
Incorporating Maliaw Essential Medicines List (MEML) 2009

Ministry of Health
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Foreword

Medicine is a dynamic science and therefore it is important that publications such as the Malawi Standard Treatment Guidelines (MSTG) be revised at short intervals. Revision of the 3rd edition of the MSTG started with a consultative meeting of stakeholders followed by editorial meetings and finally the approval process by members of the National Medicines and Medical Supplies Committee.

The MSTG includes key information on the selection, prescribing, dispensing and administration of medicines. It is designed as a digest for rapid reference and it may not always include all the information necessary for prescribing and dispensing. It should therefore be interpreted in the light of professional knowledge and supplemented as necessary by specialised publication and by reference to product literature.

Pursuant to the African Union Assembly Abuja Declaration of 2005, Malawi like other member states of the Union aims at putting 15% of the National budget towards the health budget. Resources, particularly financial resources for health service delivery are often scarce. Prudent use of these resources through improved diagnosis, rational prescribing, dispensing and use of medicines is paramount. The MSTG aims at standardizing prescribing and dispensing practices.

The 4th edition MSTG provides prescribers and dispensers with the currently recommended treatment as well as preventative schedules for most common disease states found in the country.

I would like to thank all those who took time to review the previous edition. Your contributions are greatly appreciated.

I look forward to your continued support and contributions to future reviews of the MSTG and other relevant publications.

C.V. Kang’ombe
SECRETARY FOR HEALTH
References

The following are national guidelines or reference text which should be consulted for further information on specific areas or topics:

- Malawi National Medicine List, MOHP, 2008
- Malawi Prescribers Companion, MOHP, 1993
- Common Medical Problems in Malawi, P A Reeve (ed. J J Wirima)
- Manual of the National TB Control Programme in Malawi, MOHP, 1997
- Infection Prevention Standards, MoH, 2006
- Acute Respiratory Infection Policy, MoH ARI Program,
- Cervical Cancer Service Delivery Guidelines, MoH/JHPIEGO, 2005
- Recommended Guidelines for the practice of safe blood transfusion in Malawi, National blood Transfusion Service/MOHP NACP, 1997
- Malawi National Reproductive Health Service Delivery Guidelines, MoH Reproductive Health Unit, 2007
- National IMCI Chart Booklet, MoH IMCI Unit, 2007,
- MOH Guide for Pre- and Post-test Counselling and AIDS Counselling information.
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The National Medicines and Medical Supplies Committee (NMMC) expresses its gratitude to the following people and organisations without whose support and collaboration the revision of this document would not have been possible:-
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The NMMC is particularly grateful to the cooperating partners WHO and USAID funded Management Sciences for Health Strengthening Pharmaceutical Systems Program (MSH/SPS) for the financial and technical support provided during the review process.
Prescribing Guidelines

1. General points

Consider each of the following general points before writing a prescription:

1.1 Not all patients need a prescription for medicines. Non-medicine treatments and/or giving of simple advice may be more suitable in certain situations.

1.2 Good therapeutics depends on:

- Accurate diagnosis, based on thorough history-taking, necessary careful physical examination and, if required, supporting laboratory testing
- Knowledge of the medicines available
- Careful selection of the appropriate medicines
- Prescribing correctly the selected medicines and
- Ensuring that the patient understands fully how to use each prescribed medicine properly.

1.3 Try to resist patient demand to prescribe injections or other expensive dosage forms. E.g. capsules and oral liquids. Always make an effort to explain to the patient that these may not represent the best form of treatment for the particular condition.

1.4 In life threatening conditions, always prescribe the most effective medicine available irrespective of the cost or limited availability.

1.5 In order to avoid possible confusion, always prescribe medicines by their generic name and not by the brand name e.g. diazepam (not Valium), paracetamol (not Panado) or abbreviations i.e. PCM

1.6 Avoid prescribing combination medicines unless they have a known significant therapeutic advantage over single ingredient preparations.

1.7 When prescribing any medicine, always take into consideration factors such as:

- Patient’s age
- Patient’s sex
- Patient’s weight
- The effect of other diseases present
- Pregnancy
- Breast-feeding
- The likely degree of patient compliance with treatment.
1.8 In all cases the likely benefit of any prescribed medication/s must be weighed against potential risks

1.9 Avoid overuse of symptomatic treatments for minor self-limiting conditions

1.10 Avoid multiple prescribing (polypharmacy), especially when the diagnosis is not clear

2. Prescribing of placebos
2.1 Avoid this whenever possible. Instead spend time reassuring and educating the patient

2.2 If it is absolutely necessary to prescribe a placebo, always choose a safe, cheap medicine which is not essential for the treatment of other important conditions, e.g. multivitamin tablets or vitamin B compound tablets

2.3 Never prescribe injections as placebo

2.4 Never prescribe tranquilizers e.g. diazepam, phenobarbitone, as placebos

3. Prescription writing
   Note: Whenever possible, return all incomplete, inaccurate, illegible or unclear prescriptions to the prescriber for clarification, completion, or correction, before they are presented for dispensing

3.1 Write all prescriptions legibly in ink. Poor writing may lead to errors in interpretation by the dispenser which may have harmful and possibly disastrous consequences for the patient

3.2 Write the full name and address of the patient, and sign and date the prescription form

3.3 Write the name of the medicine or preparation using its full generic name. Do not use unofficial abbreviations, trade names, or obsolete names as these may cause confusion

3.4 Always state the strength of the preparation required where relevant
Prescribing guidelines

3.5 For solid dosage forms:
   • quantities of one gram or more should be written as 1g, 2.5g, 10g, etc
   • quantities of less than one gram but more than one milligram should be written as milligrams rather than fractions of a gram, e.g. 500mg and not 0.5g

3.6 Quantities less than one milligram should be expressed as micrograms (in full) and not as fractions of a milligram, e.g. 100 micrograms rather than 0.1 mg or 100mcg.

3.7 If decimals are used, always write a zero in front of the decimal point where there is no other figure, e.g. 0.5mL and not .5mL

3.8 Always state the full dose regimen, i.e.
   • dose size
   • dose frequency
   • duration of treatment
   The quantity to be dispersed will be deduced from this.

3.9 Avoid use of the direction “to be used/taken as required”. Instead state a suitable dose frequency. In the few cases where ‘as required’ is appropriate, the actual quantity to be supplied should be stated

3.10 Avoid using unknown abbreviations. The following abbreviations can be used when writing a prescription:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>b.i.d. or b.d.</td>
<td>twice a day</td>
</tr>
<tr>
<td>prn</td>
<td>occasionally</td>
</tr>
<tr>
<td>q4h</td>
<td>every 4 hours</td>
</tr>
<tr>
<td>q6h</td>
<td>every 6 hours</td>
</tr>
<tr>
<td>q8h</td>
<td>every 8 hours</td>
</tr>
<tr>
<td>q.i.d or q.d.</td>
<td>4 times a day</td>
</tr>
<tr>
<td>t.i.d. or t.d.</td>
<td>3 times a day</td>
</tr>
<tr>
<td>o.m.</td>
<td>every morning</td>
</tr>
<tr>
<td>o.n.</td>
<td>every night</td>
</tr>
<tr>
<td>nocte</td>
<td>at night</td>
</tr>
<tr>
<td>mane</td>
<td>in the morning</td>
</tr>
<tr>
<td>n et m or n.m.</td>
<td>night and morning</td>
</tr>
</tbody>
</table>
Prescribing guidelines

p.o. by mouth
a.c before meal
p.c. after meals
stat immediately or at once
sig label

3.11 For oral liquids, doses should be stated in terms of 5mL spoonfuls for linctuses, elixirs, syrups and paediatric preparations, and in 10mL spoonfuls for adult mixtures

3.12 Doses other than 5mL or 10mL or multiples of these will be diluted to the nearest equivalent 5mL or 10mL quantity for dispensing

3.13 Total volumes of liquid preparations prescribed are usually selected from 50, 100, 300 or 500mL volumes

3.14 Total quantities of solid or semi-solid preparations prescribed are usually selected from 25, 50, 100, 200, 300, or 500g except where the product is supplied ready packed in a particular pack size, e.g. tetracycline eye ointment (3.5g)

3.15 Where relevant, always remember to include on the prescription any special instructions necessary for the correct use of a medicine or preparation, e.g. “before food” etc.

4. In-patient prescriptions
4.1 Write these prescriptions and records of dispensing and administration on in-patient treatment cards

4.2 Only use one card per patient at any one time

4.3 Clearly state a suitable dose frequency, or time of administration on medicines to be given ‘as required’

4.4 Always state the route of administration for all medicines prescribed

4.5 When any changes or cancellations are made to a prescription card, or if treatment is to be stopped, clearly sign and date the card in the appropriate place
4.6 If the timing of a medicine dosage is critical, ensure that suitable arrangements are made for the medicine to be given at the specific time/s required

5. Guide to quantities to be supplied

5.1 *Oral liquids*

Adult mixtures (10 mL dose)
- 200mL (20 doses)
- 300mL (30 doses)

Elixirs, linctuses and paediatric mixtures (5mL dose)
- 50mL (10 doses)
- 100mL (20 doses)
- 150 mL (30 doses)

5.2 *Preparations used in body cavities*

E.g. ear drops, nasal drops

5.3 *External preparations*

<table>
<thead>
<tr>
<th>Part of body</th>
<th>Semi-solid (g)*</th>
<th>Liquids (mL)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>5-15</td>
<td>100</td>
</tr>
<tr>
<td>Groin and genitalia</td>
<td>15-25</td>
<td>100</td>
</tr>
<tr>
<td>Both hands</td>
<td>25-50</td>
<td>200</td>
</tr>
<tr>
<td>Scalp</td>
<td>50-100</td>
<td>200</td>
</tr>
<tr>
<td>Both arms and legs</td>
<td>100-200</td>
<td>200</td>
</tr>
<tr>
<td>Whole body</td>
<td>200</td>
<td>500</td>
</tr>
</tbody>
</table>

* E.g. creams, pastes, ointments etc
**E.g. lotions, applications, topical solutions, etc (for paints normally 10-25mL is supplied)

6. Prescriptions for controlled medicines

6.1 These medicines are controlled by the Laws of Malawi, The Pharmacy Medicines and Poisons Act, 1988. Consult the relevant sections of the Act for details of the appropriate legal requirements in each case

6.2 Medicines covered by the Act and which are also used in the MSTG are:
- Morphine sulphate injection
- Morphine sulphate solution
Prescribing guidelines

- Pethidine hydrochloride injection
- Morphine sulphate tablets

6.3 These medicines have potential for abuse which may be result in dependence. Carefully record all procedures involving them in the appropriate record books.

6.4 Prescriptions for these medicines may only be written by registered medical practitioners.

6.5 The following legal requirements must also be observed when writing such prescriptions:
   a) the prescription must be in the prescriber’s own handwriting
   b) it must be signed and dated
   c) the prescriber’s address must be shown
   d) the name and address of the patient must be stated
   e) the total amount of the item to be supplied must be stated in words and figures

6.6 It is an offence for the prescriber to issue and for the pharmacy/dispensary to dispense prescriptions for controlled medicines, unless the requirements of the law are fully complied with.

Notes:
   a) In certain exceptional circumstances, senior nurses in charge of departments, wards, or theatres, and midwives, may also obtain and administer certain controlled medicines as part of their work. The relevant sections of the Act should be consulted for the details of the appropriate legal requirements in each case.
   b) Hospital in-patient prescriptions for controlled medicines should be prescribed on a separate prescription as well as written on treatment cards or case sheets and signed/dated by the person administering the medicine.

7. Adverse drug reactions (ADRs)
7.1 Nearly all medicines may produce unwanted or unexpected adverse effects, some of which may be life threatening e.g. anaphylactic shock, liver failure.
7.2 Prescribers should immediately report any serious or unexpected adverse effects thought to be due to a medicine to:

*The Registrar,*

*Pharmacy, Medicines and Poisons Board,*

*PO Box 30241, Lilongwe.*

*Tel: 01 755 165/166 Fax: 01 755 204*

7.3 Rules for prevention of ADRs

a) Never use a medicine unless there is a clear indication for its use
   a. Only use medicines in pregnancy if absolutely essential
   b. Check if the patient has had any previous reactions to the medicine or to similar medicines
   c. Remember to reduce doses when necessary e.g. in the young, the elderly, and if liver or renal disease is present
   d. Always prescribe the minimum number of medicines possible
   e. Carefully explain the dose regimens to patients, especially those on multiple medicines, the elderly and anyone likely to misunderstand
   f. If possible, use medicines with which you are familiar
   g. Look out for ADRs when using new or unfamiliar medicines
   h. Warn patients about likely adverse effects and advise them on what to do if they occur
   i. Patients on certain prolonged treatments e.g. Anticoagulants, corticosteroids, Insulin etc should carry a small card giving information about the treatment

8. **Paediatric prescribing**

8.1 In these guidelines, paediatric medicine doses are usually given according to body weight and not age, and are therefore expressed as mg/kg etc. The main reason for this is that children of the same age may vary significantly in weight.

   Thus it is safer and more accurate to prescribe drugs according to body weight. Moreover, this should encourage the good practise of weighing children whenever possible.

8.2 When a weighing scale is not available, the following graphs showing weight of children from 1-24 months and 2-15 years respectively can be used to estimate the weight of a child of known age after assessment of whether the child appears of average, small or large in size for its age.
Three lines are shown on each graph

- the middle (50th percentile) line shows weight for average children
- the lower (3rd percentile) line shows weights for children who are very small for their age
- the upper (97th percentile) line shows weights for children who are very large for their age

Example: When prescribing for an 8 months old baby who is fatter than usual, (i.e. larger than average weight for age):
- look along the x-axis (age) of the graph to the 8 month mark
Prescribing guidelines

- follow the vertical line from there to the point somewhere between the middle (50th percentile) and top of (97th percentile) lines on the graph
- from there follow a horizontal line left to cut the y-axis (weight)
- the estimated weight is around 10 kg

Example: when prescribing for an $8\frac{1}{2}$ year old thin child, (i.e. less than average weight for age) of years:

- Look along the x-axis (age) of the graph to mid way between the 8 and 9 year marks
- Follow the vertical line from there until it meets the lower (3rd percentile) line on the graph
- From there follow a horizontal line left to cut the y-axis (weight)
- The estimated weight is around 20.5 kg
8.3 Neonates have delayed hepatic and renal excretion of medicines. Therefore give special consideration when prescribing for children less than 30 days old and especially premature infants.

9. Medicine interactions
9.1 Whenever prescribing a particular medicine, care should be taken to avoid problems of interactions with other medicines, whether these are:
   - also prescribed at the same time
   - previously prescribed by another prescriber for the same or another condition and currently being taken by the patient
   - purchased or otherwise obtained by the patient for the purpose of self-medication

9.2 Thus, before prescribing a medicine, *always* obtain details of any other medication currently being taken by the patient

9.3 Where a medicine interacts with alcohol (e.g. metronidazole, diazepam, anti-diabetic medicines, tricyclic antidepressants etc.) remember to counsel the patient to avoid taking alcoholic drinks during the course of treatment and for at least 48 hours after completion of the course

Presentation of Information
   a. Arrangement of sections
      Standard treatments have been grouped in sections according to either body systems (e.g. respiratory conditions, gastrointestinal conditions, etc) or types of disorder (e.g. parasitic diseases, nutritional disorders, etc)

      Use the table of contents, pp ii, to locate the particular section required.

   b. Indexing and Cross-referencing
      All diseases, conditions, tables, etc are included in an index. Extensive cross-references are given in the text, by section number and page number, to facilitate location of other references to the subject elsewhere in the guidelines.

      Use the Index on page 201-208 to quickly find the required subject.
Prescribing guidelines

Prescriber’s guidance points

- These are given for most standard treatments and are key points to be considered before prescribing for a patient with a particular condition.
- Certain points as well as warnings are given added emphasis by inclusion in a boxed border.

Medicine administration

- Unless otherwise specified, the oral route is to be used. Even when a parental route is specified, with medicines which are well absorbed orally and which are available as an oral dosage-form, it is often possible to switch to oral administration once the patient has improved and is able to swallow/tolerate oral medication
- Additional guidance on medicine administration is given, where relevant, as bulleted points after dosage regimen.

Medicine names

- Medicines recommended for use are those on the current Malawi National Medicine List, 2009. Generic names are used and indicated in bold type. Where necessary, proprietary names are indicated in italic type.

Alternative medicines

- These are indicated where appropriate and available for alternative treatment of a particular condition. They should be used only if the recommended medicine is not available or is not suitable for a particular patient.
- In some cases (where indicated) alternative (i.e. 2nd line) medicines may be used when a satisfactory response has not been obtained with the recommended (1st line) medication.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARI</td>
<td>Acute respiratory infections</td>
</tr>
<tr>
<td>ART</td>
<td>Anti retroviral therapy</td>
</tr>
<tr>
<td>BF</td>
<td>blood film examination</td>
</tr>
<tr>
<td>BP</td>
<td>blood pressure</td>
</tr>
<tr>
<td>CSF</td>
<td>cerebrospinal fluid</td>
</tr>
<tr>
<td>CVA</td>
<td>cerebrovascular accident</td>
</tr>
<tr>
<td>CXR</td>
<td>chest x-ray</td>
</tr>
<tr>
<td>DIC</td>
<td>disseminated intravascular coagulopathy</td>
</tr>
<tr>
<td>FBC</td>
<td>Full blood count</td>
</tr>
<tr>
<td>FFP</td>
<td>Fresh Frozen Plasma</td>
</tr>
<tr>
<td>g</td>
<td>gram</td>
</tr>
<tr>
<td>Hb</td>
<td>haemoglobin</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immunodeficiency virus</td>
</tr>
<tr>
<td>i/m</td>
<td>intramuscular</td>
</tr>
<tr>
<td>i/v</td>
<td>intravenous</td>
</tr>
<tr>
<td>IU</td>
<td>international units</td>
</tr>
<tr>
<td>JVP</td>
<td>juvenile venous pressure</td>
</tr>
<tr>
<td>Kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>L</td>
<td>litre</td>
</tr>
<tr>
<td>LP</td>
<td>lumbar puncture</td>
</tr>
<tr>
<td>LRTI</td>
<td>lower respiratory tract infection</td>
</tr>
<tr>
<td>mg</td>
<td>milligram</td>
</tr>
<tr>
<td>mL</td>
<td>milliliter</td>
</tr>
<tr>
<td>mmol</td>
<td>millimole</td>
</tr>
<tr>
<td>MU</td>
<td>mega (1 million) units</td>
</tr>
<tr>
<td>NGT</td>
<td>nasogastric tube</td>
</tr>
<tr>
<td>PCV</td>
<td>packed cell volume</td>
</tr>
<tr>
<td>s/c</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infections</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TTP</td>
<td>Thrombotic thrombocytopenic purpura</td>
</tr>
<tr>
<td>URTI</td>
<td>upper respiratory tract infection</td>
</tr>
</tbody>
</table>
### Metric Units

<table>
<thead>
<tr>
<th>Metric</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kilogram (kg)</td>
<td>= 1,000 grams (g)</td>
</tr>
<tr>
<td>1 g</td>
<td>= 1,000 milligrams (mg)</td>
</tr>
<tr>
<td>1 mg</td>
<td>= 1,000 micrograms</td>
</tr>
<tr>
<td>1 litre (L)</td>
<td>= 1,000 millilitres</td>
</tr>
<tr>
<td>1 ml of water</td>
<td>= 1 g</td>
</tr>
<tr>
<td>1% (m/v)</td>
<td>= 10 mg/mL</td>
</tr>
</tbody>
</table>

### Equivalents

<table>
<thead>
<tr>
<th>Metric</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 litre</td>
<td>= 1.8 pints</td>
</tr>
<tr>
<td>1 pint</td>
<td>= 568.3 mL</td>
</tr>
<tr>
<td>1 kg</td>
<td>= 2.2 pounds</td>
</tr>
<tr>
<td>1 lb</td>
<td>= 453.4 g</td>
</tr>
<tr>
<td>1 ounce (oz)</td>
<td>= 28.35 g</td>
</tr>
</tbody>
</table>
1. Blood and blood disorders

1.0 Blood and blood diseases

1.1 Blood: Guidelines for Appropriate Use

- Refer to the National Transfusion Service/National AIDS Control programme booklet *Recommended Guidelines for the Practice of Safe Blood Transfusion in Malawi* for further details including information on:
  - donor recruitment and selection,
  - blood collection,
  - storage procedures and records,
  - laboratory testing of donor and recipient’s blood,
  - transfusion reactions and
  - clinical aspects of blood transfusion and administration.

