprains.

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following:</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3.5–5</td>
<td>48 mg</td>
<td>2 mL</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7</td>
<td>72 mg</td>
<td>3 mL</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–9</td>
<td>96 mg</td>
<td>4 mL</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;9–11</td>
<td>120 mg</td>
<td>5 mL</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>144 mg</td>
<td>6 mL</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5</td>
<td>180 mg</td>
<td>7.5 mL</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>240 mg</td>
<td>10 mL ½ tablet</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>360 mg</td>
<td>15 mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35–55</td>
<td>500 mg</td>
<td>–</td>
<td>&gt;11–15 years</td>
</tr>
<tr>
<td>&gt;55</td>
<td>1 000 mg</td>
<td>2 tablets</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>

PHENOBARBITAL
21.20 Status epilepticus.

- Phenobarbitone, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Tablet 30 mg</th>
<th>Age Months/ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2.5–3.5</td>
<td>60 mg</td>
<td>2 tablets</td>
<td>Birth–1 month</td>
</tr>
<tr>
<td>&gt;3.5–5</td>
<td>75 mg</td>
<td>2½ tablets</td>
<td>&gt;1–3 months</td>
</tr>
<tr>
<td>&gt;5–7</td>
<td>120 mg</td>
<td>4 tablets</td>
<td>&gt;3–6 months</td>
</tr>
<tr>
<td>&gt;7–11</td>
<td>180 mg</td>
<td>6 tablets</td>
<td>&gt;6–12 months</td>
</tr>
<tr>
<td>&gt;11–14</td>
<td>210 mg</td>
<td>7 tablets</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14</td>
<td>240 mg</td>
<td>8 tablets</td>
<td>&gt;3 years</td>
</tr>
</tbody>
</table>

PRAZIQUANTEL
10.13 Schistosomiasis.

- Praziquantel, oral, 40 mg/kg as a single dose.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Tablet 600 mg</th>
<th>Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;12–17.5</td>
<td>600 mg</td>
<td>1 tablet</td>
<td>&gt;2–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>900 mg</td>
<td>1½ tablet</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>1 200 mg</td>
<td>2 tablets</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35</td>
<td>1 800 mg</td>
<td>3 tablets</td>
<td>&gt;11 years</td>
</tr>
</tbody>
</table>

PROMETHAZINE
21.18 Anaphylaxis.

- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Use one of the following injections:</th>
<th>Age Months/years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;12–17.5</td>
<td>2.5 mg</td>
<td>25 mg/mL 0.1 mL 50 mg/2 mL 0.1 mL</td>
<td>&gt;2–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25</td>
<td>5 mg</td>
<td>0.2 mL 0.2 mL</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35</td>
<td>7.5 mg</td>
<td>0.3 mL 0.3 mL</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35–55</td>
<td>15 mg</td>
<td>0.6 mL 0.6 mL</td>
<td>&gt;11–15 years</td>
</tr>
<tr>
<td>&gt;55</td>
<td>25 mg</td>
<td>1 mL 0.5 mL</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>
### Quinine Dihydrochloride

**10.8.2 Malaria, severe.**

- Quinine dihydrochloride, IV or IM, 15–20 mg/kg immediately as a single dose and refer urgently.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose mg</th>
<th>Injection 300 mg/mL</th>
<th>Use one of the following:</th>
<th>Age (Months/years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;9–11 kg</td>
<td>180 mg</td>
<td>0.6 mL</td>
<td>2 mL Sodium chloride 0.9%</td>
<td>&gt;12–18 months</td>
</tr>
<tr>
<td>&gt;11–14 kg</td>
<td>210 mg</td>
<td>0.7 mL</td>
<td>2.5 mL Dextrose 5%</td>
<td>&gt;18 months–3 years</td>
</tr>
<tr>
<td>&gt;14–17.5 kg</td>
<td>300 mg</td>
<td>1 mL</td>
<td>3 mL Dextrose 5%</td>
<td>&gt;3–5 years</td>
</tr>
<tr>
<td>&gt;17.5–25 kg</td>
<td>360 mg</td>
<td>1.2 mL</td>
<td>4.5 mL Dextrose 5%</td>
<td>&gt;5–7 years</td>
</tr>
<tr>
<td>&gt;25–35 kg</td>
<td>510 mg</td>
<td>1.7 mL</td>
<td>7.5 mL Dextrose 5%</td>
<td>&gt;7–11 years</td>
</tr>
<tr>
<td>&gt;35–55 kg</td>
<td>750 mg</td>
<td>2.5 mL</td>
<td>10 mL Dextrose 5%</td>
<td>&gt;11–15 years</td>
</tr>
<tr>
<td>&gt;55 kg</td>
<td>900 mg</td>
<td>3 mL</td>
<td>10 mL Dextrose 5%</td>
<td>&gt;15 years</td>
</tr>
</tbody>
</table>

