STANDARD TREATMENT GUIDELINES

AND

ESSENTIAL DRUGS LIST

FOR

SOUTH AFRICA

PRIMARY HEALTH CARE

2003 EDITION
We are what we repeatedly do  
Excellence then is not an act  
But becomes a habit  

Aristotle

South Africa is a country of socio-economic contrasts. This poses a unique challenge to the Department of Health to make cost-effective healthcare accessible to all the inhabitants of this diverse country. The Standard Treatment Guidelines and Essential Drugs List is a valuable tool that should be used to meet this challenge.

The third edition of the Standard Treatment Guidelines and Essential Drugs List for Primary Health Care is the result of dedication and commitment of many people. Experts in the spheres of medical and pharmaceutical practice formed the National Essential Drugs List Committee.

We have learnt from past experiences and have endeavoured to consult as widely as possible with programme managers within the Department as well as with the Provincial Pharmacy and Therapeutics Committees, experts in different medical specialities and other stakeholders. We would like to take this opportunity to thank all who contributed for their help and to congratulate them on this achievement. This is a dynamic document that will assist healthcare providers to make informed decisions about appropriate health interventions.

We welcome comment and constructive criticism on the acceptability and usefulness of this new edition. Consultation with persons at all levels of healthcare will enable us to amend the guidelines and treatment regimens from time to time to keep abreast with the latest developments in healthcare. We undertake constantly to strive for excellence.

It is our expectation that healthcare providers at all levels will embrace the use of the Standard Treatment Guidelines and Essential Drugs List to promote access to affordable healthcare to all persons in South Africa.

DR MANTO TSHABALALA-MSIMANG  
MINISTER OF HEALTH
In keeping with the objectives of the National Drug Policy, the third edition of the Standard Treatment Guidelines and Essential Drugs List for Primary Health Care has been developed.

The implementation of this new concept is a time consuming process and it has been five years since the previous review. Advocacy and training are vital to this implementation.

Several actions were taken to improve access to medicines at Primary Health Care level. Legislation has been adapted to address the issues around affordability. Pharmacovigilance remains an important aspect to ensure the safety of medicines used. In order to strengthen the adverse drug reaction reporting system in South Africa, a guideline together with a reporting form has been incorporated to assist healthcare providers.

The cost, time and effort expended in producing this book will be in vain if the concepts of evidence based selection of medicines and cost-effective treatment protocols are not integrated into the curricula for doctors, nurses and pharmacists. It is the responsibility of every health professional to advocate the implementation and use of the Standard Treatment Guidelines and Essential Drugs List.

It should be remembered that the Standard Treatment Guidelines and Essential Drugs List are a guideline to the compilation of provincial formularies. Formularies remain the responsibility of provincial Pharmacy and Therapeutics Committees.

Together we can make medicines work.

Acting Director-General: Health
ACKNOWLEDGEMENTS

It is impossible to name all who have played a part in producing this edition. Most of the persons acknowledged also contributed much of their free time and without their dedication to the process this publication might not have been possible. We offer sincere thanks to those who contributed appropriate information and to the members of the National Essential Drugs List Committee.

We are especially grateful to Prof BW van de Wal, Co-ordinator of the PHC Expert Review Committee, for his commitment and tireless effort during the review process.

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THE ESSENTIAL DRUGS 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.

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. They include the following:

- any drug included must meet the needs of the majority of the population
- sufficient proven scientific data regarding effectiveness must be available
- any drug included in the EDL should have a substantial safety and risk/benefit ratio
- all products must be of an acceptable quality, and must be tested on a continuous basis
- the aim, as a rule, is to include only products containing single pharmacologically active ingredients
- combination products, as an exception, will be included where patient compliance becomes an important factor, or two pharmacologically active ingredients are synergistically active in a product
- products will be listed according to their generic names only
- where drugs are clinically equally effective, the drugs will be compared using the following:
  - the best cost advantage
- the best researched
- the best pharmacokinetic properties
- the best patient compliance
- the most reliable local manufacturer

- A request for a new product to be included on the EDL must be supported by scientific data and appropriate references on its advantages and benefits over an existing product.

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

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

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

The treatment guidelines are presented in chapters according to the organ systems of the body except chapters 18, 19 and 20 that address more than one system.

Information on the major Poison Centres in the country is given in the chapter on Trauma and Emergencies.

Where relevant this book is consistent with the case management guidelines of the Integrated Management of Childhood Illness Strategy (IMCI) and other National Programme treatment guidelines. The IMCI strategy, a strategy for improving child health at primary care level, provides detailed action-orientated guidance on assessing, classifying, treating and counseling children and their caregivers on common childhood illnesses. This book compliments that strategy.

Each chapter starts with a list of drugs used in that section followed by the disease or condition and the ICD 10 number. This number refers to an international classification method used when describing certain diseases and conditions. A brief description and more common signs and symptoms of each disease is followed by the management objectives and non-drug and drug treatments. These guidelines also make provision for referral of patients to other health facilities.

In order to find the relevant sections in the book easily, use the indices at the back of the book. These have been divided into an index of drug names and a disease condition index. The Essential Drugs List is the list of drugs derived from the treatment guidelines. At the back of the book is the full list of drugs used in the whole book. Some of the drugs listed are only examples of a therapeutic class. In such cases the Provincial Pharmacy and Therapeutics Committees (PTCs) will decide on their drug of choice within that therapeutic class.

Information on the reporting of adverse drug reactions is provided in the section Pharmacovigilance. All health care workers are encouraged to report suspected adverse reactions to drugs (ADR) when the reaction is potentially serious or clinically significant. The purpose of ADR reporting is to reduce the risks associated with the use of drugs and ultimately improve patient care.

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

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.

Comments that aim to improve these treatment guidelines will be appreciated. The
FLOW DIAGRAMS
There is need to have a problem-based approach to the management of health conditions presenting at a PHC facility. This is facilitated by the inclusion of flow diagrams and information on how to use them.

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

- **The hexagonal** (6-sided) blocks contain information that will guide you on making your clinical decision. Note that these boxes always have a **YES** or **NO** attached to them.

- **The rectangular** blocks usually describe a clinical state or diagnose a condition. If there is a diagnosis, the standard treatment guideline (STG) for this condition appears in the EDL. To find more information on the management of the condition, refer to the index to find the page number for that particular condition.

- **The oval** boxes are so-called “do boxes”. These boxes are a guide on how to manage the patient. They have the following meanings:
  - **Treat**: see management details as described in the STG;
  - **Refer**: refer as appropriate for routine referral, and
  - **Refer urgently**: these conditions require immediate action. The patient must be stabilised, and immediate transportation must be arranged.

PRESCRIPTION WRITING
Drugs should be prescribed only when they are necessary for treatments following clear diagnosis. Not all patients or conditions need prescriptions for drug. In certain conditions simple advice and non-drug treatment may be more suitable.

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

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

In all prescription writing the following should be noted:
• the name of the drug or preparation should be written in full using the generic name and
• no abbreviations should be used due to the risk of misinterpretation.

• Avoid unnecessary use of decimal points and only use where decimal points are unavoidable. A zero should be written in front of the decimal point where there is no other figure, e.g. 2 mg not 2.0 mg or 0.5 ml and not .5 ml

• State the treatment regimen in full:
  ▪ drug 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

**Calculating Body Mass Index**

Body mass index = \( \frac{\text{weight (kg)}}{\text{height}^2 \text{ (m}^2\text{)}} \)

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<td>healthy weight</td>
<td>20 – 24.9</td>
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<tr>
<td>overweight</td>
<td>25 – 29.9</td>
</tr>
<tr>
<td>obese</td>
<td>30 – 39.9</td>
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<tr>
<td>very obese</td>
<td>more than 40</td>
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A GUIDE TO PATIENT EDUCATION IN CHRONIC CONDITIONS

Poor therapeutic outcome of chronic conditions such as asthma, diabetes, epilepsy and hypertension can, in many cases, be ascribed to:

- poor or non-adherence to an otherwise sound therapeutic regimen;
- lack of communication between the various health care providers involved in the patient's management;
- lack of effective communication between health care provider and patient;
- ineffective and/or insensitive regimens;
- inconsistency of medicine supply.

Patient Compliance

A patient's compliance to his or her therapeutic regimen may be influenced by:

- medicine selection - prescribing should be the result of a process of concordance whereby the patient's needs and preferences are matched to the available therapeutic alternatives;
- patient education - this empowers the patient to make an informed decision as to whether he or she should comply or not.

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

Other influencing factors might be:

- adverse side effects of the medicines;
- lifestyle behaviour;
- level of responsibility to manage and control the disease.

Patients behaviour patterns contributing toward poor compliance

Patients may perceive treatment as unnecessary.

In conditions that are asymptomatic, e.g. hypertension, or those that only produce transient symptoms such as epilepsy:

- the patient often questions the validity of complying with therapy where there are no obvious results. As a result he or she decides to abandon therapy particularly where the therapy introduces new symptoms (side effects);
- the patient is compliant in a cyclical fashion - for a short period following transient symptoms (eg. seizure) or increased awareness (eg. following a BP reading at the clinic) but after a period returns to being non-compliant until the next episode of symptoms or clinic visit.

In conditions where symptoms show no improvement and where therapy merely controls the pathophysiological process.

- the patient often feels that his/her therapy has not contributed toward quality of life and in many ways has placed certain demands upon his/her lifestyle.

To be compliant on a sustained basis means that the patient must adjust his/her lifestyle in such a fashion that the regimen becomes habit. Inclusion of a regimen into
the patient's lifestyle is determined by the magnitude with which this adaption intrudes upon his/her established pattern. The greater the demand, the less likely the patient is to comply. Thus for example a lunchtime dose in a school-going child who remains at school for extramural activity is unlikely to succeed. A shift worker may need to take a sedating medicine in the morning when working night shifts, and at night, when working day shifts.

Some patients’ 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.

**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 the latter.

Provide realistic expectations regarding:

- normal progression of the illness - especially important in those diseases where therapy merely controls the progression.
- 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.

**Towards concordance when prescribing**

Establish the patient’s

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

Balance these againsts the therapeutic alternatives identified based on clinical findings. Any clashes with the chosen therapy should be discussed with the patient in such a manner that the patient will conform to a changed lifestyle.

**Note:**

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

**Improving Continuity of Therapy**

Clear and concise records.

Patient involvement 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

Notes on prescribing in chronic conditions.
• Don’t change doses without good reason.
• Never blame anyone or anything for non-adherence before fully investigating the cause.
• If the clinical outcome is unsatisfactory - investigate compliance (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 problem ask yourself whether or not this medicine is being used to manage a side effect.
• Compliance with a once daily dose is best. Twice daily regimens show agreeable compliance. However once the interval is decreased to 3 times a day there is a sharp drop in compliance with poor compliance to 4 times a day regimens.
• Keep the total number of tablets to an absolute minimum as too many may lead to medication dosing errors and may influence compliance.
Normal peak flow readings for children aged 5 to 18 years

Normogram redrawn from original data, Godfrey S et al, Br J Dis Chest 1970;64:15
**Peak expiratory flow in normal subjects**

In men, values of PEF up to 100 litres/min. less than predicted and in women less than 85 litres/min. less than predicted are within normal limits.

<table>
<thead>
<tr>
<th>AGE IN YEARS</th>
<th>PEF L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>380</td>
</tr>
<tr>
<td>20</td>
<td>390</td>
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<td>25</td>
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<tr>
<td>65</td>
<td>480</td>
</tr>
<tr>
<td>70</td>
<td>490</td>
</tr>
</tbody>
</table>

**Standard deviation**
- Men: 48 litres/min
- Women: 42 litres/min

**Graphical Representation**

- **MEN**
  - Heights: 5'0", 5'3", 5'6", 5'9".
  - PEF values: 190, 183, 175, 167, 160 litres/min.
- **WOMEN**
  - Heights: 4'9", 5'3", 5'6", 5'9", 6'0".

**References**
CALCULATING % PREDICTED PEAK FLOW RATE

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

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

CALCULATING PEAK FLOW VARIABILITY

There are a number of methods for calculating PEF variability.

The one we use is as follows:

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

So, in this example, where a patient has readings of 300 to 400, the variability is 25% and asthma is diagnosed (i.e. ≥ 15%)
1 ACUTE ABDOMINAL PAIN WITHOUT FEVER

- **trauma and shock**
  - **YES**
    - ruptured internal organ
    - refer urgently
  - **NO**
    - **full bladder**
      - **YES**
        - retention of urine
        - refer urgently
      - **NO**
        - **vomiting/constipation, distended abdomen**
          - **YES**
            - intestinal obstruction
            - refer urgently
          - **NO**
            - **severe cramp like pain**
              - **YES**
                - kidney ureter stone
                - refer
              - **NO**
                - **steady pain associated with meals, recurrent**
                  - **YES**
                    - dyspepsia
                    - treat
                  - **NO**
                    - **not associated with meal**
                      - **YES**
                        - referred pain
                        - refer
                      - **NO**
                        - **history of missed period**
                          - **YES**
                            - see flow diagram on vaginal bleeding
                          - **NO**
                            - **cause unknown**
                              - **YES**
                                - refer
2 ADULT WITH GENERALISED OEDEMA

- **dyspnoea**
  - **YES**
    - basal crackles
    - enlarged liver
    - raised neck veins
    - **heart failure**
      - refer urgently
  - **NO**
    - pregnant
      - **YES**
        - BP > 140/90 mmHg and proteinuria
        - pregnancy induced hypertension (PIH)
        - refer
      - **NO**
        - severe anaemia
          - **YES**
            - refer urgently
          - **NO**
            - mild oedema of pregnancy
              - refer
        - protein and/or blood in the urine
          - **YES**
            - acute glomerulonephritis or nephrotic syndrome
              - treat
          - **NO**
            - ascites jaundice
              - **YES**
                - liver cirrhosis or portal hypertension
                  - refer
              - **NO**
                - cause unknown
                  - **YES**
                    - refer

- **NO**
3 EARACHE

- **pain and swelling behind the ear**
  - **YES**: mastoiditis → refer urgently
  - **NO**: red tympanic membrane with or without perforation/discharge
    - **YES**: otitis media → treat
    - **NO**: ear canal red, scaly or pustular
      - **YES**: otitis media → treat
      - **NO**: painful swelling below and in front of ear
        - **YES**: mumps → treat
        - **NO**: referred pain e.g. dental problem
          - **YES**: analgesia & refer
          - **NO**: cause unknown
            - **YES**: analgesia & refer
            - **NO**: refer
4 HEADACHE

1. fever
   - NO
   - YES → neck stiffness or vomiting
     - NO
     - YES → meningitis → refer urgently

2. pregnancy
   - NO
   - YES → proteinuria, oedema, raised BP
     - YES → pregnancy-induced hypertension → refer
     - NO
     - YES → diastolic BP more than 130 mmHg
       - YES → malignant hypertension → treat/refer urgently
       - NO
       - YES → diastolic BP more than 110 mmHg
         - NO
         - YES → severe hypertension → treat and refer

3. acute onset of impaired consciousness
   - NO
   - YES → malaria risk
     - NO
     - YES → suspect cerebral malaria → treat/refer urgently

4. recent head injury
   - NO
   - YES → post trauma headache
     - NO
     - YES → confusion or neurological signs
       - NO
       - YES → refer

5. recurrent headache
   - NO
   - YES → nausea or vomiting
     - NO
     - YES → migraine → treat

6. history of stress worries at work or home
   - YES → headache related to stress → treat
   - NO
   - YES → tenderness over sinus areas
     - NO
     - YES → sinusitis → treat

7. cause unknown
   - NO
   - YES → refer
5A SEXUALLY TRANSMITTED INFECTIONS - MALE

- Swollen testis:
  - YES: Painful with urethral discharge
    - YES: Epididymo orchitis
      - Treat
    - NO: Painful without discharge
      - YES: Torsion of testis
        - Refer urgently
  - NO

- Urethral discharge:
  - YES
  - NO

- Genital ulcer:
  - YES
  - NO

- Inguinal swelling ± ulcer:
  - YES
  - NO

- Genital warts:
  - YES
  - NO

- Genital herpes/blisters:
  - YES: HIV
    - YES: Treat and condoms
    - NO: Supply condoms
  - NO

- Pubic lice:
  - YES
  - NO
5B SEXUALLY TRANSMITTED INFECTIONS - FEMALE

- Lower abdominal pain and vaginal discharge
  - YES: Pain on moving the cervix and tenderness in both adnexae
    - YES: Treat
  - NO
    - NO: Inguinal swelling ± ulcer
      - YES: Treat
      - NO: Genital warts
        - YES: Refer
        - NO: Genital herpes/blisters
          - YES: HIV
            - YES: Treat and condoms
            - NO: Supply condoms
          - NO: Refer
    - NO: Genital warts
      - YES: Refer
      - NO: Pubic lice
        - YES: Treat
        - NO
6 SORE THROAT

- Difficulty in swallowing liquids or open mouth: YES → refer; NO → hoarseness longer than 3 weeks.
  - YES → refer; NO → obstructive symptoms e.g. stridor, greyish membrane on tonsils.
    - YES → refer; NO → tonsils red ± follicles, fever.
      - YES → runny nose cough hoarse voice → YES → treat viral pharyngitis; NO → streptococcal throat → treat.
      - NO → more than 4 episodes chronic condition not responding chronic cervical lymphadenopathy.
        - YES → refer; NO → streptococcal infection in children must be treated for 10 days with antibiotics (3 - 15 years).
7 VAGINAL BLEEDING

heavy bleeding within 1 week of childbirth

YES → post partum haemorrhage → refer

NO

missed periods

YES → pregnant → refer urgently

NO

severe lower abdominal pain and dark blood from vagina

YES → tenderness in one adnexae → YES → ectopic pregnancy → refer urgently

NO

daily bleeding more than two weeks or bleeding between periods or post menopausal bleeding or post coital bleeding

YES → visual inspection cancer cytology → refer

NO

regular heavy periods and anaemia

YES → lower abdominal mass → YES → fibroids → refer

NO → menorrhagia → refer

cause unknown

YES → refer
Chapter 1 – Dental and oral conditions

Drugs used in this section

- aciclovir
- antifungal lozenge (troche)
- erythromycin
- imidazole
- metronidazole
- paracetamol
- amoxicillin
- chlorhexidine 0.2%
- gentian violet 0.5%
- lidocaine (lignocaine)
- nystatin

1.01 Abscess and caries, dental

1.01.1 Abscess, dental

K04.7

Description
Acute or chronic suppuration related to teeth, due to infection, characterised by:
- acute pain, sometimes very severe, continuous and gnawing
- severe pain on tapping involved tooth
- loosening of the tooth after the infection has spread to the bone
- swelling of upper or lower jaw

Chronic dental abscess may have few symptoms including pain.

Management objectives
- treat abscess and eliminate pathogens
- relieve pain
- improve oral hygiene

Prophylaxis and non-drug treatment
- oral hygiene after each meal to remove plaque and food debris
- frequent complete brushing of teeth
- dental flossing at least once a day
Dental and oral conditions

Drug treatment
Initiate treatment before referral.
• amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3.75 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

penicillin–allergic patients:
• erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

and
• metronidazole, oral for 5 days

<table>
<thead>
<tr>
<th>Approx Age (years)</th>
<th>Dose (mg)</th>
<th>Dose Frequency</th>
<th>Suspension 200 mg/5mL 1 hour before meals</th>
<th>Tabs 200mg with or after meals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3 years</td>
<td>50</td>
<td>8 hourly</td>
<td>1.25 mL</td>
<td>—</td>
</tr>
<tr>
<td>3–7 years</td>
<td>100</td>
<td>12 hourly</td>
<td>2.5 mL</td>
<td>—</td>
</tr>
<tr>
<td>7–10 years</td>
<td>100</td>
<td>8 hourly</td>
<td>2.5 mL</td>
<td>1/2 tab</td>
</tr>
<tr>
<td>over 10 years and adults</td>
<td>200</td>
<td>8 hourly</td>
<td>5mL</td>
<td>1 tab</td>
</tr>
</tbody>
</table>
Dental and oral conditions

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose</th>
<th>Syrup</th>
<th>Tab</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>kg</td>
<td>mg</td>
<td>120 mg/5 mL</td>
<td>500 mg</td>
<td>years</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
- all cases on diagnosis

1.02 Candidiasis, oral (thrush)

B37.0

Description
An infection of the mouth and sometimes of the pharynx caused by species of the Candida fungus presenting as painful creamy white patches that can be scratched off the tongue and buccal mucosa.
- common in healthy babies up to 3 months
- Candida also exists in healthy individuals but only causes disease under certain conditions:
  - poor hygiene
  - feeding bottles sterilised with hypochlorite
  - immunosuppression (severe cases are common)
  - prolonged use of broad spectrum antibiotics or corticosteroids (also inhaled)
  - certain chronic diseases, e.g. diabetes mellitus
  - due to trauma e.g. poorly fitting dentures

Management objectives
- identify and eliminate the cause

Non-drug treatment
- improve oral hygiene
- avoid bottle feeding and replace with cup feeding
- avoid the use of hypochlorite to sterilise feeding bottles
  - if this is not possible, rinse bottles adequately after sterilising
- ensure proper fitting dentures
Dental and oral conditions

Drug treatment

• gentian violet, 0.5%, aqueous solution, applied to the inside of the mouth three times daily, continue for 48 hours after cure

infants

• nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed. Keep nystatin in contact with affected areas for as long as possible.

adults

• antifungal lozenges (troches), oral, one lozenge (troche) sucked 6 hourly for 5 days

in severe cases or if the above treatment fails

adults and children

• imidazole oral gel, applied twice daily for 10 days

Note
HIV infected patients with oral candidiasis and painful or difficult swallowing have oesophageal involvement and may need fluconazole (see section 20.02.2).

Referral

• no improvement
• uncertain diagnosis
• pharyngeal spread

1.03 Gingivitis

1.03.1 Gingivitis, acute, necrotising, ulcerative
A69.1

Description
A non-contagious infection associated with the fusiform bacilli and a spirochete. It is also known as Vincent’s angina and is associated with:

• poor oral hygiene
• stress
• blood disorders
• heavy smoking
• nutritional deficiencies (vitamin B and C)
Dental and oral conditions

It is common in young adults and is characterised by:
• sudden onset
• acutely painful bleeding gums
• greyish membrane between teeth on gums which can be removed
• involvement of whole mouth or one tooth
• halitosis
• no fever

Management objectives
• reduce pain
• eliminate infection
• promote good oral hygiene

Non-drug treatment
• oral hygiene after each meal to remove plaque and food debris
  ▪ frequent complete brushing of teeth
  ▪ dental flossing at least once a day
  ▪ gentle removal of the membrane
• improve nutrition

Drug treatment
• amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>1.25 mL</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
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<td>—</td>
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</tr>
</tbody>
</table>
Dental and oral conditions

penicillin–allergic patients:
  • erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
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<th>Syrup 250 mg/5 mL</th>
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<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

and
  • metronidazole, oral for 5 days

<table>
<thead>
<tr>
<th>Approx Age years</th>
<th>Dose mg</th>
<th>Dose frequency</th>
<th>Suspension 200 mg/5mL 1 hour before meals</th>
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<tbody>
<tr>
<td>4–7 years</td>
<td>100</td>
<td>12 hourly</td>
<td>2.5 mL</td>
<td>—</td>
</tr>
<tr>
<td>7–10 years</td>
<td>100</td>
<td>8 hourly</td>
<td>2.5 mL</td>
<td>½ tab</td>
</tr>
<tr>
<td>over 10 years and adults</td>
<td>200</td>
<td>8 hourly</td>
<td>5 mL</td>
<td>1 tab</td>
</tr>
</tbody>
</table>

• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
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<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
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<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

• chlorhexidine 0.2%, 15 mL as a mouthwash, 2 to 4 times daily after brushing and flossing for 5 days

!CAUTION! prolonged use of chlorhexidine may cause darkening of teeth
Dental and oral conditions

Referral
• no improvement within 5 days

1.03.2 Gingivitis, uncomplicated
K05.1

Description
Inflammation of the gum margin causing the gums to separate from the teeth.
• pockets form between the gums and the teeth
• pus and bacteria can collect in these pockets, eventually causing periodontitis, a
disease in the tissue that surrounds and supports the teeth. It is often found in
smokers. (see section 1.05)

Characteristics:
• change in the normal gum contour • may be painful
• redness • swollen gums
• watery exudate/bleeding • gum recession may occur
• gingivitis may recur

Management objectives
• reduce pain
• improve oral hygiene
• prevent recurrence to preserve teeth

Prophylaxis and non-drug treatment
Oral hygiene is usually adequate to prevent superficial mouth and gum infection:
• oral hygiene after each meal to remove plaque and food debris
• frequent complete brushing of teeth
• dental flossing at least once a day
• homemade salt mouthwash may help, e.g. 1/2 medicine measure of table salt in a
glass of lukewarm water. Rinse mouth for one minute twice daily.

Drug treatment
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Dental and oral conditions

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

![CAUTION!](https://via.placeholder.com/150)
prolonged use of chlorhexidine may cause darkening of teeth

1.04 Herpes stomatitis, cold sore, fever blister
B00.2

**Description**
Inflammation of the lips and mouth area caused by infection with *Herpes simplex* virus type 1, characterised by shallow painful ulcers on the lips, gums and tongue. This makes eating difficult.
It usually occurs spontaneously but may complicate infections such as pneumonia.
It is a self-limiting condition and usually clears up within 10 days.

**Management objectives**
• relieve symptoms
• prevent complications and secondary infection

**Non-drug treatment**
• homemade salt mouthwash may help, e.g. 1/2 medicine measure of table salt in a glass of lukewarm water. Rinse mouth for one minute twice daily.
• improve nutrition
• adequate hydration
• fluid diet for children
• avoid acidic drinks, e.g. orange juice or soft drinks as they may cause pain

**Drug treatment**
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
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<td>500</td>
<td>—</td>
<td>1 tab</td>
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</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
extensive oral herpes
• lidocaine 2%, gel, applied every 3 to 4 hours. Apply a thin layer on the affected areas only.

Note
HIV infected patients with Herpes stomatitis should be treated with aciclovir
• aciclovir, oral, 400 mg 8 hourly. Doctor-initiated.

Referral
• severe condition with complications
• dehydrated patients
• no improvement after 1 week of treatment

1.05 Periodontitis
K05.3

Description
Progressive gingivitis to the point where the underlying bone is eroded and is characterised by loose teeth in their sockets. It is also known as pyorrhoea. It is a cause of tooth loss in adults. (see section 1.03).

Management objectives
• improve oral hygiene
• preserve teeth
• prevent further disease

Non-drug treatment
• advice on improving and maintaining oral hygiene
• remove all deposits on teeth, e.g. plaque, etc
• regular re-evaluation

Drug treatment
• chlorhexidine 0.2%, 15 mL as a mouthwash, 2 to 4 times daily for 5 days

!CAUTION!
prolonged use of chlorhexidine may cause darkening of teeth
Referral
• all cases

1.06 Ulcers, mouth
K12.0

Description
Acute painful ulcers on the lips or inside the mouth, including the tongue, occurring singly or in groups.

Management objectives
• reduce discomfort
• accelerate the healing process

Drug treatment
• chlorhexidine 0.2%, 15 mL as a mouthwash, 2 to 4 times daily for 5 days

[CAUTION!]
prolonged use of chlorhexidine may cause darkening of teeth

• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
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<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
• recurrent mouth ulcers
• widespread ulcers
Chapter 2 – Gastro-intestinal conditions

Drugs used in this section

- albendazole
- bismuth subgallate compound
- cimetidine
- dextrose 5% in sodium chloride 0.9%
- liquid paraffin
- metronidazole
- ORS (oral rehydration solution)
- Ringer–Lactate
- tetracaine
- aluminium hydroxide/magnesium trisilicate
- ceftriaxone
- ciprofloxacin
- Darrow’s half-strength/dextrose 5%
- lactulose
- loperamide
- nalidixic acid
- praziquantel
- sennosides A and B
- trimethoprim/sulfamethoxazole

2.01 Abdominal pain, dyspepsia, heartburn, indigestion

Description

Abdominal pain, dyspepsia, heartburn and indigestion are common symptoms, which often present with non-specific abdominal discomfort and minimal change in bowel habits.

Accompanying clinical features include:

- nausea
- constipation
- tenderness
- tachycardia
- vomiting
- diarrhoea
- fever
- distension

Any abdominal pain or discomfort must be assessed for the following features:

- duration
- severity
- location
- type

Activity levels of patients with severe pain, e.g. restlessness or inability to lie still, ongoing heartburn or indigestion are difficult diagnostic problems because they are often non-specific.
Obtain clear description of the specific symptoms.
Perform a thorough physical examination to see if referral is needed.
Gastro-intestinal conditions

The pain is not associated with the following:
• meals
• weight loss
• blood in stools
• stress or psychogenic conditions

The differential diagnosis may include:
• peptic ulcer disease • reflux oesophagitis
• gastric cancer • pancreatitis
• pancreatic carcinoma • gallbladder disease
• worm infestation • abuse of purgatives
• mesenteric adenitis • surgical conditions

Intermittent indigestion, heartburn or dyspepsia may be associated with:
• spicy food
• alcohol
• carbonated drinks
• excessive smoking
• use of NSAIDs, e.g. ibuprofen, aspirin

! CAUTION !
always consider the possibility of a differential diagnosis

Management objectives
• identify the cause
• relieve pain
• modify lifestyle
• identify cases for referral

Non-drug treatment
• stop smoking
• limit alcohol intake
• eat small frequent meals
• check haemoglobin
• check for a drug cause likely to be associated with dyspeptic symptoms
• educate patients on normal bowel functions and frequency
Drug treatment
Initiate drug therapy only after full assessment.
• aluminium hydroxide 250 mg/magnesium trisilicate 500 mg, oral, 2–4 tablets
  chewed or sucked when needed. Maximum of 16 tablets daily or continuous
  treatment for 7 days.
if there is no response
• cimetidine, oral, 400 mg at bedtime for 14 days

Referral
• abdominal pain at specific sites:
  ▪ right iliac fossa
  ▪ lower abdomen
  ▪ epigastric
• no response to treatment
• uncertain diagnosis
• blood in the stools
• abdominal mass
• signs of peritonitis

2.02 Anal conditions

2.02.1 Anal fissures
K60.2

Description
Painful small cracks just inside the anal margin. Often seen together with a sentinel
pile or external haemorrhoids. May cause spasm of the anal sphincter.

Management objectives
• treat symptomatically
• refer severe cases

Non-drug treatment
• dietary advice to promote soft stools
Gastro-intestinal conditions

Drug treatment
- bismuth subgallate compound, ointment, topical, applied twice daily
- tetracaine 1%, cream, topical, applied after each bowel action

children
- liquid paraffin, oral, 5 mL (1 mL/kg dose), at bedtime for short-term use (3–5 days)

adults
- liquid paraffin, oral, 15–25 mL, at bedtime for short-term use (3–5 days)

Referral
- severe pain
- recurrent episodes
- poor response to symptomatic treatment

2.02.2 Haemorrhoids
I84.9

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

Management objectives
- symptomatic treatment
- dietary advice

Non-drug treatment
- high-fibre diet
- counsel against chronic use of laxatives
- avoid straining at stool

Drug treatment
symptomatic treatment
- bismuth subgallate compound, ointment, topical, applied 2–4 times daily
- tetracaine 1%, cream, topical, applied after each bowel action

Referral
- for surgical intervention if necessary
  - if the haemorrhoid cannot be reduced
  - if the haemorrhoid is thrombosed
2.03 Appendicitis
K35

Referral
• all patients with suspected appendicitis

2.04 Cholera
A00.9
Note: notifiable condition.

Description
Very acute severe watery diarrhoea due to infection with the micro-organism *Vibrio cholerae*.

Clinical features include:
• rice water appearance of stools
• no blood in stools
• no pus in stools
• no faecal odour
• possible vomiting
• rapid severe dehydration

Management objectives
• treat and prevent dehydration
• prevent spread to other people
• notify the condition

Note
The prime objective is to prevent and treat dehydration. Due to widespread resistance, antibiotics are not indicated in the PHC setting.

Non-drug treatment
If feasible in adult patients, a Foley’s catheter in the rectum of a patient with profuse watery diarrhoea will make nursing and estimation of fluid loss a lot easier.

Drug treatment
Treat vigorously.
• oral rehydration solution (ORS)
or
• homemade sugar and salt solution (see section 2.06)
The volume of fluid required for oral rehydration depends on the severity of the dehydration.
Gastro-intestinal conditions

children
• Darrow’s half-strength solution with dextrose 5%, IV

adults
• dextrose 5% in sodium chloride 0.9%, IV

Referral
• severely ill patients
• according to provincial and local policy

2.05 Constipation
K59.0

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

Constipation may have many causes
• incorrect diet (fibre and fluid)  •  lack of exercise
• pregnancy  •  old age
• certain drugs  •  metabolic
• endocrine  •  neurogenic
• lower bowel abnormalities  •  psychogenic disorders
• chronic use of enemas and laxatives  •  cancer of the bowel
• ignoring the urge  •  behavioural problems in children

! CAUTION !
be suspicious of a sudden change in bowel habits, as there is a possibility of cancer of the large bowel

Management objectives
• symptomatic relief
• advise on diet and lifestyle

Non-drug treatment
• encourage exercise
• increase intake of fibre-rich food, e.g. vegetables, coarse maize meal, bran and cooked dried prunes
• encourage regular bowel habits
• discourage continuous use of laxatives
Drug treatment

**children over 12 months**
- lactulose 0.5 mL/kg/dose once or twice daily

**adults**
- sennosides A and B, oral, 7.5 mg, 2 tablets at night. In resistant cases increase to 4 tablets.

! CAUTION !
prolonged severe constipation may present with overflow “diarrhoea”

Referral
- recent change in bowel habits
- faecal impaction
- poor response to treatment
- uncertain cause of constipation

2.06 Diarrhoea, acute

A09

! CAUTION !
there is no place for antidiarrhoeal preparations in the treatment of acute diarrhoea

HOMEMADE SUGAR AND SALT SOLUTION (SSS)

**children:**
- 1/2 level medicine measure of table salt

**adults:**
- 1 level medicine measure of table salt
  
  and
  
  8 level medicine measures of sugar (no more)
  
  dissolved in 1 litre of boiled (if possible) then cooled water
  
  1 level medicine measure = approximately 1 level teaspoon
2.06.1 Diarrhoea, acute, in children

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

Management objectives
• assess the degree of dehydration
• treat and prevent dehydration
• exclude bloody diarrhoea
• identify complications:
  ▪ convulsions
  ▪ altered level of consciousness
  ▪ metabolic derangement especially hyper- and hyponatremia and hypokalemia
  ▪ acidosis or salicylate toxicity

Approach to diarrhoeal disease
Carry out the normal history and examination.

Special risk situations
Diarrhoea in infants less than 2 weeks, malnourished babies, and babies with other danger signs such as:
• convulsions
• altered level of consciousness
• persistent vomiting
• respiratory distress
• persistent diarrhoea
• hypothermia
• surgical abdomen
These babies should be referred for treatment and should receive a first dose of ceftriaxone, IM, before transfer.

Special types of diarrhoea
• bloody diarrhoea - consider dysentery, give nalidixic acid
• diarrhoea with high fever or very ill – consider typhoid, refer
• persistent diarrhoea, more than 14 days – consider referral
Gastro-intestinal conditions

Assess hydration
• Identify signs present to classify dehydration as:
  • severe dehydration – C
  • some dehydration – B
  • no visible dehydration – A

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

Treatment according to hydration classification:

C – Severe Dehydration
Give rapidly:
• Ringer-Lactate, IV, 20 mL/kg.
Repeat twice if radial pulse is weak or undetectable.
Continue with 20 mL/kg every hour for the next 5 hours.
Refer urgently for continued management.

Reassess every 2 hours while awaiting transfer.
If hydration status does not improve, give IV fluids more rapidly.

As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give:
• ORS, oral, 5 mL/kg/hour

If IV administration is not possible, insert a nasogastric tube and give:
• ORS, 20 mL/kg/hour over the next 6 hours via the nasogastric tube
If only oral administration is possible, or the condition is not improving, transfer the child urgently giving ORS during transfer.
Gastro-intestinal conditions

If not doing well within 8 hours, refer while continuing drip during the transfer. If there is improvement after 4 hours, treat as **B – Some dehydration**

**B – Some dehydration**

Give:
- ORS, oral, 80 mL/kg over 4 hours, i.e. 20 mL/kg/hour.
  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 breast-feeding.

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**

**A – No visible dehydration**

Show the caregiver how to give ORS with a cup and spoon using frequent small sips.
Encourage caregiver to give 10 mL/kg after each diarrhoeal stool until diarrhoea stops, i.e.
- child age up to 2 years, 50–100 mL
- child age 2 years or more, 100–200 mL after each loose stool
Continue at home.
Encourage the caregiver to continue feeding the child, especially breast-feeding.
Instruct the caregiver how to make ORS/SSS at home and to continue treatment.

**Child should return immediately if:**
- no improvement
- condition deteriorates
- poor drinking or feeding
- blood in stool
- fever develops
- sunken eyes
- slow skin pinch

Home made sugar and salt solution may be used if oral rehydration formula is not available. (see section 2.06)
Gastro-intestinal conditions

Referral
- severe dehydration with other complications
- dysentery in children less than 12 months
- malnourished children
- children with general danger signs, e.g. altered level of consciousness, convulsions, inability to feed or drink, intractable vomiting
- suspected acute surgical abdomen

2.06.2 Diarrhoea, acute, without blood, in adults
K52.9

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

Management objectives
- maintain adequate hydration

Drug treatment
Treat vigorously.
- oral rehydration solution (ORS)

or
- homemade sugar and salt solution (SSS) (see section 2.06)

Referral
- diarrhoea with complications

2.06.3 Diarrhoea, chronic, in adults
K52.9

Description
Diarrhoea lasting more than 2 weeks.
Serious underlying causes like cancer of the bowel or AIDS may be present.
Some causes may be easily treatable.

Drug treatment
When facilities for stool microscopy and culture/sensitivity are available, treatment of the causative agent may be initiated at PHC.
chronic diarrhoea in HIV/AIDS (see section 20)

- trimethoprim/sulfamethoxazole, 80/400, oral, 4 tablets twice daily for 5 days
  or
- trimethoprim/sulfamethoxazole, 160/800, oral, 2 tablets twice daily for 5 days
  and
- metronidazole, oral, 400 mg 8 hourly for 5 days
- loperamide, oral, 1–2 tablets after each loose stool

Referral
- all other cases

2.07 Dysentery
A06.0

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

Referral
- no response to empirical treatment

2.07.1 Dysentery, amoebic
icd10

Description
A condition characterised by diarrhoea, caused by the parasite *Entamoeba histolytica*, with:
- blood
- mucus
- unpleasant odour
- may alternate with constipation
- usually without fever

Management objectives
- rehydrate the patient in the acute phase
- refer for investigation and treatment if case cannot be confirmed

Drug treatment
if dehydrated
- rehydrate (see section 2.06)
if case confirmed by identification of organisms on wet stools:

• metronidazole, oral, 8 hourly for 7 days

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose</th>
<th>Suspension 200 mg/5mL 1 hour before meals</th>
<th>Tabs 200mg with or after meals</th>
<th>Tabs 400mg with or after meals</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6</td>
<td>60 mg</td>
<td>1.5 mL</td>
<td></td>
<td></td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10</td>
<td>100 mg</td>
<td>2.5 mL</td>
<td>½ tab</td>
<td></td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18</td>
<td>200 mg</td>
<td>5mL</td>
<td>1 tab</td>
<td>½ tab</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25</td>
<td>300 mg</td>
<td>7.5mL</td>
<td></td>
<td></td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50</td>
<td>400 mg</td>
<td>—</td>
<td>2 tabs</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>800 mg</td>
<td>—</td>
<td>4 tabs</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

2.07.2 Dysentery, bacillary (shigellosis)

Description
Acute infection of the bowel usually caused by *Shigella* micro-organisms.

There is sudden onset diarrhoea with:

• bloody stools  
• mucus in the stools  
• fever  
• toxic appearance  
• possible associated convulsions

Management objectives

• prevent dehydration  
• prevent spread to other people  
• treat aggressively  
• refer serious cases

Non-drug treatment
Prevent spread of micro-organism by:

• preventing contamination of food and water through good sanitation  
• washing hands thoroughly before handling food  
• washing soiled garments and bed clothes
Gastro-intestinal conditions

Drug treatment
First confirm diagnosis of blood and mucus in watery stools.
- oral rehydration solution (ORS)
or
- homemade sugar and salt solution (see section 2.06)
The volume of fluid required for oral rehydration depends on the severity of the dehydration.

children less than 12 months
- ceftriaxone, IM, 50 mg/kg, immediately, before referral

children
- Darrows half-strength solution with dextrose 5%, IV
- nalidixic acid, oral, 6 hourly for 5 days

<table>
<thead>
<tr>
<th>Approx Age in years</th>
<th>Dose</th>
<th>Syrup</th>
</tr>
</thead>
<tbody>
<tr>
<td>12–24 months</td>
<td>125 mg</td>
<td>2.5 mL</td>
</tr>
<tr>
<td>2–5 years</td>
<td>250 mg</td>
<td>5 mL</td>
</tr>
<tr>
<td>5–10 years</td>
<td>375 mg</td>
<td>7.5 mL</td>
</tr>
</tbody>
</table>

adults
- dextrose 5% in sodium chloride 0.9%
- ciprofloxacin, oral, 500mg, 12 hourly for 5 days

Note
Other antibiotic treatment, e.g. ceftriaxone, must be adapted to local sensitivity patterns, as resistance to nalidixic acid is common.
Check for complications such as intestinal perforation or peritonitis and ensure adequate urine output to exclude haemolytic uraemic syndrome.

Referral
- malnutrition
- severe illness
- dehydration
- no improvement after 3 days treatment
- children less than 12 months of age
2.08 Giardiasis
A07.1

**Description**
Acute or chronic diarrhoea, unresponsive to conservative management. The stools smell offensive and are:
- bulky
- greasy
- frothy

**Drug treatment**
Treat vigorously.
- oral rehydration solution (ORS)
- homemade sugar and salt solution (SSS) (see section 2.06)

**children**
- Darrows half-strength solution with dextrose 5%, IV
**adults**
- dextrose 5% in sodium chloride 0.9%, IV
- metronidazole, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight in kg</th>
<th>Dose mg</th>
<th>Suspension 200 mg/5mL 1 hour before food</th>
<th>Tabs 200 mg with or after food</th>
<th>Tabs 400 mg with or after food</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6</td>
<td>40 mg</td>
<td>1 mL</td>
<td></td>
<td></td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10</td>
<td>80 mg</td>
<td>2 mL</td>
<td>1/2 tab</td>
<td></td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18</td>
<td>120 mg</td>
<td>3 mL</td>
<td>—</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25</td>
<td>200 mg</td>
<td>5 mL</td>
<td>1 tab</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50</td>
<td>200 mg</td>
<td>—</td>
<td>1 tab</td>
<td>1/2 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>400 mg</td>
<td>—</td>
<td>2 tabs</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Referral**
- all cases not responding to oral treatment
2.09 Helminthic infestation
B82.0

2.09.1 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*

Signs and symptoms include:
• vague abdominal pain
• diarrhoea
• weight loss
• flat white worm segments seen in the stool

Suspect cysts in the brain if there are:
• seizures
• severe headaches
• nausea
• vomiting
• progressive loss of visual acuity

Management objectives
• prevent spread
• eliminate the tapeworm

Non-drug treatment
• health education on adequate preparation of potentially infected meat

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

• albendazole, oral, once daily for 3 days
  children 1–2 years  200 mg
  children over 2 years  400 mg
  adults  400 mg
Gastro-intestinal conditions

pregnant women
- praziquantel, oral, 10–20 mg/kg single dose

! CAUTION !
albendazole is not safe in pregnancy as it may cause congenital defects

Referral
- abdominal tenderness or pain
- abdominal masses
- vomiting
- suspected cysts in the brain

2.09.2 Helminthic infestation, excluding tapeworm
B82.0

Description
Types of worm infestation and the characteristics is shown in the table below.
Check for anaemia.

<table>
<thead>
<tr>
<th>Type of worm</th>
<th>Description</th>
<th>Other signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundworm</td>
<td>• long pink/white worms</td>
<td>• cough</td>
</tr>
<tr>
<td><em>Ascaris lumbricoides</em></td>
<td>• often seen in the stools</td>
<td>• if there is vomiting consider intestinal obstruction</td>
</tr>
<tr>
<td>Threadworm</td>
<td>• white and thread-like</td>
<td>• anal itching - worse at night</td>
</tr>
<tr>
<td><em>Enterobius vermicularis</em></td>
<td>• often seen in the stools</td>
<td>• self-infection common</td>
</tr>
<tr>
<td>Hookworm</td>
<td>• passed in the stool</td>
<td>• no symptoms or pain</td>
</tr>
<tr>
<td><em>Ancylostoma duodenale</em></td>
<td></td>
<td>• severe anaemia</td>
</tr>
<tr>
<td>Whipworm</td>
<td>• worms and eggs in the stools</td>
<td>• no symptoms</td>
</tr>
<tr>
<td><em>Trichuriasis</em></td>
<td></td>
<td>• light infestations</td>
</tr>
<tr>
<td></td>
<td></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>
Gastro-intestinal conditions

Non-drug treatment

- patient counselling and education
  - wash hands with soap and water
    - after passing a stool
    - before working with food or eating
  - keep fingernails short
  - wash fruit and vegetables well or cook
  - keep toilet seats clean
  - teach children to use toilets and wash hands
  - do not pollute the soil with sewage or sludge
  - dispose of faeces properly

Drug treatment

- albendazole, oral, single dose, repeat after 3–4 weeks if needed
  - children 1–2 years 200 mg
  - children over 2 years 400 mg
  - adults 400 mg

! CAUTION !

albendazole is not safe in pregnancy as it may cause congenital defects
delay treatment until after delivery
treat underlying anaemia if present

Referral

- abdominal tenderness
- pain
- vomiting
- pregnancy

2.10 Nausea and vomiting, non-specific

Description

There are many possible and sometimes serious causes of nausea and vomiting and this should be assessed.
Vomiting alone may be a symptom of many conditions, e.g. motion sickness (vertigo and vomiting under specific circumstances).
Exclude alcohol abuse as a cause.
Gastro-intestinal conditions

It is called non-specific even when organic causes are known, e.g.:
- early pregnancy
- depression
- gastro-intestinal disease
- liver disease
- renal failure

Establish if the vomiting is associated with:
- nausea
- abdominal pain
- diarrhoea
- food intake
- drugs, e.g. iron preparations, digitalis
- the sequence of the illness, e.g. migraine

Management objectives
- relieve symptoms
- prevent dehydration
- identify cause

Non-drug treatment
- withhold food for a period or give frequent small meals (do this with caution in children)
- maintain adequate hydration with clear fluids

Drug treatment
- oral rehydration solution (ORS)
or
- homemade sugar and salt solution (SSS) (see section 2.06)

children
- Darrows half-strength solution with dextrose 5%, IV, for 3 days only

adults
- dextrose 5% in sodium chloride 0.9%, IV, for 3 days only
HOMEMADE SUGAR AND SALT SOLUTION (SSS)

**children:** 1/2 level medicine measure of table salt

**adults:** 1 level medicine measure of table salt

and

8 level medicine measures of sugar (no more)

dissolved in 1 litre of boiled (if possible) then cooled water

1 level medicine measure = approximately 1 level teaspoon

Referral

**URGENT**

if patients are:

- dehydrated (see section 2.06)
- shocked
- known diabetic or patient with glycosuria
- septicaemic
- jaundiced
- infants with projectile vomiting
- showing signs of intestinal obstruction, i.e. no stool or flatus passed
- presenting with abdominal tenderness with guarding and rigidity
- vomiting with digested or fresh blood present
- complex combination of signs and symptoms

Referral

- symptoms are present for more than one week
- obvious causes

### 2.11 Typhoid fever

**A01.0**

**Note:** notifiable condition.

**Description**

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

It may present with:

- acute abdomen (see section 2.01)
- prolonged or high fever in a previously healthy individual
- fever with a slower pulse rate than expected
Gastro-intestinal conditions

• headache and possible convulsions
• in the first week constipation
• diarrhoea may occur later in the illness and may be accompanied by frank bleeding
• confirmation is only by stool culture or blood tests

Management objectives
• prevent dehydration
• prevent spread in the community
• notify the condition

Non-drug treatment
• patient education and counselling to prevent spread in the community
• if more than one case occurs, look for sources, e.g. carriers

Drug treatment
Treat as diarrhoea.
during epidemics initiate fluid therapy if necessary (see section 2.06)
• oral rehydration solution (ORS)
or
• homemade sugar and salt solution (SSS) (see section 2.06)

if necessary
children
• Darrows half-strength solution with dextrose 5%, IV
adults
• dextrose 5% in sodium chloride 0.9%, IV

• ceftriaxone, IV
  children  80 mg/kg daily
  adults    1 000 mg 12 hourly

Referral
• all cases or suspected cases
3.01 Diabetes mellitus

3.01.1 Diabetes mellitus type 1 in children

**Description**
Diabetes mellitus type 1, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM).

Diabetes in children usually presents with severe symptoms such as:
- possibly very high blood glucose levels
- marked glycosuria
- ketonuria

Suspect diabetes in any child presenting with the following symptoms:
- loss of weight despite a good appetite
- polyuria
- polydipsia
- sweet smell on the breath with a positive test for urine ketones with or without loss of consciousness
- tiredness

All children with suspected or confirmed diabetes mellitus type 1 should be referred to hospital immediately for:
- confirmation of diagnosis
- initiation and stabilisation of therapy
- education
- long term monitoring of control
Diagnosis
A diagnosis can be made when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:
• random blood glucose (RBG) 11 mmol/L or higher
or
• fasting blood glucose (FBG) 7 mmol/L or higher
A small proportion of children present with less severe symptoms and may require fasting blood glucose measurement and referral to a specialist centre for assessment. Others may present with features of ketoacidosis in the absence of obvious causes.