- Blood transfusion although having undoubted benefits, also carries serious risks including:
  - Possible transfusion of infections (e.g. HIV and hepatitis)
  - Immune-system related problems (e.g. Intravascular haemolysis)
  - Circulatory overload

- It is expensive and uses a scarce human resource, therefore only prescribe blood if:
  - Less hazardous therapy has been or will be ineffective, and
  - The benefits outweigh the risks involved
  - The decision to transfuse blood has been based on careful assessment of the patient which indicates that it is necessary to save life or prevent major morbidity

- Except in the most exceptional life-threatening situations, always transfuse blood which has been obtained from appropriately screened donors and/or appropriately screened for infectious agents

- Ensure that compatibility testing is carried out on all blood transfused even if, in life-threatening emergencies, this is done after it has been issued.

- Observations of patient’s vital signs should be done every 15 minutes during blood transfusion and 4 hourly after transfusion for the next 24 hours.

1.2 Indications for whole blood or red cell suspension transfusion
1. Blood and blood disorders

1.2.1 Severe anaemia

**Neonates**
- If Hb less than 9 g/dl and requiring oxygen or with haemodynamic disturbance (e.g. shock, heart failure)

**Children and infants**
- If Hb less than 4 g/dl or PCV <12
- If Hb less than 6 g/dl or PCV <18 and there are clinical complications e.g. heart failure

**Dose**
- Transfuse 20ml/kg of whole blood or 10ml/kg of red cell suspension
- In severely malnourished children give 10mls/kg of whole blood over 4 hours and frusemide 1mg/kg should be given with the transfusion

**Pregnancy**
- If Hb less than 7 g/dl at any time during pregnancy
- If Hb less than 10 g/dl during the 3rd trimester

**Adults**
- If Hb less than 6 g/dl
- If Hb less than 7 g/dl and there are clinical complications

**Dose**
- One unit of whole blood or one unit of red cell suspension will raise a patient’s haemoglobin by 1-1.5g/dl

**Pre-operatively Surgery**
- If Hb less than 7 g/dl

1.2.3 Acute haemorrhage with shock *(See Section 1.5 page 4, Table 1)*

1.2.4. Intra-operative use (where necessary)
Note: Do not use whole blood or red cell suspension transfusion to expand blood volume

1.3 Platelets

- Platelets have a short half life of 5 days
- Must be transfused immediately upon arrival. Platelets should never be stored in a refrigerator or blood bank or in the ward.
- Decision to transfuse should be based on a combination of clinical and laboratory findings rather than empirical platelet levels.

1.3.1 Indications for platelets use

- Bleeding due to thrombocytopenia as a result of defective platelet production such as aplastic anaemia or leukaemia
- Increased consumption e.g DIC
- Dilutional effects e.g. in massive transfusion

Note: All patients needing platelets need further investigations, please refer to Central Hospital.

Dose

- 1 unit per 10kg
- For infants under 10 kg, 5ml/kg

1.4 Fresh frozen plasma

- Contains all clotting factors
- Comes in volumes of 200-300 mls
- Fresh frozen plasma (FFP) should be thawed before use using water bath at 30-37 degrees. (If water bath is not available, a plastic basin with lukewarm water or cold tap water can be used.) Never use hot water
- Once thawed, FFP must be used immediately. FFP must never be refrozen.
- The patient needs further investigations; please refer to the central hospital.

1.4.1 Indications for use of fresh frozen plasma

- Replacement of single factor deficiencies (if single factor concentrates are not available)
- Immediate reversal of warfarin effect
- Vitamin K deficiency associated with active bleeding
- Acute disseminated intravascular coagulopathy
1. Blood and blood disorders

- Thrombotic thrombocytopenic purpura (TTP)
- May be used in massive transfusion or liver disease
  
  **Dose**
  
  15-20ml/kg

**Note:** No justification for use in hypovolaemia, nutritional support in protein losing states, plasma exchange except in TTP.

### 1.5 Acute haemorrhage

- In massive haemorrhage i.e. from trauma it is difficult to estimate how much blood a patient has lost. However a good estimate can be made by calculating the patient’s normal circulating volume versus vital signs and other organ function tests. *See Table 1 below.*
- Restoration of blood volume with suitable replacement fluids (*see note above*) is more important than red cell replacement in the management of previously healthy patients who have lost under 30% of their blood volume.
- The need for blood transfusion must be determined by:
  - The amount and speed of blood loss
  - The patient’s vital signs

**Table 1: Assessment of Blood Loss (For a 70 kg adult)**

<table>
<thead>
<tr>
<th></th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood loss (litres)</strong></td>
<td>&lt;0.75</td>
<td>0.75-1.5</td>
<td>1.5-2</td>
<td>&gt;2</td>
</tr>
<tr>
<td><strong>Pulse rate</strong></td>
<td>&lt;100</td>
<td>&gt;100</td>
<td>&gt;120</td>
<td>&gt;140</td>
</tr>
<tr>
<td><strong>BP</strong></td>
<td>Normal</td>
<td>Normal</td>
<td>90/60</td>
<td>&lt;70</td>
</tr>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>&lt;20</td>
<td>&gt;20</td>
<td>&gt;30</td>
<td>&gt;40</td>
</tr>
<tr>
<td><strong>Capillary Refill</strong></td>
<td>&lt;3 seconds</td>
<td>&lt;3 seconds</td>
<td>&gt;3 seconds</td>
<td>&gt;3 seconds</td>
</tr>
<tr>
<td><strong>Mental State</strong></td>
<td>Normal</td>
<td>Anxious</td>
<td>Confused</td>
<td>Lethargic</td>
</tr>
<tr>
<td><strong>Urine output/Hour</strong></td>
<td>&gt;30 mls</td>
<td>20-30 mls</td>
<td>&lt;20 mls</td>
<td>&lt;10 mls</td>
</tr>
<tr>
<td><strong>Replacement fluid vol (L)</strong></td>
<td>2L</td>
<td>2-4.5L</td>
<td>&gt;5L plus 2 units blood</td>
<td>&gt;6L plus 3 units blood</td>
</tr>
</tbody>
</table>

- Replacement fluids which may be used are:
  - **Haemacel**: Replace every 1 ml of blood lost with 1 ml of fluid
  - **Sodium lactate compound** (*Ringers lactate*) i/v infusion or **Normal saline** i/v infusion Replace 1 ml of blood lost with 3 mls of fluid.

**Do not use dextrose 5% or Darrow’s ½ strength in dextrose 5% as replacement fluid**
• Maintain the airway and give oxygen by face mask first, especially for patients in stage 3 and 4. Make sure they are breathing adequately.
• Insert 2 large bore cannulae (gauge 14 or 16) and collect blood samples for full blood count (FBC), grouping and cross-matching.
• Give half of the calculated dose of replacement fluid in the first hour and give the other half over 3 hours.
• Always assess the effects of fluid therapy. Remember to give warm fluids and cover patients to avoid hypothermia.
• Aim at improving oxygen carrying capacity first before correcting anaemia. Remember to add maintenance fluids to the replacement fluid plus any on-going losses.

Note: Maintenance fluids can be calculated as follows:
(i) Adults: Body weight x 1.5mls
(ii) Children: May use the rule of 4.2.1 for children or refer to section on diarrhoea. (Section 7.5 page 42)

• Remember: deficit + maintenance + on-going loss

1.6 Adverse reactions to transfusion

• Suspect an adverse reaction if any of the following occurs:
  ➢ Severe pain at transfusion site or in the back, chest or hand
  ➢ Rise in temperature of 1°C above the baseline
  ➢ Increase in pulse rate of >20/minute above baseline
  ➢ Fall in systolic BP >20 mm Hg
  ➢ Urticaria
  ➢ Rigors
  ➢ Haemoglobinuria
  ➢ Shortness of breath,
  ➢ Wheezing
• If a reaction occurs within 15 minutes then
  ➢ Stop the transfusion.
  ➢ Set up a normal saline infusion in the opposite arm.
  ➢ Inform a clinician.
• If a reaction occurs after 15 minutes then
  ➢ Inform clinician for a decision on what action to take
  ➢ If Medical Officer is not available to assess patient within 15 minutes of being informed stop the transfusion.
1. Blood and blood disorders

1.6.1 Mild reaction

- **Signs and symptoms:** itchy rash

**Treatment**
- Slow the transfusion
- Give **Chlorpheniramine** 10mg i/m stat

**Alternative**
- **Promethazine** 25 mg i/m stat
- Continue transfusion if there is no progression of symptoms after 30 minutes
- If symptoms persist, treat as moderate reaction.

1.6.2 Moderate reaction

- **Signs and symptoms:** Severe itching, urticaria, fever, rigors, tachycardia

**Treatment**
- Stop the transfusion
- Set up a normal saline infusion in the opposite arm
- Inform clinician
- Give **Hydrocortisone** 200mg i/v stat,

**Alternative**
- **Chlorpheniramine** 10 mg i/m stat
- If wheezing, give bronchodilator *see Section 16.2.1 page 137.*
- If no improvement treat as life threatening reaction

1.6.3 Life Threatening Reactions

- Stop blood transfusion, but keep i/v line open with normal saline
- Maintain airway and give oxygen
- Give **Adrenaline** 0.01mg/kg body weight
- Treat shock (*See Section 5.1.1 page 29*)

1.7 Sickle cell disease

- Educate patient and family on the nature and complications of the disease
- Avoid factors precipitating sickle cell crises such as:
  - Dehydration
  - Exposure to cold
  - Extreme physical exercise
1. Blood and blood disorders

- High altitude

**Treatment**

**Anti- malarial prophylaxis**

- **SP 525mg** as a single dose each month

**Alternatively**

- **Proguanil 200mg daily** or **Chloroquine 250mg**

- Encourage to be sleeping under an insecticide treated bed net (ITN) every night

- **Folic acid 5mg** daily

- In children more than 6 months old, long term antibiotic prophylaxis
  
  - **Benzathine penicillin** 1.2 MU i/m once monthly
  
  - < 30 kg: give **Benzathine penicillin** 600,000 MU/dose

  **Alternatively**

  - **Phenoxymethylpenicillin** 250 mg 8 hourly daily
  
  - Refer for further consultation

1.7.1 **Sickle cell disease crisis**

- Consider sickle cell crisis in the following:
  
  - **Dactylitis** – hand foot swelling in early infancy.
  
  - **Painful crisis** – involving muscle, bone, lung and intestines.
  
  - Life threatening decline in haemoglobin levels due to aplastic crisis, sequestration crisis and haemolytic crisis
  
  - **Priapism** – sudden painful onset of a tumescent penis that will not relax. Occurs typically in boys between 6 and 20 years old
  
  - **Stroke**

**Management**

- Rehydration therapy

- Give analgesics usually with narcotics or non steroidal anti-inflammatory drugs *(See Section 24 page 196)*

- Give oxygen

- Consider
  
  - blood transfusion for severe anaemia
  
  - Antibiotics
  
  - Follow-up through monthly clinics

- Diagnose and treat the precipitating caus
2.0 Cardiovascular diseases

2.1 Acute Pulmonary Edema

*Signs and symptoms:* dyspnoea, cough (often with frothy, pink-tinged sputum), tachypnoea, signs of increased respiratory effort and diffuse rales or crackles.

*General measure*

- Prop up patient to sitting position
- Restrict fluids

*Treatment*

- Oxygen therapy
- Drain pleural effusions if present.

*Adults*

- **Furosemide** 40-80 mg slow i/v (over 5 mins). Repeat if required
- **Morphine** 5-10 mg slow i/v and **Metoclopramide** 10mg i/v. Repeat both if required.
- If no response: Give **Aminophylline** 250-500 mg slow i/v (over 10-20 mins)

*Children*

- Give **Morphine** 5-10 mg slow i/v (over 5 mins) Repeat every 4 hours if required
- Give **Furosemide** 1-2mg/kg.
- Specific treatment should be given according to the cause e.g. hypertension

2.2 Congestive Heart Failure

*Signs and symptoms* include tachycardia, hepatomegaly, oedema raised JVP.

- Extra cardiac symptoms may be the primary manifestation in children and these may include tachypnea, wheezing, poor feeding, sweating, cough, excessive weight gain and failure to thrive
- Look for underlying cause or precipitating and aggravating factors (e.g. hypertension, anemia, pericardial effusion, arrhythmia, infection and hyperthyroidism) and treat accordingly.
2. Cardiovascular diseases

**General measures**
- Reduce salt intake
- Prop the patient up on pillows
- Treat underlying cause if possible, e.g. anaemia, rheumatic carditis, hypertension
- Bed rest in severe cases, reduced activity in milder cases,
- Give oxygen if cyanosed or restless

**Treatment**

**Adults**
- **Frusemide** 40-160 mg daily in divided doses plus
  - **Enalapril** 10-20 mg once or twice daily

**Alternatively**
- **Spironolactone** 25mg once daily
- If atrial fibrillation is present add **Digoxin** 0.25mg every 6 hours. on first day then from day two onwards, **Digoxin** 0.125-0.25 mg daily
- If rapid atrial fibrillation is present (heart rate >100/min), a loading dose of 0.75mg – 1mg in divided doses on the first day can be given
- Treat underlying cause

**Note:** Potassium supplementation is not required in patients on frusemide and enalapril or spironolactone.

**Children**
- Give **Frusemide** 1-2 mg/kg orally or i/v once or twice daily

### 2.3 Hypertension

- Diagnosis is based on a raised blood pressure measured while patient is at rest on at least 3 separate readings.
- Hypertension is generally asymptomatic.
- Essential hypertension is unusual in children and young adults and an underlying cause should be excluded at hospital level
- Refer all children with hypertension to a doctor for management
- A child’s expected BP can be calculated as:
  - Mean systolic BP = (age in years x 2) + 80
  - Mean diastolic BP = 2/3 of systolic BP
2. Cardiovascular diseases

- Remember to use the correct cuff size when measuring BP. It should cover 2/3 of the upper arm

**Table 2: Classification of Hypertension**

<table>
<thead>
<tr>
<th>Type of Hypertension</th>
<th>Systolic Blood Pressure</th>
<th>Diastolic Blood Pressure</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>&gt;180</td>
<td>&gt;110</td>
</tr>
</tbody>
</table>

**General measures**

- Reduce salt intake
- Stop smoking
- Regular exercise
- Loose weight
- Avoid excessive alcohol consumption
- Consider medicine treatment for mild hypertension only if the above general measures are unsuccessful

**Treatment**

- Explain to the patient that treatment must be regular (every day), closely monitored and generally has to be taken for life
- Use the following stepped treatment approach with the medicines *in this order* unless there are specific contraindications, co-morbidities or side-effects:

**2.3.1 Stepped anti-hypertensive treatment approach (adults)**

- **Step 1: Hydrochlorothiazide** 25 mg each morning, increasing the dose is not advised
  
  Alternatively
  
  **Bendrofluazide** 2.5 mg each morning. Avoid in pregnancy and breast-feeding

- **Step 2: Hydrochlorothiazide** 25mg once daily and **Amlodipine** 5-10mg once daily
- Where Amlodipine is not available **Nifedipine** 10-20mg slow release tablets twice daily can be used.
2. Cardiovascular diseases

- **Step 3**: Hydrochlorothiazide 25mg once daily, Amlodipine 5-10 mg once daily and Enalapril 10-20mg once daily
- Where Enalapril is not available Captopril 12.5-50mg every 8 hours can be used.

  **Note:**
  (i) Best to start with a lower dose of Enalapril 5mg and increase to 10mg after observation of the BP response over a few days.
  (ii) Avoid Enalapril and Captopril in pregnancy and breast-feeding

- **Step 4**: Hydrochlorothiazide 25mg once daily, Amlodipine 5-10 mg once daily, Enalapril 10-20mg once daily and Atenolol 50-100mg once daily.
- Where Atenolol is not available Propranolol 40mg - 80mg every 8 hours can be used.
- **Step 5**: Refer to Medical Specialist

  **Note:**
  (i) Side-effects may outweigh benefits
  (ii) In patients with severe hypertension or complications (heart failure, renal failure) start medicine treatment immediately
  (iii) In patients without co-morbidity, aim for a BP of around 140/90

### 2.3.2 Emergency antihypertensive treatment

*Symptoms/Signs of hypertensive crisis*: encephalopathy, convulsions, retinal hemorrhages or blindness.

- Reduce the blood pressure in a controlled manner to avoid impaired auto-regulation of cerebral blood flow.
- Only use parenteral therapy in:
  - hypertensive heart failure
  - hypertensive encephalopathy
  - malignant hypertension
  - eclampsia
  - hypertension and dissecting aneurysm of the aorta

  **Note**: Intravenous rapid lowering of blood pressure has several risks and should be done under close monitoring only, preferably in a high or intensive care setting. It is only indicated in hypertensive emergencies mentioned above.
2. Cardiovascular diseases

Treatment

Adults
- **Hydralazine** 5-10 mg i/m
- Repeat up to every 1 hour as necessary
- *If heart failure:* add **Furosemide** 40 mg i/v stat

Children
- *For fluid overload:* **Furosemide** 1 mg/kg bolus i/v or i/m
- *For hypertensive encephalopathy:* **Hydralazine** 0.15 mg/kg slow i/v
  - Repeat every 30-90 minutes as required
  - Maximum dose: 1.7-3.6 mg/kg in 24 hours
- Long term management of hypertension would depend on the cause hence these patients need to be referred for proper management.

2.4 Angina Pectoris

- Minimize risk factors by:
  - weight reduction (if obese)
  - control of hypertension
  - stopping smoking
- Address other factors such as:
  - high blood cholesterol
  - stressful lifestyle
  - excessive alcohol intake
- Encourage regular moderate exercise

2.4.1 Stable angina (infrequent attacks)

Treatment
- **Aspirin** 150 mg daily
  - contraindicated in peptic ulcer
- and **Glyceryl trinitrate** 0.5 mg sublingually as required.
- Maximum 3 tablets per 15 minutes
- deteriorates on storage: keep tablets in original container for no more than 3 months after opening
- Alternatively use **Isosorbide dinitrate** 5-10mg sublingually as required instead of glyceryl trinitrate

Sub-lingual nifedipine (10 mg) should be avoided due to the unpredictable response of the blood pressure, unless parenteral drugs are unavailable.
2. Cardiovascular diseases

Prophylaxis:
- **Isosorbite dinitrate** 30-120 mg daily in 2 divided doses
- **Atenolol** 50mg daily

Alternatively
- **Amlodipine** 5-10mg daily may replace or be cautiously added to Atenolol.
- If pain continues despite the above treatment refer to Medical Specialist
3.0 Central nervous system conditions

3.1 Seizures and epilepsy

3.1.1 Seizures

- Sudden abnormal function of the body, often with loss of consciousness, and excess of muscular activity, or sometimes loss of it, or an abnormal sensation.
- Ensure airway is clear and patient is not hurting himself. Turn patient in a recovery position. Don’t insert any object between the teeth.
- Monitor blood sugar. If hypoglycemia is suspected, give 1 ml/kg 50% Dextrose or 5 ml/kg 10% Dextrose.