### Zidovudine

**21.11.1 Rape and sexual violation.**

- Zidovudine, oral, 180–240 mg/m² 12 hourly for 28 days.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Use one of the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;3–6 kg</td>
<td>6 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;6–8 kg</td>
<td>9 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;8–14 kg</td>
<td>12 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;14–20 kg</td>
<td>15 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;20–25 kg</td>
<td>17 mL 12 hourly</td>
</tr>
<tr>
<td>&gt;25 kg</td>
<td>19 mL 12 hourly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use one of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution 10 mg/mL</td>
</tr>
<tr>
<td>Capsule 100 mg</td>
</tr>
<tr>
<td>Tablet 300 mg</td>
</tr>
</tbody>
</table>

- 2 caps in the morning + 1 cap in the evening
GUIDELINES FOR THE MOTIVATION OF A NEW MEDICINE ON THE NATIONAL ESSENTIAL MEDICINES LIST

Section 1: Medication details

» Generic name
   A fundamental principle of the Essential Drug Programme is that of generic prescribing. Most clinical trails are conducted using the generic name.

» Proposed indication
   There will usually be many registered indications for the medication. However, this section should be limited to the main indication which is supported by the evidence provided in section 2.

» Prevalence of the condition in South Africa
   This information is not always readily available. However, it is an important consideration in the review of a proposed essential medicine.

» Prescriber level
   Here the proposed prescriber level should be included. If more than one level is proposed each relevant box should be ticked.

Section 2: Evidence and motivation

» Estimated benefit
   - Effect measure: this is the clinical outcome that was reported in the clinical trial such as BP, FEV, CD₄, VL etc.
   - Risk benefit: this should reported in the clinical trial and, in most cases, includes the 95% confidence level (95% CI). Absolute risk reduction, also termed risk difference, is the difference between the absolute risk of an event in the intervention group and the absolute risk in the control group.
   - Number Need to Treat (NNT): gives the number of patients who need to be treated for a certain period of time to prevent one event. It is the reciprocal of the absolute risk or can be calculated using the formula on page xxv.
Calculations

<table>
<thead>
<tr>
<th>Measure</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute risk</td>
<td>[ \frac{b}{b+d} - \frac{a}{a+c} ]</td>
</tr>
<tr>
<td>Number needed to treat</td>
<td>[ \frac{1}{\frac{b}{b+d} - \frac{a}{a+c}} ]</td>
</tr>
<tr>
<td>Relative risk</td>
<td>[ \frac{a}{a+c} + \frac{b}{b+d} ]</td>
</tr>
<tr>
<td>Odds ratio</td>
<td>[ \frac{\frac{a}{a+c} + \frac{c}{a+c}}{\frac{b}{b+d} + \frac{d}{b+d}} = \frac{a/c}{b/d} ]</td>
</tr>
</tbody>
</table>

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 contains only three levels:

<table>
<thead>
<tr>
<th>Level I</th>
<th>Good quality evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Systematic review of RCTs with consistent findings</td>
</tr>
<tr>
<td></td>
<td>High quality individual RCT</td>
</tr>
<tr>
<td>Level II</td>
<td>Limited quality patient orientated evidence</td>
</tr>
<tr>
<td></td>
<td>Systematic review of lower quality studies or studies with inconsistent findings</td>
</tr>
<tr>
<td></td>
<td>Low quality clinical trial</td>
</tr>
<tr>
<td></td>
<td>Cohort studies</td>
</tr>
<tr>
<td></td>
<td>Case-control studies</td>
</tr>
<tr>
<td>Level III</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series</td>
</tr>
</tbody>
</table>

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 may be 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:
     o 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.
     o 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.
     o 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 spreadsheet 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**

<table>
<thead>
<tr>
<th>Generic name (or International Nonproprietary Name):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed indication:</td>
</tr>
<tr>
<td>Prevalence of condition (based on epidemiological data, if any):</td>
</tr>
<tr>
<td>Prescriber level</td>
</tr>
<tr>
<td>Primary Health Care</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