Note
All children must be referred on presentation for diagnosis, stabilisation, initiation of treatment and planning.

Management objectives
• prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma
• prevent chronic complications
• control the blood sugar level within acceptable limits (glycaemic control)
• improve and maintain quality of life
• educate and counsel patients and caregivers on self-care

Non-drug treatment
• a regular meal pattern is important
• regular exercise
• lifestyle modification, including self care practices
• the patient should be told to carry a disease identification bracelet, necklace or card

Drug treatment
• oral antidiabetic drugs are ineffective and dangerous in children and should never be used
• almost all childhood diabetics require at least 2–3 times daily insulin injections to prevent decompensation
• the regimen will vary from child to child but will usually be the use of biphasic insulin, given twice daily
• do not miss an insulin dose
Diabetic emergencies in children

Children with diabetes type I may present with a decreased level of consciousness due to hyper- or hypoglycaemia. Both will need referral to reassess management. In all children with abnormal levels of consciousness, determine if the blood glucose level is high or low.

<table>
<thead>
<tr>
<th></th>
<th>Hyperglycaemia</th>
<th>Hypoglycaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>blood glucose test</td>
<td>11 mmol/L or higher</td>
<td>2.5 mmol/L or lower</td>
</tr>
<tr>
<td>urine test for glucose</td>
<td>positive</td>
<td>negative</td>
</tr>
<tr>
<td>urine test for ketones</td>
<td>positive</td>
<td>usually negative</td>
</tr>
</tbody>
</table>

Symptoms of hypoglycaemia include:
- sweating
- anxiety
- pallor
- headache
- palpitations
- tremor
- behavioural changes

It is usually possible to distinguish between high and low blood glucose levels. If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently. Low blood glucose presents the most immediate danger to life.

Diabetic keto-acidosis or hyperglycaemia and ketones in the urine:
- initiate treatment before urgent referral

**NB: Early administration of large amounts of fluid initially is life saving and is vital at this stage.**

**if in shock**
- sodium chloride 0.9%, IV, 20 mL/kg within 1 hour

**if no shock or after shock is corrected**
- sodium chloride 0.9%, IV
  - 10 – 20 kg 60 mL/hour
  - 20 – 30 kg 70 mL/hour
  - 30 – 40 kg 75 mL/hour
  - 40 – 50 kg 80 mL/hour

Refer urgently with drip in place and running at planned rate.
When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:
- insulin, short acting, IM, 0.05 units/kg as a bolus

**Hypoglycaemia**

**if conscious and able to feed**
- oral sugar solution
  - dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of water

**if unconscious**
- dextrose 10%, IV, 5 mL/kg over 5 minutes
  - 10% solution – dilute 1 part dextrose 50% to 4 parts water for injection
  - or
  - dextrose 10%, 5 mL/kg via a carefully placed nasogastric tube

Give adequate glucose to maintain normoglycaemia.

**Referral**

**URGENT**
- diabetic emergencies

**Referral**
- all children on presentation for diagnosis, stabilisation and planning
- all children with
  - excessive thirst or excessive passage of urine
  - loss of weight
  - sweet smelling breath suggestive of the presence of ketones, urine test will show ketones and glucose
  - hypoglycaemia
  - diabetic ketoacidosis
  - decreased level of consciousness or confusion
  - significant illness in diabetics
  - sub-optimal glucose control
  - vomiting
  - growth failure
  - delay of puberty
  - eating disorders
- all children for regular review and advice

**Type 2 diabetes mellitus in adolescents**
Increasing numbers of adolescents, particularly those who are overweight and/or with a strong family history of type 2 diabetes are presenting with type 2 diabetes in childhood. They may present with the classical symptoms of lethargy, polyuria and polydipsia and require referral to a specialist centre.
Endocrine system

3.01.2 Diabetes mellitus type 1 in adults

Description
Diabetes mellitus type 1, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM).

Diabetes mellitus type 1 presents with:
- hunger
- polyuria
- ketoacidosis
- thirst
- weight loss
- tiredness

Note
All patients must be referred on presentation for diagnosis, stabilisation, initiation of treatment and planning.

Management objectives
- control the blood sugar level within acceptable limits (glycaemic control)
- prevent chronic complications
- prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma
- improve and maintain quality of life
- educate and counsel patients on self-care

Non-drug treatment
- dietary control, regular exercise and self care practices are important control factors
- the patient should be advised to carry a disease identification bracelet, necklace or card

Drug treatment
- insulin according to individual needs

Diabetic emergencies in adults

Patients with diabetes type 1 may present with a decreased level of consciousness due to hyper- or hypoglycaemia. Both will need referral to reassess management. In all patients with abnormal levels of consciousness, try to determine if the blood glucose level is high or low.
Endocrine system

<table>
<thead>
<tr>
<th></th>
<th>Hyperglycaemia</th>
<th>Hypoglycaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>blood glucose test</td>
<td>11 mmol/L or higher</td>
<td>2.5 mmol/L or lower</td>
</tr>
<tr>
<td>urine test for glucose</td>
<td>positive</td>
<td>negative</td>
</tr>
<tr>
<td>urine test for ketones</td>
<td>positive</td>
<td>usually negative</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.

Ketoacidosis – hyperglycaemia and ketones in the urine:
• initiate treatment before urgent referral

NB Early administration of large amounts of fluid initially is life saving and is vital at this stage. Exclude hypoglycaemia.

if in shock
• sodium chloride 0.9%, IV, 20 mL/kg within 1 hour

if no shock or if shock is corrected
• sodium chloride 0.9 %, IV, 80 mL per hour

Refer urgently with drip in place and running at planned rate.

When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:
• insulin, short acting, IM, 0.05 unit/kg

!CAUTION!
Do not administer IV short-acting insulin if the serum electrolyte status, especially potassium is not known.
Continue with IV fluids but delay giving insulin in these cases in consultation with referral facility as this delay should not negatively influence the patient. Hypokalaemia with resultant cardiac dysrhythmias definitely will. See section 19

Hypoglycaemia
(see section 19)
Endocrine system

Referral

- all patients with diabetes mellitus type 1 should be referred at diagnosis for the initiation and stabilisation of therapy
- excessive thirst or passage of urine
- loss of weight
- sweet smell on breath (ketones). Urine test will show ketones and glucose.
- recurrent hypoglycaemia
- suboptimal glycaemic control
- complications
- significant illness
- altered level of consciousness
  - exclude hypoglycaemia and manage accordingly

3.03 Diabetes mellitus type 2

Description
Diabetes mellitus type 2 is a chronic debilitating metabolic disease characterised by an abnormally high blood glucose level with serious acute and chronic complications. It is an important component of the metabolic syndrome (syndrome X).

In adults the condition may only be diagnosed accidentally or when complications are discovered, e.g.:
- ischaemic heart disease
- peripheral artery disease
- stroke
- deteriorating eyesight
- foot ulcers

Symptoms of an abnormally high blood sugar level are:
- thirst, especially noticed at night
- polyuria
- tiredness
- periodic changes in vision due to fluctuations in the blood glucose level
- susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note
It is important to distinguish diabetes mellitus type 2 from diabetes mellitus type 1.
Diagnosis
Features of diabetes mellitus:
• glycosuria
and
• random blood glucose (RBG) above 11 mmol/L
or
• fasting blood glucose (FBG) above 7 mmol/L
if asymptomatic
• abnormal FBG or RBG on 2 occasions
or
• one abnormal FBG and one abnormal RBG

Management objectives
• control the blood sugar level within acceptable limits (glycaemic control)
• prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma
• manage chronic conditions associated with diabetes
• prevent complications, e.g. foot care to prevent gangrene
• improve and maintain quality of life
• educate and counsel patients on self-care

Non-drug treatment
Step 1 – Diet and lifestyle
All patients require lifestyle modification:
• appropriate weight loss if weight exceeds ideal weight
• regular exercise
• stop smoking
• moderate or no alcohol intake

Appropriate diet and weight loss, if overweight, are the cornerstones of the management and involve the following:
• eliminating sugars from the diet
• abstaining from eating snacks or sweets between meals
• eating 2–3 regular meals with balanced energy (kilojoule) distribution
• reducing total energy intake, if overweight
• gradual weight reduction
• adjusting energy intake to achieve a weight loss of about one kilogram per month
• regular exercise, e.g. brisk walking for 30 minutes every day, helps to burn off excessive fat
Endocrine system

### Entry to Step 1

<table>
<thead>
<tr>
<th>Typical symptoms - thirst, tiredness, polyuria</th>
<th>Treatment and duration</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>and random blood glucose above 11 mmol/L</td>
<td>lifestyle modification for life</td>
<td>random blood glucose below 10 mmol/L</td>
</tr>
<tr>
<td>or fasting blood glucose level above 7 mmol/L</td>
<td>appropriate diet</td>
<td>fasting glucose 6–8 mmol/L</td>
</tr>
<tr>
<td></td>
<td>weight loss until at ideal weight</td>
<td>or urine glucose 0–0.5% (– to +)</td>
</tr>
<tr>
<td></td>
<td>assess monthly</td>
<td>and ideal body weight</td>
</tr>
</tbody>
</table>

Note: Weight reduction may be a lengthy process

### Drug treatment

all adult diabetics, unless contraindicated

- aspirin, soluble, oral, 150 mg daily

### Step 2

**Biguanide or sulphonylurea**

**Biguanides (metformin)**

Contraindicated in:

- pregnancy
- cardiovascular disease
- renal disease
- hepatic disease

**CAUTION!**

Prescribe biguanides with care in the elderly

- metformin, oral, 500 mg daily.
  
dose increments if the blood or urine glucose is uncontrolled:
  
  - increase to 500 mg twice daily after two weeks
  - increase to 850 mg twice daily after another two weeks if needed
  - maximum dose of 850 mg three times daily
Endocrine system

**Sulphonylureas** (glibenclamide or gliclazide)
Contraindicated in:
- pregnancy
- renal failure
- impaired liver function
- any insulin-dependent diabetes like type 1 diabetes and diabetes from chronic pancreatitis

! CAUTION !
It is important to eat after taking a sulphonylurea

- glibenclamide, oral, 2.5 mg daily with breakfast
dose increments if the blood or urine glucose is uncontrolled:
  - increase by 2.5 mg daily at two-weekly intervals
  - maximum dose – 15 mg daily
  - if 7.5 mg daily or more is needed, divide the total daily dose into two, with the larger dose in the morning

or

if an alternative is required e.g. in the elderly
- gliclazide, oral, 40 mg daily with breakfast
dose increments if the blood or urine glucose is uncontrolled:
  - increase by 40 mg daily at two-weekly intervals
  - maximum dose – 160 mg twice daily
  - if 80 mg or more daily is needed then divide the total daily dose into two
Continue lifestyle modification and initiate drug treatment according to the following schedule:

<table>
<thead>
<tr>
<th>Entry to Step 2</th>
<th>Treatment and duration</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>fasting blood glucose above 8 mmol/L</td>
<td>lifestyle modification and initiate drug therapy with: metformin or sulphonylurea</td>
<td>random blood glucose below 10 mmol/L or fasting glucose 6–8 mmol/L or urine glucose 0–0.5% (– to +) and ideal body weight Note: Weight reduction may be a lengthy process.</td>
</tr>
<tr>
<td>after 3 months of compliance with treatment plan in step 1 e.g. weight loss and symptoms of thirst, polyuria and weakness</td>
<td>and random blood glucose above 10 mmol/L</td>
<td></td>
</tr>
</tbody>
</table>

### Step 3
**Biguanides and sulphonylurea**

<table>
<thead>
<tr>
<th>Entry to Step 3</th>
<th>Treatment and duration</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>fasting blood glucose above 8 mmol/L</td>
<td>lifestyle modification and • metformin and • sulphonylurea</td>
<td>random blood glucose below 10 mmol/L or fasting glucose 6–8 mmol/L or urine glucose 0–0.5% (– to +) and ideal body weight Note: Weight reduction may be a lengthy process.</td>
</tr>
<tr>
<td>after 3 months of compliance with treatment plan in step 2 and maximal dose of single agent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Step 4
**Insulin therapy**
- insulin is indicated when oral combination therapy fails
- continue lifestyle modification
- insulin therapy must be initiated by a doctor
- sulphonylurea should be discontinued once insulin therapy is initiated
Education on insulin therapy should include:

- types of insulin
- injection technique and sites
- insulin storage
- glucose monitoring, urine and blood
- meal frequency as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal
- recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia

<table>
<thead>
<tr>
<th>Insulin type</th>
<th>Starting dose</th>
<th>Increment</th>
<th>Maximum daily dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>intermediate to long-acting as supplementation</td>
<td>10 units in the evening before bedtime</td>
<td>if 10 units not effective, increase to 20 units</td>
<td>20 units</td>
</tr>
<tr>
<td>biphasic as substitution</td>
<td>twice daily</td>
<td>4 units weekly</td>
<td>30 units</td>
</tr>
<tr>
<td></td>
<td>total daily dose: 15 units divided as follows:</td>
<td>increase 0.6 units on a daily basis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2/3 of total daily dose, i.e. 10 units, 30 minutes before breakfast</td>
<td>first increment is added to dose before breakfast</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/3 of total daily dose, i.e. 5 units, 30 minutes before supper</td>
<td>second increment is added to dose before supper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stop oral sulphonylurea only after adequate control has been achieved</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note

Patients with diabetes mellitus type 2, especially the elderly, often have:

- associated heart disease, e.g. ischaemic heart disease and cardiac failure
- a variable degree of renal function impairment
- hypertension
- degenerative conditions of the peripheral and central nervous system
- arterial disease - atherosclerosis and arteriosclerosis
Endocrine system

Refer these patients in order to establish optimum drug management of diabetes mellitus and associated conditions.
Daily, finger prick glucose testing over 5 days will give an indication of poor control and the need to improve treatment.

Referral
URGENT – same day
• metabolic complications:
  ▪ dehydration and hypotension
  ▪ nausea and vomiting
  ▪ heavy ketonuria and ketosis
  ▪ hyperglycaemia over 20 mmol/L
• complications, e.g. infections which may have the following symptoms:
  ▪ slow onset of progressive apathy leading to confusion, stupor, pre-coma and coma
  ▪ sepsis, including gangrene
  ▪ sudden deterioration of vision
  ▪ serious infections, e.g. TB

Note
Before transferring very ill patients, consider IV infusion with sodium chloride 0.9%.

Referral
Six-monthly or annual for assessment of progress and potential complications
• fundoscopy
• renal
• cardiovascular
• neurological
• feet
• laboratory

Referral
• all type 1 diabetics
• pregnancy
• failure of step 4 to control diabetes
4.01 Anaemia

D50.9

Description
A condition characterised by pallor.
It is commonly caused by:
• defective red cell production (haematinic deficiency)
• increased red cell destruction (haemolysis)
• blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, excessive menstruation

Other causes include:
• infiltration or replacement of the bone marrow
• abnormal haemoglobin or red cells
• chronic systemic diseases

Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Hb less than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-pregnant women</td>
<td>11 g/dL</td>
</tr>
<tr>
<td>pregnant women</td>
<td>10 g/dL</td>
</tr>
<tr>
<td>males</td>
<td>12 g/dL</td>
</tr>
<tr>
<td>children 1–5 years</td>
<td>10 g/dL</td>
</tr>
<tr>
<td>children over 5 years</td>
<td>11 g/dL</td>
</tr>
</tbody>
</table>

Clinical examination and assessment of a peripheral blood smear is required to indicate the type of anaemia:
• normochromic
• hypochromic or microcytic
• macrocytic

Further investigations to identify the cause of the anaemia may be required.
Nutritional and blood conditions

In children less than 5 years
• anaemia is most often due to iron deficiency and should be treated as such
• consider blood loss if the anaemia is severe (Hb less than 7 g/dL)
• refer anaemia associated with enlargement of liver, spleen or lymph nodes
• exclude blood loss due to parasites

Referral
• unknown cause
• symptoms of anaemia e.g. syncope, palpitations and shortness of breath
• evidence of cardiac failure
• signs of chronic disease, e.g. TB
• anaemia associated with enlargement of the liver, spleen or lymph nodes
• signs and symptoms of acute blood loss or bleeding disorder
• blood in stool or melaena
• pregnant women over 34 weeks of gestation and a Hb less than 7 g/dL
• no improvement despite correct treatment
  ▪ Hb increase less than 1.5 g/dL over a 2 week period
  or
  ▪ Hb increase less than 2 g/dL over a 3 week period

4.01.1 Anaemia, iron deficiency

Description
Iron deficiency is a common cause of anaemia in:
• younger children and women of child-bearing age
• the elderly
In pregnancy and during the post-partum period, folate deficiency and/or combined iron or folate deficiency are common.
Diagnosis can only be confirmed with a blood smear.

Non-drug treatment
• identify and treat the cause
• lifestyle and dietary adjustment
• counselling
Drug treatment

children

• iron, oral, 2 mg/kg elemental iron per dose 8 hourly with meals

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Elemental iron (mg)</th>
<th>Ferrous gluconate syrup (40 mg/5mL)</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>10 mg</td>
<td>1.5 mL</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>20 mg</td>
<td>2.5 mL</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>40 mg</td>
<td>5 mL</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>60 mg</td>
<td>7.5 mL</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>80 mg</td>
<td>10 mL</td>
<td>8–14 years</td>
</tr>
</tbody>
</table>

adults

• ferrous sulphate, oral, 200 mg three times daily with food

Follow up at monthly intervals.
The expected response is an increase in Hb of 2 g/dL or more in 3 weeks.
Continue for 3 to 4 months after Hb is normal to replenish body iron stores.

! CAUTION !
iron is extremely toxic in overdose, particularly in children
all medication should be stored out of reach of children

Prophylaxis

all premature babies, day 15 to 1 year

• ferrous gluconate, oral, 16 mg/kg (2 mg/kg elemental iron) daily
• multivitamin, drops, oral, 0.3 mL daily

full term babies after 2 months

• ferrous gluconate, oral, 8 mg/kg (1 mg/kg elemental iron) daily for one year
• multivitamin, drops, oral, 0.6 mL daily

4.01.2 Anaemia, macrocytic or megaloblastic

B52.0/B53.1

Description
Anaemia with large red blood cells is due to folate or vitamin B₁₂ deficiency.
Folate deficiency is common in pregnant women and in the elderly.
Nutritional and blood conditions

Vitamin B12 deficiency occurs mainly in adults. Special investigations are required to confirm the diagnosis.

Referral
- all patients with suspected macrocytic anaemia, except in pregnancy, for diagnosis and treatment
- adults with a history suggestive of vitamin B12 deficiency including:
  - TB
  - malabsorption
  - chronic diarrhoea
  - weight loss
  - the elderly
  - vegetarians
  - liver disease
  - hypothyroidism
  - any neurological signs or symptoms

4.01.3 Folate deficiency
(See section 7.02 Anaemia in pregnancy)

4.02 Childhood malnutrition and anaemia, including failure to thrive (FTT)
R62.8

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

Description
Severe malnutrition is defined as a weight-for-age of less than 60% of the expected weight (50th percentile) or oedema of both feet.

Clinical presentation:
kwashiokor – nutritional oedema associated with skin changes and hepatomegaly
marasmus – clinical (visible) severe wasting
marasmic kwashiorkor – features of both

Exception
Any baby, including ex-premature babies, growing parallel to or better than the percentiles, would not be classified as severe malnutrition.

Danger signs:
• dehydration
• lethargy
• hypothermia
• jaundice
• shock
• weeping skin lesions
• hypoglycaemia
• refusing feeds

All children with severe malnutrition need stabilisation, followed by urgent referral, as they are at risk of complications or death due to:
• hypothermia
• hypoglycaemia
• infection
• fluid overload leading to heart failure

Initiate non-drug and drug treatment while waiting for transport to hospital.

Non-drug treatment
prevent or treat hypoglycaemia:
• begin feeding immediately if the child is stable and able to take oral feeds
  • feed at 15 mL/kg 3 hourly
  • feed 2 hourly if child is hypothermic or hypoglycaemic
  • feed via a nasogastric tube if oral feeds are refused or not finished
  • use expressed breast milk if mother is breastfeeding or any available milk source
Nutritional and blood conditions

prevent or treat hypothermia:
• measure under-arm temperature 3 hourly
• keep child warm using mother-child skin-to-skin contact (Kangaroo care), if mother is present
• keep the child dry and covered at all times, especially the head and avoid drafts
• if the axillary temperature is below 36°C, treat urgently
• monitor temperature 2 hourly until more than 36.5°C

Drug treatment

<table>
<thead>
<tr>
<th>!CAUTION!</th>
</tr>
</thead>
<tbody>
<tr>
<td>where IV fluids are considered for severe dehydration give</td>
</tr>
<tr>
<td>Ringer-Lactate 10 mL/kg/ hour</td>
</tr>
<tr>
<td>continue with ORS orally or by nasogastric tube</td>
</tr>
</tbody>
</table>

infection

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

if there are no danger signs
• amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>1.25 mL</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3.75 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
</tbody>
</table>

if the child has any general danger signs
• ceftriaxone, IM, 50 mg/kg immediately and daily, until referred

an additional, non-routine, dose vitamin A
• vitamin A, oral, 100 000 units
Nutritional and blood conditions

Failure to thrive or not growing well

Description
Children and infants who have either:
• unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health Chart
or
• low weight for age (if Road to Health Chart is not available)

Note
Ex-premature babies growing parallel to or better than the percentiles, should not be classified as failure to thrive or not growing well.

Failure to thrive (FTT) may be due to:
• insufficient food intake due to anorexia and illness or poor availability of food
• insufficient uptake of nutrients, e.g. malabsorption
• insufficient use of nutrients for growth due to chronic disease
• an increased demand for nutrients due to illness such as TB
Conduct a feeding and clinical assessment to determine the cause and to determine whether there is associated anaemia.

Non-drug treatment
• counselling on nutrition

Drug treatment
• multivitamin, oral, 2.5 mL daily
• anthelmintics
  (see section 2.09)
• vitamin A
  (see section 4.03.1)
• anaemia
  (see section 4.01)

Referral
• no response to treatment
• all children other than those with insufficient food intake
• severe malnutrition
4.03 Vitamin deficiencies

4.03.1 Vitamin A deficiency

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

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

Management objectives
- prevent Vitamin A deficiency in children under the age of 5 years, and in pregnant women
- treat vitamin A deficiency

Non-drug treatment
- dietary supplementation with vitamin A rich food including:
  - fortified maize meal and/or bread
  - carrots, sweet potato, mangoes and pawpaw
  - dark green leafy vegetables e.g. morogo/ imifino and spinach
  - liver, eggs, full cream milk and small fish
Drug treatment
Prophylaxis
• vitamin A, oral

<table>
<thead>
<tr>
<th>Target group</th>
<th>Dosage</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-breastfed infants 0–5 months</td>
<td>50 000 IU</td>
<td>a single dose at the age of 6 weeks</td>
</tr>
<tr>
<td>all infants 6–11 months</td>
<td>100 000 IU</td>
<td>a single dose at the age of 6 months or up to 11 months</td>
</tr>
<tr>
<td>all children 1–5 years</td>
<td>200 000 IU</td>
<td>a single dose at 12 months and then every 6 months until the age of 5 years</td>
</tr>
<tr>
<td>all post-partum women</td>
<td>200 000 IU</td>
<td>a single dose at delivery and not later than 6–8 weeks after delivery</td>
</tr>
</tbody>
</table>

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

Treatment
Children 0 - 5 years with:
• severe under nutrition
• persistent diarrhoea
• any of the clinical signs of vitamin A deficiency
• measles

• vitamin A, oral

<table>
<thead>
<tr>
<th>Target group</th>
<th>Immediately on diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 0–5 months</td>
<td>50 000 IU</td>
</tr>
<tr>
<td>Infants 6–12 months</td>
<td>100 000 IU</td>
</tr>
<tr>
<td>Children 1–5 years</td>
<td>200 000 IU</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.
• mothers can swallow the capsule with water
• do NOT give the capsule to the mother or the caretaker to take home
Nutritional and blood conditions

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

Referral
• all complicated cases

4.03.2 Vitamin B deficiency
E56.9

Description
A condition in which some of the B group vitamins are deficient. This occurs commonly in:
• malnutrition
• pellagra associated with multiple vitamin B deficiency
• physical and neurological complications of alcoholism

Management objectives
• correct vitamin B deficiency
• treat the underlying cause

Non-drug treatment
• lifestyle adjustment
• patient counseling
• discourage alcohol abuse

Drug treatment
children
• vitamin B complex, oral, 5 mL daily

adults
• vitamin B complex, oral, 2 tablets three times daily for 1 week, then one tablet daily for 3 months
4.03.2.1 Pellagra (nicotinic acid deficiency)

E56.9

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

Clinical features include:
- diarrhoea
- dementia
- dermatitis with darkening of sun-exposed skin

Management objectives
- correct nicotinic acid deficiency

Non-drug treatment
- lifestyle adjustment
- patient counselling
- discourage alcohol abuse

Drug treatment
children
- nicotinamide, oral, 100 mg three times daily

adults with less severe pellagra
- nicotinamide, oral, 100 mg daily

adults with severe pellagra
- nicotinamide, oral, 100 mg three times daily

Referral
- confusion
- memory loss
- dementia
- delusions
- depression
- psychosis
- hallucinations
4.03.2.2 Pyridoxine (Vitamin B₆) deficiency

**Description**
Pyridoxine deficiency is related to:
- malnutrition
- alcoholism
- TB therapy

Commonly presents as:
- signs and symptoms of anaemia
- signs of peripheral neuropathy including:
  - tingling sensation of the legs
  - leg pains
  - calf muscle cramps
  - muscle weakness

**Note**
Signs of peripheral neuropathy may occur during TB treatment due to isoniazid (INH).

**Management objectives**
- correct pyridoxine deficiency
- treat underlying cause
- lifestyle modification

**Drug treatment**
- **deficiency**
  - pyridoxine, oral, 25 mg daily for 3 weeks

- **drug-induced neuropathy**
  - **children**
    - pyridoxine, oral, 50–200 mg daily for 3 weeks
  - **adults**
    - pyridoxine, oral, 200 mg daily for 3 weeks

- **followed by**
  - **prophylactic dose**
    - pyridoxine, oral, 25 mg daily
Referral
- convulsions
- hallucinations
- anaemia
- seborrhoeic dermatitis around the eyes, nose and mouth accompanied by stomatitis and glossitis

4.03.2.3 Thiamine deficiency (Wernicke’s encephalopathy and beriberi)
E56.9

Description
Clinical features include:
- confusion
- paralysis of one or more of the ocular muscles or ophthalmoplegia
- nystagmus
- ataxia
- peripheral neuropathy
- cardiac failure

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

Management objectives
- correct thiamine deficiency
- treat beri-beri

Non-drug treatment
- lifestyle adjustment
- patient counselling
- discourage alcohol abuse

Drug treatment
mild peripheral neuropathy
- thiamine, oral, 50 mg daily for 6 weeks

severe peripheral neuropathy
- thiamine, oral, 100 mg daily for 6 weeks
Nutritional and blood conditions

**NB:** Thiamine should be administered prior to intravenous glucose to prevent permanent neurological damage.

encephalopathy or eye muscle paralysis
- thiamine, IV, 100 mg in 1 000 mL dextrose 5%
  
  or

**NB:** Patients presenting with encephalopathy or eye muscle paralysis should be given thiamine 100 mg IV in 1 000 mL dextrose 5%.

  or

if unable to administer IV
- thiamine, IM, 100 mg followed by 50 mL dextrose 50%

**Referral**
- all patients
Chapter 5 – Cardiovascular conditions

Drugs used in this section

- ACE Inhibitor
- aspirin, soluble
- benzathine benzylpenicillin
- dihydropyridine calcium channel blocker, long acting
- furosemide
- isosorbide dinitrate (nitrates organic)
- phenoxyethylpenicillin
- amoxicillin
- atenolol
- digoxin
- erythromycin
- hydrochlorothiazide
- methyldopa
- spironolactone

5.01 Cardiac arrest, cardio-pulmonary resuscitation
(See Chapter 19 - Trauma and emergencies)

5.02 Cardiac failure, congestive (CCF)

5.02.1 Cardiac failure, congestive (CCF), adults

Description

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

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

Signs and symptoms include:

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

Management objectives
• treat reversible causes
• improve symptoms
• improve quality of life

Non-drug treatment
• patient and family education
• monitoring of body weight to assess changes in fluid balance
• limit fluid intake to 1–1.5 liters per day
• salt (sodium chloride) restriction to less than 2–3 g per day
• rest when symptomatic
• regular exercise within limits of symptoms

Drug treatment
mild volume overload (mild CCF) and normal renal function – thiazide diuretic
• hydrochlorothiazide, oral, 25 mg daily
  ▪ contraindication:
    - gout
    - impaired liver function
    - impaired renal function

significant volume overload or abnormal renal function – loop diuretic
• furosemide, oral, daily
  ▪ initial dose: 40 mg
  ▪ maximum dose: 80 mg
  ▪ higher dosages may be needed if renal failure is present

acute pulmonary oedema
• furosemide, IV (see section 19)

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

all patients with CCF, unless contraindicated or poorly tolerated – ACE inhibitor
• dosages must be gradually titrated upwards until an optimal dose is achieved
  ▪ absolute contraindications:
    - cardiogenic shock
    - serum potassium above 5.5 mmol/L
Cardiovascular conditions

- bilateral renal artery stenosis
- pregnancy

**after diuretic and ACE inhibitor only if serum potassium can be monitored**
- spironolactone, oral, 25mg daily

<table>
<thead>
<tr>
<th>!CAUTION!</th>
</tr>
</thead>
<tbody>
<tr>
<td>spironolactone can cause severe hyperkalemia and should only be used when serum potassium can be monitored do not use together with potassium supplements</td>
</tr>
</tbody>
</table>

**symptomatic CCF despite diuretic and ACE inhibitor – digoxin, initiated by a doctor**
- digoxin, oral, daily
  - 0.25 mg in patients with low risk of digoxin toxicity
  - 0.125 mg in patients with high risk of digoxin toxicity
- patients at high risk of digoxin toxicity are:
  - the elderly
  - patients with poor renal function
  - hypokalaemia
  - low body weight

**Referral**
**URGENT**
- patients with prosthetic heart valve
- suspected infective endocarditis
- fainting spells

**Referral**
- initial assessment and initiation of treatment
- poor response to treatment and symptomatic

**5.02.2 Cardiac failure, congestive (CCF), children**
I50.0

**Description**
Congestion of the systemic or pulmonary venous systems due to cardiac dysfunction of various different causes and is often mistaken for respiratory infection.
Cardiovascular conditions

Signs and symptoms

**infants**

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

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

**children**

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

**Non-drug treatment 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.

**Drug treatment while arranging transfer if CCF is strongly suspected**

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

**Referral**

- all children with suspected congestive cardiac failure
5.03 Hypertension

5.03.1 Hypertension in adults

Description
A condition characterised by a blood pressure (BP) elevated above normal measured on three separate occasions, a minimum of 2 days apart.
• systolic BP equal or above than 140 mmHg
and/or
• diastolic BP equal or above than 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 or more</td>
<td>110 or more</td>
</tr>
</tbody>
</table>

Major risk factors for cardiovascular disease
• diabetes mellitus
• hypertension
• obesity
• smoking
• dyslipidaemia
• family history of primary hypertension or premature cardiovascular disease in men less than 50 years and in women less than 55 years
• physical inactivity
• pre-existing disease (target organ damage):
  ▪ left ventricular hypertrophy
  ▪ ischaemic heart disease (angina or prior myocardial infarction)
  ▪ heart failure
  ▪ transient ischaemic attacks
  ▪ stroke
  ▪ chronic renal impairment
  ▪ retinopathy
  ▪ peripheral arterial disease
Cardiovascular conditions

Management objectives
- achieve and maintain the target BP
  - in most cases the target BP should be: systolic below 140 mmHg and diastolic below 90 mmHg
- achieve target BP in special cases as:
  - in diabetic patients and patients with cardiac or renal impairment, target BP should be below 130/80 mmHg
  - in patients with renal disease with more than 1 g/24 hours macro-albuminuria, target BP should be below 120/75 mmHg

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

Drug treatment
mild hypertension
- when there are no risk factors and there is poor response to lifestyle modification measures after 3 months, initiate drug therapy

moderate hypertension
- initiate drug therapy as well as lifestyle modification at diagnosis

presence of risk factors
- drug therapy as well as lifestyle modification, should be initiated at diagnosis

Special cases
pregnancy-induced hypertension
- methyldopa oral, 250–500 mg three or four times daily, only during pregnancy

hypertension with diabetes mellitus
ACE inhibitor should be used if hydrochlorothiazide alone does not control BP
hypertension urgency
Systolic BP above 200 mmHg, diastolic BP above 130 mmHg without symptoms of target organ damage.
• initiate treatment at step 3

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

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

Note
• check adherence to medication
• advise patient to take medication on the day of the clinic visit, as this can be a reason for a high BP reading
• monitor patients monthly and adjust therapy if necessary until the BP is stable
• after target BP is achieved, patients can be seen at 3-monthly intervals

| ! CAUTION ! |
| lower BP over a few days |
| a sudden drop in BP can be dangerous, especially in the elderly |

STEPWISE TREATMENT

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 to 99 mmHg and/or systolic BP 140 to 159 mmHg without any existing disease and no major risk factors</td>
<td>• lifestyle modification</td>
<td>• BP control within 3 months to systolic BP below 140 mmHg and diastolic below 90 mmHg</td>
</tr>
</tbody>
</table>
### Cardiovascular conditions

#### 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 and • no major risk factors and • failure of lifestyle modification alone to reduce BP after 3 months or • mild hypertension with major risk factors or existing disease or • moderate hypertension at diagnosis</td>
<td>• lifestyle modification and • hydrochlorothiazide, oral, 12.5 mg daily</td>
<td>• BP control within 1 month to systolic BP below 140 mmHg and diastolic below 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 of step 2 after 1 month or • severe hypertension</td>
<td>• lifestyle modification and • hydrochlorothiazide, oral, 12.5 mg daily add • beta-adrenergic blocking agent, e.g. atenolol oral, 50 mg daily if not contra-indicated</td>
<td>• BP control within 1 month to systolic BP below 140 mmHg and diastolic below 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 compliance</td>
<td>• lifestyle modification and</td>
<td>• BP control within 1 month</td>
</tr>
<tr>
<td></td>
<td>• hydrochlorothiazide, oral, 12.5 mg daily and</td>
<td>to systolic BP below 140 mmHg and diastolic</td>
</tr>
<tr>
<td></td>
<td>• beta-adrenergic blocking agent, e.g., atenolol, oral, 50 mg daily if not</td>
<td>below 90 mmHg with no side-effects</td>
</tr>
<tr>
<td></td>
<td>contra-indicated add</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ACE-inhibitor or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• dihydropyridine calcium channel blocker, long acting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(doctor-initiated)</td>
<td></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 compliance</td>
<td>• refer</td>
<td></td>
</tr>
</tbody>
</table>

Contraindications to individual drugs
hydrochlorothiazide
• gout
• pregnancy
• severe liver failure
• renal failure

Beta-adrenergic blocking agent e.g. atenolol
• absolute
  ▪ asthma
  ▪ chronic obstructive airways disease
• relative
  ▪ heart failure
  ▪ diabetes mellitus
  ▪ peripheral vascular disease
  ▪ bradycardia: pulse rate less than 50 per minute
Cardiovascular conditions

ACE inhibitors
- pregnancy
- bilateral renal artery stenosis
- aortic valve stenosis

Hypertensive emergency

A marked elevated blood pressure and/or a diastolic BP above 130 mmHg associated with one or more of the following:
- unstable angina
- grade 3 or 4 hypertensive retinopathy
- neurological signs, e.g. severe headache, visual disturbances, confusion, coma or seizures
- pulmonary oedema
- renal failure

Drug treatment
- ACE inhibitor, oral, single dose immediately
- if ACE inhibitor cannot be used
  - calcium channel blocker, long acting, oral, single dose immediately (doctor-initiated)

! CAUTION !
a hypertensive emergency needs immediate referral to hospital
administer ACE inhibitor immediately

Referral
URGENT
- hypertensive emergencies

Referral
- young adults (under 30 years)
- BP not controlled by three drugs and where there is no doctor available
- pregnancy
- signs of target organ damage, such as oedema, dyspnoea, proteinuria, angina, etc.
- if severe side effects develop
5.03.2 Hypertension in children

I10

Refer all cases

5.04 Ischaemic heart disease, angina pectoris
(See Myocardial infarction, acute (AMI), Chapter 19 – Trauma and emergencies)

I21.9

5.04.1 Angina, stable

I20.9

Description
A clinical manifestation of coronary artery disease and coronary insufficiency as a result of atherosclerosis.
Comes on with effort or anxiety and disappears with rest or treatment with sublingual nitrates.
Usually presents as burning or crushing central chest pain or sensation. May radiate to the shoulders, jaw and inner arms particularly on the left side.

Diagnosis
Diagnosis is made clinically and by the exclusion of other causes of chest pain. ECG or stress ECG testing may confirm the presence of coronary artery disease.

Management objectives
• relieve the symptoms
• identify high risk patients
• prevent myocardial infarction

Non-drug treatment
• lifestyle modification to minimise modifiable cardiovascular risk factors
• manage other associated cardiovascular risk factors

Drug treatment
• aspirin soluble, oral, 150 mg daily
• isosorbide dinitrate, sublingual 5 mg every 5–10 minutes as needed for pain to a maximum of 5 tablets per episode
• beta-adrenergic blocking agent, e.g. atenolol, oral, 50 mg daily if not contra-indicated
Cardiovascular conditions

Referral
URGENT
• angina lasting longer than 20 minutes and not relieved by sublingual nitrates

Referral
• inadequate response to drug treatment
• unstable angina
• type 2 diabetes with angina

5.05 Myocardial infarction, acute (AMI)
(See Chapter 19 – Trauma and emergencies)
I21.9

5.06 Pulmonary oedema, acute
(See Chapter 19 - Trauma and emergencies)
J81

5.07 Rheumatic fever, acute
I01.9
Note: notifiable condition.

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

Clinical signs and symptoms include:
• arthralgia or arthritis that may shift from one joint to another
• carditis including cardiac failure
• heart murmurs
• subcutaneous nodules
• erythema marginatum
• chorea (involuntary movements of limbs or face)
• other complaints indicating a systemic illness e.g. fever
Management objectives
• prevent rheumatic fever
• limit damage, or further damage to the heart valves from recurrent rheumatic fever
• prevent infective endocarditis (see section 5.08)

Drug treatment
Prophylaxis for rheumatic fever

all patients with confirmed rheumatic fever and no rheumatic valvular disease
• benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks) until the age of 21 years

all patients with confirmed rheumatic fever and rheumatic valvular disease
• benzathine benzylpenicillin, IM, every 21–28 days (3–4 weeks) until the age of 35 years
  children under 30 kg: 600 000 IU
  children over 30 kg and adults: 1.2 MU

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

or
• phenoxybenzylpenicillin, oral, 12 hourly
  ▪ children 125 mg
  ▪ adults 250 mg

penicillin–allergic patients:
• erythromycin, oral, 12 hourly before meals
  ▪ children 125 mg
  ▪ adults 250 mg

Referral
• all patients for diagnosis and management
5.08 Valvular heart disease and congenital structural heart disease

Description
Damage to heart valves, chamber or vessel wall anomalies caused by rheumatic fever and by other causes, e.g. congenital heart defects and ischaemic heart disease.
It may be complicated by:
• heart failure
• infective endocarditis
• atrial fibrillation
• systemic embolism

Management objectives
• prevent infective endocarditis and heart failure
• prevent repeated attacks of acute rheumatic fever

Non-drug treatment
• advise all patients with a heart murmur with regard to the need for prophylactic treatment prior to undergoing certain medical and dental procedures
• advise patients to inform health care providers of the presence of the heart murmur when reporting for medical or dental treatment

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

if no anaesthetic is required
• amoxicillin, oral, 50mg/kg with a ceiling dose of 2 000 mg, 1 hour before the procedure

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 5 years</td>
<td>750 mg</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>1 500 mg</td>
</tr>
<tr>
<td>10 years and older</td>
<td>2 000 mg</td>
</tr>
</tbody>
</table>
Cardiovascular conditions

if allergic to penicillin – refer
if anaesthetic is required – refer

Referral
- all patients with heart murmurs for assessment
- all patients with heart murmurs not on a chronic management plan
- development of cardiac signs and symptoms
- worsening of clinical signs and symptoms of heart disease
- any newly developing medical condition, e.g. fever
- all patients with valvular heart disease for advice on prophylactic antibiotic treatment prior to any invasive diagnostic or therapeutic procedure
Chapter 6 - Skin conditions

Drugs used in this section

- amoxicillin
- benzoic acid 6% and salicylic acid 3%
- benzyl benzoate 25%
- calamine
- doxycycline
- erythromycin
- griseofulvin
- imidazole
- nystatin
- polyvidone iodine 5%
- sulphur 2%
- zinc oxide 15%
- albendazole
- aqueous cream (UEA)
- benzoyl peroxide 5%
- betamethasone 0.1%
- chlorpheniramine
- emulsifying ointment (UE)
- flucloxacillin
- hydrocortisone 1%
- monosulfiram
- permethrin 1%
- selenium sulphide

6.01 Acne vulgaris

Description
A skin condition caused by hormones and sebum gland hypertrophy leading to a blocking and/or infection of the follicles with Propionibacterium acnes.
- ranges in severity from mild with a few blackheads, to severe with nodules and cysts
- more common in adolescence but may also occur in adulthood
- distributed on face, chest and back

Management objectives
- improve skin condition
- eliminate pathogens

Non-drug treatment
- wash with soap and water 2–3 times daily
- do not squeeze lesions
- avoid cosmetics and hair spray

Drug treatment
many pustules
- benzoyl peroxide 5%, gel, apply at night
- doxycycline, oral, 100 mg daily for 3 months.
Referral
- no improvement after 3 months
- development of severe complications e.g. deep pustules
- severe cases of nodular acne

6.02 Bacterial infections of the skin

6.02.1 Boil, abscess

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

Note
Boils in diabetic or immunocompromised patients require careful management.

Management objectives
- eliminate the infection

Non-drug treatment
- encourage general hygiene
- apply local hot compresses three times daily until the boil/abscess starts draining.
  Drainage of abscess is the treatment of choice, with surgical incision being performed only after the lesion is mature.

Drug treatment
systemic antibiotics only as supportive therapy if there are:
- swollen lymph nodes in the area
- fever
Skin conditions

- flucloxacillin, oral, 6 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
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<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>2 caps</td>
<td>8 –14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

penicillin–allergic patients:
- erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
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</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>50</td>
<td>2 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
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<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8 –14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
- no response to treatment
- progression of the condition

6.02.2 Impetigo

Description
A common skin infection due to streptococci that occurs mainly in children.
- clinical features:
  - pussy sores with crusts or scabs
  - painful
  - usually starts on the face
  - spreading to neck, hands, arms and legs
Management objectives
• eliminate the infection
• promote healing

Non-drug treatment
• prevent infection by keeping breaks in the skin clean
• avoid insect bites
• cut finger nails
• wash and soak sores in soapy water to soften and remove crusts
• advise on the importance of washing daily
• continue with non-drug treatment until the sores are completely healed

Drug treatment
• polyvidone iodine 5%, cream, apply three times daily

antibiotic treatment is only necessary if one of the following is present:
• extensive infection
• fever
• swollen glands
• malnutrition
• HIV/AIDS

• amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
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<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>1.25 mL</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3.75 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Skin conditions

**penicillin–allergic patients:**

- erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
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<td>0–3 months</td>
</tr>
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<td>—</td>
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</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

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

**Referral**

- no improvement in 10 days
- complications such as glomerulonephritis as demonstrated by clinical investigations or presence of blood on urine test strips

**6.03 Cellulitis**

L03.9

**Description**

Usually caused by streptococci, but also staphylococci and occasionally other organisms.

- a diffuse, spreading, acute infection within solid tissues, characterised by:
  - oedema
  - increased local temperature
  - redness
  - no suppuration
- occurs mainly on the lower legs, but may occur elsewhere
- may follow minor trauma or eczema, e.g. lower legs, varicose ulcers
- frequently associated with lymphangitis and regional lymph node involvement manifested by tender swelling
Skin conditions

• there may be severe systemic manifestations
  ▪ fever
  ▪ chills
  ▪ tachycardia
  ▪ headache
  ▪ hypotension
  ▪ delirium
• may present as an acute fulminant or chronic condition

Management objectives
• eliminate the infection
• promote healing

Drug treatment
mild cases:
• amoxicillin, oral, 500 mg 8 hourly for 5 days

penicillin–allergic patients:
• erythromycin, oral, 250–500 mg 6 hourly for 5 days

severe cases:
refer for parenteral antibiotics

Referral
• children when associated with significant pain, swelling or loss of function refer urgently to exclude osteomyelitis
• recurrent cellulitis associated with underlying conditions, e.g. varicose ulcers
• acute, severe or fulminant cellulitis with systemic manifestations
• inadequate response to initial antibiotic treatment

6.04 Eczema

6.04.1 Eczema, atopic
L20.9

Description
• itchy red rash or dry rough skin linked to allergy
• in babies it appears at approximately 3 months
Skin conditions

- A family history of asthma, hay fever or atopic dermatitis are common clinical features:
  - Inner (flexural) surfaces of the elbows, knees and creases of the neck
  - In infants any part of the body can be affected
  - Very itchy at night
  - Can become chronic and infected

Management objectives
- Treat the condition aggressively
- Prevent spread to other areas

Non-drug treatment
- Avoid wearing clothes made from wool to prevent overheating
- Avoid overheating by blankets at night
- Cut nails short
- Avoid scratching
- Expose affected areas to sunlight
- Avoid soap

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

If no response within seven days or more severe eczema:
- Hydrocortisone 1% cream, applied twice daily for 7 days
  - Apply sparingly to the face
  - Do not apply around the eyes

If there is a response:
Reduce the use of hydrocortisone cream over a few days and maintain treatment with
- Aqueous cream (UEA)

If no response within seven days or more severe eczema:
- Betamethasone 0.1% ointment (doctor-initiated) applied twice daily for 7 days
  - Do not apply to face, neck and flexures

If there is a response:
Reduce the use of betamethasone ointment over a few days and maintain treatment with UEA cream
for itching:
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>½–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
• no improvement in 2 weeks

6.04.2 Eczema, seborrhoeic
L21.9

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

Management objectives
• treat the condition aggressively
• prevent spread to other areas

Non-drug treatment
• avoid wearing clothes made from wool to prevent overheating
• cut nails short
• avoid scratching
• expose affected areas to sunlight
• avoid soap

Drug treatment
• emulsifying ointment (UE), to wash or bath
• aqueous cream (UEA), applied to dry areas as a moisturiser
• hydrocortisone 1% cream, applied 2–3 times daily until improved
  ▪ then once or twice weekly for maintenance as needed
for severe eczema:
• betamethasone 0.1% ointment, (doctor-initiated ) applied twice daily
  ▪ do not apply to face and skin folds

for scalp itching, scaling and dandruff:
• selenium sulphide 2% suspension
  ▪ apply weekly by lathering on the scalp
  ▪ rinse off after 10 minutes

for itching:
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age</th>
</tr>
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<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

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

6.04.3 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.