Treatment

Adults:
- Give Diazepam 5-10 mg i/v slowly. Repeat once after 10 minutes.
- If convulsions continue for another 10 minutes or are repeated more than 3 times without patient gaining consciousness between seizures, treat as status epilepticus (Section 3.1.2 page 15). If repeated seizures, consider antiepileptic therapy as in Section 3.1.3 page 15.
- Look for treatable causes and provoking factors (malaria, infection, tumour, alcohol).
- Diazepam i/m absorbs slowly and unreliably: i/v or rectal routes are preferable.

3.1.1.1 Generalized seizures in children

Treatment

- Sodium valproate 20-40 mg/kg/day in 2 to 3 divided doses
- Alternatively
  - Phenobarbitone 5-8mg/kg daily.
  - or
  - Carbamazepine 2.5mg/kg per dose twice daily,
- Increase the dose weekly by 5mg/kg until 20mg/kg is reached.
3. Central nervous system conditions

3.1.1.2 Partial seizures in children

Treatment
- **Carbamazepine** 5mg/kg/day in 2 divided doses (2.5mg/kg bd),
- Alternatively
- **Sodium valproate** 20-40 mg/kg/day in 2 to 3 divided doses

3.1.1.3 Petit mal

Treatment
- **Ethosuximide** 15 mg/kg at night as a single dose increased gradually if necessary to 50 mg/kg daily in 2 divided doses

3.1.2 Status epilepticus

- Continuous seizure activity or seizures without recovery of consciousness for > 30 minutes
- Always an emergency, mortality is high.
- Clear airway, insert iv-line, position patient in a recovery position. Don’t insert any object between the teeth.

**Treatment**

**Adults:**
- Give **Diazepam** 5-10 mg i/v. Repeat every 10 minutes until the patient stops convulsing. If patient not controlled give continuous diazepam i/v infusion with careful attention of respiratory depression.
- Give a loading dose of anti-epileptic medicines:
  - **Phenytoin** 15 mg/kg (600-1200 mg) i/v. Dilute with 100 ml normal saline and give slowly, no more than 100 mg/minute.
  - If still fitting after 10 minutes, then give **Phenobarbitone** 10 mg/kg (400-600 mg) i/v: dilute with water for injection 1:10 and give slowly, no more than 100 mg/minute. Or give 200 mg i/m in each buttock
  - If status continues, use **Paraldehyde** 5 ml deep i/m in a buttock, and repeat 5 ml i/m in alternate buttock. Paraldehyde can also be given through the rectum using asyringe with needele removed.
- Ensure that the dose is given promptly and therefore remains in the syringe for only a short time (paraldehyde dissolves plastic)
- Check blood sugar. Give glucose, if suspiciuous of hypoglycemia, see Section 6.1 page 36
3. Central nervous system conditions

- Give **Thiamine** 100mg i/v or i/m once daily before giving glucose if patient suffers from alcoholism. Continue for 3 days.
- If still no improvement, consider general anaesthesia (in ICU setting preferably).
- If patient improves, start anti-epileptic treatment as in Section 3.1.3 page 15 and continue until cause of status epilepticus is treated.

### 3.1.3 Epilepsy

- Repeated seizures due to a disorder of the brain cells.
- Look for treatable causes (infections, neuro-cysticercosis, tumour)
- Counsel patient: no bathing alone, careful with fire, driving and climbing.
- Young female patients should be advised to plan their pregnancy. When they wish to get pregnant **folic acid** once daily should be started and continued through the pregnancy.
- Doses may be reduced to the lowest level that still prevents convulsions.
- Treatment should not be stopped because of pregnancy: it is more dangerous for the mother and foetus to have uncontrollable seizures than to continue the anti-epileptic medicine.
- If patient has more than 2 seizures in a year of unknown cause, consider starting antiepileptic therapy.
- Always start with small dose.
- Increase dose gradually over weeks or months.
- Use maximum dose of one medicine before adding another.
- Treatment should never be stopped suddenly due to risk of status epilepticus, but rather tapered-off over weeks or months.

**Treatment**

- **Phenobarbitone sodium** 60-180 mg at night
- Alternatively
  - **Carbamazepine** 100 -200mg 1-2 times daily. Increase by 100 - 200 mg weekly until dose is 800 mg - 1200mg per day.
- Alternatively
  - **Sodium valproate** 600 - 2000mg daily divided in 2 doses.
- Alternatively
  - **Phenytoin** 150 - 300mg daily divided in 1-2 doses. Can be increased to 500mg daily.
3. Central nervous system conditions

3.2 Acute Stroke

- Sudden non-convulsive loss of neurological function due to ischemic or hemorrhagic vascular event.

*Remember brain infection as a differential diagnosis in HIV infected patients*

- Risk factors include hypertension, diabetes, smoking, genetic disorders, atherosclerosis, cardiac disease, atrial fibrillation, HIV and high cholesterol.
- Look for treatable cause and counsel the patient.
- 85% of the strokes are ischaemic.

**Treatment**

- Long term **Aspirin** 75mg once daily
  
  **Note:** Aspirin is not advised in intra-cerebral or subarachnoid hemorrhage.
- Give i/v fluids to correct any dehydration, avoid i/v glucose.
- Treat hyperglycemia (see Section 6.1 page 36).
- Treat any fever: look and treat for infections (aspiration pneumonia, urinary track infection common).
- Give **Paracetamol** 1g every 8 hours orally to reduce fever.
- Keep patient half seated if increased intracranial pressure is suspected (e.g. in drowsy or unconscious patients).
- Continue antihypertensive treatment if patient is already on treatment.
- Don’t start new antihypertensives during the first 10 days.
- If hypertension is repeatedly higher than 180/120 mmHg, start **Hydrochlorothiazide** 25mg once daily orally
- Start physiotherapy on day 1.
- Start mobilisation as soon as it is possible. Consider referral to an institutional rehabilitation unit.

3.3 Psychiatric conditions

3.3.1 General guidelines on psychotropics use

- Identify complicating factors i.e. psychological, medical, social, etc.
- Review past successful medication and other interventions.
- Weigh the risks and benefits of any intervention.
- Involve the patients and their families in all decisions around treatment.
- Target symptoms e.g. use a more sedating agent if insomnia is a problem.
- Start with low doses and go slow.
- Avoid poly-pharmacy.
3. Central nervous system conditions

- Never stop medication suddenly. Wean off slowly.
- Take caution in special circumstances such as:
  - Pregnancy and lactation.
  - Elderly patients.
  - HIV Infection
  - Renal or hepatic impairment.
  - Medicine interaction.
- Psychosocial interventions are imperative.

3.4 Organic Disorders

3.4.1 Delirium

- Impairment of consciousness, usually accompanied by global impairment of cognitive functions, usually acute and reversible

*Symptoms/signs:* fluctuating level of consciousness, disorientation, perceptual disturbances

- Look for treatable causes: systemic and CNS infections, hypoxia, hypo- or hyperglycaemia, drugs, alcohol excess or withdrawal (delirium tremens), mental illness, post-convulsion phase in epilepsy, head trauma, subdural hematoma, stroke etc.

*Treatment*

- Identify and treat underlying cause
- **Haloperidol** 2 - 5mg or **Chlomprimazine** 50 - 75mg
- use sedatives cautiously

3.4.2 Dementia

- Chronic disorder characterised by multiple cognitive deficits, including memory loss, but no impairment of consciousness

*Symptoms/signs:* disturbances of orientation, memory, intellectual function, personality changes

*Treatment*

- Supportive e.g. proper nutrition and exercise.
- Avoid barbiturates and benzodiazepines

3.5 Temporal Lobe Epilepsy

*Symptoms/signs:* Auras, illusions, hallucinations, personalization, derealisation

*Treatment*
3. Central nervous system conditions

- **Carbamazepine** 200 - 600mg twice daily, *Alternative*
- **Phenytoin** 100 - 150mg one daily

3.6 Alcohol Related Disorders

3.6.1 Alcohol intoxication

- Drunkenness, recent ingestion of sufficient amount of alcohol to produce acute maladaptive behaviour

*Symptoms/signs:* euphoria, talkativeness, aggression, labile mood

*Treatment:*
- Usually supportive.

3.6.2 Alcohol Withdrawal Syndrome

- Syndrome that occurs within several hours of cessation, or reduction after prolonged heavy consumption

*Symptoms/signs:* Autonomic hyperactivity, hand tremor, insomnia, transient illusions or hallucinations (visual and tactile) and seizures.

*Treatment*
- May need admission to hospital as an emergency
- Treat psychotic symptoms (confusion, delusions, hallucination) with **Haloperidol** 2mg-10mg orally (or by deep i/m if necessary) as required until the delirious state improves
- Sedate with **Diazepam** 10 mg i/v initially then orally every 8 hours
- **Vitamin B1 (Thiamine hydrochloride)** 100 - 200mg daily, 3-5 days, i/m
  *Alternatively*
  - **Vitamin B Complex** i/m then orally for 2 weeks
  - Reduce dose as soon as acute phase begins to settle.
  - Give fluid replacement as required.

*Note:*

(i) Do not discharge the patient on diazepam due to the risk of dependence. This condition has a high mortality rate.

(ii) Delirium tremens is a medical emergency and requires supportive measures.
3. Central nervous system conditions

3.6.3  Wernicke (and Korsakoff) Encephalopathy
- Amnesia, confabulation and oculomotor disturbances.
- Due to Vitamin B1 deficiency in alcoholics and malnourished non-alcoholics

*Treatment*
- **Vitamin B1** 100 mg i/v or i/m 3-7 days.
- **Glucose** (5-10%) i/v with *multivitamins* orally and/or **Vitamin B complex** can be given.
- Glucose without Vitamin B1 can worsen Wernicke’s encephalopathy.
- After Vitamin B1 injections, continue with Vitamin B1 25 - 100 mg orally once daily.
- To treat delirium tremens: see *Section 3.4.1 page 18*

3.6.4  Alcoholic Hallucinosis
- Syndrome characterised by vivid persistent hallucinations following a decrease in alcohol consumption, in a dependent person.

*Treatment*
- **Diazepam** 5-10mg and **Haloperidol** 2-5mg stat or **Chlorpromazine** 50-100mg stat

3.6.5  Physical and neurological complications of alcohol dependence
- Counsel the patient
- Abstinence may be essential
- Refer to Alcoholic Anonymous groups
- Encourage a healthy diet with high protein and vitamin content (give vitamin B complex if necessary)
- Treat specific disorders symptomatically (e.g. gastro-intestinal disorders, cirrhosis, neuropathy)

3.6.6  Treatment of psychological and social complications
- Counsel the patient
- Educate and support the family

3.7  Anxiety disorders
*Types:*
  i. **Panic disorder:** characterized by spontaneous panic attacks
  ii. **Generalized anxiety disorder:** excessive worry about actual circumstances/ events
3. Central nervous system conditions

iii. Phobias: irrational fear of objects/public situations.

iv. Post traumatic stress disorder: anxiety produced by extraordinary stressful events, re-occurs as flashbacks.

v. Obsessive compulsive disorder: recurrent intrusive ideas, images thoughts or repetitive ritualized patterns of behavior

Symptoms/signs:
- Excessive anxiety and worry
- Persistent excessive and unreasonable worry

Treatment
- **Diazepam** 2-10mg 2-4 times daily
- **Fluoxetine** 20-60mg daily
- Psychotherapy

3.8 Psychiatric Emergencies

3.8.1 Attempted suicide

Risk factors: males, older age, non-married, physically unwell, mentally unwell

General Measures
- Do not leave them alone
- Take threats seriously
- Treat underlying disorders e.g. depression
- Hospitalize unless if properly supervised at home

3.8.2 Violence

- Associated disorders: psychotic disorders, substance intoxication, withdrawal states, post ictal disturbances
- Violence predictors: previous acts of violence, verbal/physical threats, paranoid feature, violent command hallucinations, alcohol or medicine intoxication

General Measure:
- protect yourself, have enough people to handle patient, don’t immediately remove physical restraints

Treatment
- Slow i/v **Diazepam** 10-20mg
- Intra muscular **Haloperidol** 5mg or **Chlorpromazine** 50-150mg
3. Central nervous system conditions

3.9 Psychotic Disorders

3.9.1 Schizophrenia

Symptoms/signs: delusions, hallucinations, abnormal affect diminished level of function, illogical thoughts

Treatment:
• Chlorpromazine 100mg once daily
  Alternatively
• Haloperidol 2-30mg once daily
• If catatonic use Electroconvulsive therapy (ECT), Fluphenazine decanoate 25mg i/m monthly for chronic cases
• Psychosocial interventions and psycho-education.

3.9.2 Substance Induced Psychosis

• Psychotic features in a patient who has used psychoactive substances in last 2 months

Symptoms/signs: Aggression, hallucinations (visual), illusions, delusions

Treatment
• Chlorpromazine 100mg twice daily for 1 month
• Haloperidol 2mg twice daily for I month ,
• Diazepam 5 -10mg  twice daily for 7 days
• Counseling
• Psychotherapy

3.9.3 Post Partum Psychosis

• Psychotic illness developing days, weeks, months after delivery
• Also refer to Section 12 page 98

Treatment
• Counseling,
• Chlorpromazine 50 - 100mg twice daily for 2 weeks
• ECT in extreme cases

3.10 Mood Disorders

• Disorders characterized by a pervasive emotional tone that profoundly influence ones outlook and perception of self, others and environment
3. Central nervous system conditions

3.10 Depression

- Disorder characterised by low affect for over two weeks

Symptoms/signs: depressed mood, anhedonia, social withdrawal, weight loss/gain, insomnia

Treatment
- Amitriptyline 100-150mg at bedtime, start from 25mg and titrate
- Fluoxetine 20mg once daily
- ECT in very severe cases

3.10.1.1 Post Partum Depression

- Severe depression beginning within 4 weeks of delivery. Most often in women with underlying mood or other psychiatric disorder

Symptoms/signs: insomnia, emotional lability, suicide, delusions

Treatment
- Amitriptylline 50 – 100 mg at night for one month
- Imipramine 100 - 150mg at night,
- Fluoxetine 20 - 40mg in the morning

3.11 Mania

- Disorder characterised by elated mood

Symptoms/signs: erratic/disinhibited behaviour, excessive energy, excessive spending, euphoria, delusions (grandiosity)

Treatment:
- Chlorpromazine 100mg twice daily for 1 month
- Carbamezapine 200mg - 600mg once daily for 1 month
- Haloperidol 2mg -10mg twice daily for 1 month
5. Emergencies

4.0 Ear Nose and Throat Conditions

4.1 Mastoiditis

- A bone infection characterised by painful swelling behind or above the ear.
- Watch for complications of brain involvement (meningitis or brain abscess).
- Surgical drainage may be necessary.
- Refer patient to hospital

**Treatment**

**Adults**

- **Ampicillin** 1g every 8hourly for 5 days plus
- **Flucloxacillin 500mg** i/m, 6 hourly for 5 days plus
- **Metronidazole 500mg** i/v, 8 hourly for 5 days
- Analgesics as necessary. See **Section 24.1 page 196 on Pain Relief**

**Alternatively**

- **Ceftriaxone** 2g daily for 5 days

**Children**

- **Ampicillin** 25 – 50mg/kg i/m or i/v every 8 hours for 5 days

4.2 Otitis

4.2.1 Otitis Externa

- This is an inflammation of the skin lining the external auditory canal. May be a furuncle or diffuse.

**Treatment**

(a) Furuncle

- Analgesia
- **Flucloxacillin** 500mg every 6 hours for 5 days

**Alternatively**

- **Cloxacillin** 500mg every 6 hours for 5 days
- Make a wick of ribbon gauze impregnated with ointment containing **Hydrocortisone** or **Betamethasone cream** and gently insert in the ear for 2 to 3 days.

(b) Diffuse Otitis Externa

- Analgesia when necessary
5. Emergencies

- Dry mop the ear
- **Acetic acid** ear drops 2% in **Alcohol** 6 hourly for 5 days

### 4.2.2 Acute Otitis Media (Children)

- Local medicine treatment is ineffective and should be avoided

| Acute otitis media is often viral in origin and needs only a simple analgesic for pain |

**Symptoms/Signs:** Fever in about 50% of patients, sudden persistent ear pain or pus discharge for < 2 weeks

**Treatment**
- **Amoxycillin** 15 mg/kg every 8 hours for 5 days

**Alternatively**
- **Erythromycin 6.25 mg/kg** every 6 hours for patients with penicillin allergy
- Give analgesia as required *Section 24.1 page 196*

### 4.2.3 Chronic (Suppurative) Otitis Media

- Pus discharge from the ear for over 2 weeks
- If the eardrum has been ruptured for over 2 weeks, secondary infection with multiple organisms usually occurs
- Common in immunosuppressed patients
- This makes oral antibiotic therapy much less effective.

**Treatment**
- Ensure ear is alway dry.

**Note:** A chronically draining ear can only heal if it is **dry**. Drying the ear is time consuming for both the health worker and the mother but it is the only effective measure.
- The mainstay of treatment is topical therapy with **Acetic acid** ear drops 2% in Alcohol 6 hourly for 5 days
- Demonstrate/explain carefully to the patient (or guardian in the case of a child) how to dry the ear by wicking (see below)
- Refer for further assessment if no improvement after 3-4 weeks therapy
- **Dry the ear by wicking**
  - Roll a piece of clean absorbent cloth into a wick and insert carefully into the patient’s ear
  - Commercially made ear buds should be avoided in cleaning the ear
  - Leave for one minute
5. Emergencies

- Remove and replace with a clean wick
- Watch the patient/guardian repeat this until the wick is dry when removed
- The patient/guardian should dry the ear by wicking at home at least four times daily until the wick stays dry
- If bleeding occurs, temporarily stop drying the ear
- Do not leave anything in the ear between treatments
- The patient should avoid swimming or otherwise getting the inside of the ear wet

- Re-assess weekly to ensure that patient/mother is drying the ear correctly
- Check for mastoiditis

**Note:** TB is an important cause of a chronically discharging ear in Malawi

### 4.3 Nose Conditions

#### 4.3.1 Epistaxis

- Bleeding can be bilateral or unilateral.
- Causes include trauma, repeated nose pickings, infections such as rhinosinusitis, systemic causes such as hypertension, bleeding disorders, anaemia and leukemia etc.

**Treatment**

- Pinch the nose alar (wings) for 5 to 10 minutes. Let the patient lean forward and breathe through the mouth.

**Alternatively**

- Apply cold pack or ice block to the forehead
- Use ribbon gauze impregnated with liquid paraffin

**Alternatively**

- Apply nasal packs soaked in Adrenaline

**Note:** Avoid use of adrenaline in hypertensive patients

- If bleeding continues, refer to hospital

#### 4.3.2 Vestibulitis

- Diffuse infection of the skin of the anterior nares and may occur due to frequent trauma such as occurs in constant nose picking.
- Persistent nasal discharge leads to excoriation and infection of the skin of the nasal vestibule

**Treatment**
5. Emergencies

- Analgesia, see Section 24.1 page 196 on pain relief
- **Amoxycillin** 500mg 8 hourly for 5 days and
- **Liquid paraffin** 2 drops each nose 3 times a day

### 4.3.3 Sinusitis

- Inflammation of one or more sinuses that occurs most often after a viral nasal infection or allergic rhinitis.

#### 4.3.3.1 Bacterial Sinusitis

**Symptoms/Signs:** purulent nasal discharge, persistent or intermittent, pain and tenderness over one or more sinuses, nasal obstruction, postnasal discharge, occasional fever.