**Section 2: Evidence and motivation**

**2.1 Estimated benefit**

<table>
<thead>
<tr>
<th>Effect measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk difference (95% CI)</td>
</tr>
<tr>
<td>NNT</td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Journal ref</th>
</tr>
</thead>
</table>

**B. Older product with weaker evidence base**: Poorer quality controlled trials or high quality observational studies (Level II)

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Journal ref</th>
</tr>
</thead>
</table>

**2.3: Cost-considerations**

<table>
<thead>
<tr>
<th>Have you worked up the cost?</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily cost</td>
<td>Cost minimisation</td>
<td>Cost-effectiveness analysis</td>
</tr>
</tbody>
</table>

Other relevant cost information if available:

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Journal ref</th>
</tr>
</thead>
</table>

**2.4: Additional motivating comments.**

**Section 3: Motivator's Details**

<table>
<thead>
<tr>
<th>PTC Title:</th>
<th>Date submitted:</th>
</tr>
</thead>
</table>

xxxii
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) as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?
All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.
What happens to a report?

All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

» additional investigations into the use of the medicine in South Africa;
» educational initiatives to improve the safe use of the medicine;
» appropriate package insert changes to include the potential for the reaction, and
» changes in the scheduling or manufacture of the medicine to make it safer.

The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?

An 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) 395 8003/8176; Fax: (012) 395 8468

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 REACTION AND PRODUCT QUALITY PROBLEM REPORT FORM
(Identities of reporter and patient will remain strictly confidential)

NATIONAL ADVERSE DRUG EVENT MONITORING CENTRE NADEMC
The Registrar of Medicines
Private Bag X 828
Pretoria 0001
In collaboration with the WHO International Drug Monitoring Programme

PATIENT INFORMATION

Name (or initials): .................................................................
Patient Reference Number: ......................................................
Sex: M F Age: DOB: Weight Height (cm)

............... ...../ ....../ ........ ........... ........... ...........

ADVERSE REACTION/PRODUCT QUALITY PROBLEM (tick appropriate box)

Adverse reaction and/or Product Quality problem

Date of onset of reaction: 

.........../.........../.......... 

Time of onset of reaction:

...........hour ...........min 

Description of reaction or problem (Include relevant tests/lab data, including dates):

.................................................................
1. MEDICINES / VACCINES / DEVICES (include all concomitant medicines)

<table>
<thead>
<tr>
<th>Trade Name and Batch No. (Asterisk Suspected Product)</th>
<th>Daily Dosage</th>
<th>Route</th>
<th>Date Started</th>
<th>Date Stopped</th>
<th>Reasons for use</th>
</tr>
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ADVERSE REACTION OUTCOME (Check all that apply)

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<tr>
<th>death</th>
<th>life-threatening</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>disability</th>
<th>hospitalisation</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>congenital anomaly</th>
<th>Other..................</th>
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<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>required intervention to prevent permanent impairment/damage</th>
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<td></td>
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</table>

Reaction abated after stopping medicine:

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
</tr>
</thead>
</table>

Event reappeared on rechallenge:

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
<th>Rechallenge not done</th>
</tr>
</thead>
</table>

Recovered:

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
</tr>
</thead>
</table>

Sequelae:

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
</tr>
</thead>
</table>
Describe Sequelae:  

COMMENTS: (e.g. Relevant history, Allergies, Previous exposure, Baseline test results/lab data)

2. PRODUCT QUALITY PROBLEM:

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Batch No</th>
<th>Registration No</th>
<th>Dosage form &amp; strength</th>
<th>Expiry Date</th>
<th>Size/Type of container</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tbody>
</table>

Product available for evaluation?:  

REPORTING HEALTHCARE PROFESSIONAL:

NAME: ..................................................................................

QUALIFICATIONS:..................................................................

ADDRESS: .............................................................................

.............................................................................Postal Code: ........  

TEL: (...........)......................................................

.................................................................

Signature                     Date

This report does not constitute an admission that medical personnel or the product caused or contributed to the event.

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ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:
• medications (drugs, vaccines and biologicals)
• medical devices (including in-vitro diagnostics)
• complementary / alternative medicines (including traditional, herbal remedies, etc)

Please report especially:
• adverse drug reactions to newly marketed products
• serious reactions and interactions with all products
• adverse drug reactions which are not clearly reflected in the package insert.