Management objectives
• treat the condition aggressively
• treat secondary infections
• prevent spread to other areas

Non-drug treatment
• sodium chloride 0.9% dressings, applied daily or twice daily
• avoid use of soap on affected areas
Drug treatment
antibiotic treatment for staphylococcal secondary infection:
• amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>1.25 mL</td>
<td>—</td>
<td>0–3 months</td>
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<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3.75 mL</td>
<td>—</td>
<td>1–5 years</td>
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<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
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<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

penicillin–allergic patients:
• erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
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<th>Syrup 250 mg/5 mL</th>
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<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8 to 14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

for itching:
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age</th>
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<td>2.5 mL</td>
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</tr>
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<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
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</tr>
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<td>—</td>
<td>1/2 –1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Topical steroids should only be considered after the infection has cleared.

**Referral**
- no improvement after a week
- severe acute moist or weeping eczema

### 6.05 Fungal infections of the skin
B35

### 6.05.1 Athlete’s foot - tinea pedis
B35.3

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

**Non-drug treatment**
- discourage the use of shared bathing or swimming areas until healed
- use own towels and toiletries
- keep feet dry:
  - wear open shoes or sandals
  - do not wear socks of synthetic material
  - dry between toes after washing the feet or walking in water
  - wash and dry feet twice daily before applying treatment

**Drug treatment**
- benzoic acid 6% and salicylic acid 3% ointment, applied twice daily for 4 weeks

**if no response:**
- imidazole cream, applied twice daily for 4 weeks

**antibiotic treatment for secondary bacterial infection with purulent discharge, pain and tenderness between toes:**
- amoxicillin, oral, 250mg 8 hourly for 5 days

**penicillin–allergic patients:**
- erythromycin, oral, 250 mg 6 hourly for 5 days
Referral
- severe infection
- involvement of the nails
- no improvement after 4 weeks

6.05.2 Candidiasis, skin
B37.2
(Vaginal candidiasis: see STI syndrome section 10.13)

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

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

Note
Infection often occurs in immunocompromised patients:
- suspect HIV if the infection is severe or chronic
- exclude diabetes or other endocrine diseases

Management objectives
- eliminate the cause

Drug treatment
for skin folds:
- imidazole 2% cream, applied three times daily for 14 days

for nail folds:
- nystatin ointment 100 000 IU/g, applied three times daily. Continue for 14 days after healing.
**Referral**
- no response to topical treatment

---

**6.05.3 Ringworm and other tineas**
B35.9

**Description**
A highly contagious fungal infection of the skin that can be found anywhere on the body:
- arms
- breasts
- around the waist
- back
- buttocks
- groin
- scalp

Clinical features:
- itchy ringlike patches
- raised borders
- patches slowly grow bigger
- as the patch extends a clear area develops in the center which becomes pigmented in dark skin

**Non-drug treatment**
- prevent spreading the infection to others
- do not share:
  - clothes
  - towels
  - toiletries, especially combs and hair brushes
- wash skin well and dry before applying treatment

**Drug treatment**
Treat any secondary skin infection with antibiotics. (see section 6.02.2)

- benzoic 6% acid and salicylic acid 3% ointment, applied 2–3 times daily for 4–6 weeks (not in sensitive areas)
in groin and other sensitive skin areas:
• imidazole 2% cream, topical, applied 3 times daily. Continue using ointment for at least 2 weeks after lesions have cleared.

for nail and scalp infections (doctor-initiated):
• griseofulvin oral, once daily for a minimum of 8 weeks. Take with fatty meals or milk.
  children: 10 mg/kg
  adults: 500 mg

Note
• do not give to women of child-bearing age unless they are using an effective contraceptive
• avoid exposure to the sun

Referral
• scalp ringworm if no doctor available
• infection is widespread
• no response to treatment after 4 weeks

6.06 Parasitic infections of the skin

6.06.1 Lice (pediculosis)

Description
An infestation of the hairy parts of the body with lice.

Head lice:
• are common in children
• the eggs (nits) appear as fixed white specks on the hair

Body lice:
• live in the seams of clothing
• only come to the skin to feed

Clinical features:
• itching
• bite marks
• secondary eczema and secondary infection may be present
Skin conditions

Note
Body lice may carry typhus fever.

Non-drug treatment
Head lice
• wash hair
• use a fine comb to comb out the nits after washing hair
• shave the head – may not be necessary with permethrin rinse
• prevent spread by treating other contacts
• remove nits manually from eyelashes

Body lice
• do not shave the pubic area
• prevent spread by treating other contacts
• regularly wash bed linen and underclothes in hot water and expose to sunlight

Drug treatment

! CAUTION !
do not use commercial insect sprays, they are toxic
lotions used for the treatment of lice are toxic when swallowed

head lice
• permethrin 1% cream rinse, applied after washing hair with shampoo. Rinse off after 10 minutes.

Note
• do not apply to broken skin or sores
• avoid contact with eyes

body lice
adults and adolescent children:
• benzyl benzoate 25% lotion, undiluted, applied over the whole body. Leave on overnight and wash off the next day. Repeat once a week for up to 3 weeks.
Note
• do not apply to neck and face
• avoid the eyes
• the lotion is toxic if swallowed
• itching may continue for 2–3 weeks after treatment
• do not continue if a rash or swelling develops
• avoid contact with eyes and broken skin or sores
or
• monosulfiram 5% medicated soap, topical, used daily for the whole body. Repeat daily for 5 days. Lather the soap well on the body. Allow the lather to dry and remain on the body until the next wash.

Antibiotic treatment for secondary infection (see section 6.02.2)

Referral
• lice infestation of eyelashes

6.06.2 Scabies
B86

Description
An infestation with the parasite *Sarcoptes scabei*. Most commonly occurs in the skin folds.
Spreads easily and usually affect more than one person in the household.

Clinical features:
• intense itching, more severe at night
• presents as small burrows between fingers, toes, elbow areas and skin folds where the parasite has burrowed under the skin
• secondary infection may occur due to scratching with dirty nails

Non-drug treatment
• all close contacts must be treated simultaneously
• cut finger nails and keep them clean
• wash all linen and underclothes in hot water
• expose all bedding to direct sunlight
• thoroughly wash the whole body with a mild soap and water
• scrub the affected areas with a brush or wash-cloth and dry well with a clean towel
• put on clean, washed clothes after drug treatment
Skin conditions

Drug treatment
adults and children over 6 years:
• benzyl benzoate 25% lotion, undiluted, applied to the whole body from the neck to the feet on two consecutive days. Leave on overnight and wash off the next day.

if benzyl benzoate is unsuccessful:
• sulphur 2% ointment, applied daily for 3 days

children under 6 years:
• monosulfiram 5% medicated soap, used daily for the whole body. Repeat daily for 5 days. Lather the soap well on the body. Allow the lather to dry on the body and remain on body until the next wash.

Treatment may need to be repeated after one week.

Antibiotic treatment for secondary infection. (see section 6.02.2)

Note
• do not apply to neck and face
• avoid the eyes
• the lotion is toxic if swallowed
• itching may continue for 2–3 weeks after treatment
• do not continue if rash or swelling develops
• avoid contact with eyes and broken skin or sores

6.07 Napkin rash
L22

Description
A diffuse reddish eruption usually caused by irritation from persistent moisture and irregular cleaning and drying or napkin area, diarrhoeal stools and sometimes by underlying skin conditions due to improper rinsing of napkins to remove soap.

Non-drug treatment
• change nappies regularly
• do not use waterproof pants to cover napkin
• expose napkin area to air and sunlight if possible especially with severe napkin dermatitis
Skin conditions

• educate caregiver and give advice on:
  ▪ washing and drying of the napkin area when soiled
  ▪ regular napkin changes
  ▪ proper washing and rinsing of nappies

Drug treatment
• zinc oxide 15% ointment, applied after each nappy change

if no improvement within 3 days, suspect candida:
• nystatin ointment 100 000 IU/g, applied after each nappy change

Referral
• no improvement after 3 days

6.08 Sandworm
B76.9

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

Drug treatment
• albendazole, oral, daily for three days
  children under 2 years 200 mg
  children over 2 years and adults 400 mg
Skin conditions

- chlorpheniramine, oral, 3 times daily

<table>
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<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age</th>
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<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

6.09 Urticaria

L50.9

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

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

Management objectives
- identify and remove the cause
- relieve itching

Non-drug treatment
- detailed history taking to detect trigger factors
- lifestyle adjustment
Skin conditions

Drug treatment
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
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<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

for itching:
• calamine lotion, applied on the skin

Referral
• no improvement or response after 24 hours
• progressive illness
Chapter 7 – Gynaecology and obstetrics

Drugs used in this section
- adrenaline
- benzathine benzylpenicillin
- ceftriaxone
- ciprofloxacin
- dextrose 10%
- dihydralazine
- ergometrine
- ethinyl oestradiol
- folic acid
- ibuprofen
- lidocaine 1% (lignocaine)
- medroxyprogesterone
- metronidazole
- nevirapine
- oestradiol
- oxytocin
- promethazine
- sodium chloride 0.9%
- anti-D immunoglobulin
- calcium gluconate
- chloramphenicol
- clotrimazole
- dextrose 5%
- doxycycline
- erythromycin
- ferrous sulphate
- hexoprenaline
- levonorgestrel and ethinyl oestradiol
- magnesium sulphate
- methyl dopa
- naloxone
- nifedipine, short-acting
- oestrogen, conjugated
- pethidine
- Ringer-Lactate
- vitamin K

7.01 Abortion

O06

7.01.1 Abortion, incomplete, spontaneous

O03

Description
Spontaneous termination of pregnancy before 28 weeks of gestation after the last normal menstrual period.

Management objectives
- ensure complete evacuation of the uterus
- prevent or control bleeding
- prevent Rhesus iso-immunisation
- provide psychological support
Non-drug treatment
- monitor vital parameters, e.g. haemoglobin, pulse, blood pressure
- treat for shock if indicated
- counselling and support

Drug treatment
- oxytocin, IM, 5–10 IU
  or
- oxytocin, IV, 10–20 IU diluted in 1000 mL dextrose 5% in water, administered at 15–60 drops per minute, depending on the response (cessation of bleeding)

if still bleeding:
- ergometrine, IV, 0.2 mg after abortion

!CAUTION!
ergometrine should be avoided in patients with pregnancy hypertensive disorder and cardiac problems

in Rh-negative mothers:
- anti-D immunoglobulin, IM, 100 micrograms within 72 hours after abortion

Referral
- all patients

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

7.02 Anaemia in pregnancy
7.02 Anaemia in pregnancy
O99.0

Description
Anaemia in pregnancy is pallor plus a haemoglobin (Hb) of less than 10 g/dL, mostly due to either iron deficiency, folic acid deficiency or a combination of both.
Drug treatment

Prevention:
All antenatal patients, routine iron and folic acid supplementation. Advise to avoid soil eating, ‘pica’.

**single pregnancy:**
- ferrous sulphate, oral, 200 mg daily with food
  
  and

  - folic acid, oral, 5 mg daily

**twin or multiple pregnancy:**
- ferrous sulphate, oral, 200 mg twice daily with food
  
  and

  - folic acid, oral, 5 mg daily

**Established anaemia with Hb less than 10 g/dL:**
Assess peripheral blood smear if facilities are available.
- ferrous sulphate, oral, 200 mg three times daily with food. Continue for three months after the Hb normalises in order to replenish body iron stores.

**Referral**
- Hb less than 8 g/dL at any stage
- Hb less than 10 g/dL and patients over 34 weeks of gestation
- non-responding Hb
- a rise in the Hb of less than 1.5 g/dL over 2 weeks or less than 2 g/dL over 3 weeks in early pregnancy
- any low Hb with an obstetric complication
- signs or symptoms of acute or chronic blood loss
- pallor (anaemia) plus signs of chronic disease, e.g. suspicion of TB, or the presence of hepatosplenomegaly
- evidence of cardiac failure
- anaemia of sudden onset
7.03 Bleeding, vaginal

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

7.03.1 Abnormal vaginal bleeding during fertile years

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

Non-drug treatment
• assess current contraceptives used
• exclude pregnancy complication or organic disease e.g. fibroids

Drug treatment
• combined oral contraceptive pill (levonorgestrel and ethinyl oestradiol)
• ibuprofen, oral, 200–400 mg 8 hourly with or after food as needed for 2–3 days
  ▪ ibuprofen may reduce blood loss in menorrhagia associated with:
    - intrauterine contraceptive device (IUCD)
    - chronic salpingitis (see STI syndromic treatment guidelines)
    - menstruation following puberty when no ova are produced (anovulatory cycles)

if blood loss has been severe or there are signs of anaemia:
• ferrous sulphate, oral, 200 mg three times daily after food for 1 month

Referral
• no improvement
• girls less than 12 years with vaginal bleeding before the development of their secondary sexual characteristics
• for investigation of other causes such as:
  ▪ sexual abuse
  ▪ foreign bodies
  ▪ tumours of the genital tract
  ▪ severe anaemia
7.03.2 Bleeding, post-menopausal
N95.0

Description
Bleeding after menstruation has ceased for 2 years.

Note
If bleeding profuse stabilise before referral.

Referral
• all cases, to exclude underlying malignancy and other pathology

7.04 Cracked nipples during breastfeeding
O92.1

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

Causes of cracked nipples include:
• poor attachment
• removing the baby from the breast before suction is broken

The four signs of good attachment are:
• chin touching breast (or very close)
• mouth wide open
• lower lip turned outward
• more areola visible above than below the mouth

Management objectives
• prevent cracked nipples
• ensure good attachment of the baby to the breast

Non-drug treatment
• apply expressed breast milk to the nipples between feeds
• if too painful, express the milk and nurse the baby on the other breast until improvement
• prevent infection
7.05 Delivery, normal
O80.9

Description
Normal delivery is divided into three stages of labour:

- **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

Management objectives
- support the normal birth process
- monitor the status of the mother and the baby
- reduce maternal and perinatal morbidity and mortality

Non-drug treatment
- supportive
  - psychological support
  - hydration and nourishment of the mother

Drug treatment
mother
- **first stage with cervical dilatation of less than 9 cm:**
  - analgesia:
    - pethidine, IM, 100 mg immediately
    and
    - promethazine, IM, 25 mg

- **second stage:**
  - local anaesthetic for episiotomy:
    - lidocaine 1%. Do not exceed 20 mL.

- **foetal distress during labour:**
  - hexoprenaline, IV, 10 mcg slowly and refer. Place the mother in the left lateral position. Do not administer hexoprenaline if mother has cardiac disease.
inadequate or inco-ordinate uterine contractions:
Use only for primipara and titrate to individual needs. Contraction frequency should never exceed 5 in 10 minutes.
- oxytocin, IV, 2 IU in 1 000 mL of Ringer-Lactate at infusion rate of 1 mL /minute, increased by 1 mL/minute at 30 minute intervals until the desired response is achieved. Maximum 4 mL/minute.

if desired response is not achieved:
- oxytocin, IV, 4 IU in 1 000 mL of Ringer-Lactate at infusion rate of 3 mL /minute, increased to 4 mL/minute after 30 minutes

prevention of post-partum haemorrhage after delivery of the baby:
(check for twin)
- oxytocin, IM, 10 IU.

post-partum haemorrhage:
- Ringer-Lactate as fluid replacement
- oxytocin, IV, 20 IU in 1 000 mL Ringer-Lactate rapidly

if no response:
- ergometrine, IM, 0.5 mg. Avoid ergometrine in hypertensive women unless haemorrhage is life-threatening.

Rh incompatibility:
- anti-D immunoglobulin, IM, 100 mcg
Administer to Rh-negative mother if baby is Rh-positive or baby’s Rh group is not known.

baby
See section 7.05.1 Care of the neonate

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

Note
- keep membranes intact in labour
- give nevirapine after counselling if mother is HIV positive
- avoid unnecessary episiotomy and other invasive procedures in HIV, to reduce the mother to child transmission of HIV
Referral
- prolonged labour according to charting on partogram
- post-partum haemorrhage
- incomplete delivery of the placenta
- other complications of mother or baby

7.05.1 Care of the neonate

Management objectives
- provide appropriate care to the neonate including warmth, appropriate cord care and protection
- promote breast feeding
- minimise mother to child transmission of HIV infection
- prevent ophthalmia neonatorum
- prevent haemorrhagic disease of the newborn
- advise on appropriate care and hygiene of the cord and cord stump
- detect the presence of serious conditions
- exclude readily detectable birth anomalies
- exclude neonatal jaundice and institute the appropriate management

Drug treatment
**neonatal conjunctivitis prophylaxis:**
- chloramphenicol ophthalmic ointment 1%, applied routinely to each eye after birth

**bleeding prophylaxis:**
- vitamin K, IM, 1 mg immediately after birth routinely to prevent hypoprothrombinaemia

**neonate not breathing well:**
after mother received pethidine up to 4 hours before birth
- naloxone, IM, 0.02 mg

**routine immunisation EPI:**
- BCG vaccination, intradermal, once stable
- polio vaccine, oral, once stable
7.05.2 Sick neonate and neonatal emergencies

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

The most common serious conditions are:
- septicaemia or infections
- respiratory conditions
- congenital abnormalities
- late effects of asphyxia

Possible serious bacterial infection or other severe abnormalities must be suspected when any of the following are found:
- convulsions
- fast breathing (more than 60 breaths per minute)
- severe chest indrawing
- nasal flaring or grunting respiration
- bulging fontanelles
- 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

Non-drug treatment
Keep the neonate warm, the axillary temperature should be 36.5–37°C.
- this is best done by “Kangaroo Care” where the neonate is kept naked against the mother’s skin between her breasts inside her clothing
- alternatively, use an incubator or heated cloths. Insulate baby well once the temperature is normal.

Drug treatment
if baby’s tongue and lips are blue:
- oxygen, using nasal catheter at 2 L/minute
if infection is suspected and jaundice has been excluded:
• ceftriaxone, IM, 50 mg/kg into the lateral thigh

Monitor blood glucose and exclude hypoglycaemia, if less than 2.5 mmol/L and baby able to suckle or take orally:
• breast feed

or
• dextrose 10%, oral

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

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

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

7.05.3 Neonatal resuscitation

Neonatal resuscitation depends on the following:
• rapid assessment and initial steps in stabilisation
• ventilation, including bag-mask or bag-tube ventilation
• chest compressions
• drug treatment

All newly born infants require rapid assessment, including:
• examination for the presence of meconium in the amniotic fluid or on the skin
• evaluation of:
  ▪ breathing
  ▪ muscle tone
  ▪ colour
• classification of gestational age as term or preterm
Newly born infants with a normal rapid assessment require only routine care:
• warmth
• clearing the airway
• drying
All others receive routine care and:
• positioning
• stimulation to initiate or improve respiration
• oxygen as needed

**Initial steps in stabilization:**
• place the infant under an overhead radiant heater
• dry the body and head to remove amniotic fluid. This also provides gentle stimulation to initiate or help maintain breathing.
• position the infant supine with the neck either in a neutral position or slightly extended. Avoid over extension or flexion which may produce airway obstruction.
• suctioning of the upper airway is only required if the baby has absent, slow or difficult breathing
  ▪ apply suction first to the mouth and then nose
  ▪ if the nose was cleared first the infant may gasp. Aspirate secretions in the pharynx with a soft F8 or F10 catheter attached to a gentle mechanical suction of less than 100 mmHg. If this is not available, use a mucus extractor operated by mouth suction.
  ▪ do not suction more than about 5 cm beyond the mouth or nose to avoid stimulating spasm of the larynx. Limit suctioning to 5 seconds at a time
  ▪ if meconium is present in the amniotic fluid, suction the infant’s mouth, pharynx and nose before the head is delivered (i.e. intrapartum suctioning before the first breath is taken). If thick meconium is present suctioning should be performed by experienced staff.
  ▪ if drying and suctioning do not induce effective breathing, gently flick the soles of the feet. Do not waste time continuing stimulating if there is no response to this after 10 seconds.
  ▪ if cyanosis, bradycardia or other signs of distress are noted in a breathing newborn during stabilization, administration of 100% oxygen is indicated while determining the need for additional intervention. Free-flow oxygen can be delivered through a facemask or a hand cupped around oxygen tubing. The oxygen source should deliver at least 5–8 L/minute and the oxygen should be held close to the face to maximize the inhaled concentration.
Further evaluation and interventions are based on:
- respirations
- heart rate
- colour

respirations:
- infants who are apnoeic or gasping despite brief stimulation attempts should receive positive-pressure (bag-and-mask) ventilation
- if there is adequate spontaneous breathing, proceed to the next step

heart rate:
- monitor either by auscultating the heart or by palpating the base of the umbilical cord
  - if the heart rate is below 100 beats per minute, begin bag and mask ventilation, even if the infant is making some respiratory efforts
  - if the heart rate is above 100 beats per minute, proceed to the next step

colour:
- the presence of central cyanosis indicates that the baby is inadequately oxygenated. Free-flow 100% oxygen at 5 L per minute using a mask held closely to the infant’s face should be administered. Withdraw oxygen gradually when the infant becomes pink.

Bag and mask ventilation is indicated when:
- apnoea (absence of breathing) or gasping respiration is present
- the heart rate is less than 100 beats per minute
- central cyanosis persists despite delivery of 100% oxygen

The key to successful neonatal resuscitation is establishment of adequate ventilation. Most neonates can be adequately ventilated with a bag and mask. A resuscitation bag is used, together with a neonatal facemask. The bag is connected to an oxygen supply. Delivery of oxygen occurs only when the bag is compressed. If oxygen is not available, ventilation using room air is acceptable and may be adequate.

Ventilation should be adequate with 40 to 60 assisted breaths per minute. Adequate ventilation is assessed by observing chest wall motion and hearing breath sounds bilaterally.
Advanced support:
- administer oxygen 100% with effective ventilation
- few babies require endotracheal intubation, chest compression or medication
- endotracheal intubation, chest compression and insertion of umbilical venous lines should only be performed by experienced staff
- chest compressions should be administered if the heart rate is absent or remains less than 60 beats per minute despite adequate assisted ventilation for 30 seconds. The two-thumb, encircling-hands method of chest compression is preferred, with a depth of compression one-third the anterior-posterior diameter of the chest and sufficient to generate a palpable pulse.
- stop resuscitation after 15 minutes if there is no spontaneous circulation

Drug treatment
heart rate is zero, or heart rate stays below 60 despite effective ventilation with 100% oxygen and chest compressions for at least 30 seconds:
- adrenaline, IV, 1:1 000, 1 mL diluted with sodium chloride, 0.9% to 10 mL
  - give 0.5 mL rapidly and repeat every 5 minutes

suspected blood loss, or infant appears in shock:
- pallor persisting after oxygenation
- a weak pulse despite a good heart rate
- poor response to resuscitative efforts
- sodium chloride 0.9% or Ringer-Lactate, IV, 10 mL/kg over 5–10 minutes

after mother received pethidine up to 4 hours before birth:
- naloxone, IV, 0.1 mg/kg rapidly
  or
- naloxone, IM, 0.1 mg/kg into anterolateral aspect of the thigh

Referral
- newborns that have been successfully resuscitated require monitoring
- babies:
  - requiring oxygen
  - appear floppy or lethargic
  - have complications
Supply completed documentation with referral.
7.05.4 Prevention of mother to child transmission of human immunodeficiency virus

Z29.2

Description
Transmission of Human Immune Deficiency Virus (HIV) from mother to child may occur during pregnancy, delivery and breast-feeding. 30–40% of children born to HIV infected women will become infected. With intervention, the rate of spread can be significantly decreased.

Management objectives
• prevent transmission of HIV from mother to child
• provide voluntary counselling and testing prior to appropriate interventions

Management
• offer HIV testing, and pre- and post-test counselling to all pregnant women
• mothers who are HIV negative or of unknown status, declining HIV tests, should be managed as if potentially HIV infected
  ▪ promote protection from infection during pregnancy and thereafter
  ▪ promote normal delivery and breast feeding
  ▪ do not give nevirapine to the mother or the baby

HIV infected mothers
Non-drug treatment
The health care worker involved in the delivery and postnatal care needs to be informed of the mother’s HIV status, so that optimal plans and procedures can be put in place for mother and child.

Mode of delivery
• rupture of membranes:
  ▪ avoid early rupture of membranes
  ▪ when using an amniohook to rupture membranes take care not to scratch the foetal scalp
• episiotomy:
  ▪ avoid unnecessary episiotomy
  ▪ episiotomy may indicated in prolonged second stage and foetal distress
• injuries to the child,s skin or pharynx:
  ▪ do not carry out routine pharyngeal suction after delivery unless specifically required for asphyxia resuscitation
• cleaning of baby after delivery:
  ▪ gently wipe secretions from the babies skin with a soft towel or tissue
Feeding during the first 6 months:
- discuss the financial, health and other implications of breastfeeding versus bottle feeding
- exclusive replacement feeding is the preferred option as it eliminates postnatal transmission of HIV from mother to child
- if this is not possible, exclusive breastfeeding for the first few months, followed by rapid cessation of breastfeeding when replacement is safe, sustainable and accessible is recommended. Continuing to give mixed feeding, simultaneous breast and bottle-feeding, appears to increase the rate of transmission of HIV infection from breast milk.
- when it is not possible to safely stop breast feeding at the normal time of weaning onto solids, the only option may be to continue with mixed feeding as the risk of malnutrition may be greater. If possible, try to avoid this situation by appropriate social and nutritional intervention.

Support of mother and child:
- offer professional follow up at the highest accessible level

Community based support team:
- actively encourage the establishment of community based support teams

Infant care
- all babies should have routine immunisation and nutritional support, including multivitamin syrup and vitamin A according to standard regimens
- when clinically indicated, provide counselling and HIV testing
- manage symptomatic children appropriately

Drug treatment to prevent the transmission of HIV from mother to child
mother
- nevirapine, oral, 200 mg single dose as early as possible in labour for elective caesarean section
- nevirapine, oral, 200 mg single dose 4 hours pre-operatively

baby
- nevirapine, oral, single dose within 72 hours of birth
  - less than 2kg  2mg/kg
  - more than 2kg  6mg

If no nevirapine is given to the mother or the nevirapine is given less than two hours before delivery, give the baby’s dose as soon as possible after delivery.
Referral
If the PHC site is not suitably resourced to provide the following service:
• a mother who wishes to have an HIV test
• a mother who, knowing her results, wishes to take part in the prevention of mother to child transmission programme

7.06 Dysmenorrhoea
N94.6

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

Management objectives
• determine the cause and treat accordingly
• relieve symptoms

Non-drug treatment
• advise and reassure women with primary dysmenorrhoea about the nature of the condition
• encourage patient to carry on with normal everyday activities

Drug treatment
primary dysmenorrhea:
• ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days

secondary dysmenorrhea:
• ibuprofen, oral, 400 mg 8 hourly with or after food as needed for 2–3 days

Treat for pelvic infection when present.

Referral
• poor response to treatment
• if an organic cause is suspected
7.07 Haemorrhage, antepartum  
O46.9

**Description**
Vaginal bleeding in pregnancy after 20 weeks of gestation to the end of the second stage of labour.

**Drug treatment**
- Ringer-Lactate, IV
- treat for shock if necessary
- avoid vaginal examination

**Refer**
- all patients

7.08 Hormone replacement therapy  
N95.1

**Indications:**
- menopausal symptoms, e.g. hot flushes
- urogenital atrophy
- osteoporosis
- oophorectomy in pre-menopausal woman

A risk benefit assessment should be individualised in all patients.

Should not be used for primary or secondary prevention of atherosclerotic disease.

**Contra-indications:**
- endometrial cancer
- breast cancer
- previous deep vein thrombosis
- porphyria
- undiagnosed vaginal bleeding
- recent myocardial infarction
- liver disease
- uncontrolled hypertension

**Drug treatment**
**women with intact uterus per cycle:**
- ethinyl oestradiol, oral 0.02 mg–0.05 mg daily
- conjugated oestrogens, oral 0.3 mg–0.625 mg daily
and
• medroxyprogesterone, oral 5 mg

women with no uterus (post-hysterectomy):
• ethinyl oestradiol, oral 0.02 mg–0.05 mg daily
or
• conjugated oestrogens, oral 0.3 mg–0.625 mg daily

Referral
• annually, for re-evaluation

7.09 Hypertensive disorders of pregnancy

Description
Hypertension in pregnancy, pre-eclampsia and eclampsia may have very serious and fatal consequences for both the mother and the baby. Hypertension at 20 weeks of gestation or more (gestational hypertension) characterised by a BP elevated above normal measured on two occasions about 4 hours apart.
• systolic BP equal or above 140 mmHg
and
• diastolic BP equal or above 90 mmHg

Hypertensive disorders of pregnancy can be classified as:
• pre-eclampsia or pregnancy-induced hypertension (PIH) is hypertension with proteinuria
• eclampsia is the presence of generalised tonic-clonic seizures in patients with hypertension
• pre-eclamptic toxaemia (PET)

LEVELS OF SEVERITY

<table>
<thead>
<tr>
<th>Level of hypertension</th>
<th>BP Level mmHg</th>
<th>Proteinuria</th>
<th>Oedema</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Systolic</td>
<td>Diastolic</td>
<td></td>
</tr>
<tr>
<td>mild</td>
<td>140–150</td>
<td>or 90–100</td>
<td>–</td>
</tr>
<tr>
<td>moderate</td>
<td>150–160</td>
<td>or 100–110</td>
<td>+</td>
</tr>
<tr>
<td>severe</td>
<td>above 160</td>
<td>and above 110</td>
<td>++</td>
</tr>
</tbody>
</table>
Management objectives
- identify patients with moderate or severe hypertension, or any proteinuria
- treat urgent and aggressively to prevent complications before urgent referral

Mild hypertension:

<table>
<thead>
<tr>
<th>Non-drug treatment</th>
<th>Drug treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- may be managed without admission before 38 weeks of gestation</td>
<td>none</td>
</tr>
<tr>
<td>- weekly review of:</td>
<td></td>
</tr>
<tr>
<td>- BP</td>
<td></td>
</tr>
<tr>
<td>- weight</td>
<td></td>
</tr>
<tr>
<td>- urine analysis</td>
<td></td>
</tr>
<tr>
<td>- foetal heart rate and movements</td>
<td></td>
</tr>
<tr>
<td>- foetal size</td>
<td></td>
</tr>
<tr>
<td>- ed rest</td>
<td></td>
</tr>
<tr>
<td>- education on signs requiring follow-up</td>
<td></td>
</tr>
<tr>
<td>- admit at 38 weeks for delivery</td>
<td></td>
</tr>
</tbody>
</table>

Moderate hypertension:

<table>
<thead>
<tr>
<th>Non-drug treatment</th>
<th>Drug treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- as for mild hypertension</td>
<td>- methyldopa, oral, 500 mg immediately, then 250–500 mg three to four times daily. Maximum dose 500 mg four times daily.</td>
</tr>
<tr>
<td>- admit if proteinuria is present</td>
<td></td>
</tr>
</tbody>
</table>

Severe hypertension or eclampsia:

<table>
<thead>
<tr>
<th>Non-drug treatment</th>
<th>Drug treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ensure safe airway</td>
<td>- Ringer-Lactate 300 mL loading dose over 20 minutes IV, then 80 mL per hour magnesium sulphate as follows:</td>
</tr>
<tr>
<td>- administer oxygen</td>
<td>- loading dose: dilute magnesium sulphate</td>
</tr>
<tr>
<td>- stabilise prior to urgent referral</td>
<td>- 4 g in 200 mL dextrose 5% and water,</td>
</tr>
<tr>
<td>- insert a Foley’s catheter</td>
<td>- infuse over at least 20 minutes</td>
</tr>
<tr>
<td></td>
<td>and</td>
</tr>
<tr>
<td></td>
<td>- magnesium sulphate, IM, 10 g given as 5 g in each buttock</td>
</tr>
<tr>
<td></td>
<td>- then IM, 5 g every 4 hours in alternate buttocks</td>
</tr>
</tbody>
</table>
Non-drug treatment | Drug treatment
---|---
• stop magnesium sulphate if urine output is less than 100 mL in 4 hours, or respiratory rate is less than 16 breaths per minute or patellar reflexes absent

If magnesium toxicity suspected (decreased tendon reflexes)
• calcium gluconate 10% (10 mL), IV, over 2–3 minutes as antidote
• nifedipine 5 mg, oral, may be administered if BP remains above 160/110 mmHg, this may be repeated every 30 minutes for four doses.
• dihydralazine, IM, 6.25 mg if lengthy transfer is anticipated

Referral

URGENT
• severe PIH - stabilise the patient, initiate magnesium sulphate infusion and IM injection before referral

Referral
• poor compliance in mild PIH

Note
Hypertension starting early in pregnancy (less than 20 weeks gestation) should be differentiated from pregnancy induced hypertension, as these patients often remain hypertensive for more than 8 weeks after delivery, and may have a treatable cause.

7.09.1 Pregnancy in patients with chronic hypertension

Stop ACE Inhibitors when pregnancy is planned or as soon as pregnancy is diagnosed.
• methyldopa, oral, 250mg three times a day. Maximum dose 500 mg four times daily.
Nifedipine may also be used if initiated by a doctor.
7.10 Labour, pre-term

Description
Regular painful uterine contractions, three per 10 minutes before 38 weeks of gestation.

Management objectives
• if less than 26 weeks of gestation refer without tocolysis
• if 26–34 weeks of gestation, refer with tocolysis
• if more than 34 weeks of gestation, delivery should be allowed to continue

Drug treatment
if 26–34 weeks of gestation, initiate treatment with tocolysis before referral
• hexoprenaline, IV, 5–10 micrograms over 5 minutes
or
• nifedipine, oral, 20 mg every 1/2 hour for 3 doses

Referral
• all cases less than 34 weeks of gestation

7.11 Pregnancy, ectopic

Description
Pregnancy outside the uterus, usually presenting with the combination of:
• missed menstruation
• sudden lower abdominal pain
• dizziness
• shock
• anaemia
• urine pregnancy test usually positive

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

Refer
• all suspected cases of ectopic pregnancy
• treat shock if indicated
7.12 Ulcers, vaginal
(See Chapter 10 – Infections, STI Protocol 3)

7.13 Vaginal discharge/lower abdominal pain in women
(Stanford Protocols 2 and 4)
A54.9
(See section 10.13 Sexually transmitted infections)
Chapter 8 - Family planning

Drugs used in this section

- levonorgestrel 0.03 mg
- levonorgestrel 0.15 mg and ethinyl oestradiol 0.03 mg
- norgestrel 0.5 mg and ethinyl oestradiol 0.05 mg

- levonorgestrel and ethinyl oestradiol
  - 11 tablets levonorgestrel 0.05 mg and ethinyl oestradiol 0.05 mg
  - 10 tablets levonorgestrel 0.125 mg and ethinyl oestradiol 0.05 mg
  - 7 tablets placebo

- levonorgestrel and ethinyl oestradiol
  - 6 tablets levonorgestrel 0.05 mg and ethinyl oestradiol 0.03 mg
  - 5 tablets levonorgestrel 0.075 mg and ethinyl oestradiol 0.04 mg
  - 10 tablets levonorgestrel 0.125 mg and ethinyl oestradiol 0.03 mg
  - 7 tablets placebo

- medroxyprogesterone acetate
- norethisterone enanthate

Note
levonorgestrel is a progestogen and ethinyl oestradiol is an oestrogen

8.01 Contraception, barrier methods

- Condoms, male, rubber latex, lubricated smooth surface with teat closed end
- Condoms, female, polyurethane
8.02 Contraception, emergency
Z30.9

! CAUTION!

tablets must be taken within 72 hours of unprotected intercourse

Use monophasic preparations formula 2 (see section 8.03.2).
• norgestrel 0.5 mg and ethinyl oestradiol 0.05 mg, oral, 2 tablets within 72 hours of unprotected intercourse
and
• 2 tablets 12 hours later

8.03 Contraception, hormonal

8.03.1 Contraceptives, injectable
Z30.0

• medroxyprogesterone acetate, 150 mg long-acting
• norethisterone enanthate, 200 mg

8.03.2 Contraceptives, oral
Z30.0

monophasic: progestogen only tablets
• levonorgestrel 0.03 mg

monophasic: combination of progestogen and oestrogen in each tablet
formula 1 – levonorgestrel 0.15 mg and ethinyl oestradiol 0.03 mg
formula 2 – norgestrel 0.5 mg and ethinyl oestradiol 0.05 mg

biphasic preparations: combination of progestogen and oestrogen
• levonorgestrel and ethinyl oestradiol
  ▪ 11 tablets levonorgestrel 0.05 mg and ethinyl oestradiol 0.05 mg
  ▪ 10 tablets levonorgestrel 0.125 mg and ethinyl oestradiol 0.05 mg
  ▪ 7 tablets placebo
Family planning

Triphasic preparations: combination of progestogen and oestrogen
- levonorgestrel and ethinyl oestradiol
  - 6 tablets levonorgestrel 0.05 mg and ethinyl oestradiol 0.03 mg
  - 5 tablets levonorgestrel 0.75 mg and ethinyl oestradiol 0.04 mg
  - 10 tablets levonorgestrel 0.125 mg and ethinyl oestradiol 0.03 mg
  - 7 tablets placebo

8.04 Contraception, intrauterine contraceptive device (IUCD)
Z30.1

- 250 – short type for a uterus with sound length of 6 cm
- 375 – standard type for a uterus with sound length of over 7 cm
**Chapter 9 - Renal and urinary tract conditions**

**Drugs used in this section**
- ceftriaxone
- ciprofloxacin
- furosemide
- nifedipine

**9.01 Glomerulonephritis, acute**
N05.9

**Description**
A syndrome in children and adults, usually secondary to untreated streptococcal infection (impetigo, tonsillitis/pharyngitis), which results in acute glomerular inflammation and reduced renal function.

Presents with a varied combination of:
- painless macroscopic bloody or turbid brownish urine
- peripheral and facial oedema
- pulmonary oedema (circulatory overload)
- hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions
- oliguria or anuria

**Main objectives**
- recognise syndrome
- treat life threatening hypertension or fluid overload
- refer for management

**Non-drug treatment**
- stop all fluid intake if patient does not pass urine (DO NOT put up a drip)
- stop intake of all salt containing foods and fluids
- give oxygen and nurse in semi-Fowler’s position if distressed

**Drug treatment**
if diastolic blood pressure is greater than 100 mmHg or systolic blood pressure is above 150 mmHg:
Renal and urinary tract conditions

children
• nifedipine, oral, 0.25–0.5 mg/kg sublingually. Withdraw contents of 5 mg capsule with a 1 mL syringe.
  10 to 25 kg   2.5 mg
  25 to 50 kg   5 mg
  over 50 kg    10 mg

adults
• nifedipine, oral, 10 mg, single dose

if there is respiratory distress (rapid respiration, chest indrawing):
  children
• furosemide, as an initial IV bolus, 2 mg/kg (do not put up a drip AND DO NOT give a fluid infusion)
  adults
• furosemide, as an IV bolus, 80 mg (do not put up a drip AND DO NOT give a fluid infusion)

Referral
• all cases

9.02 Pyelonephritis, acute
N11.9

Description
Infection of the kidney parenchyma.
Any UTI with a fever should be regarded as pyelonephritis.
The urine may be turbid and/or bloodstained and tests positive for nitrites.

Drug treatment
Treatment must be initiated before referral.
• ceftriaxone, IM
  children – 50mg/kg, single dose
  adults – 1 000 mg, single dose

Referral
• all patients
9.03 Urinary tract infection
N39.0

Description
An acute condition, in most cases caused by *Escherichia coli*. Other micro-organisms may be present, especially in patients previously managed in hospitals. Uncomplicated urinary tract infections occur in women who are menstruating and have normal renal tracts. All other urinary tract infections (including children and men) are seen as complicated.

Signs and symptoms include:
- burning or pain on passing urine (dysuria)
- frequent passing of small amounts of urine
- in more severe cases there is lower abdominal pain and tenderness
- children may present with non-specific symptoms such as diarrhoea, upper respiratory symptoms, etc
- Urine may be turbid and/or bloodstained and test positive for leucocytes and nitrites.

Diagnostic tests
- dipstix of freshly passed urine positive for leucocytes and nitrites
- if the dipstix is only leucocytes positive, repeat the test on a freshly passed clean midstream specimen of urine and if still only leucocytes, refer for urine examination and culture

Note
- if the urine tests negative for leucocytes and nitrites, there is no urinary tract infection
- pelvic inflammatory disease must be excluded in women

Management objectives
- eliminate causative micro-organisms
- prevent complications

Non-drug treatment
- encourage liberal fluid intake
- reduce the stasis of urine in the bladder
- lifestyle adjustment
Renal and urinary tract conditions

Drug treatment

adults

uncomplicated UTI in adult women, excluding pregnant women:
• ciprofloxacin, oral, 500 mg as a single dose

recurrent UTI in women and all males:
• ciprofloxacin, oral, 250 mg, 12 hourly for 7 days

children
• nalidixic acid suspension, oral, 250 mg/5mL, 6 hourly for 5 days
  ▪ children 2 to 5 years: 250 mg/dose 5 mL
  ▪ children over 5 years: 375 mg/dose 7.5 mL

pregnant women, if severely ill, before referral:
• ceftriaxone, IM, 1000 mg

Referral
• all children less than 2 years
• all children with UTI and abdominal pain, persistent vomiting or failure to show appropriate weight gain pattern
• girls less than 5 years of age
• all males, after initiating treatment
• pregnant women
• recurrent infections
• persons who have recently had urinary tract instrumentation
• urinary tract infection not responsive to therapy (i.e. symptoms do not subside)
Infections and related conditions

Chapter 10 – Infections and related conditions

Drugs used in this section

• amoxicillin
• artemether/lumefantrine
• benzyl benzoate 25%
• ceftriaxone
• chlorhexidine 0.05%
• chlorhexidine 0.5% in alcohol 70%
• chlorpheniramine
• clotrimazole
• doxycycline
• gentian violet 0.5%
• iodine
• nystatin
• permethrin 1%
• polyvidone iodine 5%
• quinine
• sodium chloride 0.9%
• trimethoprim/sulfamethoxazole

• antifungal lozenges (troche)
• benzathine benzylpenicillin
• calamine lotion
• chloramphenicol 1%
• chlorhexidine 0.2%
• chloroquine
• ciprofloxacin
• dextrose 5%
• erythromycin
• hypochlorite
• metronidazole
• paracetamol
• polyvidone iodine 10%
• praziquantel
• retinol (vitamin A)
• sulfadoxine/pyrimethamine

10.01 Bilharzia

B65

Description

A parasitic infestation with the bilharzia parasite.
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.
Chronic bilharzia may present with local or systemic complications, including urinary tract obstruction with ensuing renal failure or other organ involvement.
Infections and related conditions

<table>
<thead>
<tr>
<th>Type of worm</th>
<th>Schistosoma haematobium</th>
<th>Schistosoma mansoni</th>
</tr>
</thead>
</table>
| Clinical features | • initially (after exposure):  
| |  ▪ itching or rash  
| |  ▪ some weeks later:  
| |  ▪ blood in the urine  
| |  ▪ lower abdominal pain  
| |  ▪ low grade fever  
| |  ▪ recurrent cystitis diarrhoea  
| |  ▪ eggs in urine or stool on microscopy  
| |  ▪ rectal biopsy  
| | • diarrhoea  
| |  ▪ abdominal pain  
| |  ▪ blood and mucus in the stools |

Diagnosis

Non-drug treatment
- if bilharzia is endemic, educate the community to avoid contaminated water and infection
- do not urinate or pass stools near water used for drinking, washing or bathing
- do not swim in contaminated water
- collect water from rivers and dams at sunrise when the risk of infestation is lowest
- boil all water before use

Drug treatment
if you are not equipped to check for parasites, do not treat
if eggs of *S. haematobium* and *S. mansoni* are found in the urine/faeces
- praziquantel, oral, as a single dose
  - children over 2 years – 40 mg/kg, single dose or as 2 divided doses
  - adults – 40 mg/kg, single dose

Note
Breastfeeding women should stop breastfeeding on the day of drug administration and for the next 48 hours.

Referral
- inability to identify parasites
- children under 2 years
- complications, e.g. urinary tract obstruction, systemic complications
10.02 Chickenpox

B01.9

Description
A mild viral infection that presents 2–3 weeks after exposure, with:
• mild fever preceding the rash
• lesions beginning on the trunk and face, later spreading to the arms and legs
• small, red, itchy spots that turn into blisters and burst to form scabs. These lesions may all be present at the same time.

Chickenpox is infective for 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting with a duration of about 1 week.
Complications of encephalitis and pneumonia occur rarely and are more likely in adults.

Management objectives
• provide symptomatic treatment
• manage complications

Non-drug treatment
• isolate from immunocompromised people and pregnant women until all lesions have crusted
• ensure adequate hydration
• cut fingernails very short and discourage scratching

Drug treatment

!CAUTION!
avoid the use of aspirin in children and adolescents under 16 years because of risk of Reye’s syndrome

for itch:
• calamine lotion, applied as needed
Infections and related conditions

for pain and fever:
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

If skin infection is present due to scratching, treat as for bacterial skin infection.

Referral
• complications such as:
  ▪ meningitis
  ▪ pneumonia
  ▪ encephalitis
• babies under 6 months
• HIV infected patients
• severely ill adults
• pregnant women
• recurrent chickenpox

10.03 Cholera
(See Chapter 2 - Gastrointestinal conditions)

10.04 Dysentery, amoebic
(See Chapter 2 - Gastrointestinal conditions)
10.05 Dysentery, bacillary
(See Chapter 2 - Gastrointestinal conditions)

10.06 Giardiasis
(See Chapter 2 - Gastrointestinal conditions)

10.07 Infection control, antiseptics and disinfectants

Description
Disinfectants are used to kill micro-organisms on working surfaces and instruments, but cannot be relied on to destroy all micro-organisms. Antiseptics are used for sterilising skin and mucous membranes.
Do not mix products.