**Note:**
- (1) Sinusitis is uncommon in children under five years as sinuses are not fully developed
- (2) Unilateral foul smelling nasal discharge is a foreign body until proven otherwise

**Treatment**

**Adults**

- **Oxymetazoline 0.05%** 2 drops twice a day for not more than one week
- **Cetirizine** 10mg daily for 3-5 days
- Analgesia, see Section 24.1 page 196
- **Amoxycillin** 500mg every 8 hours for 5 days
  - Steam inhalations using menthol are advised

**Children**

- **Oxymetazoline 0.025%** 2 drops twice a day for not more than one week
- **Phenoxyethylpenicillin** 12.5 mg/kg/dose
- **Amoxycillin** 25 mg/kg/dose in exacerbations of chronic sinusitis and HIV positive children who are on cotrimoxazole prophylaxis.

*Alternatively if penicillin hypersensitivity:*  
- **Erythromycin** 12.5 mg/kg/dose every 6 hours for 7 days

If pain or fever (>39° C) give:
- Analgesic/antipyretic treatment as required

### 4.3.4 Allergic Rhinitis

- Recurrent inflammation of the nasal mucosa due to hypersensitivity to inhaled allergens e.g. pollen, house dust, grasses and animal proteins.
5. Emergencies

Symptoms/Signs: blocked stuffy nose, watery nasal discharge, frequent sneezing often accompanied by nasal itching and irritation, conjunctival itching and watering, edematous pale gray nasal mucosa, mouth breathing, snoring at night.

- Exclude other causes such as infections, vasomotor rhinitis, over use of decongestants drops, side effects of antihypertensives and antidepressants.

Treatment
- Allergen avoidance
- **Cetirizine** 10mg daily for 3-5 days plus
- **Beclomethasone** nasal sprays

### 4.3.5 Pharyngitis

- Viral pharyngitis is a painful red throat without purulence. Respiratory viruses are a major cause.

**Symptoms/Sign:** sore throat and fever, diffuse congestion of the pharyngeal wall, uvula and adjacent tissues.

**Treatment**
- Antibiotics are not indicated
- Home made salt mouth washes or gargles for 1 minute twice daily

### 4.3.6 Tonsillitis

- Acute inflammation of the tonsils. The main organism implicated in the causation is beta-hemolytic streptococcal.

**Symptoms/Signs:** sore throat, difficulty and pain on swallowing, inflamed tonsils, multiple white spots on the tonsillar surface, and sudden onset of fever.

**Treatment**
- Warm salt gargles
- **Phenoxymerhylnpenicillin** 500mg, every 6 hours for 5 – 7 days
  - Alternatively
  - **Erythromycin** 500mg, every 8 hours in Penicillin allergy
  - Analgesia see Section 24.1 page 196 on pain relief

### 4.4 ENT Emergencies

#### 4.4.1 Anaphylaxis (anaphylactic shock)

*Refer to Section 5.0 page 29*
5.0 Emergencies

5.1 Shock

- Acute circulation failure resulting in inadequate tissue perfusion and cellular hypoxia, generally with a low blood pressure.

**Causes**

1. hypovolemic (haemorrhage, cholera, severe vomiting, diabetic ketoacidosis)
   - cold, clammy skin; weak pulse, tachycardia
2. cardiogenic (myocardial infarction)
   - signs of heart failure
3. obstructive (pericardial tamponade, tension pneumothorax)
   - raised JVP, pulsus paradoxus
4. distributive (sepsis, anaphylaxis)
   - fever, warm peripheries

5.1.1 Anaphylaxis (anaphylactic shock)

- This is a medical emergency in which seconds count
- Taking appropriate measures immediately may save a life
- It requires prompt treatment for laryngeal oedema, bronchospasm and hypotension
- It is most commonly precipitated by drugs, especially after parenteral administration including:
  - antibiotics
  - aspirin and other nsaid
  - antiarrhythmics
  - heparin
  - neuromuscular blocking drugs
  - injectable iron
  - vaccines
- It may also be caused by
  - insect stings (especially wasps and bees)
  - blood products and blood transfusions
  - certain foods e.g. eggs, cow’s milk, nuts
- The priority is to give **Adrenaline** i/m
  - Determine and remove the cause
5. Emergencies

- Lie the patient down
- Keep the patient warm
- Elevate the patient’s legs
- Maintain airway
- Give 100% oxygen if available

**Treatment**

- **Adrenaline** 1 in 1,000 05-1 ml i/m (children 0.0.1 ml/kg)
- **Adrenaline** 0.01 ml/kg (adults)
- Repeat as required (several times if necessary) every 10 minutes according to BP and pulse until improvement occurs
- **Sodium chloride** 0.9 % 20 mL/kg by i/v infusion over 60 minutes
- Start rapidly then adjust according to BP
- An antihistamine is a useful additional treatment given after adrenaline and continued for 24-48 hours to prevent relapse
- **Promethazine** 25-50 mg by deep i/m or, in emergencies, slow i/v, as a solution containing 2.5 mg/mL in water for injection
  - **Adults:** max 100 mg
  - **Children:** 6-12 years: 6.25-12.5 mg:
    - 1-5 years: 5 mg
- Repeat dose every 8 hours
- An i/v corticosteroid is of secondary value in initial management of anaphylaxis as its action is delayed but should be given in severe cases to prevent further deterioration:
  - **Adults:**
    - **Hydrocortisone** 200 mg by slow i/v push
  - **Children:**
    - < 1 year: 25 mg
    - 1-5 years: 50 mg
    - 6-12 years: 100 mg
    - May be repeated as necessary

- Monitor pulse, BP, bronchospasm and general response/condition every few minutes
- If there is continuing deterioration or no improvement the following may be necessary:
- **Aminophylline** i/v as for asthma if bronchospasm persists (*see Section 16.2.1 page 137*)
5. Emergencies

- Ventilation and/or tracheotomy

    *If acidosis is severe (blood pH<7.1) after 20 minutes*

    **Treatment**

- Give *sodium bicarbonate* 50 mmol by *slow i/v* (appr. 100 mL of 4% solution)

- Monitor plasma pH

5.2 Management of Emergencies and Trauma in Children

- Triage all sick children soon when they arrive in hospital into three categories in order to identify:
  a) Those with emergency signs

    **Emergency signs include:** obstructed breathing, severe respiratory distress, central cyanosis, signs of shock, coma, convulsions, severe dehydration
  b) Those with priority signs

    **Priority signs** ("3TPR MOB"), tiny baby, very hot or very cold temperature, trauma or other urgent surgical condition, pallor severe, poisoning, pain, respiratory distress, restlessness, referral {urgent}, malnutrition, oedema of the feet, burns
  c) Those who are non urgent cases

5.2.1 Emergency management:

- Assess the airway and breathing {A,B}
  - Does the child’s breathing appear obstructed? If so open as follows
    - If no trauma – do chin lift, head tilt.
    - If suspected trauma- do jaw thrust.
  - Manage airway in choking by using back slaps, chest thrusts or Heimlich manoeuvre in an older child.
  - Is there severe respiratory distress i.e. tachypnoea, recessions, nasal flaring, cyanosis etc
  - Oxygen therapy
  - Ventilatory support if not breathing and there are signs of life - use bag and mask.

- Assess circulation and level of consciousness
  - Check if the child’s hand is cold if so
  - Check capillary refill time {apply pressure to the nailbed for 5 seconds and determine the time from the moment of release until total recovery of the pink colour} normal is <3 seconds.
  - If in shock manage as follows:
5. Emergencies

- Manage shock, coma and convulsions
  
  *If unconscious*
  - put on oxygen
  - check blood sugar
  - place in the recovery position.

- Assess and manage severe dehydration in a child with diarrhoea

5.3 Management of convulsions in children

- Establish the cause and when convulsions are controlled, treat accordingly
  - In neonates convulsions are usually due to hypoglycemia, hypoxia or infection e.g. meningitis
- Always exclude hypoglycemia as cause especially in children. If blood sugar can not be checked, assume hypoglycemia and treat accordingly
  - See Section 6.1.1 page 36 for treatment of this in children
  - Hypoglycaemia is defined as <2.5 mmol/l or 3 mmol/l in severely malnourished children.
- For persistent convulsions, see Section 5.2 page 31

**General measures**

- Ensure airway is clear
- Do not place any object which might be swallowed in the mouth of a convulsing child
- Protect patient from injury and put in lateral position

**Flow chart for controlling convulsions**

- To control the fit
  
  A- Airway: place in recovery position
  B- Breathing: support with oxygen if necessary
  C- Circulation: treat shock
  D- Don’t
  E- Ever
  F- Forget
  G- Glucose (correct hypoglycaemia with 2ml/kg of 25% Dextrose or 2.5ml/kg of 20% dextrose or 5ml/kg of 10% dextrose)

- If the fit has been going on more than 5 minutes

  ↓

  *Diazepam*

  0.5mg/kg rectal or 0.25mg/kg
5. Emergencies

- If fit still ongoing after 10 minutes or has recurred
  ↓
  **Diazepam** 0.5mg/kg rectal
  or 0.25mg/kg i/v

- If fit still ongoing after 10 minutes or has recurred
  ↓
  **Paraldehyde** 0.2ml/kg i/m
  or 0.4ml/kg rectal

- If fit still ongoing after further 10 minutes or has recurred, inform senior health worker
  ↓
  **Phenobarbitone**
  10–15mg/kg i/m or i/v

- If fit still ongoing after further 5 – 10 minutes or in status epilepticus
  ↓
  Discuss with seniors +/- anaesthetist
  For **Phenytoin** administration 18mg/kg i/v infusion over 30 minutes. Give maintenance dose 2.5-5mg/kg over 30 minutes twice daily

**Note:**
1) It is not recommended to give diazepam intramuscularly
2) Rectal administration may be quicker and easier than i/v in fitting child. Use a syringe with the needle removed.
3) For paraldehyde use a glass syringe preferably. If not available, use a plastic syringe instead but ensure that the dose is given promptly and therefore remains in the syringe for a short time (paraldehyde dissolves plastic)
4) For neonates, use **Phenobarbitone** 15-20mg/kg loading dose and maintenance dose of 2.5-5mg/kg once daily.

**5.4 Diabetic ketoacidosis (DKA)**
5. Emergencies

- Persons at extra risk: known insulin-dependent diabetics with poor compliance, intercurrent infection, failure to administer insulin when ill and not eating
- Investigate immediately blood sugar; urine dipstick for glucose and ketones, electrolytes and urea if possible
- Hypoglycaemia, subdural haematoma (elderly), stroke, malaria, meningitis, sepsis may also precipitate DKA
- If blood sugar levels cannot be obtained, it may be difficult to distinguish clinically between hypoglycaemic and hyperglycaemic coma; in that case give 50 ml 50% dextrose stat: in case of hypoglycaemia, it will wake the patient up; in case of hyperglycaemia, it will do no harm

**Treatment**

- Fluids – use large bore cannula; if possible set up 2 cannulae
  - In case of hypovolaemia i.e. blood pressure < 90 mm Hg or postural drop of blood pressure > 20 mm Hg
  - Give 4 litres Sodium chloride 0.9% in the first hour
  - In case of no hypovolaemia i.e. good urine output, normal blood pressure
  - Give 2 litres Sodium chloride 0.9% in the first hour
- In both cases after one hour give 3 litres /24 hours + amount lost in urine (see sliding scale for type of fluid)
- If still dehydrated after first hour, give 2 litres sodium chloride per hour and review
- Potassium chloride 10 mmol per litre (0.75mg) in each litre until i/v fluids are stopped

**Note:** Do not give potassium chloride with the first litre of sodium chloride.
- Give 10U Soluble insulin i/m stat, thereafter give insulin i/m according to sliding scale every 2 hours
- Check blood sugar every 2 hours

### 5.5 Hyperosmolar non-ketotic coma (HONK)

- Persons at risk: elderly with non-insulin dependent diabetes
  - Signs: confused / reduced consciousness (any reason e.g. stroke or infection)
  - Treatment
    - Fluid replacement is more important than insulin even if blood sugar is high; however fluids should not be given too rapidly to avoid large electrolyte shifts.
5. Emergencies

- Give 2 litres **Sodium chloride 0.9%** in the first hour, then 1 litre every hour. Adjust to slower rate if elderly patient with risk of heart failure.
- Change to **Dextrose 5%** when blood sugar approaches normal levels.
- **Give 10U Soluble insulin** i/m stat; this is usually enough.
- Do not try to lower the blood sugar rapidly at all cost by giving high doses of insulin.
- **Add Potassium chloride** as indicated in **Section 5.2 page 31**.
- Adjust / individualize insulin treatment when fully conscious and eating

**Table 3: Sliding scale for insulin dosage based on blood sugar taken 2 hourly**

<table>
<thead>
<tr>
<th>Blood Glucose</th>
<th>Dose soluble insulin (i/m)</th>
<th>Type of fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHH (very high)</td>
<td>10 units</td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td>&gt;400mg/dL (22mmol/L)</td>
<td>10 units</td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td>300 – 399 mg/dL</td>
<td>10 units</td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td>200 – 299mg/dL (11</td>
<td>5 units</td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td>– 16.5mmol/L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;200mg/dL (11mmol/L)</td>
<td>5 units</td>
<td>Dextrose 5%</td>
</tr>
</tbody>
</table>
6.0 Endocrine disorders

6.1 Diabetes Mellitus

- The diagnosis of diabetes is based on 2 abnormal blood sugar measurements (FBS > 7 mmol/l, 126 mg/dl or RBS >11mmol/200 mg/dl) in an asymptomatic patient or 1 abnormal measurement if the patient has symptoms of hyperglycaemia.

General Measures

- Establish treatment aims: some patients require strict glycaemic control with near normal glucose values targeted, for others symptom control and avoiding severe side effects of treatment may be the maximum achievable.
- Check BP regularly and aim for BP <130/80 mmHg see Section 2.3 page 9
- Discourage smoking
- Educate about foot care and screen annually for foot problems (neuropathy or peripheral vascular disease)
- Screen annually for decrease in visual acuities, look for cataracts

Refer for specialist opinion if:
  - Pregnant diabetic
  - Acutely ill diabetic, particularly if vomiting or decreased Glasgow Coma Score (GCS)
  - Treatable complications e.g. cataracts

Treatment

- Give Aspirin 75mg daily to hypertensive diabetics aged over 50
- If a diabetic is admitted unconscious always consider the possibility of hypoglycaemia- administer 100ml 20% or 50ml 50% dextrose/glucose i/v even if a blood glucose measurement is not available.

6.1.1 Diabetes type 1 (Insulin dependent)

- Most children will have type 1diabetes.
- Children with diabetes should be referred for proper management and treatment.
- These children need to be followed up every 3 months to monitor blood sugars and long term complications of diabetes

6.1.1.1 Adults with no ketoacidosis or other acute complication:

Treatment

- Lente/Protophane Insulin 2 doses daily
6. Endocrine disorders

- To decide the starting dose of Insulin:
  - The total daily number of Insulin units will be approximately half the patient's body weight, e.g. for a 60 Kg person give 30 units Insulin/day divided into 2 doses
  - Then give 2/3 daily dose half an hour before breakfast, give 1/3 daily dose half an hour before evening meal, preferably 12 hours apart
  - Adjust Insulin dose according to fasting blood sugar (FBS) or 2 hours post-prandial blood sugar or symptoms of hypo- or hyperglycaemia

- **Metformin** 500mg twice daily can be added to Insulin treatment to improve glycaemic control and curb weight gain in adult diabetics

**Note:** Insulin requirements can go up when a patient is acutely ill, even if they are not eating. NEVER stop Insulin in a type 1 diabetic.

- **Diet:**
  - Increase fibre intake
  - Reduce refined sugar intake
  - Insulin treated patients require 3 meals a day containing complex carbohydrate to avoid risk of hypoglycaemia
  - Advise patients to eat more before unaccustomed exercise

---

### 6.1.1.2 Children with diabetic ketoacidosis

**Signs and symptoms:** vomiting, polyuria, dehydration, ketonuria and acidosis. The blood sugar will be high >15mmol/l

- Address airway and breathing
- **i/v fluids** are the most important resuscitation measure
  - Give 20mls/kg bolus of **normal saline** or **ringer’s lactate** if in shock
  - If not in shock give maintenance plus deficit over 24 hours if patient is conscious or over 48 hours if unconscious.
  - Maintenance requirements are as follows:
    - First 10 kg body weight 100mls /kg /day
    - Next 10 kg body weight 50mls/kg/day
    - Each kg thereafter 20mls/kg /day.

- **Add potassium chloride** to i/v fluids (20 - 40 mmol/litre) when patient urinates and peripheral circulation has improved
- Give subcutaneous injection of short acting **soluble insulin** 6 hourly.
6.1.2 Diabetes type 2 (Non Insulin-Dependent)

- Adjustment of diet and/or weight reduction (if obese) and increased exercise may control blood glucose without the need for drug therapy.
- Wherever possible give a 4-6 week trial of diet before introducing oral hypoglycaemic agents. If this is unsuccessful, 

**Treatment**

- **Metformin** 500mg twice daily, increased to a maximum of 1g twice daily.

**Note:** (1) Metformin is the drug of choice in type 2 diabetes, particularly in obese patients.
   (2) It is contra-indicated in renal insufficiency, and severe respiratory and cardiac disease due to risk of lactic acidosis.
- If glycaemic control still poor, add **Glibenclamide** 5mg daily, increasing to a maximum of 10 mg twice daily

**Note:** 20% of type 2 diabetics eventually require Insulin treatment - use principles as in type 1 diabetes to initiate treatment. Use **Lente** 0.3U/kg bodyweight to start with.

6.2 Thyroid disorders

6.2.1 Hyperthyroidism

**Causes:** Graves disease, toxic multinodular goiter, toxic solitary nodule
**Signs and symptoms:** fatigue, nervousness or anxiety, weight loss, palpitations, heat insensitivity, tachycardia, warm moist hands thyromegaly and tremor.
- Management should be supervised by a doctor
- Refer to tertiary level

**Treatment**

**Adults**

- **Propranolol** 40-120mg three times daily to control symptoms, especially tachycardia
- **Carbimazole** 40mg daily for approximately 2 months then reduce dose to 10mg od
  - In Graves disease continue for 18 months then stop (in large percentage hyperthyroidism will be resolved)
  - In other causes continue carbimazole and refer for surgery

**Children**
6. Endocrine disorders

- **Carbimazole** 0.5 mg/kg once daily oral.
- **Atenolol** 1-2 mg/kg orally as a single daily dose.
- **Refer for surgery if**
  - Relapsed Graves disease after carbimazole treatment
  - Toxic nodule or toxic multinodular goitre

**Note:** If a patient develops a fever or sore throat while taking carbimazole, neutropenia should be urgently excluded. If present then stop Carbimazole and treat with antibiotics.

---

6.2.2 Hypothyroidism (Myxoedema)

- Management should be supervised by a doctor
- Refer to tertiary level

**Treatment**

- **Thyroxine** 100-150mcg (mcg) daily for life
- Elderly patients start with 25mcg then increase by 25 - 50mcg every 2 weeks up to 100mcg

---

6.2.2.1 Congenital Hypothyroidism

- Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children.
- Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairment.

**Signs and symptoms:** Prolonged jaundice, feeding difficulties, hypotonia, wide open fontanelles, oedema, constipation, enlarged tongue, dry skin, bradycardia, lethargy etc.

**Treatment**

- **Levotyroxine** 10-15 mcg/kg orally as a single daily dose for neonates and infants and 100 mcg/kg once daily
- Requires urgent referral for confirmation of diagnosis

---

6.2.3 Iodine deficiency disorders (Endemic goitre)

- More common in highland areas
- Much less likely since the introduction of iodised salt
- Only consult surgeons for treatment if large goiter causing obstructive problems or cosmetically unacceptable.