Report Product Quality Problems such as:
• suspected contamination
• questionable stability
• defective components
• poor packaging or labelling
• therapeutic failures

Report even if:
• you’re not certain the product caused the event
• you don’t have all the details

Important numbers:
Investigational Products and Product Quality Problems:
• fax: (012) 395-9201
• phone: (012) 395-9341

Adverse Events Following Immunisation:
• fax: (012) 395 8905
• phone: (012) 395 8914/5

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 medicine safety and therapy in South Africa.

PLEASE USE ADDRESS PROVIDED BELOW - JUST FOLD IN THIRDS, TAPE and MAIL

POSTAGE WILL BE PAID BY THE ADDRESSEE

BUSINESS REPLY SERVICE

DEPARTMENT OF HEALTH
DEPARTEMENT VAN GESONDHEID
REGISTRAR OF MEDICINES
REGISTRATEUR VAN MEDISYNE
PRIVATE BAG / PRIVAATSAK X828
PRETORIA
0001
DISEASE NOTIFICATION PROCEDURES

The disease reporting system in South Africa is based on government law (the Health Act, Act No. 61 of 2003), together with regulations on the reporting of specific diseases to the Local, Provincial and/or National Health Department.

Who should notify
The first health care professional to come into contact with a patient presenting with one of the prescribed Notifiable Medical Conditions is required by law to notify. This may include clinic personnel, infection control nurses, other hospital staff or private medical practitioners. In the event of deaths (or cases) in the community, a member of the community is obliged to notify the event.

Which diseases to notify
Currently 33 broad medical conditions are currently notifiable in South Africa (see List of Notifiable Medical Condition). Some conditions (e.g. tuberculosis and viral hepatitis) have been divided into various components, resulting in more than 40 notifiable medical conditions.

Notifiable medical conditions have been sub-divided into two categories according to type of disease:

a) **Category A:** these are medical conditions that require immediate notification to the regional/provincial or national Department of Health by telephone or fax upon initial diagnosis (presumptive or confirmed) with written notification form (GW17/5) to follow within five days.

Any health care professional identifying even a single case of a disease (presumptive or laboratory confirmed) contained in the Category A should make an immediate notification directly to the designated local health officer through fax or telephonically as rapidly as possible (within 24 hours). The local health officer must report to the Provincial health officer and/or to the National Department of Health. Where it is applicable, laboratory confirmation should be obtained at the earliest opportunity and also reported to the designated health office. After reporting through a telephone/fax, it is still required of the health
care provider to send a complete GW17/5 form to the designated local health authority within five days after telephonic reporting.

b) **Category B**: these are medical conditions that require written notification (GW17/5 form) only, within seven days of diagnosis.

The notification system is based on clinical notifications and, therefore, all suspected cases of a notifiable condition must be notified immediately.

**Reporting a Notifiable Disease during an outbreak**

During an outbreak of a notifiable disease, report all cases by phone, email or fax. Daily reporting by health facilities should be maintained through an Outbreak Case Line Listing Form as well through the notification form (GW17/5) to the local health authority that must report to the provincial health officials and the National Department of Health.

**Priority Reporting of MDR & XDR-TB**

Tuberculosis (TB) is one of 33 medical conditions, which is notifiable in terms of the National Health Act (Act 61 of 2003). The Directorate: Epidemiology and Surveillance have instituted a priority reporting for MDR and XDR TB. This means that all health care facilities, public and private, including clinics, hospitals, laboratories, general practitioners and private specialist doctors, are required to report all cases of MDR and XDR TB to the Department of Health within 24 hours.

**How to notify**

The initial notification of a medical condition is done on a case-based form (GW 17/5) with the relevant details by the health personnel e.g., clinic personnel, infection control nurses, other hospital staff, public or private medical practitioners. Initial notification makes tracing as easy as possible, since a disease notification demands action (follow-up) at the peripheral level. The GW17/5 form makes provision for the notification of cases as well as
deaths. Any person contracting a notifiable disease and then dies from the
disease should be notified twice: first as a “CASE” and then later as a
“DEATH”. This will ensure that when estimating the “Case Fatality Rate”
(CFR%), all deaths in the numerator are also included in the denominator.
Depending on the structural organization of the province, the completed GW
17/5 forms is sent to the relevant local health authority, district health office or
the provincial office.