Disinfecting surfaces
• guidelines for the use of disinfectants:
  ▪ never use a chemical if other more reliable methods are available
  ▪ cleansing is the first and most important step in chemical disinfection
  ▪ the disinfection fluid must entirely cover the object and penetrate all crevices
  ▪ use the recommended strengths for specific purposes
  ▪ disinfectants cannot sterilise surgical instruments
  ▪ no chemical agent acts immediately - note the recommended exposure time
  ▪ equipment has to be rinsed after immersion in a chemical
  ▪ recontamination is very easy at this stage
  ▪ make sure that the rinsing water and all other apparatus are sterile
• equipment must not be stored in chemical disinfectants
• the best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  ▪ solutions must be prepared freshly
  ▪ and discarded after 24 hours to disinfect properly
  ▪ do not use on the skin

Intact skin
• alcohol swabs may be used to swab before injections
• antiseptics like polyvidone iodine or chlorhexidine are used for surgical scrubbing, but soap and water can be just as good
Infections and related conditions

Wounds and mucous membranes

- chlorhexidine 0.05% aqueous solution can be used to clean dirty wounds
- sodium chloride 0.9% and sterile water are also used on clean wounds
- gentian violet 0.5% solution may be painted onto mucous membranes

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Indications</th>
<th>Directions for application</th>
</tr>
</thead>
<tbody>
<tr>
<td>chlorhexidine solution</td>
<td>• skin disinfection before surgery</td>
<td>• remove all dirt, pus and blood before use</td>
</tr>
<tr>
<td></td>
<td>• 0.05% aqueous solution</td>
<td>• clean dirty wounds with 0.05% aqueous solution</td>
</tr>
<tr>
<td></td>
<td>• 0.5% in 70% alcohol</td>
<td>• disinfection of instruments with 0.5% in 70% alcohol solution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• expensive, do not use for normal cleaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• use the correct concentration for a specific purpose</td>
</tr>
<tr>
<td>polyvidone iodine</td>
<td>• skin and wound infections</td>
<td>• use ointment for skin infection</td>
</tr>
<tr>
<td></td>
<td>• solution 10%</td>
<td>• use solution for cleaning skin and wounds</td>
</tr>
<tr>
<td></td>
<td>• ointment 10%</td>
<td>• avoid using on large wounds because of danger of iodine</td>
</tr>
<tr>
<td></td>
<td>• cream 5%</td>
<td>absorption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>contraindication: iodine allergy</td>
</tr>
</tbody>
</table>

Articles and instruments

- adhere to the appropriate cleansing and disinfection policy

10.08 Malaria

Note: notifiable condition.

Description

The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Test any person resident in or returning from a malaria area and who presents with fever (usually within 3 months of exposure). The progression to severe malaria is rapid and early diagnosis and effective treatment is crucial.
Pregnant women and young children up to 5 years of age are at particularly high risk and should be referred after initial dose of quinine.

Clinical features include, often in combination:
- severe headache
- fever above 38°C, may be absent in some cases
- muscular and joint pains
- sweating
- shivering attacks
- nausea and vomiting
- flu like symptoms

In young children malaria may present with:
- fever
- lethargy
- poor feeding
- vomiting
- diarrhoea
- cough

Progression to severe malaria may occur and present with the following additional clinical features:
- sleepiness, unconsciousness or coma, convulsions
- respiratory distress and/or cyanosis
- jaundice
- renal failure
- shock
- confusion
- repeated vomiting
- severe diarrhoea

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. a plasma reagent dipstick are available, these can be used to diagnose malaria within 10–15 minutes

Note
- if neither microscopy nor rapid tests are available, diagnosis should be made on the basis of clinical symptoms
- a blood smear should be made and sent for microscopic examination
- one negative malaria test does not exclude the diagnosis of malaria
Infections and related conditions

Non-drug treatment
- provide supportive and symptomatic relief
- monitor for complications
- ensure adequate hydration

Drug treatment
NB: chloroquine is no longer recommended for the treatment of *falciparum* malaria
Resistance to chloroquine is common in *Plasmodium falciparum* malaria, the most common and dangerous form of malaria.

**Uncomplicated *P. falciparum* malaria in South Africa**
(If unsure of species, treat as for *P. falciparum* malaria)

- artemether/lumefantrine
  - currently only indicated for patients less than 65 kg living in malaria endemic areas
  - administer with fat-containing food, to improve absorption
  - only to be used under the direct guidance of the malaria control programme

  or

- sulfadoxine/pyrimethamine
  - used in Mpumalanga and Limpopo provinces only
  - ineffective in KwaZuluNatal due to resistance
  - **do not use if patient has a sulpha allergy**
  - resistance is increasing and this agent should only be used under the direct guidance of the malaria control programme

  or

- quinine
  - initiate treatment with quinine

  plus either
  - add doxycycline or clindamycin 2–3 days after quinine
  - doxycycline should not be used in children under 8 years
  - clindamycin is the drug of choice in children under the age of 8 years and in pregnant women. Refer patients for this treatment.
Infections and related conditions

**fever:**
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily.

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Dosage guidelines for treatment of malaria**
- quinine – 1 tablet contains 300 mg quinine sulphate
- doxycycline – 1 capsule contains 100 mg doxycycline
- clindamycin – 1 capsule contains clindamycin 150 mg
- artemether/lumefantrine – 1 tablet contains artemether 20 mg/lumefantrine 120 mg
- sulfadoxine/pyrimethamine – 1 tablet contains sulfadoxine 500 mg/pyrimethamine 25 mg

**Regimen 1**
- artemether/lumefantrine, oral, with fat-containing food/milk to ensure adequate absorption

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose</th>
<th>Total tablets per course</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–15 kg</td>
<td>1 tablet immediately, then 1 tablet after 8 hours and then 1 tablet twice daily on the following two days</td>
<td>6 tabs</td>
</tr>
<tr>
<td>15–25 kg</td>
<td>2 tablets immediately, then 2 tablets after 8 hours and then 2 tablets twice daily on the following two days</td>
<td>12 tabs</td>
</tr>
<tr>
<td>25–35 kg</td>
<td>3 tablets immediately, then 3 tablets after 8 hours and then 3 tablets twice daily on the following two days</td>
<td>18 tabs</td>
</tr>
<tr>
<td>35–65 kg</td>
<td>4 tablets immediately, then 4 tablets after 8 hours and then 4 tablets twice daily on the following two days</td>
<td>24 tabs</td>
</tr>
<tr>
<td>over 65 kg</td>
<td>should not be used as there is limited evidence of effectiveness in people over 65 kg</td>
<td></td>
</tr>
</tbody>
</table>
Regimen 2
- sulfadoxine/pyrimethamine, oral, as a single dose

<table>
<thead>
<tr>
<th>Weight in kg</th>
<th>Dose</th>
<th>Age in years</th>
</tr>
</thead>
<tbody>
<tr>
<td>premature and newborn infants during the first weeks of life</td>
<td>refer</td>
<td></td>
</tr>
<tr>
<td>6–10 kg less than 1 year</td>
<td>refer</td>
<td></td>
</tr>
<tr>
<td>11–20 kg</td>
<td>1 tab</td>
<td>1–4 years</td>
</tr>
<tr>
<td>21–30 kg</td>
<td>1 1/2 tabs</td>
<td>5–9 years</td>
</tr>
<tr>
<td>31–40 kg</td>
<td>2 tabs</td>
<td>10–11 years</td>
</tr>
<tr>
<td>41–50 kg</td>
<td>2 1/2 tabs</td>
<td>12–13 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>3 tabs</td>
<td>13 years and older</td>
</tr>
</tbody>
</table>

Regimen 3
- quinine, oral, every 8 hours for 7 days
  - children – 10 mg/kg body weight
  - adults – 600 mg (2 tablets)

The tablets may be crushed with banana, jam or chocolate syrup.

add
2–3 days after initiating treatment with quinine
- doxycycline, oral
  - children over 8 years 4 mg/kg immediately, then 2 mg/kg daily for 7 days or until smears are negative
    Do not use in children under 8 years old
  - adults 200mg immediately, then 100–200mg daily for 7 days

Doxycycline can cause gastrointestinal intolerance and oral aphthous ulceration, it should therefore be taken preferably with a meal or swallowed with a full glass of fluid.

or
children less than 8 years and pregnant women
Clindamycin is the drug of choice. Refer patients for this treatment.

Other uncomplicated malaria
5–10% of malaria infections in South Africa could be due to *P. ovale*, vivax and *malariae*. Infections contracted in the Caribbean, the Middle East and Central America are mainly due to *P. ovale* or vivax.
Infections and related conditions

<table>
<thead>
<tr>
<th>P. ovale or P. vivax</th>
<th>chloroquine plus primaquine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- refer for primaquine treatment, which should only be administered after treatment of the acute infection
- availability of chloroquine to be determined by the district PTC under the guidance of Malaria programme where P. ovale, vivax and malariae are endemic

<table>
<thead>
<tr>
<th>P. malariae</th>
<th>chloroquine</th>
</tr>
</thead>
</table>

Chloroquine – 1 tablet contains 200mg chloroquine sulphate equivalent to 150 mg chloroquine base

**Regimen 4**

- chloroquine, oral, over 3 days.

**Note**

doses are for chloroquine base.

infants and children 10 mg base/kg immediately, then 5 mg base/kg 6–8 hours later then once daily on the following 2 days

adults 600 mg base (4 tabs) immediately, then 300 mg base (2 tabs) 6–8 hours later then once daily on the following 2 days

Due to evolving resistance patterns in South Africa, the most recent Malaria Treatment Guidelines from the Department of Health should be referred to for the most suitable management in the various endemic areas. As these guidelines are updated regularly, the most recently updated guidelines should be followed.

**Cerebral malaria**

**Description**

Any patient with a depressed level of consciousness ranging from agitation or confusion, to coma. Cerebral malaria can resemble bacterial or viral infections of the central nervous system, or any cause of raised intracranial pressure. Cerebral malaria may occur as an isolated complication or as part of multi-organ failure. These patients should be referred immediately.
Drug treatment
• quinine, IV, 20 mg/kg diluted in 5–10 mL/kg bodyweight dextrose 5% given over 4 hours, starting immediately, and refer urgently

or
• quinine, IM, diluted with sodium chloride 0.9%. Give half of the dose in each anterior thigh.

<table>
<thead>
<tr>
<th>Body weight kg</th>
<th>Quinine Dose 300 mg/mL</th>
<th>Volume of sodium chloride 0.9% for dilution</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5–15 kg</td>
<td>150 mg (0.5 mL)</td>
<td>2 mL</td>
</tr>
<tr>
<td>15–30 kg</td>
<td>300 mg (1 mL)</td>
<td>4 mL</td>
</tr>
<tr>
<td>31–45 kg</td>
<td>450 mg (1.5 mL)</td>
<td>6 mL</td>
</tr>
<tr>
<td>over 45 kg</td>
<td>600 mg (2 mL)</td>
<td>8 mL</td>
</tr>
</tbody>
</table>

Severe or complicated malaria
High-risk groups
• pregnant women
• children under 5 years

Drug treatment
adults:
• quinine, oral, 600mg immediately before referral

if immediate referral is not possible:
• quinine, oral, 8 hourly until referred
  adults: 600 mg (maximum 7 days treatment)
  children: 10 mg/kg (maximum 7 days treatment)

Always refer as soon as possible.

Referral
URGENT
• cerebral malaria
• all children less than 1 year
• pregnant women, give dose of medication prior to referral
• patients with symptoms of severe and complicated malaria
• non-falciparum malaria in the case of *p. ovale or vivax*
• inability to treat severe and complicated malaria

Referral
• all patients in non endemic areas
• patients not responding to oral treatment within 48 hours
Infections and related conditions

- burn-like skin reactions after initiating treatment
- non-falciparum malaria in the case of *p. ovale or vivax*

**Malaria, prophylaxis (self provided care)**

In the high-risk malaria areas from October to May in Southern Africa, malaria prophylaxis should be used, together with preventive measures against mosquito bites. State facilities do not provide prophylactic therapy. It is recommended that persons intending to travel to high-risk areas take the relevant prophylactic therapy.

**Non-drug treatment**

Preventative measures against mosquito bites include:
- use of insecticide treated mosquito nets, screens, coils or pads
- application of insect repellent to exposed skin and clothing
- wearing long sleeves, long trousers and socks if outside between dusk and dawn, as mosquitoes are most active at this time
- visiting endemic areas only during the dry season

**!CAUTION!**

Pregnant women and children under 5 years should avoid visiting malaria-transmission areas, as they are more prone to the serious complications of malaria

**Drug treatment**

**Africa:**

- mefloquine, oral, once weekly. Initiate treatment 8 days before entry to a malaria area. Continue for 4 weeks after leaving the area.
  - children – not recommended for children less than 5 kg
    - 5–19 kg 62.5 mg
    - 20–30 kg 125 mg
    - 31–45 kg 187.5 mg
    - over 45 kg 250 mg
  - adults – 250 mg once weekly

- doxycycline, oral. Initiate treatment 24 hours before entry to a malaria area. Continue for 4 weeks after leaving the area. Not recommended for children under 8 years.
  - children over 8 years – 2 mg/kg daily
  - adults – 100 mg daily

For malaria prophylaxis in other areas, consult the National Malaria guidelines.
10.09 Measles
B05.9

Note: notifiable condition.

Description
A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.

- initial clinical features occur about 10 days after contact with an infected individual:
  - symptoms and signs of a cold or flu
  - patient may deteriorate with fever
  - diarrhoea may occur
  - conjunctivitis with a discharge from the conjunctiva
  - cough, bronchitis and otitis media

These features usually develop in the following order:

- after 2–3 days a few tiny white spots like salt grains appear in the mouth
- the skin rash appears 1–2 days later and lasts about 5 days
- location: 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.

Management objectives
- prevent complications
- provide symptomatic treatment
- notify the condition
- provide prevention and catch-up through EPI

Non-drug treatment
- continued good nutrition
- isolate the patient to prevent spread
- treat at home if:
  - over 6 months old
  - well nourished
  - uncomplicated (no pneumonia or otitis media)
Drug treatment

All children with measles should be given:

- vitamin A (retinol), oral, as a single dose
  - children less than 12 months – 100 000 IU
  - children more than 12 months – 200 000 IU

Fever (axillary) above 38.5°C, pain, or a history of febrile convulsions:

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Children with diarrhoea:

- Rehydrate according to section 2.06
  - Rehydration solution
  - Homemade sugar and salt solution (see section 2.06)

**HOMEMADE SUGAR AND SALT SOLUTION (SSS)**

**Children:**

- 1/2 level medicine measure of table salt

**Adults:**

- 1 level medicine measure of table salt
  
  and

- 8 level medicine measures of sugar (no more)

Dissolved in 1 litre of boiled (if possible) then cooled water

1 level medicine measure = approximately 1 level teaspoon
**Infections and related conditions**

**children with bronchitis or otitis media:**
- amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>312</td>
<td>12.5 mL</td>
<td>—</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**penicillin–allergic patients:**
- erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>50</td>
<td>2 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**purulent conjunctivitis:**
- chloramphenicol, 1%, ophthalmic ointment

**Referral**
- children under 6 months
- croup, which may need adrenaline inhalations
- chest indrawing, stridor at rest, rapid breathing
- malnutrition
- dehydration
- neurological signs or symptoms like confusion
- immunocompromised and associated illness like AIDS or TB
- asthma
- severely ill adults
- all children with severe mouth or eye complications

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### 10.10 Meningitis
*(See Chapter 13 - Central nervous system)*

### 10.11 Mumps

**Description**
A viral infection involving the salivary glands.

Signs and symptoms of mumps appear 2–3 weeks after exposure:
- 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

**Management objectives**
- provide symptomatic treatment

**Non-drug treatment**
- bed rest during febrile period
- isolate until swelling subsides
- advise on oral hygiene
- recommend plenty of fluids and soft food during acute stage
- patient is infectious from 3 days before parotid swelling to 7 days after it started
- children may return to school 1 week after initial swelling

**Drug treatment**
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Infections and related conditions

**Referral**
- high fever
- severe headache
- abdominal pain
- painful testes or orchitis
- suspected encephalitis
- pancreatitis

**10.12 Rubella (German measles)**

**Description**
A viral infection with skin lesions that is less severe than measles and lasts only 3–4 days.
A rash starts on the face spreading to the trunk, arms and legs. It usually fades as it moves on and is seldom complicated by bacterial infections.

**Clinical features include:**
- a scanty rash
- swollen and tender lymph nodes behind the ears (suboccipital)

**Note**
Infection during the first or second trimester of pregnancy may lead to severe permanent deformities in the baby. Therapeutic abortion is recommended in these patients.

**Management objectives**
- provide symptomatic treatment
- manage complications
- prevent spread

**Non-drug treatment**
- bed rest if needed
- isolate from pregnant women or women of child-bearing age
**Drug treatment**

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Referral**

**URGENT**

- pregnant women with rubella
- pregnant women who have been in contact with a patient with rubella

### 10.13 Sexually transmitted infections (STI)

**A50-A64**

**Description**

The syndromic approach to STI diagnosis and management is to treat the signs or symptoms (syndrome) of a group of diseases rather than treating a specific disease. This allows for the treatment of one or more conditions that often occur at the same time and has been accepted as the management of choice. It is important to provide the patient with information and counselling on the importance of:

- compliance with treatment
- prevention of the complications of STI's
- risk reduction for acquiring STI's
- promotion and provision of condoms and demonstration of their use
- tracing and management of sexual contacts

**Protocol 1: Urethral discharge/burning micturition in men**

**Description**

Clinical features:

- small or large amounts of mucus or pus at the end of the penis (penile discharge)
- staining of the underwear
- burning/pain on passing urine
Infections and related conditions

Non-drug treatment
- counsel on compliance and risk reduction
- provide and promote the use of condoms
- take blood for RPR/VDRL
- notify partner to be treated
  - ask to return in 1 week
  - always look for another STI (if present use appropriate protocol)

Drug treatment
- ciprofloxacin, oral, 500 mg immediately and
- metronidazole, oral, 2 000 mg immediately for female partner
then
- doxycycline, oral, 100 mg twice daily for 7 days for both patient and female partner

Protocol 2 and 4: Vaginal discharge / lower abdominal pain in women

Description
Signs and symptoms include:
- excessive vaginal secretion
- staining of underwear
- change in vaginal secretion odour
- change in vaginal secretion colour
- itching or redness of the vulva
- burning or pain on passing urine
- lower abdominal pain

One or more of the following may be present on examination:
- vaginal discharge
- lower abdominal tenderness
- pain on moving the cervix

Note
In pregnant women, lower abdominal pain related to pelvic infection is rare. If present, these patients are usually seriously ill and require referral. Always look for another STI (if present use appropriate protocol).
Infections and related conditions

Non-drug treatment
- counsel on compliance and risk reduction for transmission of STI and HIV
- counsel for HIV testing
- provide and promote use of condoms
- advise on the importance of assessment and treatment of sexual partner, if needed

Drug treatment
choose one of the options below
request patient to return after 1 week

Option 1: Non-pregnant woman with a vaginal discharge and no pain on moving the cervix

Syndromic approach:
- ciprofloxacin, oral, 500 mg immediately
and
- doxycycline, oral, 100 mg 12 hourly for 7 days
and
- metronidazole, oral, 2 000 mg immediately
or
- metronidazole, oral, 400 mg 12 hourly for 7 days

Option 2: Pregnant woman with a vaginal discharge and no pain on moving the cervix
- ceftriaxone, IM, 125 mg immediately
and
- erythromycin, oral, 500 mg 6 hourly for 7 days
and
- metronidazole, oral, 400 mg 12 hourly for 7 days

Option 3: Clinical evidence of vaginal candidiasis
If there is clinical evidence of vaginal candidiasis then add to the treatment used in options 1 or 3:
- clotrimazole, 500 mg inserted in the vagina at night as a single dose

Option 4: Non-pregnant woman with pain on moving the cervix
- ciprofloxacin, oral, 500 mg immediately
and
- doxycycline, oral, 100mg 12 hourly for 14 days
and
- metronidazole, oral, 400 mg 12 hourly for 14 days
Infections and related conditions

Option 5: Pregnant woman with pain on moving the cervix

Note
In pregnant women, lower abdominal pain related to pelvic infection is rare. If present, these patients are usually seriously ill and require referral.

Referral
• history of a missed or overdue period (consider ectopic pregnancy)
• recent abortion or delivery
• abnormal vaginal bleeding
• temperature above 39°C
• abdominal rebound tenderness and/or guarding or other gastrointestinal symptoms
• pregnant women with lower abdominal pain related to pelvic infection

Protocol 3: Genital ulceration in men and women

Description
One or more ulcers on or around the genitalia. Small ulcers, often with a history of recurrences, signify genital herpes. Non-drug measures are advised.

Non-drug treatment
• counsel on compliance and risk reduction
• provide and promote the use of condoms
• take blood for RPR/VDRL
• notify partner to be examined and treated

Drug treatment
• benzathine benzylpenicillin, IM 2.4 MU immediately and
• erythromycin, oral, 500 mg 6 hourly for 7 days
or
penicillin-allergic patients:
• erythromycin, oral, 500 mg 6 hourly for 14 days
Request patient to return after 1 week.
if positive VDRL (WR) serology during pregnancy:
• benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 doses

if allergic to penicillin:
• erythromycin, oral, 500 mg 6 hourly for 28 days and penicillin to baby after delivery

Referral
• no response after 7 days

Protocol 5: Inguinal swelling/bubo - no ulcer present in men and women

Description
An inguinal bubo is a flitting or recurrent enlargement of the lymph glands in the groin.
Clinical features include:
• swelling in one or both sides of the groin
• swelling may be painful and tender
If an ulcer is present use protocol 3.

Non-drug treatment
• counsel on compliance and risk reduction
  ▪ provide and promote the use of condoms, notify partner and treat, take blood for RPR/VDRL

Drug treatment
Look for another STI (if present use appropriate protocol).
• benzathine benzylpenicillin, IM 2.4 MU immediately and
• doxycycline, oral, 100 mg twice daily for 14 days
or
penicillin-allergic patients:
• erythromycin, oral, 500 mg 6 hourly for 14 days
Request patient to return after 1 week.
Infections and related conditions

Protocol 6: Balanitis/balanoposthitis

Description
Patients complain of itching of tip of the penis and/or foreskin.
Clinical features:
• thin white film on the glans and/or foreskin
• refer to the appropriate protocol if there is an ulcer or urethral discharge
• in the absence of other findings, the likely diagnosis is moniliasis (candidiasis); this can be confirmed by microscopy of a wet smear
Also consider diabetes mellitus.

Non-drug treatment
• personal hygiene, wash with water (avoid regular use of soap on mucous membranes)
• counsel on compliance and risk reduction
• provide and promote use of male and female condoms
• investigate blood for RPR/VDRL

Drug treatment
• nystatin 100 000 IU/g, ointment, applied twice daily for 5 days
Request patient to return after 1 week.
Notify partner and treat.

Protocol 7: Painful scrotal swelling

Description
Patients usually complain of a swollen and painful testis.
• urethral discharge may be present in most STI cases
• exclude other causes of this condition, e.g. mumps, TB
• exclude sudden onset of testicular pain which may be caused by torsion of a testis. This may lead to gangrene in 6–12 hours, so immediate referral for surgery is needed.

Non-drug treatment
• counsel on compliance and risk reduction
• provide and promote use of male and female condoms
• take blood for RPR/VDRL
Drug treatment
• ciprofloxacin, oral, 500 mg immediately
and
• doxycycline, oral, 100 mg twice daily for 7 days
Request patient to return after 1 week.
Notify partner and treat.

Referral
IMMEDIATE
• suspected torsion of the testis

Referral
• person who is not sexually active
• sudden onset of pain
• history of trauma
• history of other serious non-STI disease

Protocol 8: Interpretation of syphilis serology - RPR/VDRL

RPR/VDRL negative result:
• record the result on patient’s record
• ask the patient to return for a repeat test in 3 months

when the patient returns in 3 months:
• if the result is negative after 3 months
  ▪ counsel and send home
• if the result is positive after 3 months
  ▪ treat for early syphilis
  ▪ record titre on patient’s record

RPR/VDRL positive result:
Check if titre recorded in last 2 years.
• if current titre is lower than or the same as the previous titre
  then
  ▪ counsel and send the patient home
  ▪ record titre on patient’s record
Infections and related conditions

• if current titre is higher than the previous titre
  then
  ▪ treat for early syphilis
  ▪ record titre on patient’s record
  and
  ▪ repeat RPR/VDRL in 3 months

• if no previous titre was recorded
  then
  ▪ treat for late syphilis
  ▪ record titre on patient’s record
  and
  ▪ repeat RPR/VDRL in 3 months

In 3 months
• if current titre is lower than or the same as the previous titre
  then
  ▪ patient was successfully treated, send home
  and
  ▪ record titre on patient’s record

• if current titre is higher than previous titre
  ▪ treat for early syphilis
  ▪ record titre on patient’s record
  and
  ▪ repeat RPR/VDRL in 3 months

Early syphilis treatment
Check if treated at initial visit.
• benzathine benzylpenicillin, IM, 2.4 MU immediately

  in penicillin-allergic patients:
  • doxycycline, oral, 100 mg twice daily for 14 days
  or
  if penicillin-allergic and pregnant:
  • erythromycin, oral, 500 mg four times a day for 14 days

Late syphilis treatment
check if treatment was commenced at initial visit
• benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks
Infections and related conditions

in penicillin-allergic patients:
• doxycycline, oral, 100 mg twice daily for 1 month
or
if penicillin-allergic and pregnant:
• erythromycin, oral, 500 mg 6 hourly for 1 month

Protocol 9: Return visit after 1 week

This protocol refers to the return visit and applies to all STDs.

If cured
• check and record RPR/VDRL result and follow RPR/VDRL protocol 8
• complete treatment
• counsel on risk reduction
• provide and promote the use of condoms

If not cured
• assess treatment compliance and possibility of re-infection

if there is poor compliance or re-infection:
• repeat treatment
• ask to return after 1 week

if good compliance and no chance of re-infection refer:
• check RPR/VDRL result and follow RPR/VDRL protocol 8

10.13.1 Lice, pubic
B85.3

See lice (pediculosis) (section 6.06.1)

Drug treatment
• benzyl benzoate 25%, applied and leave overnight, rinse off in the morning. Repeat once weekly for 3 weeks.
or
• permethrin 1%, cream rinse massaged into the affected hairy areas. Rub into a lather with a little water and rinse off after 4 minutes.
Infections and related conditions

10.13.2 Molluscum contagiosum
B08.1

Drug treatment
• tincture of iodine BP, applied to the core of individual lesions using an applicator

10.13.3 Scabies, genital
B86

See scabies (section 6.06.2)

10.13.4 Warts, genital
A63.0

Referral
Refer all patients with genital warts to STI clinics.

10.14 Tick-bite fever
A79.9

Description
Rickettsial disease, spread by infected ticks. After an incubation time of 7–10 days, there is fever, malaise, severe headache, a skin rash and often photophobia. The bite area develops into black skin necrosis (eschar), there often is regional lymphadenopathy. Patients are often severely ill. Diagnosis is clinical, confirmed by serological tests.

 Management objectives
• eliminate the pathogen
• prevent complications

Non-drug treatment
• symptomatic
Infections and related conditions

Drug treatment
adults
• doxycycline, oral, 200 mg immediately, then 100 mg twice daily for 7 days
• paracetamol, oral, 500 mg–1000 mg 4–6 hourly, when required to a maximum of four doses daily

Referral
• children
• severely ill patients
• pregnant women
• uncertain diagnosis

10.15 Typhoid fever
(See Chapter 2 - Gastrointestinal conditions)

10.16 Tuberculosis
(See Chapter 15 - Respiratory conditions)
Chapter 11 – Immunisation

Drugs used in this section
- BCG – Bacillus Calmette-Guerin vaccine
- DTP – diphtheria, pertussis and tetanus vaccine
- DT – diphtheria and tetanus vaccine
- HepB – hepatitis B vaccine
- Hib – Haemophilus influenzae type b vaccine
- measles vaccine
- OPV – oral polio vaccine
- TT – tetanus vaccine

Dosage and administration

Immunisation is the most important and cost-effective care that can be given to a baby and child.

Description
Immunisation:
- is in reality a natural process. It protects in two ways:
  - by greatly reducing the risk of disease in individuals
  - by preventing the spread of infections in communities
- helps the child’s body to produce antibodies against specific micro-organisms
- prevents specific organisms from causing serious illnesses and complications
- saves millions of children from death and disability every year

11.01 Vaccines for routine administration

Note
- all EPI vaccines except BCG are safe in HIV-infected children
- BCG is recommended in asymptomatic HIV-infected children
- do not immunise a sick child if the mother seriously objects, but encourage her to bring the child for immunisation on recovery
<table>
<thead>
<tr>
<th>Vaccine/Disease</th>
<th>Storage</th>
<th>Dosage/administration</th>
<th>Indications</th>
<th>Contraindications</th>
</tr>
</thead>
</table>
| **BCG**  
(*Bacillus Calmette-Guerin*) protects against **TB**  
**Meningitis and miliary TB** in children under 2 years | • diluent and vaccine in fridge at 2 - 8°C  
• discard opened vial after 6 hours or at end of immunisation sessions (whichever comes first) | • 0.5 ml of reconstituted intradema BCG vaccine, administrated into the skin (intradermally) on the right upper arm, at insertion of the deltoid | • All children at birth  
• catch up doses should only be given to children below one year | children with signs of symptomatic HIV infection or AIDS should not get BCG vaccination |
| **DTP** protects against diphtheria, pertussis and tetanus | • fridge middle shelves at 2 - 8°C  
• easily damaged by freezing  
• keep opened vials for next session if kept at correct temperature and not contaminated | • sterile IM 0.5mL  
• under 1 year: outer side of left thigh  
• over 1 year: upper arm  
• side-effects: mild fever, pain, local swelling occasionally | • 6 weeks  
• 10 weeks  
• 14 weeks  
• 18 months  
• catch-up doses: 4 weeks apart | |
| **DT** protects against diphtheria and tetanus | as for DTP | as for DTP | • 2 years and over  
• sensitively/past severe DTP reaction | • previous anaphylaxis |
<table>
<thead>
<tr>
<th>Vaccine/Disease</th>
<th>Storage</th>
<th>Dosage/administration</th>
<th>Indications</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>HepB</td>
<td>as for DTP</td>
<td>• sterile IM 0.5 mL paediatric vaccine</td>
<td>• 6 weeks</td>
<td>• previous anaphylaxis</td>
</tr>
<tr>
<td></td>
<td>Discard after 30 days</td>
<td>• under 1 year: outer side of the right thigh</td>
<td>• 10 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• over 1 year: upper arm</td>
<td>• 14 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• use opposite side to DTP/DT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• side-effects: mild fever, pain and local swelling occasionally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>as for DTP</td>
<td>• given as DTP-Hib IM into outer side of the left thigh</td>
<td>• 6 weeks</td>
<td>• previous anaphylaxis</td>
</tr>
<tr>
<td></td>
<td>Discard after 7 days</td>
<td></td>
<td>• 10 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 14 weeks</td>
<td></td>
</tr>
<tr>
<td>Oral polio vaccine (OPV)</td>
<td>fridge - top shelf (in Clinics) or freezer (in Pharmacy)</td>
<td>• 2 drops given by mouth</td>
<td>• birth</td>
<td>• none</td>
</tr>
<tr>
<td></td>
<td>• not damaged by freezing</td>
<td>• if spat out or vomited, repeat immediately</td>
<td>• 6 weeks</td>
<td>• previous anaphylaxis</td>
</tr>
<tr>
<td></td>
<td>• easily damaged by temperature above 8°C</td>
<td>• if diarrhoea, repeat next visit</td>
<td>• 10 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• vials can be reused if the VVM’s inner square remains lighter than the outer circle</td>
<td>• not affected by feeding (breast or other)</td>
<td>• 14 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Discard after 30 days</td>
<td></td>
<td>• 18 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 5 years</td>
<td></td>
</tr>
<tr>
<td>Vaccine/Disease</td>
<td>Storage</td>
<td>Dosage / administration</td>
<td>Indications</td>
<td>Contraindications</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>--------------------------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Measles</td>
<td>as for BCG</td>
<td>IM injection of 0.5 mL into outer right thigh over one year of age use upper arm</td>
<td>• 9 months • 18 months</td>
<td>• previous anaphylaxis</td>
</tr>
<tr>
<td>TT protect against tetanus (neonatal and after wounds)</td>
<td>as for DPT</td>
<td>IM injection of 0.5 mL into arm</td>
<td>• all pregnant women • first pregnancy: three doses, • first dose on first contact, • second dose 4 weeks later, • third dose 6 months later, even if it is given in the postnatal period (after birth) • subsequent pregnancy: • one dose during the antenatal period (up to a total of 5 recorded doses) • safe in early pregnancy • give booster after each trauma episode (unless given in previous 6 months)</td>
<td>• previous anaphylaxis</td>
</tr>
</tbody>
</table>
11.02 Immunisation schedule

- every day is to be immunisation day
- open a multidose vial for just one child if necessary
- immunisation is given in a specific sequence at certain ages. This is known as the immunisation schedule. Remember the following important points about the schedule:
  - **never** miss a chance to immunise
  - the schedule is not rigid - give a dose if a child is brought a few days earlier or later than expected
  - give doses no closer than 4 weeks - make follow-up dates with a minimum of 4 weeks from the previous dose
  - never turn a child away if an immunisation is needed
  - giving appropriate vaccines to children brought to the clinic for other reasons is a very important way to reach the children who have missed immunisations
  - always check the RTH card for missing doses and then give them immediately
  - catching up on missed immunisations will ensure full immunological protection
  - 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 not mixed in the same syringe
  - when the child is hospitalised:
    - give a dose of measles vaccine on admission to children 9 months and older (if a child has not had a measles vaccine)
    - give all other outstanding immunisations on discharge

There are very few contra-indications, but many missed opportunities!

Note

- discard opened vials of measles and BCG at the end of an immunisation session
- reconstituted vials of DTP-Hib should be used within 7 days of reconstitution provided the expiry date has not passed and have been stored at optimal temperature
- opened vials of other vaccines can be kept for up to 1 month if they have been kept between 2–8°C and are not contaminated. This applies to fixed clinics only.

**CAUTION!**

Previous reactions to a vaccine indicate hypersensitivity and repetition of the same vaccine should be avoided.
Children with AIDS should not receive BCG vaccine.
Give every baby the required immunisation as soon as possible, according to the schedule below. The vaccines listed are very safe and cause no or minimal side effects.

### Immunisation schedule

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine dose *</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>BCG, OPV0</td>
</tr>
<tr>
<td>6 weeks</td>
<td>OPV1, DTP1, HepB1, Hib1</td>
</tr>
<tr>
<td>10 weeks</td>
<td>OPV2, DTP2, HepB2, Hib2</td>
</tr>
<tr>
<td>14 weeks</td>
<td>OPV3, DTP3, HepB3, Hib3</td>
</tr>
<tr>
<td>9 months</td>
<td>Measles1</td>
</tr>
<tr>
<td>18 months</td>
<td>Measles2, OPV4, DTP4</td>
</tr>
<tr>
<td>5 years</td>
<td>OPV5, DT</td>
</tr>
</tbody>
</table>

*The number that follows the immunisation name (e.g. DPT3) indicates the dose number of that immunisation.

BCG – vaccine against tuberculosis
OPV – oral polio vaccine
DTP – diphtheria, tetanus and pertussis (whooping cough) vaccine
HepB – hepatitis B vaccine
Hib – vaccine against Hib disease
DT – diphtheria and tetanus vaccine
TT – tetanus vaccine

An effective dose is one given on time with unspoiled vaccine.

For adults at occupational risk a double dose of paediatric strength Hepatitis B vaccine can be administered immediately, 1 month, 6 months and 10 years later.

### 11.03 Immunisation by injection

Use aseptic technique. Use one sterile needle and one sterile syringe for each person. An injection abscess destroys the trust people have in health workers, and might cause them to refuse further immunisations, leaving their children unprotected. Dispose of syringes, needles and other sharps in the following way to ensure that no needle stick injuries occur:

- in an approved sharps container
- **never** recap needles
- dispose of the container properly, e.g. incineration or deep burial, not open pit burning
11.04 Adverse vaccine reactions

**BCG**
- Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar.
- A visible scar is seen in only 40% of vaccinations.
- In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a normal reaction.
- Lymphadenopathy less than 1.5 cm is not clinically significant.
- Occasionally the papule becomes a pustule. Management of this is usually by observation or needle aspiration or a 3 month course of isoniazid (INH).
- Rarely BCG vaccination may result in disseminated disease or osteomyelitis.

**OPV**
- May be associated with a flu-like illness and gastroenteritis.
- Children with diarrhoea may not have good uptake of the vaccine.
- Vaccine given IM within 30 days of another injection may be associated with vaccine associated paralytic poliomyelitis.

**DTP**
**Diphtheria vaccine**
The common adverse reactions are:
- Pain
- Tenderness at the injection site
- Slight fever
- Irritability

**Tetanus**
Generally a safe vaccine.

**Pertussis whole cell vaccine**
- This vaccine has the most significantly documented adverse reactions.
- 60% have fever and pain at the injection site.
- Some infants have excessive somnolence and disruption of daily routines.
- 5% have prolonged inconsolable crying lasting more than 4 hours.
- 1 in 1000 has a high-pitched abnormal cry.
- Convulsion and shock-like syndrome and acute encephalitis occur rarely but do not have long term sequelae.
- Acellular pertussis vaccines have less adverse reactions but are expensive.

**HepB**
Generally a safe vaccine.
**Hib**
Generally a safe vaccine.

**Measles vaccine**
- 10-20% of vaccines may have transient morbilliform rash and mild pyrexia 6–11 days after vaccination
- occasionally fever may rise to 39°C
- subacute sclerosing panencephalitis which may occur years after vaccination is an extremely rare complication

**11.05 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 clinic to another
- always using a cold box to keep the vaccines cold during transport and immunisation

**Correct packing of the cold box**
- Fully conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top
- if there are not enough ice packs, place available ice packs at the sides and on top of the vaccines
- DTP, DT, TT, HepB and Hib vaccines must not be allowed to freeze
- keep measles and polio vaccines very cold - place on bottom of the cold box, closest to the ice packs
- BCG can be placed anywhere in the box
- keep the lid firmly closed and the box out of the sun
- keep a thermometer in the cold box with the vaccines and the temperature 2–8°C
- live vaccines (BCG, OPV, measles) contain weakened organisms and are very sensitive to heat, sunlight and skin antiseptics

**How to pack your fridge correctly**
- top shelf - measles and polio vaccines in the coldest part
- middle shelf - BCG, DTP, DT, HepB, Hib and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles for 2 days
- do not let DTP, DT, HepB, Hib and TT vaccines touch the evaporator plate at the back of the fridge - they are destroyed by freezing
Immunisation

- do not keep vaccines in the fridge door
- store the same kind of vaccines together in one tray
- leave about 5 cm space between each tray to allow the cold air to move around
- bottles filled with salt water stored in the bottom of the fridge will keep the fridge contents cold when the door is opened
- **do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door**
- if there has been a power failure consult the supervisor
- monitor and record temperature twice daily

**CAUTION!**
do not use vaccines that have expired or missed the cold chain  
keep the fridge temperature between 2–8°C

**Note**
All vaccines with a “T” in the name are sensitive to freezing – DTP, TT, DT Hepa Tis B, liquid Hib Type B and even diluen T.

**Vaccine shake test**
Sedimentation occurs faster in a vaccine vial which has been frozen than in a vaccine vial from the same manufacturer which has never been frozen.

Hold a control sample (from the same manufacturer and frozen purposely) and the test sample together in one hand and shake vigorously for 10–15 seconds, leave both vials to rest.

Compare the sedimentation rate.
If the test sample shows a much slower sedimentation rate than the control sample, the test sample is probably potent and may be used.
If the sedimentation rate is similar and the test sample contains flakes, the vial under test has probably been damaged by freezing and should not be used

11.06 The Revised Opened Multi-Dose Vial Policy

The revised policy applies only to vaccines which meet WHO requirements for potency and temperature stability, are packaged according to ISO standards, ISO Standard 8362-2, and contain an appropriate concentration of preservative, such as thiomersal (injectable vaccines only).
Opened vials of DTP, TT, DT, 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
  ▪ 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 VVM will indicate the potency of the vaccine and the vaccine may be used for any length of time as long as the VVM has not reached discard point, and the other conditions above apply.

Reconstituted vials of DTP-Hib may be used for 7 days if:

• each vial is dated when reconstituted
• the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording, measured by the condition of the VVM, if any)
• the expiry date has not passed
• the vaccine vial septum has not been submerged in water
• aseptic technique has been used to withdraw all doses
• the VVM, if attached, has not reached the discard point

Opened vials of measles, BCG and yellow fever vaccines
Reconstituted vials of measles, BCG and yellow fever vaccines must be discarded at the end of each immunisation session or at the end of six hours, whichever comes first.

All opened vials must be discarded immediately if:
• sterile procedures have not been fully observed
• there is even a suspicion that the opened vial has been contaminated
• there is visible evidence of contamination such as a change in appearance or floating particles, etc.
A Well packed Domestic Refrigerator

FREEZING COMPARTMENT
“FREEZER”

ice packs
ice cubes

oral polio
measels

BCG, Hib, DTP
TT, DILUENT
DT, HepB

Bottles of
water

MAIN
COMPARTMENT

TOP

MIDDLE

LOWER

AND CLOSE
THE DOOR

AND CLOSE
THE DOOR
Chapter 12 – Musculoskeletal conditions

Drugs used in this section
• colchicine
• ibuprofen
• methyl salicylate
• paracetamol

12.01 Arthralgia
(See Chapter 18 - Signs and symptoms)

12.02 Arthritis, rheumatoid
M06.9

Description
A chronic, inflammatory, systemic condition of fluctuating course. It may affect many organs, predominantly joints with:
• swelling or fluid, affecting at least 3 joint areas simultaneously
• pain
• limited movement with morning stiffness for longer than 30 minutes. This distinguishes osteoarthritis from rheumatoid arthritis.
• destruction

Referral
• all patients

12.03 Arthritis, septic
M00.9

Description
A condition involving infection of one or more of the large joints. 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.
Musculoskeletal conditions

Note
Haemophiliacs may present with an acute arthritis similar to septic arthritis that is not infected.

Referral
URGENT
• all children with restricted movement of any joint particularly if associated with fever, pain and local swelling

Referral
• all patients, immediately

12.04 Gout

12.04.1 Gout, acute
M10.9

Description
A metabolic disease in which uric acid crystal deposition occurs in joints and other tissues and is characterised by following features:
• recurrent attacks of a characteristic acute arthritis
• often one joint
• extreme pain and tenderness
• swelling
• redness and very hot
• inflammation may extend beyond the joint
• in the majority of patients the first metatarso-phalangeal joint is initially involved
• the instep, ankle, heel, and knee are also commonly involved
• bursae (such as the olecranon) may be involved

Clinical picture
• Increased serum uric acid concentration (above 0.42 mmol/L). However, this may be normal even during acute attacks.
• If the expertise is available, aspiration of an affected joint and microscopic examination for birefringent crystals in polymorphs may be needed, as septic arthritis can sometimes present very much like acute gout.
Management objectives
- treat acute attacks
- prevent recurrence of acute attacks

Non-drug treatment
- bed rest
- increase (high) fluid intake
- avoid alcohol
- avoid aspirin
- avoid high purine containing foods (kidney, sardines, anchovy, turkey)
- exercise moderately
- reduce weight, if overweight

Drug treatment
Initiate treatment as early as possible in an acute attack.
- ibuprofen, oral, 800 mg immediately and refer

if referral is not possible:
- ibuprofen, oral, 800 mg 8 hourly with or after a meal for two to three days or until the condition has improved

thereafter, if needed:
- ibuprofen, oral, 400 mg–600 mg 8 hourly with or after a meal until pain and inflammation has subsided

!CAUTION!
long-term use of NSAIDs has adverse effects on renal and cardiac function, the GIT and on joint cartilage

if NSAIDS are contraindicated:
- colchicine, oral, 0.5–1 mg immediately

thereafter:
- colchicine, oral, 0.5 mg, 2–3 hourly until pain is relieved or gastrointestinal distress develops
  - do not exceed a total daily dose of 6 mg
  - do not repeat a course within 3 days
Musculoskeletal conditions

Prophylaxis
after an acute attack until uric acid lowering agents can be administered:
• ibuprofen, oral, 400mg 8 hourly with or after a meal
or
• colchicine, oral, 0.5 mg once or twice daily

Note
• colchicine is effective and specific for acute gout but it is not easy to use optimally
due to the development of gastrointestinal adverse effects
• uric acid lowering agents should not be initiated until 3–4 weeks after an acute
attack, as they may precipitate an acute attack
• uric acid lowering agents should be continued during an acute attack and not
stopped

Referral
• no response to treatment
• more than two attacks per year
• confirmation of diagnosis
• suspected chronic gout
• patients with suspected metabolic syndrome e.g.:
  ▪ hyperuricaemia
  ▪ hypertension
  ▪ diabetes mellitus
  ▪ obesity
  ▪ hyperlipidaemia

Note
Patients with suspected metabolic syndrome often have impaired renal function and
the use of NSAIDs has safety implications.

12.04.2 Gout, chronic
M10.9

Description
Gout with one or more of the following:
• uric acid deposits in and around the joints and cartilages of the extremities (tophi)
• initial involvement of the first metatarsal phalangeal joint in the majority of patients
• involvement of the instep, ankle, heel and knee
• further involvement of bursae (such as the olecranon)
Musculoskeletal conditions

- 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

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 drug treatment of these conditions could precipitate gout.

Management objectives
- lower the serum uric acid level to well below 0.5 mmol/L
- prevent complications resulting from uric acid crystal deposition
- prevent formation of uric acid kidney stones

Non-drug treatment
- if thiazide diuretic (e.g. hydrochlorothiazide) is being used, change to furosemide
- encourage controlled weight loss
- avoid alcohol
- avoid aspirin
- avoid high purine containing foods (kidney, sardines, anchovy, turkey)

Referral
- all patients

12.05 Osteoarthrosis (osteoarthritis)
M19.9

Description
A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:
- pain
- limited movement
- morning stiffness, lasting less than 30 minutes
- joint swelling
Musculoskeletal conditions

Management objectives
• reduce weight if overweight
• relieve pain

Non-drug treatment
• patient and family education
  ▪ weight reduction
  ▪ exercise
  ▪ rest during acute painful episodes
  ▪ recommend the use of a walking stick or crutch to alleviate stress on the weight bearing joint
  ▪ physiotherapy

Drug treatment
for pain relief:
• paracetamol, oral, 1 000 mg, 6 hourly. Maximum 4 000 mg per day.

if patient responds to paracetamol reduce the dose to:
• paracetamol, oral, 500 mg, 6–8 hourly as needed

if no response and inflammation is present:
add
• ibuprofen, oral, 200–400 mg, 8 hourly with or after a meal, as needed
• methyl salicylate ointment, topical, applied to affected areas
or
• combination of paracetamol, ibuprofen and methyl salicylate ointment

!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
  ▪ joint replacement considered
Chapter 13 – Central nervous system conditions

Drugs used in this section
- carbamazepine
- ceftriaxone
- ciprofloxacin
- diazepam
- phenobarbital
- phenytoin

13.01 Epilepsy

Description
Epilepsy is a neurological condition of recurrent seizures and is only diagnosed after the exclusion of:
- meningitis
- encephalitis
- metabolic conditions
- hypertension
- brain lesions

There may be other causes of provoked seizures.

It takes several forms ranging from simple absence seizures (petit mal) that only involve a brief loss of consciousness to generalised tonic clonic seizures (grand mal). Some clinical features of the different types of epilepsy include:
- aura (a warning symptom) before a seizure, e.g. visual, auditory, taste, olfactory or somatic symptoms such as a stomach cramp that moves upwards
- after a seizure some patients recover quickly
- others may be confused and have headaches for days
- may present with non-convulsive features such as abnormal behaviour

Occasional seizures e.g. febrile seizures or convulsions only occur in response to a provoking circumstance e.g. fever. Occasional seizures tend to be more common in children from 6 months to 5 years. These patients should not be classified as epileptics. Children with occasional seizures usually do not require long-term therapy with anti-epileptics.