**Prophylaxis**

- **Aqueous iodine oral solution** 130mg/ml single dose
- Repeat every 2 years
7.0 Gastro-Intestinal Conditions

7.1 Amoebiasis

- Give health education on faecal disposal, hand-washing and food hygiene
- Consider in dysentery unresponsive to antibiotic treatment

7.1.1 Intestinal (non-invasive) form

_Treatment_

_Adults_

- **Metronidazole** 800mg every 8 hourly for 5 days preferably after food

_Children_

- **Metronidazole** 7.5 mg/kg/dose every 8 hours for 5 days

7.1.2 Hepatic form (amoebic liver abscess)

_Treatment_

_Adults_

- **Metronidazole** 800mg every 8 hours for 10 days
  - Give orally (preferably after food) or i/v (depending on the condition of the patient)
  - If necessary, repeat treatment course after 2 weeks
- Consider aspiration in cases of large abscesses or superficial abscesses under ultrasound guidance.

_Children_

- **Metronidazole** 10 mg/kg/dose every 8 hours for 10 days
  - Give orally (preferably after food) or i/v (depending on the condition of the patient).
  - If necessary, repeat course of treatment after 2 weeks

7.2 Bacillary dysentery

- If the only symptom is dehydration, give health education on hand-washing (the single most important preventive measure), correct faeces disposal, and food hygiene
- Ensure complete hygienic precautions by all in contact with the patient
- Isolate the patient if possible
- Investigate source of contamination and inform environmental health authorities
7. Gastro-intestinal conditions

- Use antibiotics only if the patient is systemically unwell or septic or immunosuppressed

*Treatment*

*Adults*

- **Ciprofloxacin** 500 mg twice a day for 5 days
- Analgesic see Section 24.1 page 196

*Children > 3 months*

- **Nalidixic acid** 50 mg/kg daily in 2-4 divided doses

7.3 Cholera

- Rehydration is of prime importance
- Ensure complete hygienic precautions by all in contact with the patient, who should be isolated if possible
- Investigate source of contamination, and inform environmental health authorities
- Trace close contacts and give antibiotics in the same doses as below
- Main treatment is by rehydration but antibiotics can shorten the diarrhoea episode and are therefore indicated.

*Treatment*

*Adults*

- **Doxycycline** 300 mg stat

*Alternatively in pregnancy and children <5 years:*

- **Erythromycin** 250 mg every 6 hours for 3 days

*Children >5 years:*

- **Erythromycin** 12.5 mg/kg/dose every 6 hours for 3 days

7.4 Constipation

- Investigate and treat any identified cause
- Commonly related to inadequate dietary fiber intake and/or psychological factors
- Advise high residue diet, e.g. papaya seeds and increased fluid intake
- Reserve medication for severe cases only confirmed by examination.

> All laxatives are contraindicated if intestinal obstruction is suspected

- Do not use oral laxatives in children.
7. Gastro-intestinal conditions

- If increased fiber and oral fluids are insufficient to cure constipation and a laxative is considered necessary use liquid paraffin 5-10 mls daily.
- Refer all infants with constipation for specialist assessment
- Constipation in the neonate is usually due to a significant underlying problem such as bowel atresia or Hirschsprung’s disease.
- If a neonate has not passed stools in the first 48 hours of life:
- Refer urgently for surgical and/or pediatric assessment

Treatment

Adults

- Bisacodyl 5-10mg at night

Alternatively

- Insert one glycerol suppository at night, moisten with water before insertion.

If no response within 3-5 days:

- Refer for further management

Note: For hemorrhoids, anal fissure and other causes of persistent anal pain in adults:

Insert one Bismuth subgallate suppository rectally each night and morning after defecation

7.5 Diarrhoea

7.5.1 Acute Diarrhoea

- Replace fluid and electrolyte loss
- Maintain optimal hydration
- Establish and treat causal factors
- In adults with acute diarrhoea who are systemically unwell and/or have fever, Ciprofloxacin 500 mg every twelve hours may be considered if the patient is (suspected to be) HIV infected
- In children, if i/v fluid is indicated but is impossible to administer, consider using the intra-osseus routes

Treatment

- Give low osmolarity WHO ORS as soon as the patient’s condition improves
- Measurement of BP and pulse may help in assessment of dehydration.
7. Gastro-intestinal conditions

7.5.1.1 Use of drugs in children with diarrhea

- Only use antibiotics for dysentery and suspected cholera cases with severe dehydration
- Use Zinc 20mg per day for 10 days (>6 month) or 10mg per day for 10 days (<6 month) in addition to low osmolarity ORS
- Only use antiparasitics for:
  - Amoebiasis, after antibiotic treatment of bloody diarrhea for shigella has failed or trophozoites of *E.histolytica* containing red blood cells are seen in the faeces.
  - Giardiasis, when diarrhea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid

Antidiarrhoeals and antiemetics should never be used in children with acute diarrhea because they have no proven value and may be dangerous

7.5.1.2 Assessment of patients for dehydration

<table>
<thead>
<tr>
<th>Look at -condition</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>-eyes</td>
<td>Well, alert</td>
<td>Restless/irritable*</td>
<td>Lethargic/unconscious: floppy*</td>
</tr>
<tr>
<td>-tears</td>
<td>Normal</td>
<td>Sunken</td>
<td>Very weak sunken and dry</td>
</tr>
<tr>
<td>-tongue, mouth</td>
<td>Present</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>-thirst</td>
<td>Moist</td>
<td>Dry</td>
<td>Very dry</td>
</tr>
<tr>
<td>Drinks normally</td>
<td>Not thirsty</td>
<td>Thirsty</td>
<td>Drinks poorly or not able to drink*</td>
</tr>
<tr>
<td></td>
<td>Drinks normally</td>
<td>Drinks eagerly*</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feel Skin pinch</th>
<th>Goes back quickly</th>
<th>Goes back slowly</th>
<th>Goes back very slowly*</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Decide</th>
<th>NO SIGN OF DEHYDRATION</th>
<th>If the patient has 2 or more signs including at least one sign*: SOME DEHYDRATION</th>
<th>If the patient has 2 or more signs including at least one sign*: SEVERE DEHYDRATION</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Treat (see below)</th>
<th>Use Plan A</th>
<th>Weigh if possible Use Plan B</th>
<th>Weigh the patient Use Plan C URGENTLY</th>
</tr>
</thead>
</table>

**Note:** in severely malnourished children, skin turgor is not a reliable sign.
### 7.5.1.3 Treatment Plan A (to treat diarrhea at home)

- Use this plan to teach the mother to continue to treat her child’s current diarrhea at home and to give early treatment for any future diarrhea.
- Explain the 3 rules for treating diarrhea at home:
  1. **Give child more fluids than usual to prevent dehydration**
     - Suitable fluids include: Low osmolality ORS, plain water, food-based fluids (e.g. gruel, soup, rice water), breast milk, milk feeds prepared with twice the usual amount of water.
     - Give ORS if the child has been on Treatment Plan B or C or cannot return to the health worker if the diarrhea gets worse
       - Give ORS or water rather than a food-based fluid if the child is under 6 months old and not yet on solid foods
       - Give as much of these fluids as the child will take
       - Use the amount shown below for ORS as a guide
       - Continue giving these until the diarrhea stops

**Special notes for severely malnourished children**

- Dehydration tends to be overdiagnosed and its severity overestimated in severely malnourished children because it is difficult to assess dehydration in severely malnourished children using clinical signs alone.
- Do not use i/v route for rehydration except in cases of shock.
- In shock give oxygen, keep the child warm, establish i/v access and infuse 15mls/kg over 1 hour of ½ Strength Darrow with 5% dextrose or Ringers lactate with 5% dextrose.
- The child needs to be observed closely and if the respiratory rate and pulse rate increases stop i/v fluids.
- If the child is improving but still shocked repeat the same volume of fluids over another hour thereafter switch to oral or nasal gastric rehydration with ResoMal alternatively with F-75 for up to 10 hours.
- In severe dehydration give 5mls/kg of Resomal every 30 minutes for the first 2 hours then give 5-10ml/kg/hour for the next 4-10 hours which should be alternated with F-75 at the usual volumes.

#### Table 4: Ingredients for home made ResoMal

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>2 litres</td>
</tr>
<tr>
<td>WHO ORS</td>
<td>One 1 litre packet</td>
</tr>
<tr>
<td>Sugar</td>
<td>50 g</td>
</tr>
<tr>
<td>Electrolyte/mineral solution</td>
<td>40mls</td>
</tr>
</tbody>
</table>
7. Gastro-intestinal conditions

- In mild diarrhea without dehydration, prevent dehydration developing by continuing milk feeds – ReSoMal is not necessary in these cases.
- Monitor carefully and frequently
- Watch for signs of heart failure due to over hydration which is common in children with kwashiorkor.

2. Give the child plenty of food to prevent malnutrition

- Continue to breast-feed frequently

  *If the child is not breast-fed:*
  - give the usual milk feed

  *If the child is 6 months or older or already taking solid foods:*
  - also give cereals or another starchy food
    - mix, if possible, with pulses, vegetables, and meat or fish
    - add 1-2 teaspoonfuls of vegetable oil to each serving
    - give fresh fruit juice or mashed banana to provide potassium
    - give freshly prepared food
      - cook and mash or grind food well to make it easier to digest
  - encourage the child to eat
    - offer food at least 6 times daily
  - give the same food after the diarrhea stops
  - give one extra meal daily for 2 weeks

3. Take the child to the health worker if the child does not get better in 3 days or develops any if the following:

- many watery stools
- repeated vomiting
- marked thirst
- eating or drinking poorly fever
- blood in the stool

- If the child will be given ORS at home, show the mother how to mix ORS and how much to give after each loose stool (see table over)
- Give enough packets for 2 days treatment
7. Gastro-intestinal conditions

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Amount of ORS to give after each loose stool*</th>
<th>Amount of ORS to provide for use at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 2</td>
<td>50-100 ml</td>
<td>500 ml per day</td>
</tr>
<tr>
<td>2-10</td>
<td>100-200 ml</td>
<td>1 L per day</td>
</tr>
<tr>
<td>Over 10</td>
<td>As much as wanted</td>
<td>2 L per day</td>
</tr>
</tbody>
</table>

* Describe and demonstrate the correct amount to be given using a locally available measure, e.g. cup or coke bottle

**Show the mother how to give ORS:**

* For a child <2 years:
  - give a teaspoon every 1-2 minutes

* For an older child:
  - give frequent sips from a cup

* If the child vomits:
  - wait 10 minutes, then give ORS more slowly

* If diarrhea continues after the ORS is used up:
  - tell the mother to give other fluids as described in rule 1 above or to return for more ORS

**Explain how to prevent diarrhea in child:**

- give only breast milk for the first 4-6 months and continue to breastfeed for at least the first year
- introduce clean, nutritious weaning foods at 4-6 months
- give the child freshly prepared and well-cooked food and clean drinking water
- make sure all family members wash their hands with soap after using the toilet, and before eating or preparing food
- quickly dispose of the stool of young children in a latrine or by burying

7.5.1.4. Treatment Plan B (to treat dehydration)

**1. Give ORS solution for the first 4 hours:**

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Amount (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td>200-400</td>
</tr>
<tr>
<td>5-8</td>
<td>400-600</td>
</tr>
<tr>
<td>8-11</td>
<td>600-800</td>
</tr>
</tbody>
</table>
7. Gastro-intestinal conditions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11-16</td>
<td>800-1,200</td>
</tr>
<tr>
<td>16-30</td>
<td>1,200-2,200</td>
</tr>
<tr>
<td>Over 30</td>
<td>2,200-4,000</td>
</tr>
</tbody>
</table>

- Encourage the mother to continue breast-feeding
- Give more ORS if the patient wants it
- For infants under 6 months who are not breast-fed, also give 100-200 ml of clean water during this period
- Observe the child carefully and help the mother give ORS solution:
  - show her how much solution to give the child
  - show her how to give it (see Plan A)
  - check from time to time to see if there are any problems
- If the child vomits:
  - wait 10 minutes
  - then continue with ORS, but more slowly
- If the eyelids become puffy:
  - stop ORS
  - Give breast milk
  - Give ORS again (as in Plan A) when the puffiness has gone

2. After 4 hours, reassess the child using the assessment chart. Choose a suitable treatment plan to continue

   If there are no signs of dehydration:
   - use Plan A. When dehydration has been corrected the child usually passes urine and may also be tired and fall asleep

   If signs showing some dehydration are still present:
   - repeat Plan B, but start to offer food, milk and juice as described in Plan A

   If signs of severe dehydration have appeared:
   - change to Plan C

   If the mother must leave before completing Plan B:
7. Gastro-intestinal conditions

- show her how much ORS to give to finish the 4 hour treatment at home
- give her enough ORS packets to complete rehydration and for 2 more days as shown in Plan A
- show her how to make the ORS solution
- explain to her the 3 rules in Plan A for treating the child at home

7.5.1.5. Treatment Plan C (to treat severe dehydration quickly)

1. Start i/v fluids immediately
   - If patient can drink, give ORS by mouth while the drip is set up
   - Intravascular route: if unable to get an i/v line in quickly, consider using this useful method of rehydration fluid administration if familiar with the technique:
     - If an intra-osseus needle is not available, use a 21G hypodermic needle or a large bore LP needle instead
     - **Ringer’s Lactate** 100 ml/kg divided as in the table below
       - Alternatively if not available
     - **Normal saline**

   **Note:** Both of these i/v solutions do not contain glucose and are thus not suitable for long-term i/v fluid therapy in children – use **Darrow’s ½ strength + dextrose 5%** instead

   **Table 5: Rate of administration of i/v rehydration fluid**

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30 ml/kg in:</th>
<th>Then give 70 ml/kg in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12 mths</td>
<td>1 hour *</td>
<td>5 hours</td>
</tr>
<tr>
<td>&gt;12 mths</td>
<td>30 minutes*</td>
<td>2 1/2 hours</td>
</tr>
</tbody>
</table>

   * Repeat once if radial pulse is still very weak or undetectable

   **Alternative method of i/v rehydration fluid administration**
   - May be useful where the above schedule is difficult to follow on a busy ward
     - give 10 ml/kg of the i/v fluid as a bolus given over 5 minutes using a syringe
     - then give 100 ml/kg as an infusion over a further 6 hours
7. Gastro-intestinal conditions

With either method:
- reassess the patient every 1-2 hours

If hydration is not improving:
- give the i/v fluid more rapidly
- also give ORS (approx. 5 ml/kg/hour) as soon as the patient can drink – usually after 3-4 hours (infants) or 1-2 hours (older patients)
- after 6 hours (infants) or 3 hours (older patients), evaluate the patient using the assessment chart
- then choose the appropriate Plan A, B or C to continue treatment

If i/v therapy cannot be given, but is available within 30 minutes:
- send the patient immediately for i/v treatment

If the patient can drink:
- provide the mother with ORS solution
- show her how to give it during the trip

If i/v therapy cannot be given and is not available nearby, but nasogastric therapy is available:
- start rehydration by nasogastric tube with ORS solution
  - give 20 ml/kg/hour for 6 hours (i.e. a total of 120 ml/kg)
- reassess the patient every 1-2 hours
- if the child has malnutrition, give half this amount

If there is repeated vomiting or increased abdominal distention:
- give the fluid more slowly

If hydration is not improving after 3 hours:
- refer for i/v therapy
- reassess after 6 hours
- choose the appropriate treatment plan to continue treatment

If both i/v and nasogastric therapy are not available, but the patient can drink:
- start rehydration by mouth with ORS solution
- give 20 ml/kg/hour for 6 hours (i.e. a total of 120 ml/kg)
- re-assess the patient every 1-2 hours
If there is repeated vomiting:
- give the fluid more slowly

If hydration is not improving after 3 hours:
- refer for i/v therapy
- reassess after 6 hours
- choose the appropriate treatment plan to continue treatment

If i/v and nasogastric therapy are not available and the patient cannot drink:
- refer urgently for i/v or nasogastric therapy
- If possible, observe the patient at least 6 hours after rehydration to be sure the mother can maintain hydration with ORS solution by mouth
- If the patient is under 2 years old and there is cholera in the area, treat for this (see Section 7.3 page 41) after the patient is alert

7.5.2. Chronic diarrhoea (adults)

- Defined as liquid stools for 3 or more times daily or episodically for over 1 month
- Common presentation in HIV/AIDS patients.

Treatment
Adults:
- Correct any dehydration and maintain hydration
- Consider potassium supplements
  - Advice the patient to eat more potassium-rich foods if possible, e.g. bananas, Oranges, tangerines, and other citrus fruits
- Give supplementary feeding when required/as tolerated
- Always do HIV test
- Investigate stool for presence of ova, cysts and parasites
  - If the condition persists
Give cotrimoxazole 960mg every 12 hours for 7 days

- If the condition responds to treatment but recurs within 4 weeks:
  - Re-treat in accordance with the initial response
    - Relapse may be due to short duration of initial treatment
7. Gastro-intestinal conditions

- If no response to cotrimoxazole within 3 days, or if no improvement after recurrence and retreatment with cotrimoxazole;
  o Give metronidazole 800 mg every 8 hours for 7 days

- If improved after re-treatment;
  o Follow up as required

- If still no response after adding metronidazole or if no improvement after recurrence and re-treatment with cotrimoxazole/metronidazole;
  o Give albendazole 400mg twice daily for 2 weeks

- If still not improved after albendazole treatment;
  o Refer for microscopic examination of stool, See note (d) below
    o Multiple stool examination may increase the diagnostic yield of parasites if present

  a) If bacteria or parasite found;
    o Treat accordingly
      If the condition responds to treatment but recurs within 4 weeks:
      o Re-evaluate

  b) If bacteria or parasite is not found, use a constipating agent to control the diarrhoea for up to 5 days treatment
    - Give loperamide 4mg initially then 2mg after each loose stool
    - Usual dose 6-8mg daily up to 16mg daily

Alternatively
    - codeine phosphate 30mg every 6 hours

- If still not improved within 1 week:
  - Stop treatment
  - Re-evaluate

- If no treatable cause of the diarrhoea is found
  - Counsel the patient
7. Gastro-intestinal conditions

**Note:**

a. Do not use constipating agents in patients with bloody diarrhoea because of the risk of inducing toxic megacolon

b. In persistent diarrhoea, perianal application of soft paraffin (Vaseline®) may soothe anal mucosa

c. Chronic diarrhoea caused by cryptosporidium infection and caused by HIV infection itself (HIV enteropathy) needs to be treated with antiretroviral therapy

### 7.5.3. Persistent diarrhoea (children)

- Defined as liquid stool 3 or more times daily for over 14 days
- A pathogen will only be identified in a small number of cases
- Consider TB and chronic infections e.g. UTI, as uncommon causes
- Persistent diarrhoea is a common symptom of protein-energy malnutrition (PEM) and will resolve with treatment of this
  - Correct any acute dehydration and maintain hydration
  - Maintain nutrition
    - Including breast feeding, where appropriate

<table>
<thead>
<tr>
<th>Presence of fever and/or bloody stool makes bacterial infection more likely and malnutrition puts a child at increased risk of dying from persistent diarrhoea. Empiric (trial) antimicrobial treatment is therefore indicated in these conditions</th>
</tr>
</thead>
</table>

- **If bloody stool and fever:**
  - Give **Nalidixic acid** 50 mg/kg divided in 4 doses per day for 5 days
- **If malnourished giv:**
  - **Cotrimoxazole** 24 mg/kg every 12 hours for 5 days and
  - Supplemental feeding and supplements
- **If worsening, or not improving after 14 days:**
  - refer for microscopic stool examination
  - consider giving **Albendazole** for worms *(see Section 15.5 page 131)*
  - and/or give **Metronidazole** for giardiasis

### 7.6 Gastritis (Peptic Ulcer)

- Advise patient to avoid hot spices, alcohol, tobacco, carbonated drinks
- Encourage regular meals
7. Gastro-intestinal conditions

**Treatment**

- Chew 2 Magnesium trisilicate compound tablets every 6 hours or more frequently as required for 7 days
  - Take preferably before food
  - Take the last dose at night

**Alternatively**

- Ranitidine 300mg at night or 150mg every twelve hours for 4 weeks OR
- Cimetidine 400mg every twelve hours or 800mg at night OR
- Omeprazole 20mg once daily for 2 weeks

*If severe pain continues:*
  - Exclude perforation

*If no response, or in the presence of danger signs such as weight loss and haematemesis:*
  - Refer for endoscopy and further management e.g. with triple therapy
  - In patients with gastric or duodenal ulcers give triple therapy for Helicobacter pylori:
    - Omeprazole 40mg once daily for 2 weeks
    - Metronidazole 400mg every 8 hours for 7–10 days
    - Amoxycillin 1g every twelve hours for 7–10 days

Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDS) e.g. indomethacin, ibuprofen, are contraindicated in patients with a history of peptic ulcer

### 7.7 Vomiting

- Always look for a possible cause and treat accordingly
- Do not give symptomatic treatment without knowing the cause
- Always exclude mechanical obstruction
- Correct dehydration where necessary

**Treatment**

- Metoclopramide 10 mg i/m or slow i/v (over 2 minutes) 3 times daily as required

*Note:* Patients less than 20 years require special caution. Observe dose requirements and use restrictions.
8. Hepatic disorders

8.0 Hepatic Disorders

8.1 Acute liver failure

- Withdraw the causative agent if possible e.g. drugs or alcohol
- Avoid hepatotoxic drugs e.g. paracetamol
- Ensure adequate intake of glucose (dextrose)
- Induce diarrhoea with Lactulose 5ml every 6 hours and/or Neomycin sulphate 1g every 6 hours (1 week)
- Give antibiotic prophylaxis for patients with liver failure: Ceftriaxone 2g od iv
- Prophylaxis of bleeding: Vitamin K 10 mg i/m stat

- *If the patient is drowsy or comatose*
  - Give an i/v infusion of dextrose 50%
  - Reduce protein intake
  - Do not give sedatives or hypnotics
  - Refer the patient for further diagnosis and management
  - Thiamine 100 mg i/v or i/m 3-7 days in case of known or suspected alcoholic cause
9. Infectious diseases

9.0 Infectious Diseases

9.1 HIV and related conditions

- People infected with HIV may develop HIV-related illnesses, the most common of which is TB.