National Department of Health
Cluster: Health Information, Evaluation & Research (HIER)
Directorate: Epidemiology & Surveillance
Private Bag X828
PRETORIA
0001
Tel: 012 395 8150/1
List of Notifiable Medical Conditions

**Category A:** Immediate notification (within 24 hours) of diagnosis by the health care professional (telephone or fax) to the designated district or provincial health officer.
- Acute flaccid paralysis
- Anthrax
- Cholera
- Crimean-Congo haemorrhagic fever
- Other haemorrhagic fevers of Africa
- Food poisoning
- Measles
- Meningococcal infection
- Plague
- Rabies, human
- Yellow fever

**Category B**
- Brucellosis
- Congenital syphilis
- Diphtheria
- Haemophilus Influenza type B
- Lead poisoning
- Legionellosis
- Leprosy
- Malaria
- Paratyphoid fever
- Poisoning agricultural stock remedies
- Poliomyelitis
- 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
- Typhoid fever
- Typhus fever (lice-borne)
- Typhus fever (rat flea-borne)
- Viral hepatitis type A (acute)
- Viral hepatitis type B (acute)
- Viral hepatitis non-A non-B (acute)
- Viral hepatitis unspecified
- Whooping cough
The South African Road to Health Booklet is an extremely important document for the child and family. It is designed to support and integrate the various child health strategies such as IMCI, EPI, TB and HIV care and the Integrated Nutrition Programme. It reminds health care workers to look for, respond to, and record important events and care given to the child.

**OWNERSHIP OF THE BOOKLET**
The Road to Health Booklet is the exclusive property of the parent (primary caregiver) and the child. This is important as the booklet contains information on the child’s health including HIV status, and if the booklet is used for other purposes, mothers may hide the booklet or refuse to allow important information to be recorded in it. This can result in the child receiving less than optimal care.

**USE OF THE ROAD TO HEALTH BOOKLET**

**Issuing the Road to Health Booklet**
At birth all children should be issued with a Road to Health Booklet – in which all vital information is recorded including:

- Name and date of birth — Page 1 (front cover)
- Details of child and family — Page 4
- Neonatal information — Page 5
- Immunisations at birth — Page 6
- PMTCT/HIV information — Page 7

**Use at health service contacts**

On the cover the booklet states:

“IMPORTANT: always bring this booklet when you visit any health clinic, doctor or hospital”

To use the booklet effectively the attending nurse or doctor should ask, at each attendance, to see the Road to Health booklet both due to its intrinsic value as part of a child health consultation and to emphasise the importance of the booklet and its use to the mother.
**On each visit complete/record appropriately**

- Well child visit routine care (incl. growth, TB status, PMTCT HIV status, feeding etc) – Pages 2 and 3.
- Information on the HIV status of the mother and child (if HIV-exposed) – Page 8.
- Weight for age, length/height for age and weight for length/height charting – Pages 14–19.
- Any clinical notes (ideally using IMCI classification, treatment and follow up should be made in the clinical notes) – Pages 21–27.
- Any hospital admissions should be recorded – Page 19.

During the health visit certain care given will depend on whether this is a scheduled well child visit, a follow-up visit, or a first attendance for a new illness.

<table>
<thead>
<tr>
<th>Well child visit</th>
<th>Sick child consultation</th>
<th>Follow up consultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greet mother and child</td>
<td>Ask why she has come and whether she has any concerns.</td>
<td>Ask how the child is and whether any further concerns have arisen.</td>
</tr>
<tr>
<td>Ask why she has come and whether she has any concerns.</td>
<td>Ask why she has come and what her concerns are.</td>
<td></td>
</tr>
<tr>
<td>Ask for Road to Health Booklet and use it.</td>
<td>Proceed to sick child consultation (IMCI).</td>
<td>Carry out the follow-up process from IMCI, but also check the well child consultation.</td>
</tr>
<tr>
<td>If the child has an illness, proceed to sick child consultation (IMCI) in addition to the well child consultation.</td>
<td>Proceed to sick child consultation (IMCI). Ensure that promotive aspects of IMCI (nutrition, immunisations, HIV and TB status) are covered.</td>
<td></td>
</tr>
<tr>
<td>Check and record all due visit items – see above.</td>
<td>Carry out and record the well child visit.</td>
<td>Manage the child according to IMCI classification. Follow up as required.</td>
</tr>
<tr>
<td>Carry out and record the well child visit. Note and respond to any other problems identified.</td>
<td>Manage the child according to IMCI classification. Follow up as required. Carry out and record the well child visit. Note and respond to any other problems identified.</td>
<td></td>
</tr>
<tr>
<td>Tell mother what has been done, what was found and what this means. Ensure the mother knows when to follow up for the next well child visit, and when to come if the child is ill or for other scheduled follow up.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### WHO Weight-for-Length Reference Card (below 87 cm)