Epilepsy is associated with many psychological, social and legal problems and cultural perceptions.
Central nervous system conditions

Diagnosis
• is usually made clinically
• requires an accurate witnessed description of the seizure

Epilepsy should be differentiated from:
• syncope
• hyperventilation
• transient ischaemic attack (TIA)
• pseudoseizure
• occasional seizures

<table>
<thead>
<tr>
<th>Seizure type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>simple partial</td>
<td>• no loss of consciousness</td>
</tr>
<tr>
<td></td>
<td>• seizure on one side of the body</td>
</tr>
<tr>
<td>complex partial</td>
<td>• partial with secondary generalisation or loss of consciousness</td>
</tr>
<tr>
<td>generalised</td>
<td>• loss of consciousness preceded by</td>
</tr>
<tr>
<td>tonic</td>
<td>▪ a brief stiff phase followed by</td>
</tr>
<tr>
<td>clonic</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>• jerking may start in any part of the body and spread</td>
</tr>
<tr>
<td></td>
<td>▪ jerking of one or more muscles in any part of the body with or</td>
</tr>
<tr>
<td></td>
<td>without loss of consciousness</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>

Management objectives
• make correct diagnosis
• exclude other treatable causes of seizures
• prevent all or nearly all seizures by using optimal doses of appropriate anti-epileptic drugs
• monitor and minimize side effects of the drugs. Most anti-epileptic drugs are associated with side effects e.g. phenobarbital is associated with cognitive problems in children
• support the person in leading a normal life-style and specially children with schooling

Non-drug treatment
• extensive health education
• record keeping in a seizure diary recording dates and if possible the times of the seizures
• present seizure diary at each consultation for assessment of therapy
• carry a disease identification bracelet, necklace or card
• counselling and advice on:
  ▪ the adverse effect of alcohol on seizures
  ▪ the effect of missing a dose of medication
  ▪ discontinuing the drug treatment without advice of the doctor

Drug treatment

Note
General rule: a single drug is best
Recommended doses are general guides and will work for most patients. Some patients may need much higher or lower doses. Therapeutic monitoring will assist with dosage adjustments.

adults:

<table>
<thead>
<tr>
<th>Seizure</th>
<th>Drug treatment*</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>generalised</td>
<td>phenytoin, oral, 4.5–5 mg/kg daily on lean body mass,</td>
<td>• the choice between these two agents must be made on the acceptability of side-effects and how the number of doses influences lifestyle</td>
</tr>
<tr>
<td>tonic clonic</td>
<td>maximum dose 400 mg at night or carbamazepine, oral, 100 mg twice daily for first 2 weeks,</td>
<td>• be aware of dose-related side effects</td>
</tr>
<tr>
<td>partial</td>
<td>then 200 mg twice daily, and further titrated upwards every two weeks, maximum dose 600 mg twice daily</td>
<td>• refer if not controlled</td>
</tr>
<tr>
<td>myoclonic</td>
<td>refer</td>
<td></td>
</tr>
</tbody>
</table>

children:
The decision to initiate long-term therapy is generally made if the child has experienced two or more convulsions.
• all children with epilepsy must be referred to the doctor for initiation of therapy
• phenobarbital and carbamazepine are both effective in generalized tonic clonic seizures
### Seizure Drug treatment* Comments

<table>
<thead>
<tr>
<th>Seizure</th>
<th>Drug treatment</th>
<th>Comments</th>
</tr>
</thead>
</table>
| generalised tonic clonic | phenobarbital, oral, 3.5–5 mg/kg at night (under 6 months of age)
or carbamazepine, oral, 10 mg/kg daily for 2 weeks, then 15 to 20 mg/kg daily maximum dose 20 mg/kg daily divided into 2 or 3 doses per day | once treatment has been initiated, review behaviour profile and academic performance                  |
| absence                  |                                                                                | refer for initiation of treatment                                                                   |
| mixed and myoclonic      |                                                                                | refer for initiation of treatment                                                                   |

*Petit mal, myoclonic and other complicated forms of seizures to be referred*

**Loss of control of epilepsy**

Ask about the following as these can influence decisions on drug therapy.

- has the patient been compliant in taking the medication regularly for **at least** 2 weeks or more before the seizure? Ask about drug dosage and frequency.
- has the patient recently used some other medication?
- is there a chance that alcohol or some other drug is involved?

If one or more of the above can be identified as a problem there is no need to adjust therapy at this time.

**Referral**

- all new patients including children for diagnosis and initiation of therapy by a doctor
- increased number of seizures or changes in the seizure type
- patients who have been seizure free on therapy for 2 years or more (to review therapy)
- pregnancy in known epileptics
- development of neurological signs and symptoms
- adverse drug reactions
- suspected toxicity

**Information on the seizures that should accompany each referral case**

- number and frequency of seizures per month (or year)
- date and time of most recent seizures
- detailed description of the seizures, including:
  - aura or warning sign
  - what happens during the seizure? (give a step-by-step account)
  - is the person conscious during the seizure?
Central nervous system conditions

- 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 drug used to date?
- does the person return regularly for repeat of medication?

13.02 Febrile convulsions
(See Chapter 18 - Signs and symptoms)
R56.0

13.03 Meningitis

13.03.1 Meningitis, acute bacterial
G03.9
Note: *H. influenzae* type B and meningococcal meningitis are notifiable conditions.

This is a medical emergency.

(See also section 20)

Description
The acute or recent inflammatory response of the meninges due to mainly the following organisms:
- *H. influenzae*
- *N. meningitidis*
- *S. pneumoniae*

Clinical signs and symptoms include:
- headache
- neck stiffness
- fever
- malaise
Central nervous system conditions

Management objectives
• notify the disease as soon as possible
• initiate antibiotic treatment immediately to limit neurological complications
• prevent the spread to contacts (see following section)
• perform a lumbar puncture when possible under safe circumstances and within the scope of practice. Send cerebro-spinal fluid (CSF) in separate sterile containers (for culture, microscopy and chemistry and for glucose) with patients.
  NB: a separate container for glucose determination is needed
• stabilise patient prior to referral

Emergency measures
• maintain airway
• give oxygen
• ensure hydration
• stabilise patient before referral

Drug treatment
Initiate drug treatment before transfer:
• ceftriaxone, IM or IV
  neonates, infants and children – 100 mg/kg immediately
  adults – 2 g immediately

for convulsions:
neonates up to 3 months of age
• phenobarbital, IM, 20 mg/kg

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Ampoule (200 mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kg</td>
<td>20</td>
<td>0.1 mL</td>
</tr>
<tr>
<td>2 kg</td>
<td>40</td>
<td>0.2 mL</td>
</tr>
<tr>
<td>3 kg</td>
<td>60</td>
<td>0.3 mL</td>
</tr>
<tr>
<td>4 kg</td>
<td>80</td>
<td>0.4 mL</td>
</tr>
</tbody>
</table>

• diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose. Half this dose may be repeated after 10 minutes if convulsions continue (exclude hypoglycaemia!)
(diazepam for injection 10 mg in 2 mL is used undiluted)

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Ampoule 10 mg/2 mL</th>
<th>Approx age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>2.5 mg</td>
<td>0.5 mL</td>
<td>6 months–1 year</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>5 mg</td>
<td>1 mL</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>7.5 mg</td>
<td>1.5 mL</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>10 mg</td>
<td>2 mL</td>
<td>8–14 years</td>
</tr>
</tbody>
</table>

**adults:**
- diazepam, rectal, 10 mg. Repeat every 10 minutes if necessary up to a maximum of 30 mg.

**Referral**
- all patients with suspected meningitis

**13.03.2 Meningitis meningococcal, prophylaxis**

**Management objectives**
- prevent the spread of proven meningococcal meningitis to close contacts e.g.
  - same household
  - medical staff
  - day centre attendees
- notify the condition

**Drug treatment**

**Prophylaxis**

**children**
- ceftriaxone, IM, 125 mg, single dose

**adults**
- ciprofloxacin, oral, 500 mg, single dose

**13.04 Status epilepticus**

*(see Chapter 19 - Trauma and emergencies)*
Chapter 14 – Mental health conditions

Drugs used in this section
• amitriptyline
• chlorpromazine
• fluphenazine decanoate
• lorazepam
• zuclopenthixol acetate
• biperiden
• fluoxetine
• haloperidol
• orphenadrine
• zuclopenthixol decanoate

14.01 Aggressive disruptive behaviour
F23.9

Manage as acute psychosis (section 14.05)

14.02 Anxiety and stress related disorders
F41.9

Refer
• poor response to counselling

14.03 Delirium - acutely confused, aggressive patient
F05.9

See section 19.05

14.04 Mood disorders
F32.9

Description
Mood disorder with a depressed mood or diminished interest and pleasure in activities, characterised by:
• somatic symptoms, e.g. change in appetite and sleep, agitation or retardation and loss of energy
• psychic symptoms, e.g. feeling of worthlessness, guilt, diminished concentration or indecisiveness, thoughts of death and suicide
Mood disorders are classified as:
- major depressive disorder – episodes of major depression
- dysthymia – not all the criteria for a major depression episode are met
  - lasts at least 2 years
- bipolar mood disorder – both episodes of major depression and of mania
- mood disorder due to a general medical disorder – the mood disturbance is secondary to an underlying medical condition
- substance-induced mood disorder – mood disorder is secondary to substance use or withdrawal
- adjustment disorder with depressed mood – depressive symptoms as a response to a major crisis or event
  - lasts no longer than 6 months

Major depressive episodes can be further described in terms of:
- severity – mild, moderate or severe
- duration – chronic
- other features e.g. psychotic, postpartum

Note
Consultation with a community psychiatrist or medical practitioner is recommended to verify diagnosis.

Management objectives
- monitor symptoms
- ensure patient safety, e.g. prevent suicide
- provide drug treatment and/or effective psychotherapy
- address relevant psychosocial stressors

Non-drug treatment
Effective psychotherapies include:
- cognitive-behavioural psychotherapy
- interpersonal psychotherapy

Broader stressors may need to be addressed:
- marital and family issues
- accommodation and vocational issues

Drug treatment
major depressive disorder, particular if there are severe or melancholic features:
adults
- amitriptyline, oral, at bedtime
  - initial dose 75 mg
### Mental health conditions

- increase by 25 mg per day at 14 day intervals
- maximum dose – 150 mg. Consult if more than 150 mg is needed.

#### elderly
- amitriptyline, oral, at bedtime
  - initial dose 25 mg
  - increase by 25 mg per day at 7–10 day intervals
  - maximum dose – 100 mg

### CAUTION!
- tricyclic antidepressants can be fatal in overdose
- caution is advised when prescribing these agents to outpatients with possible suicidal ideation
- the elderly are more sensitive to side-effects and need lower doses of tricyclic antidepressants (amitriptyline)
- avoid tricyclic antidepressants (amitriptyline) in patients with heart disease, urinary retention, glaucoma, epilepsy

#### major depressive disorder, dysthymia or if amitriptyline is contra-indicated:
- adults
  - fluoxetine, oral
    - initial dose 20 mg
    - increase to 40 mg if well tolerated and if there is no or partial response after 4–8 weeks. Consult if no response after 8 weeks.
- elderly and in patients with panic attacks:
  - fluoxetine, oral
    - initial dose 10 mg

### Note
- In cases of first episode of major depressive disorder, continue drug treatment for at least 9 months after symptoms have ceased.
- In cases where there have been multiple episodes, or where other complications exist, longer treatment is indicated.
- 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 give antidepressants to a patient with bipolar disorder without consultation, as a manic episode may be precipitated
- be careful of interactions between antidepressants and other agents including herbs

Referral
- suicidal ideation
- major depression with psychotic features
- bipolar disorder
- failure to respond to available antidepressants
- patients with concomitant medical illness, e.g. heart disease, epilepsy
- poor social support systems
- pregnancy and lactation
- children and adolescents

14.05 Psychosis, acute
F23.9

Description
Schizophrenia is the most common psychotic disorder characterised by a loss of contact with reality.
It is further characterised by:
- positive symptoms, delusions and hallucinations
- negative symptoms, blunting of affect, avolition
- mood symptoms

Clinical features include:
- delusions – fixed, unshakeable false beliefs
- hallucinations – perceptions without adequate stimuli, e.g. hearing voices
- disorganised speech – e.g. derailment or incoherence
- grossly disorganized or catatonic behaviour
- negative symptoms – affective flattening, avolition, alogia
- social or occupational dysfunction

Only make the diagnosis if:
- there is social or occupation dysfunction
Mental health conditions

• signs and symptoms are present for at least 6 months
• general medical and substance-related causes are excluded

Management objectives
• control behaviour during the acute psychotic episode
• provide drug treatment
• use psychosocial interventions to prevent relapse and encourage rehabilitation

Non-drug treatment
Effective psychotherapy include:
• family therapy
• cognitive-behavioural psychotherapy
Rehabilitation may be enhanced by:
• assertive community programs
• supported employment

Note
Consultation with a community psychiatrist is recommended to confirm diagnosis and treatment.

Drug treatment
schizophrenia where a less sedating agent is required:

adults
• haloperidol, oral
  ▪ initial dose 2.5 mg twice daily
  ▪ gradually increase dose until symptoms are controlled or until a maximum of 12.5 mg per day is reached
  ▪ once stabilised, administer as a single dose at bedtime

elderly
• haloperidol, oral
  ▪ initial dose 1.5 mg twice daily
  ▪ increase dose more gradually until symptoms are controlled or until a maximum of 12.5 mg daily is reached
  ▪ once stabilised, administer as a single dose at bedtime

schizophrenia where a more sedating agent is required:
• chlorpromazine, oral
  ▪ initial dose 25 mg three times daily
  ▪ gradually increase dose until symptoms are controlled
  ▪ once stabilised, administer as a single dose at bedtime
  ▪ maintenance dose: 75–300 mg at night, but may be as high as 1 000 mg
Only for health care workers with advanced psychiatric training
The management of acute psychosis includes the use of antipsychotic agents and benzodiazepines in order to:
• decrease agitation
• decrease positive symptoms

<table>
<thead>
<tr>
<th>CAUTION!</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Always</strong> consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to:</td>
</tr>
<tr>
<td>• children and adolescents</td>
</tr>
<tr>
<td>• the elderly</td>
</tr>
<tr>
<td>• pregnant and lactating women</td>
</tr>
</tbody>
</table>

management of acute psychosis (including mania):
• lorazepam, IM, 2–4 mg immediately
and
• haloperidol, IM, 2–5 mg
  ▪ may be repeated at hourly intervals, usually 4–8 hourly, if needed
  ▪ maximum dose 20 mg in 24 hours
  ▪ refer if higher doses are required

after the acute phase:
• haloperidol, oral 2.5–12.5 mg 2–3 times daily in divided doses. Maintenance dose: 2.5–10 mg daily.
  or
• zuclopenthixol acetate, IM, 100 mg immediately. Do not repeat within 4 days.
violent patients:
• zuclopenthixol acetate, IM, 200 mg immediately.

long-term therapy:
• haloperidol, oral, 2.5–12.5 mg daily given as a single dose or in two divided doses
  or
• fluphenazine decanoate, IM, 25 mg every 2–4 weeks
  or
• zuclopenthixol decanoate, IM, 100–200 mg every 3–4 weeks

Note
• long acting antipsychotics are particularly useful in patients unable to adhere to their oral medication regimes
Mental health conditions

- long-term therapy should always be in consultation with a doctor or a psychiatrist. Patients should be re-assessed every 6 months.

Extra pyramidal side-effects
If extrapyramidal side-effects occur with the lowest effective dose of antipsychotic medication:
- an anticholinergic agent, e.g. orphenadrine or biperiden can be co-prescribed for dystonia
- the low potency agent, chlorpromazine, is less likely to cause dystonia

- orphenadrine, oral, 50–150 mg, daily according to individual response
  - 50 mg twice daily is usually enough
  - do not prescribe more than 150 mg per day at primary care level
  - use with caution in the elderly

for acute dystonic reaction:
- biperiden, IM, 2 mg

Referral
- first psychotic episode
- poor social support
- high suicidal risk
- children and adolescents
- pregnant and lactating women
- no response to treatment
- intolerance to drug treatment
- concurrent medical or other psychiatric illness
- the elderly
- epilepsy with psychosis
Chapter 15 – Respiratory conditions

Drugs used in this section

- adrenaline
- beclomethasone
- beta₂ agonist
- corticosteroid
- doxycycline
- ethambutol
- ipratropium bromide
- medroxyprogesterone acetate
- paracetamol
- pyridoxine
- rifampicin/isoniazid
- rifampicin/isoniazid/pyrazinamide/ethambutol
- sodium chloride 0.9%
- theophylline
- amoxicillin
- benzylpenicillin
- budesonide
- dextrose 5%
- erythromycin
- hydrocortisone
- isoniazid
- norethisterone enanthate
- prednisone
- rifampicin
- rifampicin/isoniazid/pyrazinamide
- salbutamol
- streptomycin
- trimethoprim/sulfamethoxazole

15.01 Asthma

15.01.1 Asthma, chronic

J45

Description
A chronic inflammatory disorder with reversible airways obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infection stimuli 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 conditions

• viral diseases
• non-specific irritating substances

Asthma must be distinguished from chronic obstructive bronchitis (section 15.01.3)

Asthma cannot be cured. Treatment helps to prevent further acute episodes of asthma and helps to relieve acute signs and symptoms.

Note
The diagnosis of asthma can be difficult in children under 6 years of age.
If asthma is suspected refer the patient for assessment and confirmation of the diagnosis.

Management objectives
• diagnose and assess the severity of the asthma as soon as possible
• relieve symptoms of acute exacerbations
• prevent acute attacks and hospitalisation with maintenance therapy
• prevent asthma-related symptoms
• optimise benefit and minimise side effects of the drug treatment
• achieve and maintain normal or best possible long-term lung function
• achieve and maintain an expiratory flow rate (PEFR) variability during the day of less than 20% and a PEFR greater than 80% of personal best of PEFR
• support the person in leading a normal life-style and specially children with schooling
• maintain an asthma diary (dated record of attacks, peak flow and medication use)

Non-drug treatment
• no smoking by an asthmatic or in the living area of an asthmatic
• avoid contact with household pets
• avoid exposure to known allergens and stimulants or irritants
• education on early recognition and management of acute attacks
• patient and caregiver education including:
  ▪ emphasising the diagnosis and explaining the nature and natural course of the condition
  ▪ teaching and monitoring the technique for use of inhalers
  ▪ reassuring parents and patients of the safety and efficacy of continuous regular therapy

Peak Expiratory Flow Rates (PEFR)
• use peak expiratory flow rate (PEFR) determinations at home and in the clinic in order to optimise therapy
Respiratory conditions

• PEFR is best assessed in the morning and evening
• the patient is requested to blow forcibly into the device after a deep inspiratory effort
• three blows are performed at each testing point
• the highest value is taken as the true value
For determining the personal best PEFR of the patient
• the mean of the morning and evening PEFRs is taken for 1 week, while the patient is well
• any value more than 80% of the personal best prior to the use of a bronchodilator is regarded as adequate control

Note
Initiating and optimising inhalation corticosteroid therapy for moderate and severe asthma is not possible without the use of peak flow meters to assess severity and treatment response of asthma.

Inhalation therapy
Inhaled therapy is preferable to oral therapy. Spacers are vital for an adequate therapeutic effect of inhaled therapy:
• spacer devices should be used for all inhaled medications in all age groups to improve efficacy of drug delivery and limit adverse effects
• inhalation spacer devices enable parents to administer inhaled therapy even to small children
• children under 3 years should have a spacer with a face mask while older children and adults can use the spacer with a mouth piece directly
• demonstrate steps 2–6 of the relevant inhaler technique more than once to ensure the correct procedure

Patient and caregiver education on inhaler and spacer techniques.
Under the age of 3 years a mask attachment should be used with the spacer.

without a spacer in adults:
1. remove the cap from the mouthpiece
2. shake the inhaler well
3. while standing or sitting upright, breathe out as much air as possible
4. place the mouth piece of the inhaler between the lips and gently close the lips around it
5. while beginning to inhale, press down the canister of the metered dose inhaler once to release one puff while breathing in as deeply as possible
6. hold the breath for 5–10 seconds, if possible
Respiratory conditions

7. breathe out slowly and rest for a few breaths (30–60 seconds)
8. repeat steps 2–6 for the second puff

**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

**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

**with a spacer and mask for infants and small children:**
1. remove the caps from the inhaler and the spacer
2. shake the inhaler well
3. infants may be placed on the caregiver’s lap or laid on a bed while administering the medication
4. apply the mask to the face, ensuring that the mouth and nose are well covered
5. with the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer
6. keep the mask in place for at least six breaths, then remove
7. repeat steps 4–6 for each puff prescribed, waiting at least 30 seconds between puffs

**Drug treatment**
Drug treatment is based on the severity of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (preventer) and to relieve bronchospasm (reliever).
Respiratory conditions

Reliever drugs in asthma:
• beta_2 agonists, e.g. salbutamol (short acting)
  ▪ are indicated for the immediate relief of the symptoms of acute attacks
  ▪ can be used as needed

beta_2 agonists:
• beta_2 agonists e.g. salbutamol, inhalation, 100–200 micrograms (2 puffs), as required 4–6 hourly until relief is obtained (not continuously)

Preventer drugs in asthma:
• inhaled corticosteroids, e.g. budesonide and beclomethasone
  ▪ must be used twice daily, even when the patient feels well
  ▪ initiate treatment with twice the maintenance dose for 1–2 weeks until control is achieved

Once symptoms and PEFR have improved, the dose should be reduced to the minimum maintenance dose needed for control.

Maximum maintenance doses initiated at PHC level if no PEFR measurement available:
children:
• corticosteroid, inhalation, 100 mcg, 12 hourly regularly

adults:
• corticosteroid, inhalation, 200 mcg, 12 hourly regularly

Doctor initiated, if PEFR can be monitored:
children:
• corticosteroid, inhalation, 200 mcg, 12 hourly regularly

adults:
• corticosteroid, inhalation, 400 mcg, 12 hourly regularly

Intermittent asthma

Indications for only intermittent reliever therapy:
• not more than one or two episodes of daytime cough and/or wheeze per week
• less than one night-time cough and/or wheeze per month
• no recent (within the last year) admission to hospital for asthma
• PEFR more than 80% predicted between attacks

children and adults:
• beta_2 agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved
Respiratory conditions

Mild persistent asthma

- 2–4 episodes of wheeze and /or cough per week
- 2–4 episodes of night time wheeze or cough
- PEFR more than 80% predicted between attacks

children and adults:
- corticosteroid, inhalation, low dose, 12 hourly regularly
  and
- beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved

Moderate persistent asthma

- more than 4 episodes of day time wheeze, tightness or cough per week
- more than 4 night time awakenings per month
- PEFR more than 60% but less than 80% predicted

children and adults:
- corticosteroid, inhalation, medium dose, 12 hourly regularly
  and
- beta₂ agonist, e.g. salbutamol, inhalation, 1–2 puffs 3–4 times daily as needed until symptoms are relieved

Referral
- failure to control disease with this regimen

Severe persistent asthma

- continuous wheeze, tightness, cough
- frequent nocturnal symptoms
- PEFR less than 60% predicted

Referral
- all patients

NB: If salbutamol and the inhaled corticosteroids at the above dosages are insufficient to control asthma in adults, the patient should be referred for modification of chronic maintenance therapy. All children with inadequate control of asthma should be referred.
Stepping treatment down or up
• review treatment every 3 months

Stepping down treatment:
• attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months
• gradually reduce the dose or stop regular inhaled corticosteroid therapy
• if the symptoms are seasonal, corticosteroids may often be stopped until the next season
• if symptoms reappear, increase the therapy to the level on which the patient was previously controlled

Stepping up treatment:
• therapy should be stepped up if a patient is not appropriately controlled
• inadequate control is recognised by:
  • increasing symptoms
  • increasing use of reliever
  • deteriorating peak flow rates as detected from record in an asthma diary

Referral
• unstable asthma
• inadequate response to treatment
• confirmation of diagnosis or management
• with or after a life-threatening episode
• pregnant women with aggravated asthma
• all children less than 6 years with recurrent wheeze on first presentation for assessment and confirmation of diagnosis

15.01.2 Bronchitis, chronic and emphysema
J44.9

Also referred to as chronic obstructive airways disease (COAD) or chronic obstructive pulmonary disease (COPD).

Description
Chronic bronchitis and emphysema are conditions manifested by:
• chronic cough with or without sputum production on most days
• dyspnoea or shortness of breath
• wheezing
Respiratory conditions

The onset is very gradual with progressively worse symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. The airways obstruction is not fully reversible. The main causes of chronic bronchitis and emphysema are chronic irritation of the airways caused by smoking and air pollution, although there are many other causes. It is not primarily an infection, but a degenerative condition.

Patients usually present with some of the following:
- wheezing
- shortness of breath
- cough with or without sputum
- manifestations of right-sided heart failure
- acute bronchitis after a cold or flu with the above symptoms

Note
The airways obstruction of chronic bronchitis and emphysema is not completely reversible as it is in asthma. Inhaled corticosteroids have no effect and should not be used. Oral corticosteroids may be required, but these have severe long-term complications and should only be used if benefit can be proven by lung function testing.

Management objectives
- achieve and maintain maximum relief
- prevent deterioration of airways obstruction
- prevent exacerbations
- treat acute infective bronchitis early

Non-drug treatment
- stop smoking
- chest physiotherapy to improve breathing and coughing mechanics and during infective episodes
- encourage adequate fluid intake especially in the elderly and those with prolonged dyspnoea
- pulmonary rehabilitation

Drug treatment
acute airways obstruction – treat as for asthma
chronic obstruction management:
The use of inhaled corticosteroids is not recommended, unless where, on lung function testing there is a more than 15% and more than 200 mL improvement of the FEV$_1$. This should be doctor-initiated.
- ipratropium bromide, inhalation
- prednisone, oral

if therapy with ipratropium and prednisone has failed in exacerbations:
Doctor initiated:
- theophylline, oral, 125–150 mg 12 hourly for three days
  - titrate upwards by 125–150 mg per day every third day if well tolerated up to a maximum dose: 14 mg/kg/day or 900 mg/day whichever is the higher
  - doses exceeding these should only be used with plasma theophylline level monitoring
  - ongoing use of theophylline should be re-evaluated periodically - if there is no benefit after 4 weeks they should be discontinued
  - if the 12 hourly daily doses are different, the higher dose should be given at night
  - a slow release formulation is preferred to avoid wide trough to peak level differences during the day
  - side effects are dose-related and include nausea and gastric intolerance.
    Titrate doses slowly upwards to reduce side effects. Titration may be interrupted or reversed to the previous tolerated dose.
  - interacts with many other drugs including antibiotics such as erythromycin and quinolones

acute infective bronchitis:
- doxycycline, oral, 100 mg 12 hourly for 10 days
  or
- amoxicillin, oral, 500 mg 8 hourly for 10 days

15.01.3 Bronchospasm, acute associated with asthma and chronic obstructive bronchitis

Description
This is an emergency situation recognised by various combinations of:
- wheeze
- breathlessness
- tightness of the chest
Respiratory conditions

- respiratory distress
- chest indrawing in children

A sudden reversible (asthma) or partially reversible (chronic bronchitis) narrowing of the airways.

The clinical picture of left ventricular heart failure is similar to that of asthma. In patients over 50 years presenting with asthma for the first time, this diagnosis of pulmonary oedema due to left ventricular heart failure should be considered.

### 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>more than 40 per minute</td>
<td>more than 40 per minute</td>
</tr>
<tr>
<td>chest indrawing</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>or recession</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEFR</td>
<td>50–70% of predicted</td>
<td>below 50% of predicted</td>
</tr>
<tr>
<td>speech</td>
<td>normal or difficulty with</td>
<td>unable to speak</td>
</tr>
<tr>
<td></td>
<td>speech</td>
<td></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>drowsy or confused</td>
</tr>
<tr>
<td>respiratory rate</td>
<td>18–30 per minute</td>
<td>often more than 30 per minute</td>
</tr>
<tr>
<td>wheeze</td>
<td>loud</td>
<td>loud or absent</td>
</tr>
<tr>
<td>pulse rate</td>
<td>100–120 per minute</td>
<td>above 120 per minute</td>
</tr>
<tr>
<td>PEFR after initial nebulisation</td>
<td>approx. 50–75%</td>
<td>below 50%; may be too short of breath to blow in PEFR meter</td>
</tr>
</tbody>
</table>
Respiratory conditions

**Note**
PEFRs are expressed as a percentage of the predicted normal value for the individual or of the patient’s best value obtained previously when on optimal treatment.

**Management objectives**
- reverse the obstruction
- relieve hypoxia as soon as possible

**Drug treatment**
- oxygen, 40% or higher, using highest concentration mask

*in chronic obstructive bronchitis:*
- oxygen, 24%–28%. Higher concentrations may sometimes result in suppression of respiration.
- salbutamol 0.5%, solution, nebulised over 3 minutes
  - children 0.5–1 mL in 3 mL of sodium chloride 0.9%
  - adults 1–2 mL in 3 mL of sodium chloride 0.9%
    - if no relief, repeat every 20–30 minutes in the first hour
    - thereafter repeat every 2–4 hours if needed

*if there is no response after the first nebulisation:*

**Children**
- prednisone, oral, 1–2 mg/kg once daily for 7 days

**Adults**
- prednisone, oral, 20–40 mg once daily for 7–10 days

**NB** administer the initial dose early in a severe attack and
- ipratropium bromide, solution, added to salbutamol solution
  - children 0.5 mL
  - adults 2 mL

*if no nebuliser available:*
- salbutamol, inhalation, 4–8 puffs, using a spacer. Inhale one puff and allow for 4 breaths between puffs.

**Note**
Administering salbutamol via a spacer is as effective as using a nebuliser. In severe cases nebulisation is essential since oxygen can also be given via the nebuliser.
Respiratory conditions

if poor fluid intake or dehydrated:
children:
• dextrose 5 %, IV, 2.5 mL/kg per hour
adults:
• dextrose 5 %, IV, 100 mL per hour

if oral prednisone cannot be taken:
children:
• hydrocortisone, IV, 4–6 mg/kg immediately. Maximum dose: 100 mg.
adults:
• hydrocortisone, IV, 100 mg immediately

!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 more than 20%</td>
<td>improvement by less than 20%</td>
</tr>
<tr>
<td>respiratory rate</td>
<td>less than 40 per minute</td>
<td>more than 40 per minute</td>
</tr>
<tr>
<td>chest indrawing or recession</td>
<td>absent</td>
<td>present</td>
</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>
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</tr>
<tr>
<td>speech</td>
<td>normal</td>
<td>impaired</td>
</tr>
</tbody>
</table>

Patients responding to treatment:
• review current treatment, compliance and possible factors causing acute attack
Respiratory conditions

- advise patient or caregiver on further care at home, danger signs and follow up required
- caution patient on the high chance of further wheezing in the week following an acute attack

Referral

URGENT

- Any general danger sign and life-threatening features:
  - severe extreme tachycardia
  - drowsiness
  - confusion
  - absence
  - wheezing
  - cyanosis
  - collapse
- No response to initial treatment
  - rapid breathing
  - altered consciousness
  - unable to feed or drink
  - chest indrawing in children
- any features of a severe attack that may persist after the initial treatment
- PEFR of less than 80% of the predicted normal or best value 15–30 minutes after nebulisation
- poor or incomplete response or high-risk patients - refer with oxygen therapy and salbutamol nebulisations
- patients needing repeated courses of oral corticosteroids - more than twice over six months
- 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

15.01.4 Wheezing in children under six years

R06.2

Description:
Wheezing in early childhood is common. It may be:
- transient – occurring over the first three years
- persistent – starting in infancy but continuing into adolescence
- of late onset – starting after 6 years of age
Respiratory conditions

The wheeze can be:
• unilateral – one lung
• bilateral – both lungs

Unilateral wheeze:
• consider a foreign body, tuberculosis or congenital anatomical abnormalities of the airways
• refer the patient

Bilateral wheeze:
• administer beta2 agonist, e.g. inhaled salbutamol

if there is immediate response within 2–4 hours:
• asthma should be considered. The diagnosis of asthma will be supported by associated allergic rhinoconjunctivitis, eczema or family history of allergic disorders. Treat as per acute asthma protocol.

if there is partial or slow response over two days and the wheeze is intermittent:
• consider acute bronchiolitis. Manage child accordingly.

if there is no response and the onset of the wheeze was sudden:
• refer child immediately to exclude the inhalation of a foreign body

after treating the acute episode:
• refer the child for assessment of diagnosis and severity of disease and appropriate commencement of chronic maintenance therapy

Referral
• unilateral wheezing
• children presenting with wheeze and failure to thrive
• poor response to therapy

15.01.5 Bronchiolitis, acute in children

Description
Acute bronchiolitis is a common cause of wheezing and cough in the first two years of life.
It is caused by viral infections and presents with lower airways obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.

Child presents with:
• rapid breathing
• chest indrawing
• decreased breath sounds
• an audible wheeze

Management objectives
• recognise the severity of the illness
• refer appropriately

Non-drug treatment
• minimise contact with other children
• avoid use of antibiotics and corticosteroids
• do not sedate child

Drug treatment
• oxygen, humidified, using nasal cannula at 1–2 L per minute
• salbutamol 0.5%, solution, 0.5–1 mL diluted to 2–4 mL with sodium chloride 0.9%, nebulised over 3 minutes

Evaluate the response to salbutamol.
Send patient home on salbutamol metered dose inhaler if there is a good response.

Referral
• chest indrawing and distress not responding to salbutamol
• difficulty in feeding
• sleep disturbance
• previous admission for same problem
• oxygen saturations less than 92%

15.02 Bronchitis, acute, uncomplicated
J20.9

Description
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.

15.03 Common cold and influenza

Description
Colds and influenza are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days and influenza within 7 days.

Colds present with nasal stuffiness and throat irritation. In addition, influenza presents with headache, muscular pain and fever.

Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

!CAUTION!
malaria and measles may present with flu-like symptoms

Management objectives
• treat symptomatically
• manage complications

Non-drug treatment
• steam inhalations
• bed rest if feverish
• ensure plenty of oral fluids to prevent secretions from becoming thick and difficult to cough up
• advise patient to return to clinic if earache, tenderness or pain over sinuses develops and cough or fever persists for longer than a week

Drug treatment
Antibiotics are of no value for the treatment of the common cold and influenza.
common cold or influenza with no complications:
pain and fever:
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Infants:
• sodium chloride 0.9%, instilled into each nostril

Complications:
secondary bacterial infections, including:
• pneumonia secondary to influenza
• otitis media
• sinusitis

Referral
• severe complications
• children with
  ▪ chest indrawing. Rapid breathing, in the absence of any danger signs can be treated at the clinic, unless it has not improved after treatment.
  ▪ altered consciousness
  ▪ inability to drink or feed

15.04 Cough
(See Chapter 18 - Symptoms and signs)

15.05 Croup (laryngotracheobronchitis)
J05

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.
Respiratory conditions

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. Consider epiglottitis if the following are present in addition to stridor:
• very ill child
• drooling saliva
• unable to swallow
• sitting upright with head held erect

Assessment of the severity of airway obstruction and management in croup

| Grade 1 | inspiratory stridor | observation |
| Grade 2 | inspiratory and expiratory stridor | adrenaline, 1:1 000 diluted in saline, nebulised, immediately |
|         |                         | • dilute 1 mL of 1:1 000 adrenaline with 1 mL sodium chloride 0.9% |
|         |                         | • prednisone, oral, 1–2 mg/kg, single dose |
|         |                         | • refer |
| Grade 3 | inspiratory and expiratory stridor with pulsus paradoxus | refer |
| Grade 4 | apnoea                  | intubation |

Non-drug treatment
• keep child comfortable
• continue oral fluids
• encourage parent or caregiver to remain with the child
Drug treatment
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age (years)</th>
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<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
</tbody>
</table>

If the child requires referral - while awaiting transfer:
• 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 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, 2 mg/kg, single dose

Management during transfer:
• give the child oxygen
• continue nebulisations with adrenaline
• if grade 3 contact ambulance or nearest doctor
• if grade 4 intubate and transfer

Referral
URGENT
• all children with stridor on breathing in and out while at rest
• children with
  ▪ chest indrawing
  ▪ rapid breathing
  ▪ altered consciousness
  ▪ inability to drink or feed
• for confirmation of diagnosis
• suspected foreign body
• suspected epiglottitis
Respiratory conditions

15.06 Pneumonia

J18.9

Description

Infection of the lung parenchyma, usually caused by bacteria, especially Pneumococcus.

Management is guided by:

• age
• health status
• severity of the pneumonia

Manifestations include:

• malaise
• fever, often with sudden onset and with rigors
• cough, which becomes productive of rusty brown or yellow-green sputum
• pleuritic type chest pain
• shortness of breath
• in severe cases, shock and respiratory failure

On examination there is:

• fever
• tachypnoea
• crackles or crepitations
• bronchial breath sounds

There may be a pleural rubbing sound or signs of a pleural effusion.

Predisposing conditions include:

• the very young and old
• other concomitant diseases
• malnutrition
• HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults. Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment.
15.06.1 Pneumonia in children

Description
Classify children according to the severity of the illness:
• no pneumonia – fever and cough
• pneumonia – fever, cough and rapid breathing
• severe pneumonia – fever, cough, rapid breathing and chest wall recession
• very severe pneumonia – severe pneumonia with danger signs

Pneumonia should be distinguished from bronchitis. The most valuable sign in pneumonia is the presence of rapid breathing.

Assess the child for the severity of the pneumonia.
**moderate respiratory distress:**
• rapid breathing is defined as:
  • infants birth to 2 months  60 or more breaths per minute
  • infants 2 months to 1 year  50 or more breaths per minute
  • children 1–5 years  40 or more breaths per minute

**Severe respiratory distress presents with:**
• chest indrawing
• intercostal and subcostal recession
• nasal flaring

**Danger signs indicating urgent and immediate referral include:**
• low oxygen saturation of less than 90%. This is not applicable at high altitude.
• inability to drink
• impaired consciousness
• cyanosis
• age less than 2 months

**Non-drug treatment**
• ensure adequate hydration
• continue feeding

**Note**
There is no evidence that the following are effective:
• chest physiotherapy
• postural drainage
• nebulised therapy
• cough mixtures
Respiratory conditions

**Drug treatment**

**NB:** no antibiotics are needed if there is no pneumonia

**pneumonia:**
- amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (125 mg/5 mL)</th>
<th>Syrup (250 mg/5 mL)</th>
<th>Caps (250 mg)</th>
<th>Approx age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>312</td>
<td>12.5 mL</td>
<td>—</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**penicillin–allergic patients:**
- erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (125 mg/5 mL)</th>
<th>Syrup (250 mg/5 mL)</th>
<th>Caps (250 mg)</th>
<th>Approx age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>50</td>
<td>2 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
severe and very severe pneumonia:
• oxygen, using nasal cannula at 1–2 L per minute before and during transfer
• benzylpenicillin, IV, 500 000IU, immediately. Repeat 6 hourly until transferred.

Referral
URGENT
• all children with severe and very severe pneumonia
  ▪ chest indrawing
  ▪ altered consciousness
  ▪ unable to feed or drink

Referral
• inadequate response to treatment
• children less than 2 months
• children coughing for more than 3 weeks to exclude other causes such as TB, foreign body aspiration, pertussis

15.06.2 Pneumonia, mild in adults

A chest X-ray should be taken in all patients to confirm the diagnosis. A sputum smear to exclude TB should be done.

Non-drug treatment
• encourage high oral fluid intake

Drug treatment
if not severely ill:
• benzylpenicillin, IM, 2 MU immediately
  and
• amoxicillin, oral, 500 mg 8 hourly for 7 days

in penicillin-allergic patients:
• erythromycin, oral, 500 mg 6 hourly for 7 days
• paracetamol, oral, 1 000 mg oral 4–6 hourly when required to a maximum of four doses daily

Referral
• deterioration at any point
• no response to treatment after 48 hours
Respiratory conditions

15.06.3 Pneumonia in adults with underlying medical conditions or over 60 years

Common underlying conditions include:
- diabetes mellitus
- HIV infection
- cardiac failure
- COPD
- alcoholism
- chronic renal failure

Most of these patients will need referral.
If mild, treat as above.

15.06.4 Pneumonia, severe in adults

Clinical features include:
- moderate or severe respiratory distress
- confusion
- respiratory rate of 30 breaths or more per minute
- systolic BP less than 90 mmHg
- diastolic BP less than 60 mmHg
- cyanosis
- multilobar involvement

while awaiting transfer:
- oxygen
- ceftriaxone, IM, 1 000 mg, single dose before referral

Referral
URGENT
- severe pneumonia
- moderate to severe pneumonia in the presence of other disease

Referral
- patients with pneumonia
  - from a poor socio-economic background
  - who are unlikely to comply with treatment
  - living a considerable distance from health centres
  - have no access to immediate transport
• age over 60 years
• no response to treatment

15.07 Pneumocystis carinii pneumonia

15.07.01 Pneumocystis carinii pneumonia (PCP) in children

B59

Description
Suspect a PCP infection if there is:
• tachypnoea or rapid breathing
• hypoxaemia
  ▪ restlessness
  ▪ agitation
  ▪ decreased level of consciousness
• cyanosis
• few physical signs on auscultation relative to the degree of dyspnoea
• any child between 3 and 6 months of age with pneumonia

Drug treatment
Initiate treatment for PCP immediately in suspected cases even if the HIV status of the child has not yet been established.

in addition, treat for pneumonia:
• trimethoprim/sulfamethoxazole, oral, 20 mg/kg per day of trimethoprim component, 6 hourly for 21 days

for secondary prophylaxis in HIV infected children use:
• trimethoprim/sulfamethoxazole, oral, 5 mg/kg per day of trimethoprim component daily for 5 days each week

Trimethoprim/sulfamethoxazole syrup contains 40 mg trimethoprim and 200 mg sulfamethoxazole per 5 mL.

<table>
<thead>
<tr>
<th>PCP treatment</th>
<th>secondary prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mg/kg per day of trimethoprim</td>
<td>5 mg/kg per day of trimethoprim</td>
</tr>
<tr>
<td>2.5 mL/kg</td>
<td>0.625 mL/kg</td>
</tr>
</tbody>
</table>
15.07.02  *Pneumocystis carinii* pneumonia in adults

**Description**
Interstitial pneumonia occurring with advanced HIV infection. Patients present with aggravated shortness of breath or dry cough with onset within 12 weeks. Chest X-ray shows bilateral interstitial or ground glass pattern, but may show any pattern. Chest X-ray may be normal in the early stages.

**Management objectives**
- treat the infection

**Non-drug treatment**
- ensure adequate hydration

**Drug treatment**
- *trimethoprim/sulfamethoxazole*, oral, 6 hourly for 14–21 days

<table>
<thead>
<tr>
<th>Approx weight</th>
<th>Tablet 80/400</th>
<th>Tablet 160/800</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 40 kg</td>
<td>2 tablets</td>
<td>1 tablet</td>
</tr>
<tr>
<td>40–56 kg</td>
<td>3 tablets</td>
<td>1 1/2 tablet</td>
</tr>
<tr>
<td>more than 56 kg</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>

for secondary prophylaxis:
- *trimethoprim/sulfamethoxazole*, oral, daily

<table>
<thead>
<tr>
<th>Tablet 80/400</th>
<th>Tablet 160/800</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tablets</td>
<td>1 tablet</td>
</tr>
</tbody>
</table>

**Referral**
- breathing rate more than 24 per minute
- shortness of breath with mild effort
15.08 Tuberculosis

Note: notifiable condition
TB guidelines are updated regularly. The most recent National Tuberculosis Control Programme Guidelines should be consulted.

Description
Tuberculosis is a disease due to infection by *Mycobacterium tuberculosis*. It is a serious and growing health problem in South Africa and is expanded and complicated by HIV/AIDS and multiple drug-resistant mycobacteria.

Management objectives
• prevent and cure the disease
• prevent spread of infection from infected adults to children
• prevent progression of tuberculosis infection to tuberculosis disease in children
• prevent multi-drug resistance
• promote directly observed therapy, short-term (DOTS)

Note
A standard TB register monitoring system and treatment guidelines have been introduced.
All patients on TB treatment must be entered into a TB register to enable the completion of quarterly reports for case finding and holding. This is essential for TB control at local, provincial and national level.

Non-drug treatment
• the relationship between the person providing the care and the patient is an important factor for compliance in patient-centred care
• care providers should explain the importance of completing treatment and the following should be discussed:
  ▪ feelings and emotions
  ▪ expectations
  ▪ potential barriers or problems which may prevent success
  ▪ habits and past experience
  ▪ monitoring
  ▪ encouragement and motivation
  ▪ provide feedback on progress
• lifestyle adjustment
• avoid the use of tobacco
• avoid alcohol
Respiratory conditions

• if more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have

Directly Observed Treatment Short-term (DOTS)
• every dose of treatment swallowed is observed
• if not possible to have a written contract, a treatment-taking calendar and regular follow up are strongly advised
• each patient should choose a treatment supporter who will be responsible and whom the patient trusts:
  ▪ community health workers
  ▪ colleagues
  ▪ employers
  ▪ family members
  ▪ friends
• treatment supporters should:
  ▪ keep the drugs
  ▪ keep the treatment card
  ▪ supply the medication
  ▪ observe the patient swallow the treatment
  ▪ sign the treatment card

Note
A private practitioner may elect to monitor the progress of the patient personally. In this case, the patient should remain on the clinic TB patient register.

Drug treatment
The total daily amount of each drug should be administered in one dose and not divided.

!CAUTION!
rifampicin as a single drug should not be available for TB treatment at primary health care facilities but only in fixed-dose combinations with other TB drugs

Ethambutol and isoniazid as single formulations will be retained to facilitate appropriate doses of available fixed-dose combinations in the continuation phase of treatment. Fixed-dose combinations are strongly encouraged in adults to enhance patient adherence and reduce the risk of inappropriate monotherapy.
Respiratory conditions

Pyridoxine oral 25 mg in the mornings routinely on the day that TB drugs are taken should be given to TB patients:
• during pregnancy
• in alcoholics
• with diabetes mellitus
• with epilepsy
• with HIV infection

Important drug interactions
• rifampicin reduces the efficacy of oral and injectable contraceptives, resulting in possible unplanned pregnancies (See chapter 8: Family planning)
  ▪ discuss contraception and explain the problem and the consequences
  ▪ if necessary, alter the oral or injectable contraceptive or suggest an IUCD
    - medroxyprogesterone acetate, IM, 150 mg should be given every 8 weeks instead of every 12 weeks
    - norethisterone enanthate, IM, 200 mg every 6 weeks instead of every 8 weeks
    - combined oral contraceptives should contain at least 50 mcg of ethinylestradiol
    - the tablet-free interval should be reduced from 7 days to 4 days

!CAUTION!
anti-retroviral drugs frequently interact with TB drugs
consult the literature and drug information material

Contra-indications to TB drugs:
• streptomycin should not be given to:
  ▪ pregnant women
  ▪ persons over 65 years old
  ▪ persons with impaired renal function
• ethambutol should not be given to:
  ▪ children under 12 years
  ▪ persons with impaired renal function

Adverse effects of TB drugs:
• nausea
  ▪ may be a manifestation of liver dysfunction. If available, serum transaminase levels should be done in these patients.
  ▪ taking drugs with meals can minimise nausea
Respiratory conditions

- skin hypersensitivity or allergy
  - can be severe and may need anti-histamines, e.g. chlorpheniramine
  - discontinue treatment and refer if extensive
- all patients with jaundice and suspected drug induced hepatitis
  - should be managed at hospital level
  - stop treatment and refer
- neuropathy - adults only
  - can be prevented by taking pyridoxine on the same day as TB treatment

TB chemoprophylaxis

Initiate only after active disease is excluded.

children less than 5 years in close household contact with a smear-positive case of pulmonary TB

and

children less than 5 years of age who have a positive tuberculin test but show no other evidence of disease:
- INH, oral, 5 mg/kg per day 5 days a week for 6 months. Maximum dose: 300 mg daily.