In all cases of HIV-related illness, prompt diagnosis and proper management of the problem is crucial.

- For more details refer to the following MoH guideline
- MoH Management of HIV/AIDS Related Diseases (2008 2nd Edition) for:
  - The Malawi AIDS case definition: *Clinical and laboratory diagnosis of HIV related diseases*.
  - Treatment of AIDS Guidelines for the Use of Antiretroviral Therapy in Malawi 3rd edition.
  - PMTCT guidelines

9.1.1 Care and Support

- *General supportive care*: Proper nutrition is important.
- *Psychological support*: Inform patients of any HIV support groups in their community.
- *Spiritual support*: The spiritual needs of the patient and family should be properly addressed.

9.1.2 Immunisation of HIV (+) children

- Unless very ill, immunise with EPI vaccines (BCG, DPT, polio and measles) according to standard schedules see Section 19 page 167.
- Older children with clinical AIDS should not get BCG vaccine.
- Antibody response to vaccines may be less than normal but tends to be better in the early stages of HIV infection.

9.1.3 Breast-feeding by HIV (+) mothers

- Counsel HIV (+) women on the risks of future pregnancy
- Encourage Exclusive breast feeding up to 6months.
9. Infectious diseases

9.1.4 End organ dysfunction

- These include:
  - Bone marrow (haematological abnormalities): see section on blood diseases
  - CNS
  - GI, renal, cardiac systems
- For organ dysfunction directly caused by HIV, ART is indicated in combination with supportive treatment

9.1.5 Counselling

- Refer to the MoH Guide for Pre- and Post-test Counselling and AIDS Counselling information.
- If a child is too young, counsel the parents/guardians.
- Counselling should be private, compassionate and confidential.
- Consider modes of transmission in discussions with parents or guardians.
- Offer HIV testing to parents of HIV-infected children, and advise them on:
  - The implications of HIV infection in themselves for further children.
  - The risk of transmitting infection sexually or as blood donors in the future.

9.1.5.1 Pre-test counselling

- Refer to the MOH Guide for Pre- and Post-test Counselling and AIDS Counselling information.

9.1.5.2 Post-test counselling

- Refer to the MOH Guide for Pre- and Post-test Counselling and AIDS Counselling information.

9.1.6 Health worker safety

- Refer to the MOH/National Prevention Services booklet Recommended Guidelines for Infection Control and Prevention
9. Infectious diseases

9.1.7 Post-exposure prophylaxis (PEP)

- “PEP” refers to the treatment of HIV exposures using antiretroviral drugs.
- ART started immediately after exposure to HIV may prevent HIV infection.
- Treatment should be initiated within 1-2 hours of injury or exposure. Where this is not possible, it is still reasonable to start PEP up to 72 hours after the exposure.
- An exposed client should receive PEP only if he or she is HIV negative, because PEP is not necessary if the client is HIV infected and dual antiretroviral therapy is potentially harmful (as it can easily induce resistance).
- PEP may be given regardless of the serostatus of the source if there is a possibility that the source may be in the window period of seroconversion.

**Table 6: The PEP Regimen**

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
<th>Frequency</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine (AZT)</td>
<td>One tablet</td>
<td>Twice a day</td>
<td>30 days</td>
</tr>
<tr>
<td>Lamivudine (3TC) 150mg</td>
<td>Twice a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Duovir)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.1.8 HIV infection in children

- **Common presentation:** diarrhoea, failure to thrive (FTT) and infections including tuberculosis, thrush (moniliasis), pneumonia, and meningitis;
  - Treat these and malnutrition appropriately.
- Immunise HIV(+) children with DTP, hepatitis B, Hib, polio, and measles vaccines, unless they are very ill but,
- Do not give BCG to older children with clinical AIDS.
- Encourage mothers to continue breast feeding.
- Whenever possible, treat HIV(+) children as out-patients to minimise the risk of cross-infection, as they may be immuno-compromised.

**Note:** A reactive HIV ELISA test in a child under 18 months, even with no laboratory error, is not proof of HIV infection, as passively acquired maternal antibody may be the cause.
9. Infectious diseases

9.1.9 Management of common clinical presentations in HIV (+) patients

- Treatment of these is often similar to the treatment of the same condition in HIV(-) patients, as covered elsewhere in these guidelines.
- Differences in treatment for HIV(+) patients are indicated in the appropriate treatment schedules.

9.1.9.1 Diarrhoea disease

See Section 7.5 page 42.

9.1.9.2 Respiratory conditions (adults)

- Common HIV associated respiratory diseases: bacterial pneumonia, pulmonary tuberculosis, Pneumocystis jirovecii pneumonia (PCP), lymphoid interstitial pneumonitis (LIP), pulmonary Kaposi’s sarcoma.
- Cough without dyspnoea or tachycardia and associated with a runny nose is usually indicative of a viral URTI.

9.1.9.3 Pneumocystis jirovecii Pneumonia (PCP)

Treatment

- Cotrimoxazole oral or i/v 30 mg/kg every 8 hours for 21 days
- Wherever possible give oxygen
- Give severely dyspoenic patients Prednisolone 40mg twice a day for 5 days then 40mg once a day for 5 days then 20mg once a day for the remaining 11 days
- Risk of recurrence after treatment is very high. For prophylaxis give Cotrimoxazole 960mg twice a day

9.1.9.4 Respiratory conditions (children)

- Cough with or without difficulty in breathing.
- Pneumonia and pulmonary TB are common in HIV (+) children.
- Cough without dyspnoea or tachypnoea and associated with a runny nose is usually due to a viral URTI.

Treatment

- if upper respiratory tract infection (URTI) with fever: treat as malaria, (see Section 15.1 page 118)
  - if URTI without fever: Advise mother on general supportive home care (see Section 16.1 page 132).
9. Infectious diseases

- if pneumonia suspected: assess severity and treat according (see Section 16.1 page 132).
- Presumed pneumonia which fails to respond to treatment may be due to other causes
  - Do a chest X-ray to rule out emphysema, effusion, TB, PCP, LIP, staphylococcal infection and other conditions common in HIV(+) patients
  - Manage according to X-ray findings
- If PCP found, treat as in Section 9.1.9.3 above
  - Give Prednisolone, 1-2mg/kg every 12 hours
- If LIP found:
  - Suspect LIP if chest X-ray shows a bilateral reticular – nodular interstitial pattern. Distinguish from pulmonary TB.
  - The child may present with persistent cough, bilateral parotid swelling, persistent generalized lymphadenopathy, hepatomegaly and finger clubbing.
  - Antibiotics for bacterial pneumonia
  - Prednisolone 1-2mg/kg daily for 2 weeks,
    - Decrease dose over 2-4 weeks depending on response.
  - Beware of reactivation of TB

9.1.9.5 Fever (adults)

- A body temperature of over 38° C, continuously or intermittently, for more than 24 hours in any 72 hour period.
- Fever is common in HIV(+) patients

**Seriously ill patient**

- Start treatment for presumed sepsis (See Section 9.7 page 87)
- Maintain hydration
- Refer urgently to hospital for further management

**If patient not seriously ill**

- Maintain hydration
- Check bloodslide for malaria parasites, whether positive or negative: give presumptive 1st line antimalarial treatment (see Section 15.1.1 page 119)
9. Infectious diseases

- Look for local causes of fever: otitis media, tonsillitis, skin infections, pneumonia, PTB and EPTB, urinary tract infections, joint infections and give appropriate treatment accordingly
- Consider giving antipyretic treatment
- **If not improved within 3 days:**
  - Refer for further investigations
  - Treat according to findings
- **If there are no suggestive laboratory or radiological findings:**
  - Consider empirical (trial) treatment for suspected sepsis (see Section 9.7 page 87)
- **If fever still persists but patient is clinically stable:**
  - Presume HIV related fever
  - Give supportive care and assess for ART
  - Seek a second opinion at the earliest opportunity

### 9.1.9.6 Fever, persistent or recurrent (children)

- Persistent fever: a body temperature of >38 degrees Celcius for more than 5 days
- Recurrent fever: a body temperature of >38 degrees celcius for more than 1 episode in a period of 5 days
- Look for: Meningitis, septicemia, Occult bacterial infections, TB, Fungal, viral or parasitic infections, Neoplasms
- Maintain hydration
- Maintain nutrition
- Give antipyretic treatment (see Section 10.1 page 91)

**Treatment**

**Seriously ill child**

- Start treatment for presumed sepsis (see Section 9.7 page 87)
- Start 1st line antimalarial treatment (see Section 15.1.1 page 119)
- Refer the patient.

**Child not seriously ill**

- **If the child has completed 1st line antimalaria treatment:**
  - Amoxycilllin 50mg/kg every 8-12 hours for 7 days.
  - This is intended to treat non-serious bacterial infections, e.g. sinusitis, urinary tract.
- **If free of fever after 3 days:**
  - Complete treatment course for Amoxycilllin.
9. Infectious diseases

- Follow up as required.
  - **If not improved:**
    - Give 2nd line antimalarial treatment *(see Section 15.1.1 page 119)*.
    - Follow up as required.
  - **If the child has not completed 1st line antimalarial treatment**
    - Give 1st line antimalarial treatment *(see Section 15.1.1 page 119)*
  - **If not free of fever after 3 days:**
    - Refer to the next level

---

**9.1.9.7 Upper GIT Candidiasis**

- Presumptive diagnosis:
  - White plagues in the mouth and lesions in the esophagus and stomach,
  - Antifungal therapy is required treat according to Oropharyngeal conditions *(see Section 14.1 page 113)*

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**9.1.9.8 Mental disorders (adults and older children)**

- Refer to *Section 3.3 page 17* on psychological conditions

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**9.1.9.9 Primary neurological disorders (adults)**

- Refer for careful assessment and investigation
- Refer to *Section 3.4 page 18* on neurology disorders

---

**9.1.9.9.1 CNS disorders**

- Look for evidence of an opportunistic infection and treat the underlying cause accordingly

---

**9.1.9.9.1.1 Protozoal, viral, fungal and bacterial infections**

- Often affects the brain in HIV (+) patients
- Carry out a lumber puncture
- Refer to relevant treatment guidelines

---

**9.1.9.9.1.2 Cerebral toxoplasmosis**

- Most frequently causes focal neurological signs in patients with advanced immune-suppression.
- **Sulphadoxine/pyrimethamine (SP)** 2 tablets daily for at least 6 weeks, followed by life-long cotrimoxazole 480mg twice daily.
- Start ART after some weeks on SP.
9. Infectious diseases

- May result in complete cure

9.1.9.9.1.3 Cryptococcal meningitis

- Refer to Section 9.3.3 page 73

9.1.9.9.1.4 Tuberculosis

- Refer to Section 9.5 page 76

9.1.9.9.1.5 Syphilis

- Refer to Section 17.4 page 153
- If there is severe spasticity and ataxia:
  - Presume myelopathy
  - Treat as neuro-syphilis with Benzylpenicillin 5 MU i/v 6 hourly for 2 weeks OR Doxycycline 200 mg once daily for 3 weeks
  - Give supportive and symptomatic treatment and counseling

9.1.9.9.1.6 AIDS Dementia

- Characterised by cognitive, behavioural and motor dysfunction, often overlooked in advanced HIV infection. ART is indicated and may give a favorable response.

9.1.9.9.1.7 Progressive multifocal leucoencephalopathy (PML)

- Caused by a papova (JC) virus, rapid evolution over weeks or months; altered mental state, visual defects, motor weakness, speech dysfunction, sensory deficits and cerebellar disorders.
- Prognosis is very poor, sometimes temporary relief from ART, no causative treatment available.

9.1.9.9.2 Peripheral nervous system conditions

If predominantly sensory: sensory peripheral neuropathy
- If on tuberculosis treatment, treat with Pyridoxine 25mg once daily for the duration of tuberculosis treatment
- Check if drugs that cause neuropathy are used (vincristine, stavudine, metronidazole) and consider modifying drug treatment
- Screen for diabetes mellitus and treat accordingly if present
- Consider other causes of neuropathy: alcohol abuse, renal disease, malignancies, vitamin B12 deficiency and treat if possible
- HIV associated peripheral neuropathy often improves with ART
9. Infectious diseases

- Give supportive and symptomatic treatment:
  - Amitryptilline 25-75mg nocte
  - Painkillers if required (see Section 24.1 page 196)

### 9.1.9.10 Primary neurological disorders (children)

- Manage these in the same way as in HIV (-) children.
- Refer to hospital for careful assessment and investigation.
- Rule out treatable causes of acute episodes of neurological dysfunction such as TB, bacterial meningitis and cerebral malaria through careful history and examination in children.

### 9.1.9.11 Lymphadenopathy

- **Causes:** Tuberculosis, bacterial (including syphilis), fungal or viral infections, malignancies (Kaposi’s sarcoma, lymphoma), dermatological and other conditions.
- Persistent generalized lymphadenopathy (PGL), more than 3 separate lymph node groups affected, at least 2 nodes more than 1.5 cm in diameter at each site, duration of more than 1 month and no local or contiguous infection which might explain the lymphadenopathy
- Is common and due to HIV infection alone; requires no treatment

**General Measures**

- Ensure careful physical examination to identify any local or contiguous infection which might explain the lymphadenopathy.
- **If there is local or contiguous infection:**
  - Treat as indicated
- **If TB is suspected**
  - Do fine needle aspiration for acid fast bacilli. Treat accordingly (see Section 9.5 page 76)
- **If there is a papulo-squamous rash and/or evidence of recent genital ulcer (adults only)**
  - Do a TPHA or RPR
  - If positive, treat for syphilis see Section 17.4 page 153
- **If the patient has recent symptomatic lymphadenopathy of uncertain aetiology or if patient does not respond to empiric therapy:**
  - Refer for further assessment including lymph node biopsy

### 9.1.9.12 Failure to thrive (FTT)

- This is seen by examining the child and checking the under-5 card
9. Infectious diseases

- When assessing FTT, it is vital to take a detailed dietary and social history to determine whether the child receives sufficient calories and a balanced diet
- Rule out TB and HIV
- Ascertain whether the child has any TB contacts
- Do chest x-ray and tuberculin PPD test, and also sputum test in an order child
- Tuberculin PPD testing is however usually unhelpful in severe FTT
- Identify any other associated problems and treat accordingly. These may include
  - Persistent Diarrhoea (see Section 7.5.3 page 52)
  - Oral thrush (see Section 14.1 page 113)
  - Respiratory conditions (see Section 16 page 132)
- Assess the severity of FTT
  - Inability to feed and severe apathy are important indicators of severity
  - Severe malnutrition is often associated with extensive oedema and dermatitis
- If able to feed and not severely malnourished:
  - Give a trial of home feeding
  - If possible, give exact recommendations on the schedule and content of the diet
  - Assess the availability of food at home
  - Encourage the mother to provide, whenever possible, a balanced nutritious diet including, for example soya, beans, groundnuts, bananas, other fruits, eggs, meat and fish
  - Review after 2-4 weeks
- If TB is not found
  - Carry out other investigations as indicated from history and examination e.g.
    - Stool analysis and urea and electrolytes
- If neither TB or other conditions are identified
  - Presume HIV-related FTT
- If not able to feed and moderately or severely malnourished:
  - Admit the patient
  - Treat for malnutrition (see Section 23 page 188)
- If the child is taking adequate oral feeds
  - Continue these for 2-3 weeks
9. Infectious diseases

- Reassess the patient
  - *If the child is unable to take adequate oral feeds, use NGT feeding until able to take oral feeds*
  - *Once the child is improving*
    - If anemic, give **Ferrous Sulphate** and **Folic Acid**
    - If helminth infestation is suspected, treat with **Albendazole**
    - *If on re-assessment the child is not improving, refer to the higher level*
  - *Where severe FTT is considered to be HIV-related*
    - Improve nutritional and supportive care
    - Prolonged NGT feeding may occasionally be appropriate
    - Initiate HAART

9.1.9.13 Pain relief

Refer to Section 24 page 196

9.1.9.14 Kaposi’s sarcoma

- Kaposi’s sarcoma (KS) patients need to be started on ART, as there is a direct beneficial effect on KS at whatever stage of disease patients present.
- Full blood count must be done before starting treatment

**Treatment**

- 2mg once a week for 6 doses
- Review after 6 weeks
  - *If there is ‘no effect’ nor side effects and/or limited stable disease then discontinue*
  - *If there is ‘good effect’ or minimal side effects and residual disease*
    - continue with 2mg once every 2 weeks for six doses
- Review after 6 weeks
  - *If there is ‘no effect’ nor side effects and/or limited stable disease then discontinue*
  - *If there is ‘good effect’ or minimal side effects and residual disease*
    - continue with 2mg once a month for six doses
- Final assessment of efficacy and side effects should be recorded in health passport for future reference
- Review after 3 months after treatment (earlier as required for pain and symptom management)
9.1.10 Antiretroviral Treatment Regimens

9.1.10.1 First Line regimen

- Introduction of the first line regimen includes:
  - Staging and management of HIV related diseases
  - Group counseling on issues surrounding ART
  - Individual counseling and assessment of contraindications for ART
  - Baseline weight
  - Other blood tests may be done (full blood count, CD4 count, creatinine, liver enzymes) but are not mandatory

Table 7: Steps in administering 1st line ARV Therapy

<table>
<thead>
<tr>
<th>First two weeks (starter pack)</th>
<th>d4T/3TC/NVP 1 tablet in the morning plus d4T/3TC 1 tablet in the evening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuation pack</td>
<td>d4T/3TC/NVP 1 tablet in the morning plus d4T/3TC/NVP in the evening</td>
</tr>
</tbody>
</table>

9.1.10.1.1 Alternative First Line regimen

- Alternative first line substitutions can be made in cases of medicine reactions:
  - Severe peripheral neuropathy: due to stavudine component
    - Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP)
  - Liver toxicity such as hepatitis: due to nevirapine component
    - Stavudine (d4T) + Lamivudine (3TC) + Efavirenz (EFZ)
  - Severe skin reactions: due to nevirapine component
    - Stavudine (d4T) + Lamivudine (3TC) + Efavirenz (EFZ)

9.1.10.2 Second Line regimen

- Switch to second line regimen in cases of failure to first line regimen:
  - **Adults**
    - Zidovudine (AZT) + Lamivudine (3TC) + Tenofovir (TDF) +
    - Lopinavir/Ritonavir (LPV/RTV)
  - **Children**
    - Didanosine (ddI) + Abacavir (ABC) + Lopinavir/Ritonavir (LPV/r)
9. Infectious diseases

9.1.11 Dosage Guidelines for First Line ARV Therapy in Children in Malawi

Table 8: Doses for 1st line ARV Therapy in Children

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stavudine (d4T)</td>
<td>2mg/kg/day</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>8mg/kg/day</td>
</tr>
<tr>
<td>Nevirapine (NVP)</td>
<td>8mg/kg/day</td>
</tr>
</tbody>
</table>

- i.e. target dose ratio = 1: 4: 4 (d4T:3TC:NVP)
- d4T/3TC/NVP dose ratio = 1: 3.75: 5

For d4T/3TC/NVP:

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Dose a.m.</th>
<th>Dose p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 8</td>
<td>¼</td>
<td>-</td>
</tr>
<tr>
<td>8&lt;12</td>
<td>¼</td>
<td>¼</td>
</tr>
<tr>
<td>12&lt;18</td>
<td>½</td>
<td>¼</td>
</tr>
<tr>
<td>18&lt;22</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>22&lt;28</td>
<td>¾</td>
<td>½</td>
</tr>
<tr>
<td>28&lt;32</td>
<td>¾</td>
<td>¾</td>
</tr>
<tr>
<td>32&lt;38</td>
<td>1</td>
<td>¾</td>
</tr>
<tr>
<td>&gt; 38</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- The second line ARV treatment in children is a combination of abacavir, didanosine and kaletra.