<table>
<thead>
<tr>
<th>Boys’ weight (kg)</th>
<th>Girls’ weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
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</table>
## WHO Weight-for-Height Reference Card (87 cm and above)

<table>
<thead>
<tr>
<th>Boys' weight (kg)</th>
<th>Girls' weight (kg)</th>
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</thead>
<tbody>
<tr>
<td>-4 SD</td>
<td>-3 SD</td>
</tr>
<tr>
<td>8.9</td>
<td>9.6</td>
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<tr>
<td>9.1</td>
<td>9.8</td>
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<tr>
<td>9.9</td>
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<td>9.4</td>
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<tr>
<td>14.1</td>
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## PEAK EXPIRATORY FLOW RATES

Suggested reference peak expiratory flow (PEF) values for children:

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Paediatric Hospital Level STG, 2013.
Peak expiratory flow in normal adult 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 table:
  e.g. 440 for a woman of age 25 years and height 167 cm
- Divide patient’s observed peak flow rate over their predicted peak flow rate:
  e.g. 200/440 = 0.45
- Multiply by 100:
  e.g. 0.45X100 = 45%

So, in this example, the patient’s observed peak flow rate is 45% of predicted.

CALCULATING PEAK FLOW VARIABILITY

There are a number of methods for calculating PEF variability.

One method is described below:
- Subtract the lowest from the highest reading.
- Divide by the highest reading.
- Multiply by 100.

So, in this example, where a patient has readings of 300 to 400, the variability is 25%. If these readings were taken before and after a test dose of salbutamol, asthma is diagnosed. (See Section 17.1.2 Chronic asthma).
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<td>PTSD</td>
<td>post traumatic stress syndrome</td>
</tr>
<tr>
<td>PZA or Z</td>
<td>pyrazinamide</td>
</tr>
<tr>
<td>R</td>
<td>rifampicin</td>
</tr>
<tr>
<td>Rh</td>
<td>Rhesus</td>
</tr>
<tr>
<td>RNA</td>
<td>ribonucleic acid</td>
</tr>
<tr>
<td>RPR</td>
<td>Rapid Plasmin Reagin</td>
</tr>
<tr>
<td>RSQ</td>
<td>Risk of Suicide Questionnaire</td>
</tr>
<tr>
<td>RTHB</td>
<td>road to health booklet</td>
</tr>
<tr>
<td>RTUF</td>
<td>ready to use food</td>
</tr>
<tr>
<td>RV</td>
<td>rotavirus</td>
</tr>
<tr>
<td>SABA</td>
<td>short-acting beta, agonist</td>
</tr>
<tr>
<td>SAM</td>
<td>severe acute malnutrition</td>
</tr>
<tr>
<td>sats</td>
<td>oxygen saturation</td>
</tr>
<tr>
<td>SC</td>
<td>subcutaneously</td>
</tr>
<tr>
<td>SJS</td>
<td>Stevens-Johnson syndrome</td>
</tr>
<tr>
<td>sol</td>
<td>solution</td>
</tr>
<tr>
<td>SSRI</td>
<td>selective serotonin re-uptake inhibitor</td>
</tr>
<tr>
<td>SSS</td>
<td>sugar and salt solution</td>
</tr>
<tr>
<td>SSW</td>
<td>scrotal swelling</td>
</tr>
<tr>
<td>STD</td>
<td>sexually transmitted disease</td>
</tr>
<tr>
<td>STEMI</td>
<td>ST elevation myocardial infarction</td>
</tr>
<tr>
<td>STG</td>
<td>standard treatment guideline</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infection</td>
</tr>
<tr>
<td>susp</td>
<td>suspension</td>
</tr>
<tr>
<td>T4</td>
<td>thyroxine</td>
</tr>
<tr>
<td>tab(s)</td>
<td>tablet(s)</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TBSA</td>
<td>total body surface area</td>
</tr>
<tr>
<td>Td</td>
<td>tetanus and diptheria</td>
</tr>
<tr>
<td>TDF</td>
<td>tenofovir</td>
</tr>
<tr>
<td>TEN</td>
<td>toxic epidermal necrolysis</td>
</tr>
<tr>
<td>TG</td>
<td>triglycerides</td>
</tr>
<tr>
<td>TIA</td>
<td>transient ischaemic attack</td>
</tr>
<tr>
<td>TOP</td>
<td>termination of pregnancy</td>
</tr>
<tr>
<td>TPHA</td>
<td>Treponema pallidum haemagglutination</td>
</tr>
<tr>
<td>TPPA</td>
<td>Treponema pallidum particle agglutination</td>
</tr>
<tr>
<td>TSH</td>
<td>thyroid-stimulating hormone</td>
</tr>
<tr>
<td>TST</td>
<td>tuberculin skin test</td>
</tr>
<tr>
<td>TT</td>
<td>tetanus toxoid vaccine</td>
</tr>
<tr>
<td>UE</td>
<td>ung emulsificans (emulsifying ointment)</td>
</tr>
<tr>
<td>UEA</td>
<td>ung emulsificans aqueosum (aqueous cream)</td>
</tr>
<tr>
<td>UTI</td>
<td>urinary tract infection</td>
</tr>
<tr>
<td>VDS</td>
<td>vaginal discharge syndrome</td>
</tr>
<tr>
<td>VHF</td>
<td>viral haemorrhagic fever</td>
</tr>
<tr>
<td>VL</td>
<td>viral load</td>
</tr>
<tr>
<td>VVM</td>
<td>vaccine vial monitor</td>
</tr>
<tr>
<td>WFI</td>
<td>water for injection</td>
</tr>
<tr>
<td>WHO</td>
<td>World health organisation</td>
</tr>
<tr>
<td>WHZ</td>
<td>weight for height Z score</td>
</tr>
<tr>
<td>XDR-TB</td>
<td>extensively drug-resistant tuberculosis</td>
</tr>
<tr>
<td>ETAT tool</td>
<td>emergency triage assessment and treatment tool</td>
</tr>
</tbody>
</table>
USEFUL NUMBERS AND URL LINKS