Note
TB chemoprophylaxis should not be given to immunocompetent children over 5 years.

TB and HIV/AIDS

Sputum smears in HIV/AIDS patients with TB are often negative as cavitation does not occur until the TB is far advanced. Sputum culture is more useful in these patients to confirm the diagnosis of tuberculosis.

HIV/AIDS patients with suspected TB should have two or more negative sputum smears before sputum is sent for culture.

Standard short-course treatment also effectively cures tuberculosis disease in patients with HIV/AIDS.

Inform HIV/AIDS patients who are not ill from TB and have a positive Mantoux test that the following symptoms may present:
- persistent cough
- night sweats
- loss of weight
Side-effects of TB drugs are more pronounced in HIV/AIDS patients.

**Multiple drug-resistant (MDR) TB**

All cases should be referred to a specialised centre.

MDR TB is the result of irregular TB treatment and is identified when there is resistance to rifampicin and isoniazid on sputum culture sensitivity testing. If available, chest X-ray should be used as an ancillary diagnostic tool.

Resistance can be prevented by ensuring cure the first time round.

The effectiveness of preventive therapy in persons exposed to MDR TB bacteria is not known. Treatment is often required for a period of two or more years. The cure rate is only between 30–50%. All close contacts should be screened for signs and symptoms of MDR TB and by sputum sampling to detect early disease.

**TB Control Program drug regimens**

Treatment should be given five times per week in both the intensive and continuation phases.

In special circumstances, treatment may be given three times per week in the continuation phase, provided it is properly supervised.

**Note**

In order to avoid dosage errors, clinics should adhere to either a five-times per week or a three-times per week dosage schedule in the follow-up treatment phase.

R – Rifampicin
H – Isoniazid
Z – Pyrazinamide
E – Ethambutol

<table>
<thead>
<tr>
<th>Fixed dose drug combination available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adults</strong></td>
</tr>
<tr>
<td>RH – 150,75 mg</td>
</tr>
<tr>
<td>RH – 150,150 mg</td>
</tr>
<tr>
<td>RH – 300,150 mg</td>
</tr>
<tr>
<td>RHZE – 150,75,400,275 mg</td>
</tr>
</tbody>
</table>
Regimen 1 – New cases with age above 8 years and adults
New smear-positive and new smear-negative patients and extrapulmonary TB

<table>
<thead>
<tr>
<th>Pretreatment body weight</th>
<th>Two months initial phase treatment given five times a week</th>
<th>Four months continuation phase</th>
<th>Five months continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>body weight</td>
<td>When given five times a week</td>
<td>When given three times a week</td>
</tr>
<tr>
<td>RHZEH</td>
<td>150,75,400,275</td>
<td>RH 150,75</td>
<td>RH 150,150</td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tabs</td>
<td>2 tabs</td>
<td>2 tabs</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tabs</td>
<td>3 tabs</td>
<td>3 tabs</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tabs</td>
<td>2 tabs</td>
<td>3 tabs</td>
</tr>
<tr>
<td>71 kg and over</td>
<td>5 tabs</td>
<td>2 tabs</td>
<td>3 tabs</td>
</tr>
</tbody>
</table>

Regimen 2 – Retreatment cases
Previously treated TB patients after cure, completion, interruption and failure

<table>
<thead>
<tr>
<th>Pretreatment body weight</th>
<th>Two months initial phase treatment given five times a week</th>
<th>3rd month initial phase</th>
<th>Five months continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>body weight</td>
<td>RH 150,75,400,275</td>
<td>RH 150,75,400,275</td>
</tr>
<tr>
<td>RHZEH</td>
<td>150,75,400,275</td>
<td>RH 150,75,400,275</td>
<td>RH 150,75,400,275</td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tabs</td>
<td>2 tabs</td>
<td>2 tabs</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tabs</td>
<td>3 tabs</td>
<td>3 tabs</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tabs</td>
<td>3 tabs</td>
<td>2 tabs</td>
</tr>
<tr>
<td>71 kg and over</td>
<td>5 tabs</td>
<td>5 tabs</td>
<td>2 tabs</td>
</tr>
</tbody>
</table>
**Respiratory conditions**

<table>
<thead>
<tr>
<th>Pretreatment body weight</th>
<th>Two months initial phase treatment given <strong>five</strong> times per week</th>
<th>3rd month initial phase</th>
<th>Five months continuation When given <strong>three</strong> times a week</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHZE 150,75,400,275</td>
<td>Streptomycin* 150,75,400,275</td>
<td>RH* 150,150</td>
<td>RH 300,150</td>
</tr>
<tr>
<td>30–37 kg</td>
<td>2 tabs 500 mg</td>
<td>2 tabs 2 tabs</td>
<td>2 tabs</td>
</tr>
<tr>
<td>38–54 kg</td>
<td>3 tabs 750 mg</td>
<td>3 tabs 3 tabs</td>
<td>3 tabs</td>
</tr>
<tr>
<td>55–70 kg</td>
<td>4 tabs 1 000 mg</td>
<td>4 tabs</td>
<td>3 tabs 4 tabs</td>
</tr>
<tr>
<td>71 kg and over</td>
<td>5 tabs 1 000 mg</td>
<td>5 tabs</td>
<td>3 tabs 4 tabs</td>
</tr>
</tbody>
</table>

* Streptomycin should not be given during pregnancy and to those over 65 years.

** RH 150,150 should only be used when treatment is given three times weekly in the continuation phase only.

---

**Regimen 3 – Children with TB up to the age of 8 years**

<table>
<thead>
<tr>
<th>Pretreatment body weight</th>
<th>Two months initial phase treatment given <strong>five</strong> times a week</th>
<th>Four months continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHZ 60,30,150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3–4 kg</td>
<td>1/2 tab</td>
<td>1/2 tab 1/2 tab</td>
</tr>
<tr>
<td>5–7 kg</td>
<td>1 tab</td>
<td>1 tab</td>
</tr>
<tr>
<td>8–9 kg</td>
<td>1 1/2 tabs</td>
<td>1 1/2 tabs</td>
</tr>
<tr>
<td>10–14 kg</td>
<td>2 tabs</td>
<td>2 tabs</td>
</tr>
<tr>
<td>15–19 kg</td>
<td>3 tabs</td>
<td>3 tabs</td>
</tr>
<tr>
<td>20–24 kg</td>
<td>4 tabs</td>
<td>4 tabs</td>
</tr>
<tr>
<td>25–29 kg</td>
<td>5 tabs</td>
<td>5 tabs</td>
</tr>
<tr>
<td>30–35 kg</td>
<td>6 tabs</td>
<td>6 tabs</td>
</tr>
</tbody>
</table>

* RH (60,60) should only be used when treatment is given **three** times weekly in the continuation phase only.
Respiratory conditions

The fixed-dose combinations reflected here represent the current international recommendations. These will be subject to continuous review in the light of new information.

Referral

• pregnant women
• over 65 years old
• impaired renal function
• children under 12 years
• MDR TB patients

Note

When a patient is sent to hospital, the referring nurse or doctor should provide a discharge plan on how the patient will be handled and compliance assured when the patient returns home. If possible, the mother should also be admitted when an infant is admitted.
16.01 Conjunctivitis

An inflammatory condition of the conjunctiva. It may be caused by:
- allergies
- bacterial or viral (pink eye) infections
- trauma

16.01.1 Conjunctivitis, allergic

Description
Inflammatory condition caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. There is usually a history of allergies, including hay fever. Common features include:
- itching, watery eyes and photophobia
- conjunctiva may appear normal or slightly red
- in severe cases there is conjunctival swelling
- cornea, iris and pupil are normal
- normal visual acuity

Management objectives
- identify and remove the cause
- relieve itching and swelling
- treat the secondary infection

Non-drug treatment
- cold compresses to relieve symptoms
Eye conditions

Drug treatment
adults and children:
• sodium chloride 0.9%, eye washes or irrigations
• oxymetazoline 0.025%, eye drops, instil 6 hourly for 7 days

severe cases:
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
• no response to treatment
• persons wearing contact lenses

16.01.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)
H10.0

Description
Inflammatory purulent condition of the conjunctiva caused by bacteria and characterised by:
• itchy eyes and swollen lids
• stickiness of eyelids on awakening in the morning
• discharge from one or both eyes
• redness of conjunctival angles (fornices)

Management objectives
• identify the cause and treat
• prevent spread of infection to other eye if present in one eye only
• prevent complications
Eye conditions

Non drug treatment
• patient education on personal hygiene
• counsel 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

Drug treatment
adults and children:
• chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days

pain relief:
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
• no response after 5 days

16.01.3 Conjunctivitis, viral (pink eye)
B30.9

Description
A highly contagious, viral infection, which is spread by contact with:
• hands
• towels
• face cloths
It may start in one eye and spread to the other, or more commonly both eyes are infected. Common symptoms include:
• itchy eyes
• sore eyes, feeling of grittiness (roughness) or burning which can be painful
• photophobia
Eye conditions

- watery discharge. A yellow discharge indicates a secondary bacterial infection.
- reddened and swollen conjunctiva, which may become haemorrhagic
- swelling of the eyelids
- enlarged pre-auricular node

The cornea, iris and pupil are completely normal with normal visual acuity.

Management objectives
- prevent spread of infection
- symptomatic relief

Non-drug treatment
- advise on correct cleansing or rinsing of eyes
- cold compresses for symptomatic relief

Drug treatment

adults and children:
- sodium chloride 0.9%, eye washes or irrigations
  If sodium chloride 0.9% is not available use cooled boiled water or sterile water.
- oxymetazoline 0.025% eye drops 6 hourly for 7 days

pain relief:
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
- if there is a unilateral red eye for more than one day
- suspected herpes conjunctivitis indicated by vesicles on skin next to eye
16.02 Conjunctivitis, of the newborn (ophthalmia neonatorum)

16.02.1 Conjunctivitis, gonococcal

A54.3

Description
Inflammation of the conjunctiva in the neonatal period caused by Neisseria gonorrhoea. The most common cause is infection acquired during delivery presenting with:
- heavy purulent discharge often associated with oedema of the eyelids
- eyes are often sticky
The onset is within 36–48 hours after birth.
There is often a maternal history of purulent vaginal discharge at birth.

!CAUTION!
if not treated immediately this condition can become worse, infect the cornea and lead to blindness

Management objectives
- prevent the condition from developing and spreading
- eliminate the infection

Non-drug treatment
- screen all pregnant women for sexually transmitted infections (STI) and treat
- cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab
- advise against harmful applications, such as urine, to the eyes of newborn babies

Drug management
routine administration for every newborn baby:
- chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth

if heavy purulent discharge is present:
- sodium chloride 0.9%, eye washes or irrigations as soon as possible after birth. Initially, continuous irrigation will be needed. Do not injure the cornea.
  If sodium chloride 0.9% is not available use cooled boiled water or sterile water.
- chloramphenicol 1%, ophthalmic ointment, applied 2–4 hourly
  and
- ceftriaxone, IM, 75 mg/kg. Maximum dose of 125 mg.
Eye conditions

Referral
• any purulent conjunctivitis in the newborn

16.02.2 Conjunctivitis, non-gonococcal
P39.1

Description
Eye infection caused by *S. aureus, Chlamydia* or other organisms presenting with:
• slight watery or mildly purulent discharge
• mildly inflamed conjunctiva
The onset is usually within the first days of life.

Management objectives
• prevent the condition from spreading
• treat the cause

Non-drug treatment
• cleanse eyes well with cooled boiled water and cotton or other swabs before applying ophthalmic ointment

Drug treatment
• chloramphenicol 1%, ophthalmic ointment, applied 2–4 hourly
• erythromycin, oral, 62.5 mg 6 hourly for 10 days

Referral
• no response to treatment after 5 days

16.03 Eye injuries

16.03.1 Eye injury, chemical burn
T26.9
This is a medical emergency.

Description
Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid, presenting with:
• pain
• inability to open eye
Eye conditions

- blurred vision
- excessive teary and watery eye

Management objectives
- remove chemical
- prevent damage
- avoid infection

!CAUTION!
do not neutralise acid with alkaline and vice versa

Non-drug treatment
- irrigate or wash the eye immediately and continuously with clean water for at least 20 minutes
- in severe alkaline burn cases, irrigation should be prolonged further

Drug treatment
local anaesthetic if needed:
- tetracaine, 0.5%, 2 drops, instilled in the affected eye
  - repeat irrigation or washing out of eye
  - evert upper eyelid and remove debris with cotton bud
- atropine 1%, drops, instilled immediately, maximum 2 drops
- chloramphenicol 1%, ophthalmic ointment, applied 6 hourly

pain relief:
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
- all cases within 12 hours
16.03.2 Eye injury, foreign body (blunt or penetrating)

Description
A foreign body may be embedded in the conjunctiva or cornea or deeper, causing:
- possible corneal abrasion
- disturbance of vision which is serious
- complaints of something in the eye
- pain

Management objectives
- relieve pain
- prevent infection
- prevent damage that could cause permanent loss of vision

Non-drug treatment
- establish the cause
- wash eye with clean water or sodium chloride 0.9%
- remove foreign body if visible on sclera or conjunctiva with cotton tipped stick or bud
- if foreign body is not visible, check visual acuity first, before testing with fluorescein
- stain with fluorescein to reveal corneal foreign body or complications such as abrasion
- check after removal of foreign body

Drug treatment
- sodium chloride 0.9%, eye washes or irrigations as soon as possible. If sodium chloride 0.9% is not available use cooled boiled water or sterile water.

local anaesthetic:
if needed, only to remove the foreign body
- tetracaine, 0.5%, 2 drops, instilled in the affected eye

once only for deep injuries:
- atropine, 1%, drops, instilled immediately
- chloramphenicol 1%, ophthalmic ointment, applied 3 to 4 times daily

Cover injured eye for 12 hours with eye pad.
Eye conditions

Pain relief:
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose</th>
<th>Syrup</th>
<th>Tab</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>kg</td>
<td>mg</td>
<td>mL</td>
<td>mg</td>
<td>years</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
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<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
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</tr>
<tr>
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<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**CAUTION!**
review the problem daily
do not use an eye pad with ecchymosis, lid oedema or bleeding

Referral
IMMEDIATELY (within 12 hours):
• if foreign body cannot be easily removed
• suspected retained intraocular foreign body
• acute change in vision in any eye to 6/12 or less on the Snellen chart
• double vision (diplopia)
• lid laceration or oedema
• extreme swelling which prevents adequate examination
• scleral or corneal laceration or perforation
• disruption of the sclera
• diffuse corneal damage after applying 1% atropine ophthalmic drops
• intraocular haemorrhage
• blood in the anterior chamber
• subconjunctival bleeding persisting for more than 24 hours
  ▪ post-traumatic dilatation of the pupil
  ▪ persistent corneal defect or corneal opacity
• unequal, irregular or sluggish (slow reaction) pupils
• limitation of movement of the eyes
• poor red reflex
• deformed pupil
16.04 Glaucoma, acute

Description
Glaucoma is damage to the optic nerve caused by a level of intra-ocular pressure (often raised), which results in loss of vision usually in one eye only.

Clinical features:
- the pupil is moderately dilated
- sudden onset of extremely severe, bursting pain and eye redness
- a unilateral, temporal headache, after being exposed to a period of darkness, e.g. cinema
- coloured haloes around lights (bright rings)
- the eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
- severe pain in eye (acute)
- nausea and vomiting in severe cases

Management objectives
- relieve the increased pressure within 2–3 hours
- identify all cases
- initiate treatment

Emergency drug treatment before referral
- acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly
- pilocarpine, 1%, eye drops, instilled into the affected eye every 15 minutes for 4 doses

Referral
- refer all patients to an ophthalmologist within 12 hours

!CAUTION!
chronic glaucoma may cause blindness due to continuous high ocular pressure

16.05 Occupational hazards and trauma, prevention

- health education regarding the danger of agricultural and industrial practises
- environments should be free from items posing eye hazards e.g. fireworks, paintball war games, etc.
- pre-employment visual screening and regular follow-up for jobs requiring high visual efficiency
Eye conditions

- exit visual screening on termination of employment
- availability and use of safety devices in vehicles e.g. seatbelts to be enforced
- first aid training and equipment in high-risk industries. Improve safety features of machines and/or other equipment – ensure effective maintenance and regular inspections.
- effective packaging, handling and storage of chemical materials and other dangerous substances
- supply of protective devices in high-risk industries is mandatory
- training of labour force for high-risk jobs
- adherence to minimum safety standards for workshops and factories with regard to lighting conditions and maximum working hours

16.06 Visual problems
H53.9

Description
Early signs of visual problems may be an indication of an underlying disease. Investigate a family history of the following diseases:
- diabetes
- glaucoma
- retinoblastoma
- strabismus
- retinitis pigmentosa
- hypertension

Clinical features include:
- frequent headaches and eye fatigue - suggest refractive errors
- severe headaches with nausea suggests
  - acute glaucoma
  - migraine
  - brain pathology or systemic pathology
- gradually diminishing vision in one or both eyes may suggest
  - cataract formation
  - glaucoma
- cobweb effect or black spots may suggest retinal pathology or vitreous opacification
- persistent dark areas in vision may suggest retinal diseases or optic nerve problems
- seeing coloured haloes (or bright rings) around lights may suggest acute glaucoma
- sudden visual loss
**Eye conditions**

**Assessment**
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 with a large pin, needle or point of a pen or pencil. Ask the patient to look through this hole at the Snellen chart.
- If vision improves, this suggests that the patient has a refractive error and needs glasses, refer to optometrist or ophthalmic nurse.

**Referral**
- if no improvement or vision deteriorates, this suggests cataract, glaucoma or retinal disease

**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 is:
- 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 cataracts

- if there are cataracts one usually sees:
  - black shadows against the red in immature cataracts
  - absence of red reflex in mature cataracts

In a patient above the age of 50 years with no history of trauma or previous eye disease, an absent red reflex is almost sure to be due to cataract formation, especially with decreased visual acuity.

**Note**
Associated diabetes or hypertension should be adequately managed before referral, as surgery can only be considered with appropriately managed disease.
Referral

**URGENT - within 12 hours**

- pain or redness in one eye only or unilateral watery eye especially with visual and pupil abnormalities suggests serious disease, unless a treatable cause can be confirmed
- sudden visual loss in one or both eyes for which an obvious treatable cause can not be found
- recent proptosis of one or both eyes
- squint - recent onset

Referral

- cataracts
- chronic glaucoma
- long-standing blindness – first visit to health facility
- eyelashes rubbing on the cornea (trichiasis)
- eyelids bent into the eye (entropion)
- eyelids bent out too much (ectropion)
- ptosis (drooping eyelid)
- double vision except following recent injury
- diabetic patients (once a year)

Referral - children

- leucokoria (white reflex from the pupil):
  - often due to the presence of a cataract
  - retinoblastoma (tumour of the retina)
- enlargement of the eye (buphthalmos / keratoglobus) due to:
  - congenital glaucoma
  - acquired glaucoma
- hazy cornea (corneal oedema)
- squint at any age if not previously investigated by ophthalmologist
- diabetes – once a year

---

**16.07 Xerophthalmia, prevention**

**E50.7**

**Description**

An abnormal dryness of the eyeball produced by long continued inflammation and subsequent atrophy of the conjunctiva caused by a Vitamin A deficiency. Vitamin A deficiency is the most common cause of blindness in children, if not identified and treated early.
Eye conditions

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

Drug treatment
Prophylaxis and treatment
(See Section 4.03.1 Vitamin A deficiency)
Chapter 17 - Ear, nose and throat conditions

Drugs used in this section
- acetic acid 1% in sodium chloride 0.9%
- amoxicillin
- chlorpheniramine
- erythromycin
- oxymetazoline
- phenoxyethylpenicillin
- acetic acid 2% in alcohol
- benzathine benzylpenicillin
- corticosteroids - topical
- flucloxacillin
- paracetamol
- sodium chloride 0.9%

17.01 Allergic rhinitis (hay fever)
J30.4

Description
Recurrent inflammation of the nasal mucosa due to hypersensitivity to inhaled allergens, e.g. pollen, house dust, grasses and animal proteins. Allergic rhinitis is characterised by recurrent episodes of:
- blocked stuffy nose
- watery nasal discharge
- frequent sneezing, often accompanied by nasal itching and irritation
- conjunctival itching and watering
- oedematous pale grey nasal mucosa
- mouth breathing
- snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, side effects of antihypertensives and antidepressants.

Management objectives
- prevent recurrent attacks
- provide symptomatic relief

Non-drug treatment
- avoid allergens and irritants
Ear, nose and throat conditions

Drug treatment
• chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

• corticosteroid, aqueous nasal solution, 2 sprays in each nostril twice daily

Referral
• chronic persistent attacks
• severe symptoms

17.02 Epistaxis (Nose bleeds)
(See Chapter 19 - Trauma and emergencies)

17.03 Otitis

17.03.1 Otitis, externa
H60.9

Description
Inflammation of the external ear may be one of the following two types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>diffuse</td>
<td>infections are usually due to:</td>
</tr>
<tr>
<td></td>
<td>• mixed infections</td>
</tr>
<tr>
<td></td>
<td>• allergic dermatitis (often caused by shampoo or soaps)</td>
</tr>
<tr>
<td></td>
<td>• contaminated swimming pool or other water, etc.</td>
</tr>
<tr>
<td>furuncular</td>
<td>may be caused by one or more of the following organisms:</td>
</tr>
<tr>
<td></td>
<td>• <em>Staphylococcus</em></td>
</tr>
<tr>
<td></td>
<td>• <em>Streptococcus</em></td>
</tr>
<tr>
<td></td>
<td>• <em>P. aeruginosa</em></td>
</tr>
<tr>
<td></td>
<td>• <em>Proteus</em> species</td>
</tr>
<tr>
<td></td>
<td>• <em>E. coli</em></td>
</tr>
</tbody>
</table>
Management objectives
• relieve symptoms
• eliminate the cause

Non-drug treatment
• 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
  ▪ avoid getting the inside of the ear wet
  ▪ do not leave anything in the ear
  ▪ do not add anything to the ear

Drug treatment
diffuse:
Does not usually require an antibiotic.
Make a wick where possible, using ribbon gauze or other suitable absorbent cloth to clean and dry the ear
• acetic acid 2% in alcohol, instilled into the ear every 6 hours for 5 days
  ▪ instill 3–4 drops after cleaning and drying the ear

furuncular:
• flucloxacillin, oral, 6 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
penicillin–allergic patients:
• erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
• no response to treatment

17.03.2 Otitis media, acute
H66.9

Description
Inflammation of the middle ear characterised by:
• pain
• loss of the normal light reflex of the eardrum
• bulging eardrum
• fever in about half of the cases
• loss of hearing
Mild redness of the eardrum and rubbing the ear are not reliable signs.

Risk factors:
• less than 2 years of age
• children attending day-care centres
• complicated otitis media, e.g. perforated eardrums
• recurrent or chronic otitis media
• associated allergies

Management objectives
• treat the infection
• manage complications
Non-drug treatment
• do not instil anything into the ear
• avoid getting the inside of the ear wet

Drug treatment
uncomplicated:
• amoxicillin, oral, 8 hourly for 5 days

complicated and those with risk factors:
• amoxicillin, oral, 8 hourly for 10 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>312</td>
<td>12.5 mL</td>
<td>6 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>20 mL</td>
<td>10 mL</td>
<td>2 caps</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

penicillin–allergic patients:
• erythromycin, oral, 6 hourly before meals for 10 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>50</td>
<td>2 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Ear, nose and throat conditions

**pain relief:**
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

- chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 ml</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 kg</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>½–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab 1</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Referral**
- perforation of the eardrum
- no response after 5 days treatment
- no pain relief
- bulging eardrum, not responding to treatment after 24 hours
- recurrent otitis media

### 17.3.3 Otitis media, chronic, suppurative
H66.3

**Description**
A purulent discharge from the ear for more than 2 weeks.
If the eardrum has been ruptured for 2 weeks or longer a secondary infection with multiple organisms usually occurs. Multiple organism infection makes oral antibiotic treatment alone much less effective and patients may need to be referred.
TB is an important cause of a chronically discharging ear in South Africa.
If pain is present, suspect another condition or complications.

**Note**
A chronically draining ear can only heal if it is dry.
Drying the ear is time consuming but it is the most effective treatment.

**Management objectives**
- keep the ear dry
- cure the condition
- prevent hearing loss
- prevent mastoiditis and related complications

**Non-drug treatment**
- 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
  - soak a clean wick in acetic acid 1% in sodium chloride 0.9%
  - insert carefully into the ear
  - leave in place for 1 minute
  - remove the wick and replace with a clean dry wick
  - watch the patient or caregiver repeat this until the wick is dry when removed
  - dry the ear by wicking at home three to four times daily until the wick stays dry
  - if bleeding occurs, drying the ear should be stopped temporarily
- 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

**Referral**
- all sick children, vomiting, drowsy, etc.
- painful swelling behind the ear
- large central perforation
- no improvement after 4 weeks
Ear, nose and throat conditions

17.04 Sinusitis, acute

J01.9

Description
Inflammation of one or more sinuses that occurs most often after a viral nasal infection or allergic rhinitis.
Bacterial sinusitis is characterised by:
• purulent nasal discharge, persistent or intermittent
• pain and tenderness over one or more sinuses
• nasal obstruction
• post-nasal discharge
• occasional fever

Note
Sinusitis is uncommon in children under 5 years, as sinuses are not fully developed.

Non-drug treatment
• steam inhalation may be effective in liquefying and removing secretions blocking the nose

Drug treatment
• amoxicillin, oral, 8 hourly for 10 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>20 mL</td>
<td>10 mL</td>
<td>2 caps</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Penicillin–allergic patients:
• erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Ear, nose and throat conditions

- sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes

**Pain relief:**
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

- chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Children:**
- oxymetazoline, 0.025%, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously

**Adults:**
- oxymetazoline, 0.05%, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously

**Referral**
- fever lasting longer than 48 hours
- poor response after 5 days
- dental focus of infection is present, e.g. apical tooth abscess causing maxillary sinusitis
- complications, e.g. periorbital cellulitis with periorbital swelling
- oedema over a sinus
- recurrent sinusitis
17.05 Tonsillitis and pharyngitis

17.05.1 Pharyngitis, viral

Description
A painful red throat without purulence. Respiratory viruses are a major cause.

Non-drug treatment
- homemade salt mouthwash, gargle for 1 minute twice daily
  - 1/2 medicine measure of table salt in a glass of lukewarm water

Drug treatment
- viral infections should not be treated with antibiotics

17.05.2 Tonsillitis, bacterial

Description
Commonly caused by the beta-haemolytic streptococci group A.

Clinical features of streptococcal tonsillitis are:
- sore throat with pain while swallowing
- inflamed tonsils with white patches (follicles)
- tender, enlarged cervical lymph nodes
- often associated with sudden onset of fever

Untreated streptococcal tonsillitis or pharyngitis is serious and can result in:
- acute rheumatic fever
- acute glomerulonephritis
- suppurative complications (retropharyngeal and peritonsillar abscesses)

Management objectives
- eradicate the infection completely
- prevent cardiac and renal complications

Non-drug treatment
- homemade salt mouthwash, gargle for 1 minute twice daily
  - 1/2 medicine measure of table salt in a glass of lukewarm water
**Drug treatment**

All children between the ages of 3 and 15 years who have a sore throat, pain on swallowing and pyrexia should be treated as streptococcal pharyngitis unless it is associated with:

- ulceration of the mouth or pharynx
- hoarseness
- watery nasal discharge
- conjunctivitis

- benzathine benzylpenicillin, IM, immediately
  - less than 15 kg 300 000 IU
  - 15–30 kg 600 000 IU
  - over 30 kg and adults 1.2 MU

Or

- phenoxymethylpenicillin oral twice daily for 10 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 250 mg/5 mL</th>
<th>Tab 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>500</td>
<td>10 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>10 mL</td>
<td>2 tabs</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>10 mL</td>
<td>2 tabs</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

**Penicillin-allergic patients:**

- erythromycin, oral, 6 hourly before meals for 10 days in the same dosage as phenoxymethylpenicillin

**Pain relief:**

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
Ear, nose and throat conditions

Referral
• any suppurative complications, e.g. retropharyngeal or peritonsillar abscess
• suspected acute rheumatic fever
• suspected acute glomerulonephritis
• recurrent tonsillitis or tonsillitis accompanied by severe swallowing problems
• history of previous rheumatic fever or rheumatic heart disease
• heart murmurs not previously diagnosed
Chapter 18 – Signs and symptoms

Drugs used in this section
- calamine
- codeine
- expect stim
- lactulose
- metoclopramide
- naloxone
- paracetamol/codeine
- sennosides A and B
- chlorpheniramine
- diazepam
- ibuprofen
- methyl salicylate
- morphine
- paracetamol
- pethidine
- tussi infans

18.01 Arthralgia
R52.9

Description
- joint pain without swelling, warmth, redness or systemic manifestations such as fever
- may be a manifestation of degenerative joint conditions (osteoarthrosis) or of many local and systemic diseases, in which arthralgia may be an early manifestation
- may follow injury to the joint, e.g. work, play and position during sleep
- often accompanied by painful muscle spasm around the affected joint
- several joints may be affected
- any joint may be affected. Osteoarthrosis often affects the hips, knees, back, neck and shoulders
- systemic causes of arthritis may start with pain only, e.g. rheumatoid arthritis, gout and infective arthritis
- in children rheumatic fever should always be suspected, especially if arthralgia affects several joints in succession
- re-examine frequently to exclude other diseases

Management objectives
- exclude other conditions
- relieve pain

Non-drug treatment
- apply heat locally to the affected joint, taking precautions not to burn the patient
- exercise after relief from pain
- reduce weight if overweight to decrease stress on the joint
- reassure patient after other causes have been excluded
Drug treatment
Treat for 1 week (maximum 2 weeks) provided no new signs develop.
- methyl salicylate ointment, rub into affected areas
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral
- chronic pain for 1 week in children
- chronic pain for over 2 weeks in adults
- recurrent pain
- incapacitating pain
- backache
- signs of arthritis (swelling, redness, tender on pressure, warmth)
- fever

18.02 Convulsions, febrile
R56.0

Description
A seizure triggered by a raised temperature exceeding 38.5°C.
Febrile convulsions can be simple or complex.
Simple febrile convulsions:
- are usually generalised
- occur between ages 6 months and 5 years
- usually last between 2–3 minutes and is always less than 15 minutes
- usually occurs at the beginning of the condition
- has a good prognosis and very rarely develops into epilepsy
There is often:
- only one seizure which needs no specific treatment
- a family history
- no neurological deficit
Complex febrile convulsions are characterised by:
- focal recurrent seizures (fit)
- seizures lasting longer than 10 minutes
- residual neurological abnormality
- occurrence during intracranial infection
Convulsions can also be due to:
- serious intracranial disease (meningitis)
- extracranial disease
  - pneumonia
  - viral disease
  - malaria
  - tick bite fever
  - condition peculiar to age group/sex, e.g. urinary tract infection
  - hypoglycaemia

**Note**
Fever exceeding 38.5°C requires proper investigation and appropriate management.

**Management objectives**
- control convulsions
- lower fever
- identify cause of fever

**Non-drug treatment**
- clear the airway
- remove excess clothing
- cool the body by wiping with a cool damp cloth

**Drug treatment**
Treat the underlying cause.
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose</th>
<th>Syrup</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>kg</td>
<td>mg</td>
<td>120 mg/5 mL</td>
<td></td>
</tr>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>1–5 years</td>
</tr>
</tbody>
</table>

! **CAUTION !**
do not give aspirin to children
• diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose. Half this dose may be repeated after 10 minutes if convulsions continue (exclude hypoglycaemia!)

(diazepam for injection 10mg in 2 mL is used undiluted)

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 10 mg/2 mL</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>2.5</td>
<td>0.5 mL</td>
<td>3 months –1 year</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>5</td>
<td>1 mL</td>
<td>1–5 years</td>
</tr>
</tbody>
</table>

Referral

• all convulsions except where:
  ▪ the diagnosis of recurrent simple febrile seizures has been well established
  ▪ a treatment regime is planned
  ▪ a cause for the fever is found
  ▪ the child regains full consciousness and function
  ▪ there is no evidence to suggest meningitis

18.03 Cough

18.03.1 Cough in children over 5 years and adults

Description

• cough is an extremely common symptom of a large variety of conditions in the respiratory tract, but may have other causes
• common conditions that have cough as symptom include bronchitis, asthma, tuberculosis, tonsillitis, pertussis, lung oedema from cardiac failure, pneumonia, carcinoma, foreign bodies in the airways
• cough is produced by inflammatory, mechanical, chemical and thermal stimulation of cough receptors. Common triggering factors include infection, oedema, inhalation of irritant dust, gases, cold or hot air, foreign bodies, pressure by tumour, aneurysm or pleural effusion.
• cough may be productive of infected or non-infected sputum, blood (haemoptysis), or may be non-productive (dry cough)
• the elderly and children are inclined to swallow sputum, check therefore before diagnosing dry cough
Signs and symptoms

Note
All patients with persistent cough for 3 weeks and haemoptysis need special investigation.

Management objectives
• exclude serious underlying disease such as:
  ▪ TB
  ▪ malignancy
  ▪ asthma
  ▪ foreign body aspiration
• treat the cause appropriately
• stop smoking

Non-drug treatment
• soothe the throat with safe home remedies such as breast milk in an exclusively breastfed infant, hot water with honey and lemon in other infants and in adults
• advise adequate hydration
• avoid irritants

Drug treatment
Note
Cough mixtures have no effect on the course of the underlying condition.

The following could be used:

children:
• tussi infans, oral, 8 hourly for 3 days
  0–6 months 2.5 mL
  6 months–5 years 5 mL
  over 5 years 10 mL

adults:
• expect stim, oral, 10 mL 8 hourly for 3 days

Referral
• any unexplained cough present for more than 3 weeks
• any cough which has any of the following associated symptoms:
  ▪ blood in the sputum (haemoptysis)
  ▪ weight loss
  ▪ failure to thrive (children)
  ▪ night sweats
  ▪ unexplained chest pains
  ▪ dyspnoea
  ▪ persistent fever
Signs and symptoms

• any cough which has not improved after appropriate or specific antimicrobial therapy
• any persistent cough in immunocompromised patients such as HIV, TB, diabetes mellitus, rheumatoid arthritis
• persistent cough in patients exposed to occupational lung diseases such as miners and chemical factory workers
• suspected whooping cough (pertussis)
• suspected pulmonary TB
• lung cancer or other severe and chronic chest conditions

18.03.2 Cough associated with difficulty in breathing in children
R05

Description
Cough with difficulty in breathing is a common symptom of childhood illness. Any cough that persists for 3 weeks needs special investigation.

Any general danger signs:
• inability to drink or breastfeed
• uncontrolled vomiting
• convulsions of recent onset
• lethargy
• loss of consciousness
• chest indrawing
• nasal flaring
• pneumonia less than 2 months of age

Fast breathing is defined as:
infants: birth–2 months 60 or more breaths per minute
infants: 2 months–1 year 50 or more breaths per minute
children: 1–5 years 40 or more breaths per minute

Classification according to the severity of the illness:
very severe pneumonia:
• any of the danger signs
severe pneumonia:
• chest indrawing
• stridor in a calm child
pneumonia:
• fast breathing only
and
• no general danger sign
and
• no chest indrawing
Signs and symptoms

and
• no stridor (in a calm child)
cough or cold:
• no signs of pneumonia or very severe disease
• recurrent wheeze
• If the child has a wheeze
and
• had a wheeze before this illness
  or
• has frequent cough at night
  or
• has had a wheeze for more than 7 days
  or
• is on treatment for asthma
• wheeze first episode does not have any of the above signs and symptoms

Management objectives
• assess the child thoroughly
• determine the number of breaths per minute
• listen for stridor and wheeze
• make the correct classification (or diagnosis, if possible), according to the severity of the illness
• before referral, give the appropriate pre-referral treatment
• in children coughing for more than 3 weeks, exclude any serious underlying disease such as:
  ▪ TB
  ▪ malignancy
  ▪ asthma
  ▪ foreign body aspiration

Non-drug treatment
• in severe pneumonia, test for hypoglycaemia, then prevent and/or treat hypoglycaemia
• soothe the throat and relieve the cough in children with suspected pneumonia or cough or cold
  ▪ in infants not exclusively breastfed and children, soothe the throat with warm water or weak tea, with honey and lemon
  ▪ in exclusively breastfed infants, soothe the throat with breast milk
**Drug treatment**

**severe and very severe pneumonia:**
- ceftriaxone, IM, first dose, before referral. Half the dose in each lateral thigh.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>250 mg diluted with 2 mL of sterile water</th>
<th>500 mg diluted with 2 mL of sterile water</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–3 kg</td>
<td>125</td>
<td>1 mL</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>3–6 kg</td>
<td>250</td>
<td>2 mL</td>
<td>—</td>
<td>0–4 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>500</td>
<td>—</td>
<td>2 mL</td>
<td>4–12 months</td>
</tr>
<tr>
<td>10–14 kg</td>
<td>750</td>
<td>—</td>
<td>3 mL</td>
<td>1–3 years</td>
</tr>
<tr>
<td>15–19 kg</td>
<td>1000</td>
<td>—</td>
<td>4 mL</td>
<td>3–5 years</td>
</tr>
</tbody>
</table>

- oxygen, using nasal canula at 1–2 L per minute
  or
- oxygen, using face mask without a blender at 3–4 L per minute

**stridor in a calm child:**
- adrenaline, nebulised, 1:1000, immediately using a nebuliser. If there is no improvement, repeat every 20 minutes, until the child is transferred.
  - dilute 1 mL of 1:1000 adrenaline with 1 mL sodium chloride 0.9%

**pneumonia:**
- amoxicillin, oral, 8 hourly for 5 days. Follow-up in 2 days to assess response to drug treatment.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup 125mg/5 mL</th>
<th>Syrup 250mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>125</td>
<td>5 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>312</td>
<td>12.5 mL</td>
<td>—</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>5–8 years</td>
</tr>
</tbody>
</table>

**wheeze, first episode:**
- salbutamol, inhaled, 5 puffs 3–6 times a day, using a spacer. Follow-up in 5 days to assess response to drug treatment.

**recurrent wheeze:**
- consider asthma (see section 15)
Signs and symptoms

**Note**
Cough mixtures have no effect on the course of the disease and are not recommended in children.

**Referral**
**URGENT**
- less than 2 months old with pneumonia
- severe pneumonia or very severe disease
- if no improvement or deterioration of condition on follow-up

**Referral**
- coughing for more than 3 weeks
- recurrent wheeze
- cough associated with loss of weight or growth faltering
- cough associated with other signs of chronic disease

---

### 18.04 Fever
R50.9

**Description**
Fever is a natural and sometimes useful response to infection.
Fever alone is not a diagnosis.
- fever can cause:
  - pain
  - myalgia
  - arthralgia
  - headache
  - insomnia
  - convulsions in children

**Note**
- measure temperature correctly
- do not treat low-grade fever (below 38°C)
- temperature above 40°C needs urgent lowering with evaporative cooling (cool the body by wiping with a cool damp cloth)
- observe for signs of dehydration
- in neonates and the elderly fever is often absent or preceded by other symptoms like confusion, failure to feed
- malaria must be seriously considered in anyone with fever living in a malaria-endemic area or if a malaria area has been visited in the past 4 weeks
Signs and symptoms

Management objectives
• lower body temperature
• prevent dehydration
• prevent convulsions
• stabilise before referral if necessary

Non-drug treatment
• place patient in a cool place
• remove excess clothing
• cover only with a sheet or other light covering
• sponging of the body with lukewarm water
• if the patient feels cold and begins to shiver then cover lightly

Drug treatment
fever and pain can be treated with a single drug:
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily
Only treat for 3 days, then refer if a treatable cause cannot be found.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

! CAUTION !
do not treat undiagnosed fever with antibiotics
do not give aspirin to children

Referral
• all neonates
• all children in whom a definite and easily managed cause is not found
• fever that lasts for more than 3 days without finding a treatable cause
• fever that recurs
• fever combined with:
  ▪ signs of meningitis
  ▪ coma or confusion
  ▪ toxic-looking patient
  ▪ jaundice
  ▪ convulsion

18.05 Headache, mild, non-specific
R51

Description
Headache can be benign or serious.
• headache can have serious underlying causes including:
  ▪ encephalitis
  ▪ meningitis
  ▪ mastoiditis
  ▪ otitis media
  ▪ hypertensive emergencies
  ▪ anaemia
  ▪ stroke
  ▪ brain tumour

• headache due a serious disease will often be associated with neurological symptoms and signs including:
  ▪ vomiting
  ▪ fever
  ▪ mood change
  ▪ cranial nerve fall-out
  ▪ convulsions
  ▪ confusion
  ▪ impaired consciousness
  ▪ pupillary changes and difference in size
  ▪ focal paralysis
  ▪ visual disturbances
  ▪ neck stiffness

• tension headache due to muscle spasm:
  ▪ may be worse in the afternoon
  ▪ is normally felt in the neck and the back of the head, but may be felt over the entire head
  ▪ is often associated with dizziness and/or blurring of vision
  ▪ is often described as a tight band around the head or a pressure on the top of the head
  ▪ does not progress through stages like a migraine

Management objectives
• determine cause and treat
• symptomatic support

Non-drug treatment
• teach relaxation techniques
• reassurance where applicable
Signs and symptoms

Drug treatment

- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Referral

- suspected meningitis should be referred immediately after initial treatment (see section 13.03)
- headache in children lasting for 3 days
- recent headache of increasing severity
- headache with neurological manifestations
- newly developed headache persisting for more than 1 week in an adult
- chronic recurrent headaches in an otherwise healthy patient, refer if no improvement after 1 month of treatment
- tension headache due to muscle spasm, refer if no improvement after 1 month of treatment

18.06 Insomnia

G47.0

Description

Difficulty in falling asleep or disturbed sleep patterns.

- insomnia is common, may have many causes and has an impact on the patient’s psychological state and ability to perform
- insomnia may be:
  - primary: not due to environmental or psychological stress or illness
  - secondary: due to pain, alcohol/drug abuse, anxiety

Note

History should include the following:

- duration of the problem
- determination of sleep pattern, including the following:
  - time of going to bed
  - how long it takes to fall asleep
**Signs and symptoms**

- frequency of waking up through the night
- time of waking up
- sleep during the day
- investigation of the use of stimulants, e.g. caffeine
- environmental factors, e.g. snoring partner, noise

**Management objectives**

- restore normal sleep rhythm
- treat the underlying cause

**Non-drug treatment**

- patient counselling
- lifestyle adjustment
- avoid:
  - coffee
  - chocolate
  - caffeine containing tea
- the value of maintaining a regular time for going to sleep and arising
- advice on the influence of the following on sleep:
  - food
  - drink
  - exercise
  - baths
  - environment
  - environment

**Drug treatment**

None

**Referral**

- secondary insomnia

**18.07 Itching (pruritus)**

L29.9

**Description**

Itching may:

- be localised or generalised
- be accompanied by obvious skin lesions
- accompany many systemic diseases, e.g. hepatitis
- be caused by scabies and insect bites
Signs and symptoms

Management objectives
- determine the cause and treat
- symptomatic relief

Non-drug treatment
- lukewarm baths
- cut fingernails

Drug treatment
- calamine lotion, applied when needed

severe or refractory pruritus:
- chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (2 mg/5 mL)</th>
<th>Tab (4 mg)</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>½–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

! CAUTION !
do not give an antihistamine to children under 6 months

Referral
- no improvement after 2 weeks

18.08 Jaundice
R17

Refer all patients.
18.09 Pain control
R52.9

Description
Pain should be assessed by:
• duration
• severity – does the patient wake up because of the pain?
• site
• character – stabbing, throbbing, crushing, cramp like pain
• persistent or intermittent
• relieving or aggravating factors
• accompanying symptoms
• distribution of pain
• referred pain

Management objectives
• establish the cause and manage appropriately
• ensure total pain relief with minimal side-effects

Non-drug treatment
• patient counselling
• lifestyle adjustment

Drug treatment

Mild to moderate pain

Medication for moderate pain should not be given for more than 7 days, unless the cause and expected outcome is clear and can be managed at PHC level.

Step 1
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
pain associated with trauma or inflammation:
• ibuprofen, oral 200–400 mg 6–8 hourly with food, to a maximum of 1 200 mg daily

Step 2
adults:
if no relief after two or three doses, combine paracetamol and ibuprofen at the above dosages.

Step 3
adults:
if still no relief, use ibuprofen in combination with paracetamol 500 mg/codeine 10 mg (combination tablet) for two or three doses

Acute severe pain

If no response to Step 3 in moderate pain, initiate one of the following opioids:

children:
• codeine phosphate syrup, oral, 4—6 hourly

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 25 mg/5 mL</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>4</td>
<td>0.8 mL</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>6</td>
<td>1.2 mL</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>10</td>
<td>2 mL</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>10</td>
<td>2 mL</td>
<td>8–14 years</td>
</tr>
</tbody>
</table>

adults:
• morphine, IM, 10–15 mg, 4–6 hourly when required (usually 0.2 mg/kg per dose)
or
• morphine, IV, 2.5–5 mg diluted and administered slowly over 4–5 minutes and repeated in 1–2 hours as required

Precautions and special comments on the use of morphine
Respiratory depression may be caused by morphine. This can be reversed by naloxone.
(section 19.11 Exposure to poisonous substances)
Do not administer morphine in:
- advanced liver disease
- head injury
- acute asthma
- advanced chronic obstructive bronchitis, emphysema or other respiratory disease with imminent respiratory failure
- acute abdomen (suspected renal stones, gall stones or intestinal obstruction)
- hypothyroidism

! CAUTION !
do not use morphine for any pain arising from the abdomen

Use morphine with extreme care if there is:
- hypovolaemia or shock
- morphine, IV, small incremental doses, starting at 2–5 mg with increments of 2 mg every 10 minutes. Maximum dose of 10–15 mg depending on body weight.
- recent or concurrent alcohol intake or other CNS depressants

Referral
- no response to oral pain control and unable to initiate opioid therapy
- uncertain diagnosis
- management of serious underlying conditions

18.09.1 Chronic pain control in advanced or incurable cancer
R52.9

For specially trained health workers only.

Description
- cancer pain is usually chronic and unremitting
- pain assessment requires training in:
  - history taking
  - physical examination
  - psycho-social assessment
  - assessment of need of type and dose of analgesics
  - pain severity assessment
Signs and symptoms

• pain severity and not the presence of pain determines the need for treatment
• drug treatment for pain should never be withheld
• pain is what the patient says it is

Note
Pain can and must be alleviated in all patients on demand.

Management objectives
• effective pain control
• assessment of the pain characteristics
• ensure quality of life and dying with dignity

Non-drug treatment
• counselling/hospice care
• lifestyle adjustment
• management of psycho-social factors

Note
Appropriate care is provided from the time of diagnosis.
• home palliative care is provided by the family or caregiver with the support of health care professionals
• it also involves:
  ▪ spiritual care
  ▪ social care
  ▪ cultural care
  ▪ radiation/chemotherapeutic care as appropriate and adjunctive care for emotional pain, nerve root pain, bone pain
  ▪ providing moral support for caregivers

Drug treatment
When pain is not controlled according to step 1 and 2, morphine is the treatment of choice for chronic cancer-related pain. Cancer pain in children is managed by the same principles but using lower doses of morphine than adults.
Recommended steps to pain control in cancer patients

Step 1
• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adult</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

children:
• ibuprofen, oral, 4–6 hourly with food, 4–10 mg/kg/24 hours. Do not exceed 500 mg per day. Do not use in children under 5 years.

adults:
• ibuprofen, oral, 4–6 hourly with food, 200–600 mg to a maximum of 2 400 mg/day. Discontinue if not effective after 2–3 days.