9.1.12 Cotrimoxazole prophylaxis

**Adults**

- Give Cotrimoxazole 480mg twice daily to any HIV infected person in WHO clinical stage II, III or IV; any person with a CD4 count <500 cells/mm³ regardless of symptoms; HIV + pregnant women after the first trimester
Children

- Give Cotrimoxazole 6-8mg/kg once daily to all HIV exposed children from 4-6 weeks till HIV infection has definitely been ruled out, and to all HIV infected children.
- If allergic to Cotrimoxazole, give Dapsone.

9.2 Leprosy

9.2.1 Multibacillary

- The multi-drug treatment (MDT) regimen consists of:
  - Monthly supervised doses of Rifampicin and Clofazimine taken on a fixed day at 4 week intervals
  - Daily unsupervised doses of Clofazimine and Dapsone
- Continue treatment until 24 monthly supervised doses of Rifampicin and Clofazimine have been completed within a maximum of 3 years

9.2.1.1 MDT regimen for multibacillary leprosy

Table 9: MDT regimen for multibacillary leprosy

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Frequency</th>
<th>Age years/dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-5 yrs</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Monthly</td>
<td>300</td>
</tr>
<tr>
<td>Clofazimine</td>
<td>Monthly</td>
<td>100</td>
</tr>
<tr>
<td>Clofazimine</td>
<td>Daily</td>
<td>25*</td>
</tr>
<tr>
<td>Dapsone</td>
<td>Daily</td>
<td>25</td>
</tr>
</tbody>
</table>

*25 mg capsules of clofazimine are not available. Give a 50 mg capsule every second day instead

9.2.2 Paucibacillary

- The MDT regimen consists of:
  - A monthly supervised dose of Rifampicin taken on a fixed day at 4-week intervals
  - A daily unsupervised dose of Dapsone
9. Infectious diseases

- Continue treatment until 6 monthly supervised doses of Rifampicin have been completed within a maximum period 9 months

**Table 10: MDT regimen for paucibacillary leprosy**

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Frequency</th>
<th>Age years/dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Monthly</td>
<td>300</td>
</tr>
<tr>
<td>Dapsone</td>
<td>Daily</td>
<td>25</td>
</tr>
</tbody>
</table>

### 9.2.3. Leprosy reactions

- Do not stop therapy for leprosy during treatment of reactions
- Refer urgently to Leprosy Control Assistant

#### 9.2.3.1. Severe reversal reaction; paucibacillary patients

- This is a delayed hypersensitivity allergic reaction manifesting itself as exacerbated leprosy skin lesions and/or enlarged tender nerves with or without nerve deficit

**Treatment**

- **Prednisolone** daily with the dose being gradually reduced every 2 weeks until a total of 12 weeks are completed (see table)

**Table 11: Prednisolone regimen for paucibacillary severe reversal reactions**

<table>
<thead>
<tr>
<th>Week</th>
<th>Prednisolone dose (mg daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>40</td>
</tr>
<tr>
<td>3-4</td>
<td>30</td>
</tr>
<tr>
<td>5-6</td>
<td>20</td>
</tr>
<tr>
<td>7-8</td>
<td>15</td>
</tr>
<tr>
<td>9-10</td>
<td>10</td>
</tr>
<tr>
<td>11-12</td>
<td>5</td>
</tr>
</tbody>
</table>

#### 9.2.3.2 Severe reversal reaction; multibacillary patients

- This regimen is for multibacillary patients with a severe reversal reaction or recent nerve damage
9. Infectious diseases

**Treatment**
- daily **Prednisolone** being gradually reduced at intervals of 2 or 4 weeks over a period of 20 weeks (see table)

**Table 12: Prednisolone regimen for multibacillary severe reversal reaction**

<table>
<thead>
<tr>
<th>Week</th>
<th>Prednisolone dose (mg daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>40</td>
</tr>
<tr>
<td>3-6</td>
<td>30</td>
</tr>
<tr>
<td>7-10</td>
<td>20</td>
</tr>
<tr>
<td>11-14</td>
<td>15</td>
</tr>
<tr>
<td>15-18</td>
<td>10</td>
</tr>
<tr>
<td>19-20</td>
<td>5</td>
</tr>
</tbody>
</table>

### 9.2.3.3 Severe type 2 reaction

- This is an antigen-antibody complex reaction manifesting itself as fever, malaise and general body pain, and also frequently and typically with erythema nodosum leprosum (ENL)
- Rarely is iridocyclitis or orchiditis present

**Treatment**
- standard short-course of daily **Prednisolone** with the dose being gradually reduced by 5mg every 2 days until a total of 12 days is completed (see table below)
- Do not stop therapy for leprosy during treatment of reaction
- Refer urgently to Leprosy Control assistant

**Table 13: Prednisolone regimen for severe type 2 reaction**

<table>
<thead>
<tr>
<th>Day</th>
<th>Prednisolone dose (mg daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>30</td>
</tr>
<tr>
<td>3-4</td>
<td>25</td>
</tr>
<tr>
<td>5-6</td>
<td>20</td>
</tr>
<tr>
<td>7-8</td>
<td>15</td>
</tr>
<tr>
<td>9-10</td>
<td>10</td>
</tr>
<tr>
<td>11-12</td>
<td>5</td>
</tr>
</tbody>
</table>
9. Infectious diseases

9.2.3.4 Acute dapsone allergic reaction

- **Symptoms/Signs**: itching, rash, exfoliative dermatitis or Stevens-Johnson syndrome
- Refer urgently to Leprosy Control Assistant
- Stop **Dapsone**
- Then observe

**Treatment**

- Give Antihistamines, steroids or hospitalize
  - Depends on severity

9.3 Meningitis

- Refer patient to hospital as soon as diagnosis is suspected

  A lumbar puncture is essential for diagnosis

- If possible, do a lumber puncture first and send the CSF in a sterile container along with the patient, but always start treatment before transfer with

**Treatment**

**Adults**

- **Benzyl penicillin** 5MU i/v or i/m stat
- Plus (if available) **Chloramphenicol** 1g i/v stat

**Children**

- **Benzyl penicillin** 100,000 units/kg i/v or i/m stat
- Plus  **Chloramphenicol** 25 mg/kg i/v stat

**Neonates**

**Benzyl penicillin** and **Gentamycin** i/m or i/v

- When a lumber puncture cannot be done prior to referral, this should be done as soon as possible after admission

9.3.1 Bacterial meningitis

- In hospital, start an i/v infusion for antibiotics using **Dextrose 5%** (not more than 50 mL/kg per day for an infant) and continue until oral medication can be tolerated
- Give antibiotics for at least 14 days,
9. Infectious diseases

- if there is a good response in meningococcal disease stop at 7 days

**Treatment**

**Adults (empirical treatment pending test results)**

- **Ceftriaxone** 2g i/v every twelve hours  
  Alternatively
- **Chloromphenical** 1g every 6 hours, i/v and  
  **Benzyl penicillin** 5MU every 6 hours, i/v  
  Continue i/v antibiotics until 48 hours after the fever has subsided  
  Change to oral **Amoxycillin** 500mg every 8 hours and  
  **Chloramphenicol** 500mg every 6 hours to complete 14 days.

**Children**

- Give antibiotics for at least 7 days.  
  **Ceftriaxone** 100mg/kg once daily i/m or i/v  
  Alternatively  
  **Chloramphenicol** 25mg /kg i/v every 8 hours  
  plus  
  **Benzylpenicillin** 100,000 IU/kg every 6 hours

### 9.3.2 Meningitis in neonates

- Usually caused by gram(-) organisms and requires treatment for 21 days (gram(+) infection)  
  Otherwise give 14 days treatment  
  Careful observation is essential  
  While awaiting culture and sensitivity results or if they are not available give  
  o **Benzyl penicillin** 100,000 units/kg every 6 hours, initially slow i/v or i/m  
  o Plus **Gentamycin** 2.5 mg/kg i/m or i/v every 8 hours or **Gentamycin** 5mg/kg i/m once per day if 1 week old and **Gentamycin** 7.5 mg/kg once daily if over a week old.

  Alternatively  
  o **Ampicillin** 50 mg/kg every 6 hours initially i/v later i/m as an alternative to **Benzyl penicillin**

  **If still febrile after 48 hours;**  
  o Add **Cefotaxime**.
9. Infectious diseases

9.3.3 Cryptococcal meningitis

- **Symptoms/Signs:** severe headaches, not responding to non-narcotics analgesics, the patient nearly always has HIV infection with advanced immune suppression.
- Confirm diagnosis with Indian ink stain, Cryptococcal antigen and/or culture of the CSF.
- Refer for specialist management with Amphotericin B 0.7-1.0 mg/kg daily infused in glucose 5% i/v solution over 4-6 hours for 2 weeks if tolerated, followed by Fluconazole 400 mg once daily for 6 weeks and then 200 mg once daily lifelong.

*Alternatively if available*

- Fluconazole 800mg orally or i/v once daily for 2 weeks, followed by Fluconazole 400 mg once daily for 6 weeks and then 200 mg once daily lifelong.

9.3.4 Meningococcal meningitis (prophylaxis)

- Recommended for selected groups living in very crowded conditions and for close household contacts

*Adults*

- Ciprofloxacin 500 mg stat.

*Alternatively*

- Doxycycline 300mg stat

*Children*

- Doxycycline 6 mg/kg

9.4 Tetanus

- Immunization has significantly reduced the incidence of this

9.4.1 Adult tetanus

- Good nursing care of the heavily sedated patient is essential
- Give active immunization against tetanus after recovery

*General measures*

- Nurse the patient in a quiet area
- Maintain adequate hydration and nutrition
- Prevent aspiration of fluid into the lungs
- Clean and debride necrotic wounds thoroughly
9. Infectious diseases

- Change from parenteral to oral medication as soon as possible
- Avoid provoking spasms
- Encourage active exercise after spasms have ceased

**Treatment**

- **Diazepam** 20 mg i/m or i/v **Chlorpromazine** 50 mg i/m or i/v given alternately every 3 hours

**Alternatively**

- **Diazepam** infusion 40 mg in one liter of i/v dextrose or normal saline every 6-8 hours

  - Take care: respiratory depression may occur

- Dose sizes or frequencies of the above medicines can be increased if necessary to control spasms
- **Anti-tetanus serum** 20,000 units i/v stat
  - Give this after a test dose of 1,500 units s/c
- **Benzyl penicillin** 2 MU i/v every 6 hours for 7 days
- **Metronidazole** 500 mg i/v or 400 mg oral every 8 hours for 7 days
- **Tetanus toxoid vaccination**: give the full course

9.4.2 Neonatal Tetanus

**Symptoms**: poor feeding, constipation, stiffness and spasms

- Prevent if possible and aggressively treat respiratory complications as these are the main cause of death
- Start active immunization against tetanus once the child has recovered

**General measures**

- Nurse the baby in an intensive care area with close observation and attention to airway, temperature and spasms
- Maintain adequate hydration, initially with i/v fluids
- Maintain nutrition with expressed breast milk via an NGT
- Have a mucous extractor or other suction available
- Avoid i/m injections as much as possible by use of alternative routes (e.g. NGT, rectal administration) where indicated
- Change from i/m injections to oral medication as soon as possible and keep handling to a minimum in order to avoid provoking spasms
- Thoroughly clean the umbilical area
9. Infectious diseases

Treatment

- **Paraldehyde** 0.2 ml/kg i/m or 0.4 ml/kg rectally (see note 1 below) followed by
- **Phenobarbitone** 15 mg/kg loading dose stat initially then 10 mg i/v plus 5 mg i/m
- Continue with **Diazepam** 0.5 mg/kg by NGT or rectally (see note 2 below) or slow i/v and **Phenobarbitione** 5-10 mg/kg by NGT or i/m
- Give these drugs alternatively every 3 hours
- **Anti-tetanus serum** 10,000 units i/m or i/v every 6 hours for 5 days
  *Once spasms are controlled;*
- **Phenobarbitone** 5-10 mg/kg once daily orally as maintenance dose

Note:
1) **Paraldehyde**: dissolves plastic so use a glass syringe. However if this is not available, use a plastic syringe but make sure the drug is given promptly and not left in the syringe before administration. The drug may also be given rectally using a syringe after removing the needle.
2) **Diazepam** rectal administration (by syringe after removing the needle) is as reliable as i/v and easier and safer to give.

9.4.3 Tetanus Prevention

- Promote **tetanus toxoid** vaccination (TTV) in pregnant women and all women of child bearing age (see Section 12.3 page 100)
- Ensure adequate surgical toilet plus passive (ATS 1,500 units i/m or s/c) and active (TTV) immunization after wounds, bites and burns

9.4.4 Tetanus toxoid vaccination (TTV)

9.4.4.1 Unimmunised or never fully immunized patients

- Give a full course of vaccination
- One dose (0.5 mL) s/c or i/m in weeks 1, 4 and 8
- For women of childbearing age (see Section 12.3 page 100)

9.4.4.2 Fully immunized but last booster >10 years ago:

- Give one booster dose of 0.5 mL s/c or i/m

Fully immunized patients who have had a booster within the last 10 years do not need treatment with tetanus antitoxin (ATS) or tetanus toxoid vaccination (TTV)
9. Infectious diseases

9.5 Tuberculosis (TB)

- For detailed information on the control and management of TB refer to the *National Tuberculosis Control Programme Manual (MOH, 2007)*
- Suspect pulmonary TB if coughing for 3 weeks or more, usually with one or more of the following:
  - Fever
  - Chest pain
  - Shortness of breath
  - Loss of weight
  - Hemoptysis
- *Symptoms/Signs*: enlarged lymph nodes (lymphadenopathy), swelling of abdomen due to fluid (ascites), tender swelling of the back (TB spine), sometimes weakness of the legs (TB spine), stiffness of the neck (meningitis), confusion (meningitis)
- If TB is suspected, refer the patient to hospital
- Diagnosis and classification of pulmonary TB must be based on *sputum examination* (smear microscopy for acid-fast bacilli)

**Do not start TB treatment until a firm diagnosis has been made**

- Effective treatment of TB and prevention of the development of medicine resistance depends on an appropriate combination of at least 2 medicines taken:
  - Regularly
  - In the correct dose
  - For the full recommended duration
  - Under direct observation (DOT)

**Stress to the patient the importance of regular medicine taking as the basis for the cure of TB**

- HIV positive patients can be successfully treated for TB

9.5.1 Anti-Tuberculosis Medicines

- Malawi is now treating TB patients using fixed dose combinations (FDCs), single tablets and streptomycin injection as shown below:
9. Infectious diseases

a) Combination Tablets

**Adult Formulations**
- **RHZE** contains: Rifampicin 150mg, Isoniazid 75mg, Pyrazinamide 400mg, Ethambutol 275mg
- **RHE** contains: Rifampicin 150mg, Isoniazid 75mg, Ethambutol 275mg
- **RH** contains: Rifampicin 150mg, Isoniazid 75mg

**Paediatric Formulations**
- **RHZ** contains: Rifampicin 60mg, Isoniazid 30mg, Pyrazinamide 150mg
- **RH** contains: Rifampicin 60mg, Isoniazid 30mg

b) Single tablets
- **Z (pyrazinamide)** contains: Pyrazinamide 400mg
- **E (ethambutol)** contains: Ethambutol 400mg, Ethambutol 100mg
- **H100 (isoniazid)** contains: Isoniazid 100mg

c) Injections
- **S (streptomycin)** contains: Streptomycin 1g

9.5.2. TB Treatment Regimens

9.5.2.1 Treatment Regimen 1 (for new patients)

- **Initial intensive phase:**
  - Newly diagnosed TB patients are admitted for 2 weeks in hospital where they receive daily treatment under DOT.
  - The remaining 6 weeks of the intensive phase is taken daily either in hospital or in the community according to the patient's DOT option.
  - In central hospitals, patients are started on ambulatory treatment depending on the condition of the patient from the first day, but treatment is on daily basis just like the district hospitals.

- **Continuation phase:**
  - Patients take medicines under supervision.
  - Medicines are collected from the nearest health facilities every fortnight.
## Table 14: Dosages of FDC formulations

<table>
<thead>
<tr>
<th>ADULTS</th>
<th>Initial phase 2 months</th>
<th>Continuation phase 4 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight in kg</td>
<td>[RHZE] [R150/H75/Z400/E275] Number of tablets*</td>
<td>[RH] [R150/H75] Number of tablets*</td>
</tr>
<tr>
<td>30-37</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>38-54</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>55-74</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>75 and over</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHILDREN</th>
<th>Initial phase 2 months</th>
<th>Continuation phase 4 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight in kg</td>
<td>[RHZ] (R60/H30/Z150) Number of tablets or sachets*</td>
<td>E100 Number of tablets or sachets*</td>
</tr>
<tr>
<td>&lt; 7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8-9</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>10-14</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>15-19</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>20-24</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>25-29</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Re-adjust dose as body weight increases

### 9.5.2.2 Treatment Regimen 2

*Indications for use:* relapse, return after default, treatment failure and recurrent Tuberculosis.

- The regimen is **2SRHZE/1RHZE/5RHE**
9. Infectious diseases

- Regimen consists of 2 months of **SRHZE** daily, 1 month of **RHZE** daily followed by 5 months of **RHE** daily, all under supervision.

**Note:**
(1) Sputum positive cases that have previously taken anti-tuberculosis medicines for 1 month or more must be suspected of discharging tubercle bacilli resistant to one or more anti-TB medicines.
(2) These patients must submit sputum specimens for medicine sensitivity testing before starting the re-treatment regimen.