POISONS INFORMATION CENTRES
Red Cross War Memorial Children’s Hospital Poisons Information Service 021 689 5227
Tygerberg Poison Information Centre 021 931 6129
University of the Free State Poison Control and Medicine Information Centre 082 491 0160

COMMUNICABLE DISEASES
Rabies hotline (NICD) 082 883 9920
Viral Haemorrhagic Fever outbreak hotline (NICD) 082 883 9920

MEDICINE INFORMATION CENTRES
Medicine Information Centre (Cape Town) 021 406 6829
0861 100531
Amayeza Info Centre 011 678 2332
National HIV Healthcare Worker Hotline 0800 212 506
0214066782

DEPARTMENT OF HEALTH
National Department Health website www.health.gov.za
SAEDP@health.gov.za
Third line ART applications TLART@health.gov.za
Medicine stock availability reporting stockalert@health.gov.za
Write on the chart
- Any illness e.g. diarrhea, ARI, etc.
- Admission to hospital
- Solids introduced
- Birth of next child, etc. like this:

Watch the direction of the curve showing the child's growth:

GOOD
Means the child is growing well

VERY DANGEROUS
Child may be ill

DANGER SIGN
Not gaining weight
Find out why
Refer child to hospital

Interpretation of lines:
This Weight-for-Age Chart shows body-weight relative to age in comparison to the Median (0-line).
A girl whose weight-for-age is below the -2 line, is underweight.
A girl whose weight-for-age is below the -3 line, is severely underweight. Clinical signs of Marasmus or Kwashiorkor may be observed.
If her line crosses a z-score line and the shift is away from the median, this may indicate a problem or risk of a problem.
If her line stays close to the median, occasionally crossing above or below it, this is fine.
**Boy’s Weight-for-Age Chart**

**Interpretation of lines:**
This Weight-for-Age Chart shows body-weight relative to age in comparison to the Median (0-line).

A boy whose weight-for-age is below the -2 line, is underweight.
A boy whose weight-for-age is below the -3 line, is severely underweight. Clinical signs of Marasmus or Kwashiorkor may be observed.

If his line crosses a z-score line and the shift is away from the median, this may indicate a problem or risk of a problem.

If his line stays close to the median, occasionally crossing above or below it, this is fine.