Step 2
Add codeine phosphate syrup to Step 1

children:
• codeine phosphate syrup, oral, 4 hourly, 0.5 mg/kg (syrup 25 mg/5 mL), may be increased to 1–2 mg/kg per dose

adults:
• codeine phosphate syrup, oral, 4 hourly, 30–60 mg (syrup 25 mg/5 mL)

Step 3
Paracetamol or ibuprofen can be used with morphine in step 3
Morphine is doctor initiated.

NB There is no maximum dose for morphine – dose is titrated upward against the effect on pain.
Signs and symptoms

children:
• morphine solution, oral, 4–6 hourly according to severity of the pain
children under 1 year: start with 0.2–0.4 mg 4 hourly
children 1–5 years: start with 2.5–5 mg 4 hourly
children 5–12 years: start with 5–10 mg 4 hourly
children 6–12 years: start with 5–10 mg 4 hourly (weight)

adults:
• morphine solution, oral, 4 hourly
  start with 5–10 mg

elderly adults or severe liver impairment:
• morphine solution, oral, 4 hourly
  start with 2.5–5 mg

Titrate the dose and dose frequency against the effect on pain.
• morphine, IM, 4–6 hourly according to severity of the pain
  start with 10–15 mg
• morphine, IV, 4–6 hourly according to severity of the pain
  start with 2.5–5 mg diluted and administered slowly over 4–5 minutes and repeated in 1–2 hours as required. Subsequent dose may have to be increased. Thereafter the dose interval may be attempted to be increased.

Breakthrough pain
Breakthrough pain is pain that occurs before the next regular dose of analgesia. This is due to an inadequate regular dose.
• it is recommended that the full dose equivalent to a 4 hourly dose of morphine be administered for breakthrough pain, but it is important that the next dose of morphine be given at the prescribed time, and not be delayed because of the intervening dose.
• the dosage should be titrated upward against the effect on pain in the following way:
  ▪ add up the amount of “breakthrough morphine” needed in 24 hours.
  ▪ divide this amount by 6 (the number of 4 hourly doses in 24 hours)
  ▪ the next day increase each dose by that amount.

Example:
The patient has 3 episodes of breakthrough pain.
Patient gets 10 mg morphine every four hours.
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.
• Give a double dose at night to allow reasonable sleep

Nausea and vomiting:
children:
• metoclopramide, oral

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 5 mg/5 mL</th>
<th>Dose interval</th>
<th>Approx Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 10 kg</td>
<td>1</td>
<td>1 mL</td>
<td>twice daily</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–15 kg</td>
<td>1</td>
<td>1 mL</td>
<td>2–3 times daily</td>
<td>1–3 years</td>
</tr>
<tr>
<td>15–20 kg</td>
<td>2</td>
<td>2 mL</td>
<td>2–3 times daily</td>
<td>3–5 years</td>
</tr>
<tr>
<td>20–30 kg</td>
<td>2.5</td>
<td>2.5 mL</td>
<td>3 times daily</td>
<td>5–9 years</td>
</tr>
<tr>
<td>30 kg and over</td>
<td>5</td>
<td>5 mL</td>
<td>3 times daily</td>
<td>9–14 years</td>
</tr>
</tbody>
</table>

• do not exceed 5 mg 3 times per day

adults:
• metoclopramide oral, 10 mg, three times daily as needed for significant nausea and vomiting

Constipation is a common problem due to long-term use of opioids.
children:
• lactulose, oral, twice daily

<table>
<thead>
<tr>
<th>Approx Age</th>
<th>Syrup 3.3 g/5 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1 year</td>
<td>2.5 mL</td>
</tr>
<tr>
<td>1–5 years</td>
<td>5 mL</td>
</tr>
<tr>
<td>6–12 years</td>
<td>10 mL</td>
</tr>
</tbody>
</table>

adults:
• sennosides A and B, oral, 15 mg (2 tablets) at night
• lactulose, oral, 15–30 mL daily as needed

Referral
• uncontrolled pain
• pain uncontrolled by step 1 if no doctor available
• severe emotional or other distress which may aggravate the perception of pain
### Chapter 19 – Trauma and emergencies

The following conditions are emergencies and must be treated as such. Drugs used for treatment must be properly secured and their use recorded (time, dosage, routine) on the patient's notes and on the letter of referral.

**Drugs used in this section**

- ACE inhibitor
- activated charcoal
- amoxicillin
- atropine
- calamine lotion
- chloramphenicol 1%
- chlorpheniramine
- dextrose 5%
- diazepam
- furosemide
- hepatitis B vaccine
- ibuprofen
- lamivudine
- lorazepam
- metronidazole
- naloxone
- paracetamol
- phenytoin
- polyvidone iodine
- rabies immunoglobulin
- Ringer–Lactate
- streptokinase
- tetanus vaccine
- thiamine
- acetylcysteine
- adrenaline
- aspirin soluble
- atropine 1%
- ceftriaxone
- chlorhexidine 0.05%
- dextrose 10%
- dextrose 50%
- erythromycin
- haloperidol
- hydrocortisone sodium succinate
- isosorbide dinitrate
- lidocaine 2%
- metoclopramide
- morphine
- norgestrel 0.5 mg/ethinyl oestradiol 0.05 mg
- phenobarbital
- polyvalent antiserum (snake)
- promethazine
- rabies vaccine
- sodium chloride 0.9%
- tetanus immunoglobulin
- tetracaine 0.5%
- zidovudine

#### 19.01 Angina pectoris, unstable

**I20.0**

**Description:**

It is a manifestation of increased danger of suffering from a myocardial infarction due to an intracoronary thrombus and can be described as pre-infarction angina.
Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:

- angina at rest or minimal effort
- angina occurring for the first time, particularly at rest
- prolonged angina lasting longer than 10 minutes, not relieved by sublingual nitrates
- the attacks increase in frequency and severity

Diagnosis

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

Management objectives:

- prevent myocardial infarction

Drug treatment

- aspirin soluble, oral, 300 mg immediately before referral
- isosorbide dinitrate, sublingual 5 mg immediately and then repeat once if necessary for pain relief
- morphine, IV, small increments of 1 mg/minute and titrate for pain relief to a maximum of 10 mg
  Dilute IV morphine to 10 ml with water for injection or sodium chloride 0.9%.

Referral

URGENT

- all patients

19.02 Bites and stings

19.02.1 Animal and human bites

T14.1

Note: Rabies and tetanus are notifiable conditions.

Suspected rabid bite

Description

Any mammal bite can transmit rabies.
Animal bites may be caused by:
• domestic animals (horses, cows, rabid dogs, cats)
• wild animals (meerkat, foxes, jackals, mongooses, fruit bats)

In cases of bite by a dog suspected of being rabid, confine and observe the animal for further manifestations over 10 days.

Animal or human bites may result in:
• infection, usually due to anaerobic bacteria
• puncture wounds
• tissue necrosis
• complications, e.g. tetanus or rabies

Rabies incubation period is at least 9–90 days, but could be much longer.

**Classification of rabies exposure**

**Category 1**
• touching or feeding the animal
• licking of intact skin

**Category 2**
• nibbling of uncovered skin
• superficial scratch and no bleeding
• licking of broken skin

**Category 3**
• bites and scratches which penetrate the skin and draw blood
• licking of mucous membranes

**Note**
Therapy should ideally be instituted only in consultation with referral centres.

See latest guidelines for the medical management of rabies in South Africa.

**Management objectives**
• avoid infection
• prevent tetanus and rabies
• avoid disability and scar formation
• relieve pain
• notify rabies
Note
Do not destroy rabid animals because rabies must be confirmed from the brains of these animals.

Non-drug treatment
• health education
• regular vaccination of domestic cats and dogs (legal requirement)

Drug treatment

Emergency management
All bite wounds and scratches need thorough and immediate treatment. Lacerations can be sutured later.

Irrigate and cleanse wound:
• chlorhexidine 0.05%, solution
or
• polyvidone iodine 10%, solution

!CAUTION!
do not suture puncture wounds
suture lacerations after thorough cleaning and debridement
do not apply compressive dressings

Suspected rabies
Rabies vaccine and immunoglobulin are available from the district surgeon or the nearest district hospital.

• rabies immunoglobulin 20 IU/kg
  • 1/2 dose injected in and around the wound
  • 1/2 dose, IM
### Trauma and emergencies

<table>
<thead>
<tr>
<th>Previously immunised patients</th>
<th>Non-immune patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>less than 48 hours after exposure</td>
</tr>
<tr>
<td>human anti-rabies immunoglobulin (RIG)</td>
<td>human anti-rabies immunoglobulin (RIG)</td>
</tr>
<tr>
<td>do not administer</td>
<td>administer for category 3 exposure only</td>
</tr>
<tr>
<td>rabies vaccine (categories 1, 2, &amp; 3)</td>
<td>rabies vaccine (categories 1, 2, &amp; 3)</td>
</tr>
<tr>
<td>day 0 – single dose</td>
<td>day 0 – single dose</td>
</tr>
<tr>
<td>day 3 – single dose</td>
<td>day 3 – single dose</td>
</tr>
<tr>
<td>day 7 – single dose</td>
<td>day 7 – single dose</td>
</tr>
<tr>
<td>day 14 – single dose</td>
<td>day 14 – single dose</td>
</tr>
<tr>
<td>day 28 – single dose</td>
<td>day 28 – single dose</td>
</tr>
</tbody>
</table>

Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

**non-immune patients (not immunised):**
- rabies vaccine, IM
  - adults – deltoid muscle
  - children – anterolateral thigh
  - give rabies vaccine on day 90 if rabies immunoglobulin was given on day 0

**previously immunised patients:**
- rabies vaccine, IM
  - do not give rabies immunoglobulin

All bite wounds and scratches need thorough and immediate treatment.

**irrigate and cleanse wound:**
- chlorhexidine 0.05%, solution
  - or
- polyvidone iodine 10%, solution

---

!CAUTION!

do not suture bite wounds except for haemostasis

do not apply compressive dressings
tetanus prophylaxis:
- tetanus adsorbed toxoid vaccine (TT), IM, 0.5 mL

unimmunised or not fully immunised patients:
- human tetanus immunoglobulin (TIG), IV, 250 IU

Note
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

prophylactic antibiotic to prevent infection only if the hand is bitten or for extensive wounds requiring surgery:
- amoxicillin, oral, 8 hourly for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>1.25 mL</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>187.5</td>
<td>7.5 mL</td>
<td>3.75 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>10 mL</td>
<td>2 caps</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

penicillin–allergic patients:
- erythromycin, oral, 6 hourly before meals for 5 days

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 125 mg/5 mL</th>
<th>Syrup 250 mg/5 mL</th>
<th>Caps 250 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>50</td>
<td>2 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>62.5</td>
<td>2.5 mL</td>
<td>—</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>125</td>
<td>5 mL</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>250</td>
<td>10 mL</td>
<td>5 mL</td>
<td>1 cap</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>375</td>
<td>15 mL</td>
<td>7.5 mL</td>
<td>—</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>500</td>
<td>—</td>
<td>—</td>
<td>2 caps</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
• metronidazole, oral for 5 days

<table>
<thead>
<tr>
<th>Weight in kg</th>
<th>Dose in mg</th>
<th>Suspension 200 mg/5mL 1 hour before meals</th>
<th>Tabs 200mg with or after meals</th>
<th>Tabs 400mg with or after meals</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–6 kg</td>
<td>60 mg</td>
<td>1.5 mL</td>
<td>—</td>
<td>—</td>
<td>0–3 months</td>
</tr>
<tr>
<td>6–10 kg</td>
<td>100 mg</td>
<td>2.5 mL</td>
<td>1/2 tab</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>300 mg</td>
<td>5 mL</td>
<td>1 tab</td>
<td>1/2 tab</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>400 mg</td>
<td>7.5 mL</td>
<td>1/2 tab</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>800 mg</td>
<td>—</td>
<td>2 tabs</td>
<td>1 tab</td>
<td>8–14 years and older</td>
</tr>
</tbody>
</table>

Referral
• deep and large wounds requiring elective suturing
• suspected rabid animal bites
• shock and bleeding

19.02.2 Insect bites and stings

T63.2/3/4

Description
Injury from bites and stings by bees, wasps, spiders, scorpions and other insects:
• bees and wasps - venom is usually mild but may provoke severe allergic reactions such as laryngeal oedema or anaphylactic shock (see section 19.17)
• spiders and scorpions - most are non-venomous or mildly venomous

Management objectives
• identify whether bite or sting was caused by venomous species
• apply first aid and supportive measures as for snakebite for highly venomous bites and sting

Drug treatment
emergency treatment:
for anaphylactic shock (see section 19.17)
for severe local symptoms:
- chlorpheniramine, oral, 3 times daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 2 mg/5 mL</th>
<th>Tab 4 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>0.8</td>
<td>2 mL</td>
<td>—</td>
<td>6–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>1</td>
<td>2.5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>2</td>
<td>—</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>2–4</td>
<td>—</td>
<td>1/2–1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>4</td>
<td>—</td>
<td>1 tab</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

- calamine lotion, applied when needed
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>1/2 tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

very painful scorpion stings
- lidocaine 2%, 2 mL injected around the bite as a local anaesthetic

Referral
- presence of systemic manifestations:
  - weakness
  - drooping eyelids
  - difficulty in swallowing
  - double vision
19.02.3 Snakebite

Description
Envenomation.
The symptoms of snakebite with venom include:
• swelling in 90% of cases
• weakness with or without swelling in 6–7% of cases
• bleeding is rare
Venom diffuses mainly via the lymphatics, not via blood vessels.

Management objectives
• identify the snake species
• prevent serious complications
• prevent death due to envenomation
• relieve pain and anxiety

!CAUTION!
tourniquets are dangerous and should not be used

Emergency treatment
First aid plus supportive therapy is adequate for most bites.
Arrange for admission and observe for at least 12 hours.
Antivenoms may cause anaphylaxis and other severe allergic reactions. Administer only according to the recommendations.

venom in the eyes:
irrigate extensively with water for 15–20 minutes
• tetracaine 0.5%, drops, instilled into the eye(s)
• chloramphenicol 1%, eye ointment, inserted into the eyes and covered with eye pads

venom on the skin or wound:
• wipe away excess venom from the skin
• assess the wound to confirm fang penetration
wound cleansing:
• chlorhexidine 0.05% solution. Apply a crepe bandage firmly to the entire limb to ensure constant pressure. Immobilise the limb with a splint.

analgesics according to severity of pain (see section 18.09)

tetanus prophylaxis:
• tetanus adsorbed toxoid vaccine (TT), IM, 0.5 mL

unimmunised or not fully immunised patients:
• human tetanus immunoglobulin (TIG), IV, 250 IU

supportive therapy:
• reassure and keep the patient in bed and calm
• treat shock if present or develops during the observation

Note
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might cause an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

<table>
<thead>
<tr>
<th>! CAUTION !</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyvalent antivenom can only be used in the following snake bites rinkhals, mambas, cobras and vipers.</td>
</tr>
<tr>
<td>The following require specific antivenoms</td>
</tr>
<tr>
<td>• berg adders</td>
</tr>
<tr>
<td>• gaboon adders</td>
</tr>
<tr>
<td>• boomslang</td>
</tr>
<tr>
<td>Specific antivenoms are available from the SAIMR.</td>
</tr>
<tr>
<td>Snake bite antivenoms may be available from specific hospitals in each province.</td>
</tr>
</tbody>
</table>
Trauma and emergencies

Administration of snake antivenom

Note
• 90% of patients do not need and should not be given antivenom
• only administer antivenom to the 10% of patients with snakebite who need it
• all patients with confirmed black mamba bites should receive antivenom, even before onset of symptoms
• patients with confirmed gaboon adder or puff adder bites should receive antivenom at the onset of any symptoms
• the dose of antivenom is the same for adults and children

Criteria for antivenom administration
• signs of systemic poisoning
• difficulty in breathing
• difficulty in swallowing
• weakness
• double vision
• drooping eyelids
• spreading local damage
• swelling of a hand or foot within 1 hour of a bite (80% of bites are on hands or feet)
• swelling extends to elbows or knees within 4 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

Drug treatment

infants and small children:
• polyvalent antivenom, slow IV infusion, 100 mL in sodium chloride 0.9%
• administer slowly for the first 15 minutes as most allergic reactions will occur within this period
• increase the flow rate gradually until the infusion is completed within one hour
  ▪ repeat if there is no clinical improvement after the infusion
  ▪ in infants and small children the volume of sodium chloride 0.9% must be reduced to prevent fluid overload

adults and older children:
• polyvalent antiseraum, slow IV infusion, 100 mL in 300 mL of sodium chloride 0.9%
• administer slowly for the first 15 minutes as most allergic reactions will occur within this period
• increase the flow rate gradually until the infusion is completed within one hour
• repeat if there is no clinical improvement after the infusion
• black mamba bites may require up to 200 mL or more
black mamba bites
to reverse respiratory paralysis:
• polyvalent antiserum, slow IV infusion, 200 mL or more may be required
to prevent airway obstruction in swelling of head or neck:
• polyvalent antiserum, slow IV infusion, 50 mL
difficulty in breathing with muscle weakness:
• polyvalent antiserum, slow IV infusion, 100 mL repeated within 1–2 hours if no
improvement
anaphylaxis:
• hydrocortisone sodium succinate and adrenaline (see section 19.17)

Note
Ensure that the antivenom solution is clear.
Check that the patient has no history of allergy.
If there is a history of allergy and signs of systemic poisoning:
• administer antivenom
but
• prepare to treat possible anaphylaxis

Referral
• all patients with bites or likely bites even if puncture marks are not seen
If possible take the snake to the referral centre for identification.

19.03 Burns
T30.0

Description
Burns may be caused by:
• heat or thermal burns
• chemical compounds
• physical agents, e.g. electrical
The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues.
Initially, burns are usually sterile.
The chart and figures below may be used to calculate body surface area % in children according to age.

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Body surface area %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head (A/D)</td>
<td>Thigh (B/D)</td>
</tr>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

Management objectives
• minimise the risk of infection during healing

Emergency treatment
To limit the extent of the burn, soak the affected area generously with, or immerse in cold water throughout the first hour after the accident.

Examine carefully to determine:
• the extent of the burn
• respiratory obstruction due to thermal injury or soot inhalation
Drug treatment

Fluid replacement:
The objective is to maintain normal physiology as reflected by urine output, vital signs and mental status.

Less serious and superficial burns:
• IV fluids

Burns of over 8% of body surface area, in children the palm of the hand is 1%.
• IV fluid for resuscitation

Calculation of fluid replacement:

<table>
<thead>
<tr>
<th>Ringer–Lactate IV 1–1.5 mL/kg x % body surface area burned for use in the first 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>first 8 hours</td>
</tr>
<tr>
<td>second 8 hours</td>
</tr>
<tr>
<td>third 8 hours</td>
</tr>
</tbody>
</table>

• paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>120</td>
<td>5 mL</td>
<td>—</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>240</td>
<td>10 mL</td>
<td>½ tab</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>500</td>
<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
</tr>
<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

clean the burn wound gently:
• sodium chloride 0.9% or clean water

dress the burn wound:
• paraffin gauze dressing and then dry gauze on top
The bandage should be thick enough to prevent seepage through to the outer layers. Change the dressing after 2–3 days, and as necessary thereafter.
Trauma and emergencies

infected burn:
• polyvidone iodine 5%, cream, applied daily
  or
• chlorhexidine 0.05%, solution, daily

tetanus prophylaxis:
• tetanus adsorbed toxoid vaccine (TT), IM, 0.5 mL

unimmunised or not fully immunised patients:
• human tetanus immunoglobulin (TIG), IV, 250 IU

Note
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Referral
• all children less than 3 months
• more than 8% of body surface area burnt, in children the palm of the hand is 1%
• deep burns or burns of the face, neck, hands or perineum
• circumferential burns
• deep electrical burn
• deep chemical burn
• inhalation burns
• infected burns

19.04 Cardiac arrest – cardio-pulmonary resuscitation
I46.9

19.04.1 Cardio-pulmonary arrest, adults

Description
Cardiac arrest is the sudden and unexpected cessation of effective cardiac output, on the basis of asystole or a malignant tachyarrhythmia. Irreversible brain damage can occur within 2–4 minutes.
Clinical features include:
• sudden loss of consciousness
• absent carotid and all other pulses
• loss of spontaneous respiration
• dilatation of the pupils

Management objectives
• urgent restoration of effective cardiac output and peripheral vital organ perfusion
• adequate oxygenation

Emergency treatment
• diagnose rapidly
• mentally note the time of starting
• place the patient on a firm flat surface and commence resuscitation immediately
• call for skilled help
• initiate ABCD (Airways Breathing Circulation Drip/Doctor/Drugs) sequence of CPR (Cardiopulmonary Resuscitation)
• a powerful precordial thump is recommended for immediate treatment where a defibrillator is not immediately available
• document medication and progress
• collect all ampoules used and total them at the end

Airway
• manually clear vomitus or foreign body and dentures from the mouth
• tilt the head backwards with one hand on the forehead. Do not do this where a neck fracture is suspected.
• lift the chin forward with the fingers of the other hand
• raise the shoulders to tilt the neck backwards unless a neck fracture is suspected
• insert artificial airway if available
• when breathing well, lay the patient on the side to protect the airway and support the patient by bending the uppermost arm and leg

! CAUTION !
no ventilation is possible until the airway is open
Breathing
• check breathing
if there is **no breathing**, apply artificial respiration
  • mouth-to-mouth
  or
  • mouth-to-nose
  or
  • with Ambubag
  • continue until spontaneous breathing occurs
  • oxygenate with 100% oxygen
  • endotracheal intubation is essential if prolonged ventilation is required. Intubation
  is the best method of securing the airway. Pre-oxygenate well before intubation.

Circulation
• check for carotid or other large pulse
• if there is no pulse:
  ▪ give a single firm precordial thump or defibrillate if indicated
  ▪ initiate CPR if there is no pulse or no breathing
  ▪ continue until return of the pulse and/or respiration

Drip, doctor, drugs
• initiate IV fluid
  • sodium chloride 0.9%
  or
  • Ringer-Lactate solution
  • summon the doctor without stopping CPR

Immediate emergency drug treatment
Adrenaline is the mainstay of treatment and should be given immediately, IV or
endobronchial.

• adrenaline, IV, 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL as a
  slow IV
  or
  • adrenaline, endobronchial, 1:1 000, undiluted 1 mL through endotracheal tube,
    repeat every 5 minutes when needed for a maximum of three doses
If expertise and ECG tracing is available:
for ventricular tachycardia:
• lidocaine 2%, IV 50–100 mg
or
for bradycardia:
• atropine, IV, 0.5–1 mg
• repeat after 2–5 minutes if no response

Assess continuously until the patient shows signs of recovery. Continue until transfer to hospital.

Consider carrying on for longer especially when:
• the patient is young
• hypothermia and drowning
• assumed electrolyte imbalance
• poisoning with drugs or carbon monoxide

Consider stopping resuscitation attempts and pronouncing death if:
• further resuscitation is clearly clinically inappropriate, e.g. incurable underlying disease
• no success after all the above procedures have been carried out for 30 minutes or longer

19.04.2 Cardio–pulmonary arrest, children

Description
• hypoxia is the most common cause of bradycardia or cardiac arrest in children
• asystole is the most common cardiac arrest rhythm in infancy and childhood, usually preceded by bradycardia as ventricular fibrillation is unusual in children and is inappropriate to include a blind precordial thump or DC shocks in the management of cardiac arrest in children
• cardiac arrhythmias are unusual in children, unless due to severe electrolyte abnormalities or drug overdose

The most common underlying cause of cardiac arrest in children is respiratory failure and hypoxia resulting from lung or airway disease or injury due to:
• croup
• bronchiolitis
• asthma
Trauma and emergencies

• pneumonia
• birth asphyxia
• inhalation of foreign body
• pneumothorax

Successful resuscitation in children is uncommon and situations leading to cardio-pulmonary arrest should rather be detected and managed effectively before arrest occurs.

Management objectives
• urgent restoration of effective cardiac output and peripheral vital organ perfusion
• oxygenate adequately

Emergency treatment
• diagnose rapidly
• mentally note the time of starting
• place the patient on a firm flat surface and commence resuscitation immediately
• call for skilled help
• initiate ABCD (Airways Breathing Circulation Drip/Doctor/Drugs) sequence of CPR (Cardiopulmonary Resuscitation)
• cardiac massage is recommended for immediate treatment
• document medication and progress
• collect all ampoules used and total them at the end

Airway
• manually clear vomit or foreign body from the mouth
• in neonates and infants position head in neutral position, in children position in the sniffing position
• lift the chin forward with the fingers of the other hand
• insert artificial airway if necessary and available
• when 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
• consider the possibility of a foreign body; if suspected, apply Heimlich maneuver or modification for size
• Heimlich maneuver
  child over 5 years
  ▪ make a fist with one hand
  ▪ place immediately below the child’s xiphisternum
  ▪ grasp the child with the other hand
  ▪ apply force (1–6 times) in the direction of the upper thoracic spine
child less than 5 years
- place the child face-down on one arm of the health worker
- deliver 1–4 sharp blows to the lower thoracic back with the hand

! CAUTION !
do not use blind finger sweeps of the mouth or posterior pharynx:
this can impact any obstruction further down the airway
no ventilation is possible until the airway is open

Breathing
- check breathing
if there is no breathing, apply artificial respiration
  - mouth-to-mouth
  or
  - mouth-to-nose
  or
  - preferably with Ambubag and face mask
  - breathe (inflate the chest) at least 15 times/minute (faster in babies)
  - do not stop unless spontaneous breathing starts or help arrives
  - oxygenate with oxygen 100%
  - if endotracheal intubation is essential and the skills are available, use a tube of
    approximately the same diameter as the child’s little finger or of a size that will
    just fit into the nostril. If prolonged ventilation is required, intubation is the best
    method of securing the airway.
  - pre-oxygenate well before intubation

! CAUTION !
cardiac massage is useless unless there is an open airway and
the lungs are being filled with air

Circulation
- check for a pulse
  - carotid in the older child, or femoral or brachial pulse

if there is no pulse:
- start cardiac compressions or massage at a rate of 80–100 beats per minute
- continue ventilation with 1 breath for 5 cardiac compressions
- initiate CPR if there is no pulse or breathing
- continue until of the pulse or respiration returns
Trauma and emergencies

Keep patient covered and warm while resuscitating.
Ventilate if there is a pulse but no breathing.

**Drip, doctor, drugs**
- initiate IV fluid
- sodium chloride 0.9%

or
- Ringer–Lactate solution
- have the doctor summoned without stopping CPR

**Immediate emergency drug treatment**
- adrenaline, IV, 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL 0.1 mL/kg of dilution

or
- adrenaline, endobronchial, 1:1 000, undiluted 0.1 mL/kg through endotracheal tube
  - following and subsequent doses, a 5–10 fold increase is recommended
  - repeat every 3 minutes, when needed for 3–4 doses

**bradycardia or slow heart rate:**
Hypoxia is the most common cause of bradycardia. Adequate ventilation or oxygenation is usually all that is needed.
- atropine, IV, 0.02 mg/kg to a maximum of 1 mg

**difficult or impossible IV access within 2–3 minutes:**
- administer medication through the endotracheal tube
- adrenaline dose via this route is 10 times the standard dose
- atropine can also be given via this route

**fluid replacement therapy:**
- administer a bolus of 0.9% sodium chloride to follow the IV or intraosseous injection of any drug used in resuscitation, especially if the injection is peripheral
- sodium chloride 0.9%, IV, 5–20 mL/kg, depending on the size of the child

**hypoglycaemia in sick children, especially infants:**
look for evidence during resuscitation and treat proven hypoglycaemia:
- dextrose 10%, solution, IV, 5 mL/kg. Avoid unnecessary or excessive treatment.
drug administration route:
- IV via a free-flowing drip
- avoid administration of excessive IV fluid during resuscitation
- use 60 drop per minute IV administration sets for all drips unless the arrest is due to hypovolaemia

- intraosseous route:
  - resuscitation drugs, fluids and blood
    - can be given safely
    - will reach the heart rapidly
    - access is safe, simple and rapid
    - for children of all ages and adults
    - by tibial technique, 2–3 cm below the knee

19.05 Delirium with acute confusion and aggression
F03

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 clear of 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:
- impaired awareness
- confusion
- disorientation

Other symptoms may also be present:
- restlessness
- agitation
- hallucinations
Trauma and emergencies

- autonomic symptoms such as sweating, tachycardia and flushing
- patients may be hypo-active, with reduced responsiveness to the environment
- a fluctuating course and disturbances of the sleep-wake cycle are characteristic
- aggressiveness
- violent behaviour alone occurs in exceptional cases only

Risk factors for delirium include
- extremes of age
- HIV infection
- pre-existing dementia
- cerebrovascular disease
- pre-existing neurological disease e.g. epilepsy
- drugs such as anticholinergics and hypnotics
- substance intoxication and withdrawal

Checklist for diagnosis:

D – drugs
I – infections
M – metabolic
T – trauma
O – oxygen deficit
P – psychological and perceptual

Management objectives
- stabilise the patient
- identify and treat the underlying cause

Emergency treatment
Non-drug treatment
non-organic, non-psychotic causes
- calm the patient
- manage in a safe environment

Drug treatment
if the delirium is caused by substance withdrawal or if communication is difficult
- diazepam, IV, 10–20 mg for immediate sedative or hypnotic action
- do not administer at a rate over 5 mg/minute
or
- lorazepam, IM, 2–4 mg
or
- lorazepam, IV, 1–2 mg, administered slowly
  ▪ 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, 5–10 mg, immediately

Referral
all cases as soon as possible

19.06 Exposure to poisonous substances
T65.8

Note: Poisoning from agricultural stock remedies is notifiable.

Description
Poisoning may occur by ingestion, inhalation and skin absorption. The rapid and positive identification of the poison is essential. The poison can be identified by simple inspection or by assessing the smell or odour, except in suspected cyanide exposure. Suspect poisoning from the signs and symptoms after common infections and chronic diseases, e.g. diabetes mellitus have been excluded.

Treatment depends on:
• type of poison
• method of poisoning
• time lapsed since poisoning
• condition of the patient

Management objectives
• identify the poison and keep a sample of the poison or the empty poison container
• prevent further absorption of the poison
• maintain vital functions
• reverse the effects of the poison

Non-drug treatment
• education on prevention of poisoning
• emphasize that drugs and poisons should be stored out of reach of children
• contact the nearest hospital or poison centre for advice
MAJOR POISON INFORMATION CENTRES

Gauteng: (011) 678 2332 Pharmnet Amayeza Info Centre

Free State:
(051) 401-3111
(051) 401-3177
082 410 4229

Western Cape:
Tygerberg: (021) 931 6129
Red Cross: (021) 689 5227

Emergency management
• if the patient is unconscious, perform resuscitation ABCD (see section 19.04)
• take a history and identify the nature and route of poisoning
• thoroughly wash off any poison on the skin and remove splashed clothes

Note
Health care workers should avoid inhaling or having skin contact with the poison.

Ingested poisons

Gastric lavage is usually recommended, except in:
• coma
• convulsions
• strong acids or alkalis e.g. battery acid, caustic soda, hydrochloric acid
• petroleum products, e.g. paraffin
• decreased level of consciousness
In these circumstances vomiting will also harm the patient.
Inducing vomiting is not recommended in children.

Use a large orogastric tube of between 24–36F. A 36F tube may be used from 1 year of age. Rough guide: an orogastric tube, the size of the patient’s little finger, can be passed orally.
Use sodium chloride 0.9%, 15 mL/kg per cycle with a maximum of 200–400 mL where a known toxic poison or drug has been taken in a dose that is likely to pose a danger.
• activated charcoal – as soon as possible after the ingestion

<table>
<thead>
<tr>
<th>Poisons where charcoal is ineffective and should not be given</th>
<th>Poisons where charcoal may particularly be useful if poison taken in toxic dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ethanol</td>
<td>• carbamazepine, barbiturates, phenytoin</td>
</tr>
<tr>
<td>• methanol</td>
<td>• dapsone, quinine</td>
</tr>
<tr>
<td>• essential oils, including brake fluid</td>
<td>• theophylline</td>
</tr>
<tr>
<td>• petrol or paraffin</td>
<td>• salycilates</td>
</tr>
<tr>
<td>• iron salts</td>
<td>• mushroom poisoning (Amanita phalloides)</td>
</tr>
<tr>
<td>• lithium</td>
<td>• slow release preparations</td>
</tr>
<tr>
<td>• bleach and caustic alkalis</td>
<td>• digoxin</td>
</tr>
<tr>
<td>• boric acid</td>
<td>• sotalol</td>
</tr>
<tr>
<td>• mineral acids</td>
<td>• piroxicam</td>
</tr>
</tbody>
</table>

children
• activated charcoal, via an oro- or nasogastric tube
• 1–2 g/kg activated charcoal mixed with 50–100 mL of water
• shake well and ensure that all the charcoal has been wetted
• remove by suction or with purgatives
• repeat until a total of 100 g charcoal has been ingested and recovered

adults
• activated charcoal, via an oro- or nasogastric tube
• 50 g activated charcoal mixed with 400 mL water in a 500 mL bottle
• shake well and ensure that all the charcoal has been wetted
• remove by suction or with purgatives
• repeat until a total of 100 g charcoal has been ingested and recovered

Specific antidotes
for the management of hypoxia, especially in carbon monoxide poisoning:
onxygen

for the treatment or organophosphate and carbamate poisoning:
• atropine, IV
children – 0.05 mg/kg
adults – initial dose 1 mg, repeat doses are 2–4 mg
  ▪ repeat the dose every 10–15 minutes if no adverse effects until there is control of oral bronchial secretions, thereafter continued infusion of 0.05 mg/kg per hour
in the treatment of opioid drug overdose:

• naloxone, IV, 0.4–2 mg at appropriate intervals. Maximum dose: 10 mg. All patients need to be kept under direct observation until the effect of the opiates has completely worn off.

Referral

• all patients

Further doses of naloxone may be needed while awaiting and during transport as naloxone has a short duration of action.

! CAUTION !

in some patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours – this must not prevent the use of naloxone

paracetamol poisoning:

Acetylcysteine should be given within 8 hours of ingestion but can be initiated up to 24–36 hours after ingestion.

children:

• acetylcysteine, IV, 150 mg/kg in dextrose 5% (5 mL/kg body mass) over 15 minutes as a loading dose
  ▪ then 50 mg/kg in dextrose 5% (5 mL/kg body mass) over the next 4 hours by continuous infusion
  ▪ then 100 mg/kg in 5% dextrose (10 mL/kg body mass) over 16 hours. This can be repeated until recovery.

  (Figures for volume assumes normal renal function and cardiac output)

adults:

• acetylcysteine, IV, 150 mg/kg in 200 mL dextrose 5% over 15 minutes as a loading dose
  ▪ then 50 mg/kg in 500 mL dextrose 5% over the next 4 hours by continuous infusion
  ▪ then 100 mg/kg in 1 L 5% dextrose over 16 hours. This can be repeated until recovery.
convulsions:
neonates up to 3 months of age
• phenobarbital, IM, 20 mg/kg

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Ampoule (200 mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>0.1 mL</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>0.2 mL</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>0.3 mL</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
<td>0.4 mL</td>
</tr>
</tbody>
</table>

• diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose. Half the dosage may be repeated after 10 minutes if convulsions continue (exclude hypoglycaemia!)

(diazepam for injection 10 mg in 2 mL is used undiluted)

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Ampoule (10 mg/2 mL)</th>
<th>Approx age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>2.5 kg</td>
<td>0.5 mL</td>
<td>6 months–1 year</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>5 mg</td>
<td>1 mL</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>7.5 mg</td>
<td>1.5 mL</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>10 mg</td>
<td>2 mL</td>
<td>8–12 years</td>
</tr>
</tbody>
</table>

adults:
• diazepam, IV, 10–20 mg administered at a rate of 2 mg/minute until seizures stop

Referral
• all patients with severe poisoning, i.e. poisoning accompanied by
  ▪ fast breathing
  ▪ suppressed breathing
  ▪ uncontrolled vomiting
  ▪ lethargy
  ▪ unconsciousness
  ▪ confusion
  ▪ uncontrolled blood sugar
  ▪ severe dehydration
• all patients in whom the ingested poison is known or thought to be serious including:
  ▪ petroleum and paraffin products
  ▪ corrosives acids and alkalis
  ▪ iron preparations
  ▪ insecticides
Trauma and emergencies

NB
send the following to hospital with the patient:
• written information
• a sample of the poison or the empty poison container
• any vomitus

Eye, chemical burn
(See Chapter 16)
T26.5

19.08 Eye injury, foreign body
(See Chapter 16)
S05.9 / S05.5

19.09 HIV prophylaxis, post exposure (PEP)
Z29.2

19.09.1 Penetrative sexual abuse or sexual assault
T74.2

Management Objectives
• psychological support of the victim and family
• prevent or minimise the unwanted complications of the assault
  ▪ physical trauma
  ▪ psychosocial trauma
  ▪ sexually transmitted infections
  ▪ pregnancy
• support the due legal process
  ▪ medical documentation of evidence
  ▪ collection of appropriate specimens
• conduct baseline investigations
  ▪ HIV test
  ▪ RPR
  ▪ hepatitis screening
  ▪ vaginal swabs for acid phosphatase and microbiology after consent

Non-drug treatment
• obtain informed consent from the patient and written consent from parent in case of minors before HIV testing and PEP. Children over the age of 14 years may sign their own consent.
• the patient’s HIV-status should be determined before initiating PEP. Prophylaxis
given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance.

- it is the patient’s choice to have immediate HIV testing. **No PEP will be given in the case of refusal of HIV testing.**
- a patient presenting after 72 hours will not be given PEP but should be counselled about the possible risk of transmission. HIV testing should still be offered at the time of presentation and 3 months later.
- perform a pregnancy test before initiating PEP
- pregnant rape patients should be referred
- HIV Elisa positive tested sexually abused children under the age of 15 months must be referred to have an HIV DNA PCR (polymerase chain reaction) performed. If HIV uninfected or if the child has no access to PCR, they should receive prophylaxis.
- explain the side effects of the ARV drugs, e.g. tiredness, nausea and flu-like symptoms.
- emphasise the importance of compliance with ARV treatment
- counsel all sexually assaulted patients and caregivers in the case of children
- psychosocial support
- medical risks, e.g. transmission of sexually transmitted infections including HIV, hepatitis-B and pregnancy
- psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity
- identify need for support and refer if needed
- discuss issues relating to stress management at subsequent visits.
- post traumatic stress may eventually cause exhaustion and illness. Inform the patient of the signs and symptoms of post traumatic stress, including:
  - general irritability
  - trembling
  - pain in neck and/or lower back
  - change in appetite
  - change in sleep pattern
- medico-legal assessment of injuries
- complete appropriate registers

**Note**

Refer very young or severely traumatised children to a specialised unit or facility. Children with external signs of genital trauma may need an examination under anaesthesia and should be referred. Trauma to the genital area increases transmission. The character of the exposure should be classified as:

- low risk – non receptive or non traumatic intercourse
- high risk – penetration and traumatic intercourse
Trauma and emergencies

Blood tests
• the patient should sign a consent form for both testing and PEP
• voluntary rapid HIV testing should be made available and should be done on all opting for PEP
• further blood tests should include full blood count (FBC)
• a full blood count should be repeated at 2 and 4 weeks
• blood should be taken at 6 weeks, 3 months and 6 months for HIV testing

Drug treatment

Note
• if the patient presents within 72 hours of being raped, PEP should be offered
• consent for HIV testing must be obtained from all patients before initiating PEP
• initiate PEP as soon as possible provided the patient is not HIV-infected prior to the incident
• for low risk exposure, initiate dual therapy
• for high risk exposure and children with very physically traumatic assaults, refer for management of these physical injuries and to consider the use of triple therapy. During referral dual therapy should be initiated immediately.
• in children under the age of 15 months antiretroviral therapy should be used while arranging transfer and awaiting confirmation of HIV results
• initiating therapy within 24 hours is most likely to be effective at preventing transmission of HIV
• for those refusing an HIV test, no PEP will be provided
• do a pregnancy test in all women and female adolescents. In the case of children who are clearly pre-pubertal this is omitted.

if not pregnant:
STI prophylaxis
children under 8 years:
• ceftriaxone, IM
  under 25 kg 125 mg
  over 25 kg 250 mg

adults:
(See section 10)
• post-coital contraception to prevent unintentional pregnancy
• norgestrel 0.5 mg and ethinyl oestradiol 0.05 mg, oral, 2 tablets immediately and 2 tablets 12 hours later
• an anti-emetic if needed
Hepatitis-B vaccination (see section 11)

**PEP treatment**

**children:**

As the body surface area is very difficult to calculate, the following guidelines are provided:

- zidovudine, oral, 12 hourly. Maximum 300 mg/dose.
  - 6 months–3 years  9 mg/kg/dose
  - 4–12 years  7.5 mg/kg/dose

- lamivudine, oral, 4 mg/kg/dose 12 hourly. Maximum 150 mg/dose.

Dosages may be varied by up to 1 mg/kg/dose more or less to allow a convenient volume of medication.

In children needing more than the maximum dose, use the adult dosage regimen.

**adults**

- zidovudine, oral, 300 mg 12 hourly for 28 days
- lamivudine, oral, 150 mg 12 hourly for 28 days
  - initially supply medication for 2 weeks. Evaluate patient after 2 weeks at which the remainder of the PEP treatment should be supplied.

Follow up visits should be at 6 weeks, 3 months and 6 months after the rape. HIV testing should be performed at each of these visits.

**Referral**

- all patients with severe physical or psychological injuries
- infants with significant evidence of sexual assault need referral after beginning dual therapy as soon as possible

**Note**

Refer if there are inadequate resources with regard to:

- counselling
- laboratory for testing
- medico-legal examination
- drug treatment
19.09.2 Occupational post-exposure HIV prophylaxis to health-care workers (HCW)

Description
Exposure to infectious material from HIV seropositive patients including:
• blood
• CSF
• semen
• vaginal secretions
• synovial, pleural, pericardial, peritoneal, amniotic fluid

The risk of acquiring HIV following occupational exposure is estimated at 0.3%. The risk increases 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

These are all high-risk injuries.
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 counseling should be offered.

Drug treatment
• initiate PEP immediately after the injury and within 72 hours. Do not wait for the test results on the source patient and health care worker.
• with very high risk exposures treatment may be considered beyond 72 hours. The risks of prophylaxis in this setting may outweigh the benefits.
• initiation of HIV prophylactic treatment beyond 7 days after exposure should not be considered
• prophylaxis should be continued for 4 weeks
• PEP should not be offered for exposures to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva
• it is not indicated for health care workers who are HIV-infected or when the source is HIV sero-negative unless there are features suggesting seroconversion illness. Continue prophylaxis until the results of additional tests are available. These cases should be discussed with virologists.
Trauma and emergencies

- test for HIV infection at the time of the exposure and again at 6 weeks, 3 months and 6 months
- advise about the need to take precautions, e.g. condom use, to prevent infection of their own sexual partners, should seroconversion occur
- stop PEP if HIV test is positive at the time of the injury
- perform full blood count after 2 and 4 weeks on PEP

Combinations of anti-retroviral drugs are more active in the treatment of HIV infection.
- lamivudine, oral, 150 mg 12 hourly
  - zidovudine, oral, 300 mg 12 hourly

With high-risk exposures the addition of a third agent, a protease inhibitor, is recommended.
* High risk HIV source patients include terminal AIDS, seroconversion illness or known to have a high viral load.

<table>
<thead>
<tr>
<th>Exposure of healthcare worker</th>
<th>HIV status of source patient</th>
<th>Unknown</th>
<th>Positive</th>
<th>High risk*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intact skin</td>
<td>No PEP</td>
<td>No PEP</td>
<td>No PEP</td>
<td>No PEP</td>
</tr>
<tr>
<td>Mucosal splash or non-intact skin</td>
<td>Consider zidovudine + lamivudine</td>
<td>Recommend zidovudine + lamivudine</td>
<td>Recommend zidovudine + lamivudine</td>
<td></td>
</tr>
<tr>
<td>Percutaneous - sharps</td>
<td>Recommend zidovudine + lamivudine</td>
<td>Recommend zidovudine + lamivudine</td>
<td>Recommend zidovudine + lamivudine</td>
<td></td>
</tr>
<tr>
<td>Percutaneous needle in vessel or deep injury</td>
<td>Recommend zidovudine + lamivudine</td>
<td>Recommend zidovudine + lamivudine + protease inhibitor</td>
<td>Recommend zidovudine + lamivudine + protease inhibitor</td>
<td></td>
</tr>
</tbody>
</table>

**Referral**
- patients in need of a protease inhibitor
Note
Refer if there are inadequate resources with regard to:
• counselling
• laboratory for testing
• medico-legal examination
• drug treatment

19.10 Hyperglycaemia and ketoacidosis
See section 3

19.11 Hypoglycaemia and hypoglycaemic coma
E16.2

Description
Hypoglycaemia is a blood sugar less than 2.5 mmol/L and can rapidly cause irreversible brain damage and/or death.

Clinical features include:
• sympathetic stimulation
• pallor
• sweating
• tachycardia
• abdominal pain
• hunger
• neurological
• headache
• irritability
• impaired concentration
• confusion
• delirium
• coma
• convulsions
• transient aphasia or speech disorders

There may be few or no symptoms in the following situations:
• chronically low blood sugar
• patients with impaired autonomic nervous system response, e.g.:
  • the elderly
  • very ill
  • malnourished
  • those with long-standing diabetes mellitus
  • treatment with beta-blockers
People at risk of hypoglycaemia:
- neonates with low birth weight or ill or not feeding well
- malnourished or sick children
- shocked, unconscious or convulsing patients
- alcohol binge
- liver disease
- diabetics on treatment developing abnormal behaviour or symptoms
- in diabetics
  - decreased food intake
  - increased exercise
  - faulty insulin technique or dosage
  - may be a marker of deteriorating renal function

Management objectives
- diagnose and treat hypoglycaemia
- identify the cause

Emergency treatment
- obtain blood for glucose determination immediately
- establish blood glucose level with glucometers or testing strip

**Conscious patient, able to feed:**
- breastfeeding child – administer breast milk
- older children and adults – sweets, sugar, glucose by mouth

**Or**

**Children and adults**
- oral sugar solution
  - dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of water

**Conscious patient, not able to feed without danger of aspiration:**
- dextrose 5% or milk or sugar solution via nasogastric tube

**Unconscious patient:**
- **Children**
  - dextrose 10%, IV, 5 mL/kg
  - 10% solution – dilute 1 part dextrose 50% to 4 parts water for injection
IV administration of dextrose in children with hypoglycaemia

• establish an IV line
• take a blood sample for emergency investigations and blood glucose
• check blood glucose
  ▪ if low, i.e. less than 2.5 mmol/L or if testing strips are not available:
    by rapid IV injection, administer 5 mL/kg of 10% glucose solution rapidly
• recheck the blood glucose in 30 minutes
  ▪ if still low, repeat 5 mL/kg of 10% glucose solution
• feed the child as soon as conscious

adults
• dextrose 50%, IV, 50 mL immediately and reassess. Followed by dextrose 10% solution.

in alcoholics
• thiamine, IV, 100mg immediately. If no access to veins, use the nasogastric route.

NB: thiamine should be administered prior to intravenous glucose to prevent permanent neurological damage

Referral
• all patients

19.12 Injuries
T14

Description
Soft tissue injury may present as follows:
• pain only
• traumatic swelling
• bruises with intact skin
• cuts
• abrasions
• puncture wounds
• other open wounds of varying size and severity
Injury to internal organs must be recognised and referred:
• including subtle signs of organ rupture
• 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 19.02)
An injury causing a sprain or strain may be overlooked, e.g. sport, exercise, sleep, and the symptoms appear late.
Exclude fractures, even when treatment with rest and ice is instituted.
Closed injuries and fractures of long bones may be serious and damage blood vessels. Contamination with dirt and soil complicates the outcome of treatment.

**Management objectives**
• stop obvious bleeding
• prevent further damage
• avoid infection
• relieve pain and swelling
• prevent tetanus

**Emergency management**
• immobilise injured limb
• monitor heart rate
• monitor pulses below an injury on a limb with swelling

**Wound care**
• clean the wound
• suture or splint when needed
• avoid primary suture if the wound is:
  ▪ infected
  ▪ dirty or contaminated
  ▪ crushed
  ▪ in need of debridement
  ▪ projectile inflicted
  ▪ caused by bites
Drug treatment
paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Syrup (120 mg/5 mL)</th>
<th>Tab (500 mg)</th>
<th>Approx Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
</tr>
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<td>—</td>
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<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>

Continue treatment for 1 week with periodic reviewing

tetanus prophylaxis:
• tetanus adsorbed toxoid vaccine (TT), IM, 0.5 mL

unimmunised or not fully immunised patients:
• human tetanus immunoglobulin (TIG), IV, 250 IU

Note
In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin might produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Referral
URGENT
• extensive closed or open wounds
• injury to vital structures or internal organs
• sepsis
• shock
• anaemia
• blood in the urine
• infants and young children
• enlarging and/or pulsating swelling

19.13 Myocardial infarction, acute (AMI)
I21.9

Description
AMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and intensive care management.
NB: Not all features have to be present.
The major clinical feature is severe chest pain with the following characteristics:
- site – retrosternal or epigastric
- quality – crushing or burning pain or discomfort
- radiation – to the neck and/or down the inner part of the left arm
- duration – at least 20 minutes, lasting to several hours
- occurs at rest
and is associated with:
- pallor
- sweating
- arrhythmias
- pulmonary oedema
- a drop in blood pressure

Management objectives
- support and maintain vital functions
- alleviate pain and anxiety
- stabilise heart rhythm and blood pressure
- reduce further damage to the heart muscle

Emergency treatment before transfer
Cardio-pulmonary resuscitation if necessary (see section 19.04)
- oxygen, 100%, continuously by nasal cannula
NB: aspirin soluble, oral, 300 mg as a single dose as soon as possible

For pain relief:
- morphine, IM, 10–15 mg
or
- morphine, IV, small increments of 1 mg/minute and titrate for pain relief to a maximum of 10 mg. Dilute IV morphine to 10 mL with water for injection or sodium chloride 0.9%.
- isosorbide dinitrate, sublingual, 5 mg every 5–10 minutes as needed for pain to a maximum of 5 tablets
- streptokinase, IV, 1.5 million IU diluted in 100 mL dextrose 5% or sodium chloride 0.9% and given over 30–60 minutes
Only for confirmed ST-elevation myocardial infarction or new LBBB, if patient presents within 6 hours of onset of pain.
Trauma and emergencies

<table>
<thead>
<tr>
<th>! CAUTION !</th>
</tr>
</thead>
<tbody>
<tr>
<td>• blood pressure may decrease and pulse rate may increase after administration of streptokinase</td>
</tr>
<tr>
<td>• do not stop streptokinase when there is a drop in blood pressure however,</td>
</tr>
<tr>
<td>• discontinue streptokinase if patient shows manifestations of impending shock</td>
</tr>
</tbody>
</table>

monitor continuously and also during transfer
• pulse
• blood pressure
• respiration depth and rate (count for a full minute)

Referral

URGENT
• all suspected or diagnosed cases

19.14 Nose bleed (epistaxis)

Description
Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking and occurs from the anterior and inferior area of 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 into both nostrils.
Identify the cause and refer the patient if necessary.

Referral
• recurrent nose bleeds
• attempt to stop the present bleed
• to identify the cause
19.15 Pulmonary oedema, acute

Description
A life-threatening condition with abnormal accumulation of fluid in the lungs. Acute heart failure is a common cause.

Persons with pulmonary oedema may present with acute bronchospasm. It is important to distinguish this condition from an acute attack of asthma.

! CAUTION !
morphine is contraindicated in acute asthma

Management objectives
• establish the cause and treat
• reduce the respiratory and cardiac workload by:
  ▪ reducing agitation
  ▪ inducing transient arterial and venous dilatation
  ▪ decreasing the respiratory rate
  ▪ slowing down the heart rate

Emergency treatment
Place the patient in a sitting or semi-Fowler’s position.

children:
• oxygen, 100%, using face mask to deliver 40% oxygen
or
• oxygen, 100%, using nasal canula at 2–3 L per minute
• furosemide, IV, 1–2mg/kg immediately
Do not administer any IV fluids.

adults:
• oxygen, 100%, using face mask, to deliver 40% oxygen
• furosemide, IV, 40 mg to start diuresis in 15–20 minutes
if no response:
• furosemide, IV, 80 mg after 30 minutes
if response is inadequate follow with:
• furosemide, IV, 40 mg in 2–4 hours
• morphine, IV, 1 mg per minute. Maximum dose 5 mg
and/or
• isosorbide dinitrate sublingual 5–10 mg 4 hourly

pulmonary oedema due to a hypertensive crisis:
• treat the hypertension with ACE inhibitors
(see section 5.03)

Referral
URGENT
• all cases
Continue oxygen during transfer.

19.16 Shock
R57.9

Description
A life-threatening syndrome in which peripheral blood flow and tissue perfusion are inadequate.
Poor peripheral perfusion leads to:
• inadequate oxygen delivery
• anaerobic metabolism
• increased production of lactic acid

Clinical manifestations include:
• systolic BP under 80 mmHg
• altered mental status
• low urine output or oliguria
• clammy and pale extremities, often cyanotic, with poor capillary refill

Causes of shock include:
• hypovolaemia due to acute haemorrhage or increased loss of other body fluids (hypovolaemic shock). In children gastro-enteritis is a common cause.
• cardiogenic shock
• extracardiac obstructive mechanisms such as pulmonary embolism
• traumatic shock
• maldistribution of blood flow due to increased vascular permeability occurring in anaphylactic or septic shock
Prompt diagnosis of the underlying causes is essential to ensure optimal treatment.

**Management objectives**
- restore peripheral tissue perfusion and oxygenation

**Emergency management**
- support vital functions
- keep patient warm
- position with legs raised
- control haemorrhage
- exclude cardiac causes of shock before initiating fluid resuscitation

**children**
- Ringer-Lactate, IV, 20 mL/kg over 20 minutes

**if the child becomes more distressed during the administration of the fluid bolus:**
- stop the infusion immediately
- furosemide, IV, 1 mg/kg.

**Referral**
- all patients as soon as possible after stabilisation

### 19.17 Shock, anaphylactic

**T78.2**

**Description**
A very severe allergic reaction that may occur after an injection or exposure to any allergen.

Clinical features include:
- collapse with shock
- hypotension
- bronchospasm
- laryngeal oedema
- tachycardia

**Management objectives**
- restore cardiovascular function as soon as possible
- prevent severe reactions by identifying and avoiding the allergen
- arrange for a medical alert disc or bracelet and ensure the wearing of the medical alert discs
- counsel patient regarding prevention, early warning signs and management principles
Emergency treatment
- resuscitate (ABCD) immediately, (see section 19.04)

Drug treatment
Adrenaline is the mainstay of treatment and should be given immediately, IV, SC or endobronchial.

children
- if unconscious:
  - adrenaline, IV, 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL
    - 0.1 mL/kg of dilution
  or
- for cardio-respiratory arrest:
  - adrenaline, endobronchial, 1:1 000, undiluted 0.1 mL/kg through endotracheal tube, repeat every 5 minutes when necessary for a maximum of three doses
  or
- if the above routes are not accessible:
  - adrenaline, SC, 1:1 000, undiluted 0.1 mL/kg immediately, repeat every 10–20 minutes as needed. Ensure that the heart rate does not exceed 140 beats per minute.

adults
- if unconscious:
  - adrenaline, IV, 1:1 000, 1 mL diluted with sodium chloride 0.9% to 10 mL as a slow IV
  or
- for cardio-respiratory arrest:
  - adrenaline, endobronchial, 1:1 000, undiluted 1 mL through endotracheal tube, repeat every 5 minutes when needed for a maximum of three doses
  or
- if the above routes are not accessible:
  - adrenaline, SC, 1:1 000, undiluted 1 mL immediately, repeat every 10–20 minutes as needed. Ensure that the heart rate does not exceed 140 beats per minute.
  - hydrocortisone sodium succinate, IV, 100 mg immediately

to counteract ongoing histamine release:
children
- promethazine, IM, 0.25 mg/kg

adults
- promethazine, IM, 25–50 mg
Referral
• all patients

Note
Adrenaline administration may have to be repeated due its short duration of action. Close observation during transport is essential.

19.18 Sprains and strains
T14.3

Description
Soft tissue injuries.

Clinical features include:
• pain, especially on movement
• tenderness on touch
• limited movement
• history of trauma

May be caused by:
• sport injuries
• slips and twists
• overuse of muscles
• abnormal posture

Note
In children always bear non-accidental injuries (assault) in mind.

Management objectives
• exclude serious injuries
• exclude infection
• immobilise affected area and relieve pain

Emergency treatment
• immobilise with firm bandage and/or temporary splinting
Trauma and emergencies

**children over 12 years and adults**
- ibuprofen, oral, 200–400 mg 8 hourly with or after a meal
- paracetamol, oral, 4–6 hourly, when required to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
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<td>5 mL</td>
<td>—</td>
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<tr>
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</tr>
</tbody>
</table>

**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

**19.19 Status epilepticus**

**Description**
This is a medical emergency.

A series of seizures follow one another lasting more than 30 minutes with no intervening periods of normal neurological function. The seizure may be generalised or partial, convulsive or non-convulsive.

Hypoglycaemia may cause convulsions.
Status epilepticus has the potential for causing high mortality.

**Management objectives**
- ensure adequate ventilation and oxygenation to prevent hypoxic brain damage
- control convulsions
- identify and treat causes such as hypoglycaemia and intoxication
- maintain life-support measures during referral
Emergency treatment

Non-drug treatment
- place the patient in a lateral - prone position
- do not place anything in the patient’s mouth
- do not try to open the patient’s mouth
- maintain airway
- assist respiration and give 100% oxygen
- prepare for suction and intubation
- check blood glucose
- monitor vital signs every 15 minutes
- establish an IV line

Drug treatment
neonates up to 3 months of age:
- phenobarbital, IM, 20 mg/kg

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Ampoule (200 mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kg</td>
<td>20</td>
<td>0.1 ml</td>
</tr>
<tr>
<td>2 kg</td>
<td>40</td>
<td>0.2 ml</td>
</tr>
<tr>
<td>3 kg</td>
<td>60</td>
<td>0.3 ml</td>
</tr>
<tr>
<td>4 kg</td>
<td>80</td>
<td>0.4 ml</td>
</tr>
</tbody>
</table>

children
- diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose. Half this dose may be repeated after 10 minutes if convulsions continue (exclude hypoglycaemia!)

(diazepam for injection 10mg in 2 mL is used undiluted)

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Ampoule (10 mg/2 mL)</th>
<th>Approx age</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–10 kg</td>
<td>2.5 mg</td>
<td>0.5 mL</td>
<td>6 months–1 year</td>
</tr>
<tr>
<td>10–18 kg</td>
<td>5 mg</td>
<td>1 mL</td>
<td>1–5 years</td>
</tr>
<tr>
<td>18–25 kg</td>
<td>7.5 mg</td>
<td>1.5 mL</td>
<td>5–8 years</td>
</tr>
<tr>
<td>25–50 kg</td>
<td>10 mg</td>
<td>2 mL</td>
<td>8–14 years</td>
</tr>
</tbody>
</table>

- maximum of 10 mg within 1 hour
- expect a response within 1–5 minutes
if convulsions are not controlled:
• phenobarbital, IM, 5–8 mg/kg

adults
• diazepam, slow IV, 10–20 mg. Infusion rate not to exceed 2 mg/minute
  ▪ repeat within 10–15 minutes if needed
  ▪ maximum dose: 30 mg within 1 hour
  ▪ expect a response within 1–5 minutes
  ▪ once the seizures are controlled an infusion of 5 mg/hour may be given
and
irrespective of prior phenytoin treatment
• phenytoin, IV, 15–20 mg/kg in sodium chloride 0.9% at a rate not exceeding 50 mg/kg/minute. Do not use dextrose containing fluid.
or
• phenytoin, oral or by nasogastric tube at a loading dose of 15 mg/kg. Maximum initial dose: 400 mg, with the balance divided in doses of 400 mg or less given 4 hourly until the loading dose of 15 mg/kg is reached.

! CAUTION !
avoid diazepam IM since absorption is slow and erratic
do not mix with other drugs

Referral
URGENT
any child where the seizures cannot be controlled within 1 hour

Referral
• all patients once stabilised
Clinical notes including detail on medication given should accompany patients.
Chapter 20 – Human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS)

Drugs used in this section
- aciclovir
- amitriptyline
- calamine
- codeine
- gentian violet
- hydrocortisone 1%
- isoniazid
- multivitamin
- paracetamol
- pyridoxine
- vitamin A (retinol)
- albendazole
- antifungal lozenge (troche)
- chlorpheniramine
- fluconazole
- griseofulvin
- imidazole
- nystatin
- paracetamol/codeine
- trimethoprim/sulfamethoxazole

20.01 Human immunodeficiency virus infection in adults
B33.3

Description
HIV enters lymphocytes and replicates, leading to progressive destruction of the immune system, until the infected person becomes unable to fight infection and develops the syndrome of Acquired Immune Deficiency Syndrome (AIDS).

When HIV infection first occurs a non-specific illness is common. During the course of this illness the antibodies change from positive to negative. This is known as seroconversion or primary infection and is characterised by:
- glandular fever type illness
- maculopapular rash
- small orogenital ulcers

WHO staging system for HIV infection and disease in adults and adolescents

Clinical stage I
- primary HIV infection
- asymptomatic
- persistent generalized lymphadenopathy

Performance scale 1: asymptomatic, normal activity
HIV/AIDS

Clinical stage II
• weight loss, less than 10% of body weight
• minor mucocutaneous manifestations (seborrheic dermatitis, prurigo, fungal nail infections, recurrent oral ulcerations, angular cheilitis)
• herpes zoster (shingles) within the last five years
• recurrent upper respiratory tract infections (i.e. bacterial sinusitis)
Performance scale 2: symptomatic, normal activity

Clinical stage III
• weight loss, more than 10% of body weight
• unexplained chronic diarrhoea of more than 1 month
• unexplained prolonged fever (intermittent or constant), more than 1 month
• oral candidiasis (thrush)
• oral hairy leukoplakia
• pulmonary tuberculosis within the past year
• severe bacterial infections (i.e. pneumonia, pyomyositis)
Performance scale 3: bedridden less than 50% of the day during the last month

Clinical stage IV
• HIV wasting syndrome: weight loss of more than 10% of body weight, plus either of the following persisting for more than one month
  ▪ unexplained chronic diarrhoea
  ▪ chronic weakness
  ▪ unexplained prolonged fever
• *Pneumocystis carinii* pneumonia
• recurrent bacterial pneumonia
• cancer of the cervix
• toxoplasmosis of the brain
• cryptosporidiosis with diarrhoea more than 1 month
• cryptococcosis, extrapulmonary
• cytomegalovirus disease of an organ other than the liver, spleen or lymph nodes
• herpes simplex virus infection, mucocutaneous more than 1 month, or visceral any duration
• progressive multifocal leukoencephalopathy
• any disseminated endemic mycosis (i.e. histoplasmosis)
• candidiasis of the oesophagus, trachea, bronchi or lungs
• atypical mycobacteriosis, disseminated
• non-typhoid *salmonella* bacteraemia
• extrapulmonary tuberculosis
• lymphoma
• Kaposi’s sarcoma
HIV/AIDS

- HIV encephalopathy, clinical findings of disabling cognitive and/or motor dysfunction interfering with activities of daily living, progressing over weeks to months, in the absence of a concurrent illness or condition other than HIV infection which could explain the findings.

Performance scale 4: bedridden more than 50% of the day during the last month

Diagnosis
- adequate pre- and post-test counselling must be provided
- ensure patient confidentiality
- HIV in adults must be confirmed with a second test. This can either be two rapid tests, using kits from different manufacturers or with a laboratory test, usually ELISA.
- there is a window period of up to 3 months in which antibodies are not detected by blood tests. This is the time period between becoming infected and the appearance of antibodies, which are detectable by blood tests.

Management objectives
- prevent disease transmission
- prevent and treat complications
- relieve symptoms
- adjust lifestyle

Non-drug treatment
- 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

20.01.1 Opportunistic infections, prophylaxis in adults

Primary prophylaxis with trimethoprim/sulfamethoxazole prevents many infections, e.g.:
- *Pneumocystis carinii* pneumonia
- toxoplasmosis
- bacterial pneumonia
- bacteraemia and isosporiasis (a cause of chronic diarrhoea in HIV)
**HIV/AIDS**

**Indications for primary prophylaxis:**
- WHO Clinical stage III or IV for HIV infection and disease in adults and adolescents
- CD4 count less than $200 \times 10^6$/L
- total lymphocyte count less than $1.25 \times 10^9$/L - use this if CD4 count is unavailable

Prophylaxis may be discontinued if the CD4 count increases to more than 200 on antiretroviral therapy.
- trimethoprim/sulfamethoxazole, oral, 160/800 daily

Patients with mild symptoms of intolerance, continue treatment add:
- chlorpheniramine, oral, 4 mg 8 hourly
If not tolerated, refer.

**Note**
- trimethoprim/sulfamethoxazole intolerance is common in late disease and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of trimethoprim/sulfamethoxazole, the drug must be immediately and permanently stopped.
- if a patient is referred back on antiretroviral agents, and the CD4 count has risen to more than 200, prophylaxis with trimethoprim/sulfamethoxazole can be stopped.

**20.01.2 Opportunistic infections, treatment in adults**

**Fungal nail infections**

B50.5

**Description**
Nail becomes thickened, brittle and discoloured. In HIV infection, more than one nail can become involved.
**Management objectives**
- treat the infection

**Non-drug treatment**
- keep the nails short

**Drug treatment**
- griseofulvin oral, 500 mg, once daily for a minimum of 8 weeks. Take with fatty meals or milk. Doctor-initiated.

**Note**
Toe nail infections have a very poor response to treatment and should generally not be treated.

**Referral**
- no response to therapy

**Fungal skin infections**

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<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>B50.5</td>
<td>Fungal skin infections</td>
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</table>

See section 6.05

**Gingivitis, acute necrotising ulcerative**

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<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>K05.1</td>
<td>Gingivitis, acute necrotising ulcerative</td>
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</tbody>
</table>

See section 1.03

**Herpes Zoster (Shingles)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B20.3</td>
<td>Herpes Zoster (Shingles)</td>
</tr>
</tbody>
</table>

**Description**
Painful vesicular rash in a dermatomal distribution presenting as a band on one side of the body, due to recrudescence of the varicella-zoster virus that cause chickenpox. The elderly and HIV-infected are most affected. Severe pain can occur after shingles has healed, post-herpetic neuralgia.

**Management objectives**
- relieve pain
- improve the condition
HIV/AIDS

Drug treatment
if fresh vesicles are present and preferably within 72 hours of onset:
• aciclovir, oral, 800 mg five times daily for 7 days. Doctor-initiated.

if secondary infection is present:
• erythromycin, oral, 500 mg 6 hourly

pain relief:
• paracetamol/codeine, oral, 1 000 mg/20 mg 3 to 4 times a day when needed

for prolonged pain occurring after shingles has healed:
• amitriptyline, oral, 25 mg at night.
  ▪ increase dose to 50 mg after two weeks
  ▪ and to 75 mg after a further two weeks.

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

Candidiasis, oral
B20.4

See section 1.02

Eczema, seborrhoeic
L30.9

See section 6.04.2

Papular pruritic eruption
L30.9

Exclude scabies
• chlorpheniramine, oral, 4 mg 3 times daily
for itching:
- calamine lotion, applied on the skin
- hydrocortisone 1% cream, applied twice daily for 7 days
  - apply sparingly to the face
  - do not apply around the eyes

**Candida oesophagitis**

**B20.4**

**Description**
Infection of the oesophagus with candida, a fungus causing oral thrush. Almost all cases will be HIV infected. Occurs in patients with oral thrush who have pain or difficulty on swallowing. (See section 1.0.1)

**Management objectives**
- treat the infection

**Non-drug treatment**
- maintain hydration

**Drug treatment**
- fluconazole, oral, 200 mg daily for 14 days

**Referral**
- inability to swallow
- frequent relapses

**Diarrhoea, HIV associated**

**A08.3**

See section 2.06.3

**Herpes simplex ulcers, chronic**

**B20.3**

**Description**
Painful ulcers due to herpes simplex virus, involving the skin around the anogenital area or mouth in patients with advanced HIV infection. Ulcers persist for weeks and may be several centimeters in diameter.
HIV/AIDS

Ulcers in the anogenital area fail to respond to syndromic treatment for genital ulcers (see section 10.13)

Management objectives
• relieve pain
• treat ulcers

Non-drug treatment
Keep affected areas clean with soap and water or diluted antiseptic solution.

Drug treatment
• aciclovir, oral, 400 mg 8 hourly for 10 days

pain relief:
• paracetamol/codeine, oral 1 000 mg/20 mg 3 to 4 times a day when needed

Referral
• no response to therapy
• frequent relapses

Meningitis, cryptococcal
B45.1

Description
Fungal meningitis occurring in advanced HIV infection. Presents with headache, lasting for weeks. Neck stiffness is often absent. Decreased level of consciousness and fever are common.

Management objectives
• relieve pain
• treat the infection

Non-drug treatment
Therapeutic lumbar puncture for severe headaches, removing 10-20 mL of cerebrospinal fluid or reduce CSF pressure to less than 18 cm of water, if facilities exist at PHC, otherwise refer.
Drug treatment
- amphotericin B initially for up to 2 weeks in hospital
- fluconazole, oral, 400 mg daily for 8 weeks

pain relief:
- paracetamol/codeine, oral 1 000 mg/ 20 mg 3 to 4 times a day when needed

secondary prophylaxis:
- fluconazole, oral, 200 mg daily

Referral
- all patients for initial management in hospital
- treatment unavailable at clinic level

Pneumonia, bacterial
J15.9

See section 15.07

Pneumonia, Pneumocystis carinii
B20.6

See section 15.07

Toxoplasmosis
B58.9

- trimethoprim/sulfamethoxazole, oral, 320/1 600 mg 12 hourly for 4 weeks, then 160/ 800 mg 12 hourly for 12 weeks, in hospital.

Secondary prophylaxis:
- trimethoprim/sulfamethoxazole, oral 160/ 800 mg daily.

Tuberculosis (TB)
B20.0

See section 15.08
TB chemoprophylaxis

Patients with HIV infection are more susceptible to TB infection than HIV-negative patients.

The indication for preventive therapy is a Mantoux 5 mm or larger or a recent TB contact. Initiate only once active disease is excluded.

- isoniazid, oral, 300 mg daily for 6 months
  - educate patients on the symptoms of hepatotoxicity and the need to be followed up monthly. Instruct patient to present early if these symptoms arise
- pyridoxine, oral, 25 mg once daily

Note
Only some primary care facilities are able to do Mantoux testing and exclude TB reliably. Consult with local TB Programme managers.

20.02 Human immunodeficiency virus infection in children

Description
HIV enters lymphocytes and replicates, leading to progressive destruction of the immune system, until the infected person becomes unable to fight infection and develops the syndrome of Acquired Immune Deficiency Syndrome (AIDS).

Infants infected with HIV during pregnancy, birth or breast-feeding may be initially well and later follow one of three patterns:
- in a quarter of them, the virus replicates rapidly and the child present with signs of infection in the first year of life
- many children present with symptoms between the first and fifth year of life
- approximately 5–10% remain asymptomatic until 8 years of age

When an older child acquires HIV, the infection begins with an acute non-specific flu-like illness followed by several years of good health. However, during this period immune cells are progressively being destroyed. Later, opportunistic or common infections and some malignancies occur and may be life threatening.
WHO staging system for HIV infection and disease children

Clinical stage I
- asymptomatic
- generalised lymphadenopathy

Clinical stage II
- unexplained chronic diarrhoea
- persistent or recurrent candidiasis
- weight loss or failure to thrive
- persistent fever
- recurrent severe bacterial infections

Clinical stage III
- AIDS defining opportunistic infections
- severe failure to thrive
- progressive encephalopathy
- malignancy
- recurrent septicaemia

Risk factors
HIV infection should be suspected in the following situations:
- exposure to infection from infected mothers
- sexual abuse

Diagnosis
Adequate pre- and post-test counselling must be provided.
Ensure patient confidentiality.
Antibody tests, e.g. HIV antibody rapid test and HIV ELISA test will determine the response of the body to the virus and not directly the presence of virus.
- A positive antibody test in an infant less than 15 months of age:
  - may reflect maternal antibody rather than infection in the child. If the child has features of symptomatic HIV infection, it is very likely that the child is HIV infected. The test should be repeated when the child is 15–18 months old to confirm if HIV infection is present or absent, especially in a child without signs suggestive of HIV infection.
- A positive antibody test in a child over the age of 15 months:
  - two HIV antibody tests are performed. This can either be two rapid tests (using kits from different manufacturers) or with a laboratory test (usually ELISA).
HIV/AIDS

- **A negative antibody test:**
  - means that the infant is not HIV infected, provided, that the infant has not received breast milk in the previous 6 months.
  - If the infant has received any breast milk in the previous 6 months and the mother is HIV infected, the test should be repeated 6 months after stopping breastfeeding to confirm that the child is truly HIV negative.
  - In the period between becoming infected and the development of antibodies, the antibody test may be negative, “the window period”.

Management Objectives

- provide guidance on how to prevent HIV infection (See section 7.05.4 Prevention of Mother To Child Transmission of HIV)
- counsel and test for HIV in parents and children
- prevent the transmission of HIV from mother to child
- prevent opportunistic and common infections
- provide psychological, family and social support
- provide nutritional support
- maintain immunisation schedule and prophylactic treatment

Knowledge about HIV/AIDS is constantly being updated. Practices may require changes based on the latest information.

Non-drug treatment

- ensure that a well-balanced diet is maintained
- support all members of the family
- psychosocial support
- community support

Drug treatment

- multivitamin syrup, oral, daily
  - less than 6 months 2.5 mL
  - 6 months – 5 years 5 mL
  - over 5 years 10 mL

- vitamin A, oral, according to the national protocol
  - at 6 weeks non-breastfed infants 50 000 IU
  - at 6 months 100 000 IU
  - at 1 year and 6 monthly thereafter until the age of 5 years 200 000 IU
in areas with high prevalence of intestinal worms or if signs of worms or malnutrition:
• albendazole, oral, 400 mg single dose every six months after the first year of life

20.02.1 Opportunistic infections, prophylaxis in children

Immunisation
Z26.9

Normal schedule should be followed. Siblings should also be fully immunised. BCG should not be given to children with symptomatic HIV. (See section 11 Immunisation)

Pneumonia, *Pneumocystis carinii*
B20.6

See section 15.06 Pneumonia

**When can prophylaxis be stopped?**
For infants less than 12 months of age, prophylaxis should continue until HIV infection has been ruled out.

**When should prophylaxis be continued?**
Prophylaxis should be continued for life if HIV infected child has:
• an episode of PCP pneumonia
• symptomatic HIV disease
• had three pneumonia episodes

TB Chemoprophylaxis
B20.0

See section 15.08

Bacterial infections, recurrent
B20.1

• trimethoprim/sulfamethoxazole, oral, 1.25 mL/kg daily 5 days a week, e.g. Monday to Friday
20.02.2 Opportunistic infections, treatment in children

Candidiasis, oral (thrush), recurrent
B20.4

- nystatin suspension, oral, 100,000 IU/mL, 0.5 mL after each feed. Keep nystatin in contact with affected areas for as long as possible.

or

- gentian violet, 0.5%, aqueous solution, applied to the inside of the mouth three times daily. Continue for 48 hours after cure.

Candidiasis, oesophageal
B20.4

- fluconazole, oral, 3–6 mg/kg per day as a single daily dose for 21 days

Skin conditions
B20.7

These are common and include scabies, seborrhoeic eczema and others. See section 6. If no response to simple care as in skin conditions section, refer.

Measles and chickenpox
B20.7

Children who have contracted or are exposed to measles and chickenpox should be referred.

Diarrhoea
B23.8

See section 2.06

Tuberculosis (TB)
B20.0

TB should be considered earlier in non-resolving pneumonias. Tuberculin tests are often not reliable and a negative test does not exclude TB. If TB is suspected but cannot be proven, refer for diagnosis.
Manage children with TB according to the national TB guidelines (See section 15.07)

**Lower respiratory tract infection, acute**

B23.8

See section 15 Respiratory conditions

### 20.02.3 Developmental delay or deterioration

B23.8

Refer for assessment

### 20.02.4 Anaemia

B23.8

See section 4.01

### 20.03 Palliation

Respite care in hospital or hospice or help in the home by volunteers, etc. can provide relief from the burden of nursing a dying family member and providing care at the same time.

Counseling, listening, caring and loving can provide relief from grief and bereavement.

**Pain relief:**

See section 18.09.1 Chronic pain control

**fever relief:**

- tepid sponging
- paracetamol, oral, 4–6 hourly, when needed to a maximum of four doses daily

<table>
<thead>
<tr>
<th>Weight kg</th>
<th>Dose mg</th>
<th>Syrup 120 mg/5 mL</th>
<th>Tab 500 mg</th>
<th>Approx Age years</th>
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</thead>
<tbody>
<tr>
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<td>60</td>
<td>2.5 mL</td>
<td>—</td>
<td>3–12 months</td>
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<td>—</td>
<td>1 tab</td>
<td>8–14 years</td>
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<tr>
<td>over 50 kg and adults</td>
<td>1000</td>
<td>—</td>
<td>2 tabs</td>
<td>14 years and older</td>
</tr>
</tbody>
</table>
The National Essential Drugs selection process is based upon a well-developed network of provincial, district and institutional Pharmacy and Therapeutics committees.

Motivations for inclusion in the list will only be considered if:
- The prescribed form has been fully completed.
- The motivators’ contact details are complete.
- The drug name has been stated.
- The submission has been evaluated and approved by the provincial Pharmacy and Therapeutics Committee (PTC).
- The indication has been clearly stated.
- All relevant comparator drug/s have been listed.
- There is sufficient evidence to support the proposed amendment.

Motivations may address major or minor amendments.

Major amendments include:
- new indications
- new therapeutic entities
- new therapeutic classes

All major amendments must be supported by evidence reflecting safety, efficacy and cost of the medicine compared to an already listed drug for the same indication. A major amendment may also include motivations for drugs not listed and for conditions not addressed in the EDL. In such cases submissions must be supported by demographic data.

Minor amendments include:
- new formulations
- combination therapies of existing essential drugs

For minor amendments the supporting evidence should be relevant to the nature of amendment.

Screening
Motivations are screened by the Rational Selection Group (RSG) at the National Department of Health to ensure that:
- the submission has been approved by the provincial PTC
- the motivators' contact details are included
- the drug can be identified in terms of the INN
- an indication has been included
- relevant comparator drug/s have been identified with their corresponding dosing regimens
- there are supporting references to substantiate the request
Guidelines on EDL review process & submission for amendments

RSG will compile a review of the prevailing cost of therapy.

Submissions that have been accepted by RSG are tabled at the relevant technical subcommittee for allocation to a suitably qualified reviewer who compiles a technical report. This technical report summarizes a review of the submitted data in terms of the following:

- relative safety
- relative efficacy
- practice environment – the focus here being efficacy relative to current EDL drugs
- pharmacoeconomic evaluation

The report is then presented to the technical subcommittee. The committee may request further information from the applicant through the province or commission a literature search and review.

The technical subcommittee will make recommendations to the National Essential Drug List Committee (NEDLC) for approval or rejection. Where the NEDLC is of the opinion that further review is required the decision will be sent back to the technical subcommittee for further review.

The data elements of the submission form

The motivation form is divided into 5 sections.

Section 1: Proposal

The proposal consists of:

a) The International Nonproprietary Name (INN) of the medicine – this identifies a pharmaceutical substance or active pharmaceutical ingredient by a unique name that is globally recognized and is public property. A nonproprietary name is also known as a generic name.

b) Level of Care - indicate whether the proposed medicine should be listed for use at primary care (PHC) or hospital level (Note drugs at PHC level are automatically included at the hospital level).

c) Prescriber level - indicate the level of competency required to prescribe the drug.

Section 2: Motivators' Details

The NEDLC will acknowledge all submissions and communicate decisions with supporting arguments where appropriate. This section therefore forms a vital link between the motivator and the decision making process.
Section 3: Proposed Indications

a) Indication
Points to consider:
• The EDL targets those conditions that are the most prevalent in South Africa. Where the motivator suggests an indication not currently reflected in the EDL, a brief motivation based upon South African epidemiological data must be included as an annexure.
• The indication allows for the identification of the appropriate comparator in the current EDL.
• Many drugs have multiple indications. However, not all are equally cost effective.

b) Proposed Regimen
This data will be used for cost comparison and is very important for pharmacoeconomic evaluation.

c) Cost assessment
The information is necessary for the determination of affordability. It is expected that the provincial PTC will deliberate about the affordability during their review prior to submission to NEDLC. For this reason, this data is considered mandatory at the national level.

Section 4: Drugs on the current EDL for the same indication

As a principle, the addition of an EDL item should replace an existing item. This is of particular importance when safety and economic implications are taken into account.

Evidence
Evidence is a vital component of the submission and review process. Evidence does not constitute a drug decision and merely informs the strength of the argument. It forms the basis upon which the decision is made and allows for transparent scrutiny of the decision as well as facilitating the review.

Evidence is required in support of:
• relative efficacy
• relative safety
• pharmacoeconomic benefits

Note
Evidence needs to be relevant to the South African context. Multinational or foreign studies must be supported by a motivation of the relevance of both the outcome measures as well as socio-economic facets to the South African context.
Guidelines on EDL review process & submission for amendments

The inclusion of at least one relevant reference is mandatory. A copy of the full journal article should be included in order to expedite the review process.

Section 5: For use at national level only

This section is intended to ensure that the submissions have followed the proper process.
# Motivation Form for the Inclusion of a Drug on the National Essential Drugs List

Please complete Sections 1 to 4 in full.

**NB** - Only use INN (International Nonproprietary Name/Generic names) on this form.

## Proposed Drug

For Inclusion on the Essential Drug List for

- PHC
- Hospital
- Check all appropriate blocks
- Primary Health Care - 1
- Medical Officer - 2
- Specialist - 3
- Designated Specialist - 4

[Submission Date]

PTC Title

## Proposed Indication

See reverse side for the level of evidence schedule.

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<thead>
<tr>
<th>Indication</th>
<th>Proposed Regimen</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Dose</td>
</tr>
</tbody>
</table>

| Level Of Evidence | Ia Meta-analysis | Ib Randomized Controlled Trial | IV Expert committee | V Clinical experience |

## Drugs on the Current EDL for the Same Indication

<table>
<thead>
<tr>
<th>Drug</th>
<th>Indication as per list above</th>
<th>Current</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Route</td>
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### SECTION 5

**FOR NATIONAL USE ONLY**

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<tr>
<th>Correspondence</th>
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<tbody>
<tr>
<td>Evidence</td>
<td>No of articles submitted</td>
<td></td>
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</tbody>
</table>

For National Evaluation

- Yes
- No
- Further evidence

Decision

- Accepted
- Rejected
### Motivator’s Details

<table>
<thead>
<tr>
<th>Title</th>
<th>Code</th>
</tr>
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<tbody>
<tr>
<td>Name</td>
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</tr>
<tr>
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<td>Code</td>
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<tr>
<td>Fax No</td>
<td>Code</td>
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<tr>
<td>Postal Address</td>
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<tr>
<td>E Mail</td>
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### Section 2

#### Cost assessment

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<th>Cost/Unit</th>
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<th>Cost per Course / Month</th>
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<td>Days</td>
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<td>R</td>
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<tr>
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<td>Days</td>
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<td>hourly</td>
<td>Days</td>
<td>R /</td>
<td>R</td>
<td>R</td>
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</table>

I Controlled study with no randomization  III Comparative, correlation or case control study

NB The literature review on the reverse side must support this

#### Cost regimen

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<th>Cost per Day</th>
<th>Cost per Course / month</th>
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</thead>
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<td>hourly</td>
<td>Days</td>
<td>R /</td>
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<tr>
<td>hourly</td>
<td>Days</td>
<td>R /</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>

Can Be Replaced by Proposed Drug

Yes / No

Request for more evidence

Drug | Standard Therapeutic Guideline New/Change | Prescriber level
--- | ---------------------------------------- | -----------------
<table>
<thead>
<tr>
<th>Levels of Evidence</th>
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<tbody>
<tr>
<td>Ia Meta-analysis</td>
</tr>
<tr>
<td>Ib Randomized</td>
</tr>
<tr>
<td>Controlled Trial</td>
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<tr>
<td>II Controlled</td>
</tr>
<tr>
<td>study with no</td>
</tr>
<tr>
<td>randomization.</td>
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<tr>
<td>III Comparative</td>
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<tr>
<td>correlation or case</td>
</tr>
<tr>
<td>study</td>
</tr>
<tr>
<td>IV Expert committee</td>
</tr>
<tr>
<td>V Clinical experience</td>
</tr>
</tbody>
</table>

### Evidences (articles or abstracts) included with your submission

<table>
<thead>
<tr>
<th>Heading</th>
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<tbody>
<tr>
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<td>Journal name</td>
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<td>Included</td>
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</table>

### Comments

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DISEASE NOTIFICATION PROCEDURES

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

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

Process
Forms involved

<table>
<thead>
<tr>
<th>Form</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>GW17/5</td>
<td>initial diagnosis (complete immediately)</td>
</tr>
<tr>
<td>GW17/3</td>
<td>line list of cases (complete weekly)</td>
</tr>
<tr>
<td>GW17/4</td>
<td>line list of deaths (complete weekly)</td>
</tr>
</tbody>
</table>

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

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

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

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

All the reporting units should submit their disease notifications to reach the district no
later than 9 days after the end of the reporting week. A reporting week is normally taken from Sunday to Saturday. Thus, the weekly notifications are normally expected by the following Monday.

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

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

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

Complete reporting is needed when doing surveillance on rarely occurring diseases as well as for the elimination of diseases (e.g. polio eradication in SA by 2000 – surveillance of Acute Flaccid Paralysis).
FLOW CHART
Procedure to follow with notifiable medical conditions

Diagnosis
can be any health worker, not necessarily a Doctor

GW 17/5
immediately

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

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

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

computer disks
e-mail
weekly

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

computer disks
e-mail
weekly

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

Acute flaccid paralysis
Anthrax
Brucellosis
Cholera
Congenital syphilis
Crimean-Congo haemorrhagic fever
Other haemorrhagic fevers of Africa
Diphtheria
Food poisoning
Haemophilus Influenza type B
Lead poisoning
Legionellosis
Leprosy
Malaria
Measles
Meningococcal infection
Paratyphoid fever
Plague
Poisoning agricultural stock remedies
Poliomyelitis
Rabies
Rheumatic fever
Tetanus
Tetanus neonatorum
Trachoma
Tuberculosis primary
Tuberculosis pulmonary
Tuberculosis of other respiratory organs
Tuberculosis of meninges
Tuberculosis of intestines, peritoneum
Tuberculosis of bones and joints
Tuberculosis of genito-urinary system
Tuberculosis of other organs
Tuberculosis miliary
Tuberculosis total
Typhoid fever
Typhus fever (lice-borne)
Typhus fever (rattle-borne)
Viral hepatitis type A
Viral hepatitis type B
Viral hepatitis non-A non-B
Viral hepatitis unspecified
Viral hepatitis total
Whooping cough
Yellow fever
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 two dedicated Units responsible for the monitoring of the safety of medicines. The National Adverse Drug Event Monitoring Centre (NADEMC) in Cape Town monitors the safety of all registered medicines in South Africa. In addition, a focused surveillance unit at MEDUNSA is responsible for monitoring the safety of anti-retroviral (ARV) medicines and complementary medicines. The unit at MEDUNSA is also responsible for monitoring the safety of unregistered medicines used during clinical trials.

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) or adverse reaction as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?
All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

What happens to a report?
All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

- Additional investigations into the use of the medicine in South Africa
- Educational initiatives to improve the safe use of the medicine
- Appropriate package insert changes to include the potential for the reaction
- Changes in the scheduling or manufacture of the medicine to make it safer
The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

**Will reporting have any negative consequences on the health worker or the patient?**

An adverse drug reaction report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and 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 the medicine caused the event.

What Product Quality Problems should be reported?
The following product quality problems should be reported:
• Suspected contamination
• Questionable stability
• Defective components
• Poor packaging or labeling
• Therapeutic failures

How can ADRs be prevented from occurring?
Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?
An Adverse Drug Reaction/Product Quality Report Form is enclosed in this book and should be completed in as much detail as possible before returning it by fax or post to any of the addresses provided below. Additional forms can be obtained by contacting the MCC at these addresses. Report forms may also be accessed via the following website: http://www.mccza.com

1. The Registrar of Medicines
   Medicines Control Council, Department of Health, Private Bag X828
   Pretoria, 0001
   Tel: (021) 312 0295; Fax: (021) 3123106

2. The National Adverse Drug Event Monitoring Centre (NADEMC)
   C/o Division of Pharmacology, University of Cape Town,
   Observatory, 7925
   Tel: (021) 447 1618; Fax: (021) 448 6181

3. MEDUNSA Pharmacovigilance Unit
   Fax (012) 521 4335
ADVERSE DRUG REACTION AND PRODUCT QUALITY PROBLEM REPORT FORM

PATIENT INFORMATION
Name (or initials): .............................................. Age: ......................... Weight (kg): .........................
Sex: [M] [F] DOB: .......... / ........ / ........ Height (cm): .........................

ADVERSE REACTION/PRODUCT QUALITY PROBLEM
Adverse reaction[1] and/or Product Quality problem[2] Date of onset of reaction: .......... / ........ / ........
Time of onset of reaction: ..........h...........min

Description of reaction or problem (Include relevant tests/lab data, including dates):

1. MEDICINES/VACCINES/DEVICES (include all concomitant medicines)

<table>
<thead>
<tr>
<th>Trade Name &amp; Batch No.</th>
<th>Daily Dosage</th>
<th>Route</th>
<th>Date Started</th>
<th>Date Stopped</th>
<th>Reasons for use</th>
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ADVERSE REACTION OUTCOME (Check all that apply)

- death
- disability
- congenital anomaly
- required intervention to prevent permanent impairment/damage
- life-threatening hospitalisation
- Other

Event reappeared on rechallenge: [Y] [N] [Rechallenge not done]
Treatment of reaction:

Recovered: [Y] [N]
Sequelae: [Y] [N]
Describe Sequelae:

COMMENTS: (e.g. Relevant history, Allergies, Previous exposure, Baseline test results/lab data)

2. PRODUCT QUALITY PROBLEM:

<table>
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<th>Trade Name</th>
<th>Batch No</th>
<th>Registration No</th>
<th>Dosage form &amp; strength</th>
<th>Expiry Date</th>
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Product available for evaluation?: [Y] [N]

REPORTING DOCTOR/PHARMACIST Etc:

NAME: ............................................... QUALIFICATIONS: ........................................
ADDRESS: ........................................ Signature ................................ Date

TEL: ........................................

This report does not constitute an admission that medical personnel or the product caused or contributed to the event.
ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:
- medications (drugs, vaccines and biologicals)
- medical devices (including in-vitro diagnostics)
- traditional and herbal remedies
- For Adverse Events Following Immunisation (AEFI), please follow the reporting procedure recommended by the Expanded Programme in Immunisation (EPI)

Please report:
- adverse drug reactions to recently marketed products
- serious reactions and interactions with all products
- adverse drug reactions which are not clearly reflected in the package insert.

Report even if:
- you’re not certain the product caused the event
- you don’t have all the details

Report Product Quality Problems such as:
- suspected contamination
- questionable stability
- defective components
- poor packaging or labelling
- therapeutic failures

Important numbers:
- Investigational Products and Product Quality Problems:
  - (012) 326-4344 to fax a report
  - (012) 312-0000 to report by phone
- Registered Medicines and Traditional and Herbal remedies:
  - (021) 448-6181 to fax a report
  - (021) 447-1618 to report by phone
- Adverse Events Following Immunisation:
  - (012) 312 0110 to phone for information
  - (012) 321 9882 to fax a report

Confidentiality: Identities of the reporter and patient will remain strictly confidential.

Your support of the Medicine Control Council’s adverse drug reaction monitoring programme is much appreciated. Information supplied by you will contribute to the improvement of drug safety and therapy in South Africa.

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ABBREVIATIONS

ABCD Airways, Breathing, Circulation, Drip/Doctor/Drugs
ACE angiotensin-converting enzyme
AIDS acquired immunodeficiency syndrome
AMI acute myocardial infarction
BCG Bacillus Calmette-Guerin vaccine
BP blood pressure
C Celsius
cap capsule
CCF congestive cardiac failure
CCU Critical Care Unit
CD4 cluster designation 4
cm centimetre
CNS central nervous system
COAD chronic obstructive airways disease
COPD chronic obstructive pulmonary disease
CPR cardio-pulmonary resuscitation
CSF cerebro-spinal fluid
DC direct current
dL decilitre (10ml)
DNA deoxyribonucleic acid
DOTS directly observed therapy short-term
DPT diphtheria, pertussis and tetanus vaccine
DT diphtheria and tetanus vaccine
E ethambutol
ECG electrocardiogram
ELISA enzyme-linked immunosorbent assay
EPI Expanded Programme on Immunisation
FBC full blood count
FBG fasting blood glucose
FEV₁ forced expiratory volume in 1 second
FTT failure to thrive
g gram
GIT gastro intestinal tract
H isoniazid
Hb haemoglobin
HCW health care worker
Hep B hepatitis B vaccine
Hib *Haemophilus influenzae* type B vaccine
HIV human immunodeficiency virus
IDDM insulin dependent diabetes melitis
IM intramuscular
ISO International Organisation for Standardisation
IU international units
IUCD intrauterine contraceptive device
IV intravenous

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<td>kg</td>
<td>kilogram</td>
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<tr>
<td>L</td>
<td>Litre</td>
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<tr>
<td>LBBB</td>
<td>left bundle branch block</td>
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<tr>
<td>mcg</td>
<td>microgram</td>
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<tr>
<td>MDR TB</td>
<td>multiple drug resistant tuberculosis</td>
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<td>mg</td>
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<td>mL</td>
<td>millilitre</td>
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<td>mmHg</td>
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<td>mmol</td>
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<td>MU</td>
<td>million units</td>
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<td>NSAID</td>
<td>non-steroidal anti-inflammatory</td>
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<td>OPV</td>
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<td>ORS</td>
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<td>PCP</td>
<td>Pneumocystis carinii pneumonia</td>
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<td>PCR</td>
<td>polymerase chain reaction</td>
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<td>PEFR</td>
<td>peak expiratory flow rate</td>
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<td>PEP</td>
<td>post exposure prophylaxis</td>
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<td>RHZE</td>
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<td>RIG</td>
<td>human anti-rabies immunoglobin</td>
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<td>road to health</td>
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<td>human tetanus immunoglobin</td>
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<td>tetanus vaccine</td>
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<td>emulsifying ointment</td>
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<td>aqueous cream</td>
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<td>urinary tract infection</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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<td>WR</td>
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