**Table 15: Treatment regimen 2**

<table>
<thead>
<tr>
<th>ADULTS</th>
<th>Initial phase 2 months</th>
<th>Continuation phase 5 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight in kg</td>
<td>[SRHZE]</td>
<td>[RHZE] [R150/H75/Z400/E275]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of tablets daily for 2 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[RHZE]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of tablets daily for 5 months</td>
</tr>
<tr>
<td>Streptomycin daily injection for 2 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-37</td>
<td>0.5g</td>
<td>2</td>
</tr>
<tr>
<td>38-54</td>
<td>0.75g</td>
<td>3</td>
</tr>
<tr>
<td>55-74</td>
<td>1g</td>
<td>4</td>
</tr>
<tr>
<td>75 and over</td>
<td>1g</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHILDREN</th>
<th>Initial phase daily doses for months</th>
<th>Initial phase daily dose for 1 month</th>
<th>Continuation phase daily dose for 5 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight in kg</td>
<td>[SRHZ] and E</td>
<td>[RHZ] and E</td>
<td>[RH] and E [R60/H30/] and E100</td>
</tr>
<tr>
<td>Streptomycin daily injection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[RHZ] Number of</td>
<td>[E] Number of</td>
<td>[RHZ] Number of</td>
</tr>
</tbody>
</table>
9. Infectious diseases

<table>
<thead>
<tr>
<th>Weight in kgs</th>
<th>Daily during weeks 1-8</th>
<th>Daily during weeks 9-32</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td>RH</td>
</tr>
<tr>
<td>Over 55</td>
<td>1 g</td>
<td>4</td>
</tr>
<tr>
<td>40 – 55</td>
<td>0.75g</td>
<td>3</td>
</tr>
<tr>
<td>25 – 39</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td>20 – 24</td>
<td>15mg/kg</td>
<td>1.5</td>
</tr>
<tr>
<td>15 – 19</td>
<td>15mg/kg</td>
<td>1.5</td>
</tr>
<tr>
<td>9 – 14</td>
<td>15mg/kg</td>
<td>1</td>
</tr>
<tr>
<td>5 – 8</td>
<td>15mg/kg</td>
<td>0.5</td>
</tr>
<tr>
<td>0 – 4</td>
<td>15mg/kg</td>
<td>0.25</td>
</tr>
</tbody>
</table>

- The regimen consists of 2 months of Streptomycin, Rifinah and Pyrazinamide given under supervision on a daily basis followed by 7 months of daily Rifinah.

9.5.4 Medicine Resistant Tuberculosis (MRT)

- Two types of medicine resistant TB:
  - Primary resistance (resistance in newly diagnosed TB cases) and
  - Secondary resistance (resistance in previously treated TB cases).
9. Infectious diseases

a) Multi-Drug Resistant TB (MDR-TB) - resistant to both rifampicin and isoniazid.

b) Extensively-Drug Resistant TB (XDR-TB) - also resistant to any fluoroquinolone, and at least one of the three injectable second line anti-TB medicines (capreomycin, kanamycin and amicacin)

9.5.4.1 Treatment of Medicine-resistant TB

- MDR-TB treatment requires use of second line anti-TB medicines which have to be taken for 24 months.
- The patients are managed in their communities.

Table 17: MDR-TB Treatment Regime

<table>
<thead>
<tr>
<th>Patient weight</th>
<th>Medicine</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50 KGS</td>
<td>Kanamycin (Km)</td>
<td>750 mg</td>
</tr>
<tr>
<td></td>
<td>Ethionamide (Et)</td>
<td>500 mg</td>
</tr>
<tr>
<td></td>
<td>Pyrazinamide (Z)</td>
<td>1000 mg</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin (Of)</td>
<td>600 mg</td>
</tr>
<tr>
<td></td>
<td>Cycloserine (Cs)</td>
<td>500 mg</td>
</tr>
<tr>
<td>50 - 65 kgs</td>
<td>Kanamycin</td>
<td>1000 mg</td>
</tr>
<tr>
<td></td>
<td>Ethionamide</td>
<td>750 mg</td>
</tr>
<tr>
<td></td>
<td>Pyrazinamide</td>
<td>1500 mg</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin</td>
<td>600 mg</td>
</tr>
<tr>
<td></td>
<td>Cycloserine</td>
<td>750 mg</td>
</tr>
<tr>
<td>&gt;65 kgs</td>
<td>Kanamycin</td>
<td>1000 mg</td>
</tr>
<tr>
<td></td>
<td>Ethionamide</td>
<td>750 mg</td>
</tr>
<tr>
<td></td>
<td>Pyrazinamide</td>
<td>2000 mg</td>
</tr>
<tr>
<td></td>
<td>Ofloxacin</td>
<td>800 mg</td>
</tr>
<tr>
<td></td>
<td>Cycloserine</td>
<td>750 mg</td>
</tr>
</tbody>
</table>
9. Infectious diseases

<table>
<thead>
<tr>
<th>CONTINUATION PHASE: 18 MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient weight</strong></td>
</tr>
<tr>
<td>&lt; 50 kg</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>50 – 65 kg</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>&gt;65 kg</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

See Guidelines for the Programmatic Management of Multi-medicine Resistant Tuberculosis in Malawi (MOH, 2008) for details.

9.5.5 Management of Anti–TB Drug Reactions

- The table below gives an outline of symptoms of the common drug reactions and how to manage them.

Table 18: Minor side effects not requiring treatment to be stopped:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Medicine</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain, nausea</td>
<td>Related to rifampicin</td>
<td>Give oral medicines to the patient last thing at night</td>
</tr>
<tr>
<td>Burning of the feet</td>
<td>Related to isoniazid peripheral neuropathy</td>
<td>Continue isoniazid; give pyridoxine 50 mg - 75 mg daily large doses of pyridoxine may interfere with the action of isoniazid (wherever possible, pyridoxine 10 mg daily should be given routinely with isoniazid)</td>
</tr>
<tr>
<td>Joint pains</td>
<td>Related to Pyrazinamide</td>
<td>Continue Pyrazinamide; use Aspirin or non-steroidal anti-inflammatory medicine</td>
</tr>
<tr>
<td>Red urine</td>
<td>Related to Rifampicin</td>
<td>Reassure the patient</td>
</tr>
<tr>
<td>Women on Rifampicin</td>
<td>Rifampicin may reduce the effectiveness of the Oral contraceptive pill</td>
<td>Alternative contraception should be provided</td>
</tr>
</tbody>
</table>
Table 19: Major Side effects requiring treatment to be stopped:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Medicine</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deafness</td>
<td>Related to Streptomycin</td>
<td>Otoscopy to rule out other causes Stop Streptomycin if no other explanation. Use ethambutol instead.</td>
</tr>
<tr>
<td>Dizziness</td>
<td>If true vertigo and nystagmus, related to Streptomycin</td>
<td><strong>Stop</strong> Streptomycin; If just dizziness with no nystagmus, try dose reduction for one week, but if no better stop Streptomycin. Use Ethambutol instead.</td>
</tr>
<tr>
<td>Generalised reactions including shock, purpura</td>
<td>May be due to rifampicin, Pyrazinamide and/ or Streptomycin</td>
<td><strong>Stop</strong> all medication Use different combination of medicines</td>
</tr>
<tr>
<td>Jaundice</td>
<td>Related to drug-induced hepatitis.</td>
<td><strong>Stop</strong> all antituberculosis medicines until jaundice and liver function tests revert to normal (see below)</td>
</tr>
<tr>
<td>Skin itching</td>
<td>Related to all antituberculosis medicines</td>
<td><strong>Stop</strong> antituberculosis medicines</td>
</tr>
<tr>
<td>Visual impairment</td>
<td>Related to Ethambutol</td>
<td>Visual examination –seek clarification <strong>Stop</strong> Ethambutol</td>
</tr>
<tr>
<td>Vomiting +/- confusion</td>
<td>Suspect drug-induced hepatitis</td>
<td>Urgent liver function tests (lfts) If lfts not available, <strong>stop</strong> antituberculosis medicines and observe.</td>
</tr>
</tbody>
</table>

9.5.6 Complications of Tuberculosis and their Management

9.5.6.1 Pulmonary Tuberculosis

- **Haemoptysis (coughing blood):**
  - If severe, refer to hospital for bed rest, sedatives and probably transfusion.
9. Infectious diseases

- Do a chest x-ray to rule out potentially treatable conditions such as aspergilloma or bronchiectasis.
- **Pleural effusion (collection of fluid between the lungs and the chest wall):**
  - Drain big pleural effusions to relieve symptoms of dyspnoea.
  - Empyema (collection of pus alone) should be drained.
- **Spontaneous pneumothorax (collection of air between the lungs and the chest wall):**
  - This may cause sudden onset of shortness of breath.
  - May require admission to hospital for drainage with an underwater seal.
- **Fibrosis (scarring) of the lungs:**
  - This may lead to cor-pulmonale (right-sided heart failure) in the long term.
  - Symptomatic treatment may be required.
- **Bronchiectasis:**
  - Coughing due to residual lung damage sometimes with expectoration of large volumes of sputum and sometimes blood.
  - Symptomatic treatment may be required provided that the sputum is negative for AAFB.

### 9.5.6.2 Extra-Pulmonary Tuberculosis

- Complications will depend upon the site of the disease:
  - **Tuberculosis of the spine:** paraplegia (weakness of the lower limbs). Refer to hospital immediately.
  - **TB meningitis:** cranial nerve damage. Give steroids.
  - **TB lymphadenitis:** cold abscesses and suppurating fistulae. Do I and D.
  - **Pericardial effusion:** heart failure. Give high doses of steroids.
  - **Cardiac tamponade (distress associated with shock):** Refer to tertiary level.
  - **Pleural effusion:** respiratory failure. Do therapeutic pleural tap.
  - **Tuberculoma:** focal seizures or neurological signs. Order CT scan for diagnosis
  - **TB Abdomen:** ascites. Do ascitic tap for diagnosis. Finding of lymph nodes on ultrasound scan of the abdomen can also be diagnostic.
9.5.7 Use of Anti-Tuberculosis Medicines in Special Situations

9.5.7.1 Pregnancy and Reproductive Health

- **Streptomycin** is potentially ototoxic and may cause deafness in babies.
- **Streptomycin** should not be given in pregnancy.
- **Rifampicin** stimulates formation of liver enzymes and therefore can reduce the effectiveness of the oral contraceptive pill.
- Advise patients on TB treatment to take alternative contraception while on rifinah.

9.5.7.2 Renal impairment and renal failure

- Give normal dosage of Rifampicin, Isoniazi and Pyrazinamide to patients with renal failure.

**Note:**

Streptomycin and Ethambutol are given in reduced doses and less frequently in patients with renal failure.

9.5.7.3 Liver impairment and liver failure

- Isoniazid, rifampicin and pyrazinamide are hepatotoxic.
- Patients with active liver disease who develop TB should not receive pyrazinamide or rifampicin.
  - Give streptomycin, isoniazid and ethambutol for intensive phase of treatment, and isoniazid and ethambutol for maintenance treatment.
  - If jaundice is acute and severe, treat initially with just streptomycin and ethambutol.

9.5.7.4 Epilepsy

- Rifampicin reduces plasma levels of Phenobarbitone.
- Advise patients to increase the dose of phenobarbitone.

9.5.7.5 TB/ART

- Rifampicin reduces plasma levels of Nevirapine by 30%.
- Low Nevirapine levels may increase the risk of the HIV becoming resistant to the medicine and thus compromise the effectiveness of the ART.
9. Infectious diseases

9.5.8 Corticosteroids and Tuberculosis

- Adjunctive therapy with corticosteroids, in conjunction with anti-TB medicines, may be appropriate in tuberculosis meningitis, pericardial and pleural disease.
- Prednisolone 40mg daily for 30 days in TB meningitis, patients with altered consciousness, neurological defects or spinal block, followed by a gradual reduction in dose in the succeeding weeks.
- Prednisolone 60mg for 4 weeks for pericardial effusion and constrictive pericarditis, followed by 30 mg for the next 2 weeks and tapering to zero over the next 2 weeks.
- Prednisolone 40mg daily for 1 - 2 weeks for large pleural effusion.

9.5.9 Management of Household Contacts of Smear-Positive TB Cases

9.5.9.1 Children aged 6 years and over

- Investigate for TB if symptoms are present
- Treat if TB is present.

Note:
National TB Program is advocating for active case finding for all household members.

9.5.9.2 Children below 6 years:

- Screen all children using either clinical assessment, or tuberculin test or chest x-ray including those who are household contacts of smear-positive TB cases.
- Commence child on Isoniazid preventive therapy (5mg / kg daily for 6 months) if there is no evidence of active TB.
  - If a child contact of any age has symptoms suggestive of TB, refer for further assessment.
- Register and treat the child for TB according to the National TB Program guidelines if diagnosed with TB.

9.5.9.3 Babies born to mothers with smear-positive Pulmonary TB

- Isoniazid (5 mg / kg daily for 6 months).
  - Vaccinate with BCG at the end of 6 months.
9. Infectious diseases

- Continue breast-feeding.
- Should child develop symptoms while on isoniazid preventive therapy, investigate for active TB.
- If TB is diagnosed, stop isoniazid and institute anti-TB treatment according to the guidelines.

## 9.6 Typhoid

- Prevent through clean water, improved sanitation and health education
- Diagnosis should be done by blood culture, Widal tests are inaccurate!

**Treatment**

- **Ciprofloxacin** 500mg oral or 400 mg i/v every 12 hours for 14 days treatment the same for children

**Alternatively**

- **Ceftriaxone** 2g i/v every 24 hours for 14 days
- Switch to oral Ciprofloxacin when improving and patient able to tolerate

**If severe**

- i/v treatment is preferred
- Continue for a total of 14 days, switch to oral ciprofloxacin when improving and patient is able to tolerate oral medicines

**Supportive measures:**

- i/v fluids may be needed
  Ensure meticulous hand washing and proper stool disposal
- Disinfect with chlorine
- Maintain good nutrition
- Give analgesic treatment for pain relief (*see Section 24 page 196*)
- Intestinal perforation and intestinal bleeding are complications
- Refer urgently for surgical attention if suspected

## 9.7 Sepsis

- Sepsis is a condition in which infection (mostly with bacteria) causes a systemic inflammatory response resulting in severe illness
9. Infectious diseases

- Try to find the cause and treat accordingly; where possible blood culture should be done before starting treatment
- Sepsis is common in HIV infected patients and is mainly caused by Pneumococcus and non-typhoidal Salmonella
- Always refer to hospital for systemic treatment, but in severely ill patients before referral give:

  **Adults**
  - **Chloramphenicol** 1g i/v or i/m stat *plus*
  - **Gentamycin** 240 mg slow i/v or i/m stat *plus*
  - **Quinine** 1200mg i/v in 5% dextrose over 4 hours

  **Children**
  - **Benzyl penicillin** 50,000 units/kg i/v or i/m stat *plus*
  - **Gentamycin** 7.5 mg/kg slow i/v or i/m stat *plus*
  - **Quinine** 10 mg/kg i/m stat

- The following hospital treatment regimens are empirical and should be amended accordingly based on the results of culture and sensitivity testing

  **Hospital treatment:**

  **Adults:**
  - **Ceftriaxone** 2g i/v 24 hourly for 10 days
  - Switch to oral **Co-amoxiclavulin** 625 mg every 8 hours or oral **Ciprofloxacin** 500 mg every 12 hours plus **Amoxycillin** 500 mg every 8 hours when improved

  **Alternatively**
  - **Ciprofloxacin** 400 mg i/v every 12 hours or 500 mg orally every 12 hours *plus*
  - **Benzylpenicillin** 2MU i/v every 6 hours
  - Switch to oral **Ciprofloxacin** 500 mg every 12 hours plus **Amoxycillin** 500 mg every 8 hours, or oral **Co-amoxiclavulin** 625 mg every 8 hours, when improved
  - Antibiotics should be given for a minimum of 10 days

  **If intra-abdominal source suspected:**
  - Add **Metronidazole** 500 mg i/v or 400 mg orally every 8 hours
  - **If still febrile after 72 hours reassess the patient**
9. Infectious diseases

**Children**
- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/v later orally plus
- **Benzyl penicillin** 50,000 units/kg every 8 hours, initially slow i/v later i/m

**Alternative to benzyl penicillin**
- **Ampicillin** 40 mg/kg i/v every 6 hours until oral medication can be tolerated then
- **Amoxicillin** 250 mg every 8 hours

*If still febrile after 72 hours:*
- Add **Gentamicin** 7.5 mg/kg once daily

**Neonates**
- **Benzyl penicillin** or **Ampicillin/Amoxicillin** as for (older) children above plus
- **Gentamycin** 2.5 mg/kg every 8 hours.

*If severe:*
- **Chloramphenicol** 25 mg/kg i/v bolus every 6 hours until 48 hours after fever has settled then 500 mg orally every 6 hours
- Continue for a total of 14 days
- Or **Ceftriaxone** 50 mg/kg i/v once daily until 48 hours after fever has settled then continue with **Ciprofloxacin**

---

9.8. **Chicken pox (varicella)**

- **Causes**: varicella zoster virus
- More severe and extensive in HIV (+) patients

**General Management**
- Application of wet compresses or use of cool baths may help to control itching, (scratching may lead disfigurement)
- In severe itching, give a sedative systemic antihistamine (e.g. oral **Promethazine** or **Chlorpherniramine**).
- Keep hands clean and nails clipped short to reduce problems caused by scratching

**Treatment**

**Adults (symptomatic treatment):**
- Apply **Calamine** + **Sulphur 2% lotion** nocte or 2 times daily
- Give **Paracetamol 500mg** every 4 hours
9. Infectious diseases

- Has more complications in adults, in particular those that are immunocompromised. Varicella pneumonitis is particularly serious. Therefore antiviral treatment is advised.
  **Acyclovir** 800 mg 5 times a day for 7-10 days.

**Children (symptomatic treatment):**
- Apply **calamine + sulphur** 2% lotion 2 times daily
- **Paracetamol** 10 mg/kg every 6 hours as required (Avoid Aspirin in children).
- For severe and extensive conditions give **Acyclovir** 400mg every 8 hours for 7 days
  In case of secondary infection give antibiotics as per Section 18.1 page 157, consider HIV test
10. Miscellaneous Conditions

10.0 Miscellaneous Conditions

10.1 Fever

- An axillary temperature of 38°C or over indicates significant fever and the need for antipyretic treatment. This is not the case for adults: temperatures in patients of up to 40.5 °Celsius can be accepted, but antipyretic treatment can be given for symptomatic relief.

- Investigate (by clinical assessment, assisted where available by laboratory tests) and treat the underlying cause.

- In neonates, failure to feed may precede development of fever in cases of sepsicaemia.

- A positive malaria blood slide in a patient with fever does not always mean that the fever is caused by malaria. Treat for malaria but keep an open mind for other causes such as sepsis. This is more likely in HIV infected patients with advanced immune suppression.

Treatment

- Tepid sponging may be used as a supportive measure to reduce fever.

Adults

- **Paracetamol** 500 mg every 4 hours or 1000 mg every 6 to 8 hours, maximum of 4 doses in 24 hours, preferably after food

Alternatively:

- **Aspirin** 600mg every 6 hours

Children

- **Paracetamol** 10 mg/kg/dose

Table 20: Paracetamol dose table for children

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>Dose per 6 hours (mg)</th>
<th>Tablets (500 mg)</th>
<th>Syrup (120 mg/5 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>125</td>
<td>¼</td>
<td>5 mL</td>
</tr>
<tr>
<td>1-5</td>
<td>250</td>
<td>½</td>
<td>10 mL</td>
</tr>
<tr>
<td>6-12</td>
<td>500</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>&gt;12</td>
<td>1000 (1 g)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Note:

- a) Antipyretic should not be given for more than 3 days
- b) Prolonged fever may indicate another condition and/or failure of treatment
- c) Aspirin should not be given to children less than 12 years old
11. Musculoskeletal disorders

11.0 Musculoskeletal disorders

11.1 Arthritis (non-infective)
- Make specific diagnosis whenever possible and treat accordingly
- An acute mono-arthritis should always be considered to be infective until evidence to the contrary is obtained

11.1.1 Non-specific inflammatory arthritis, and rheumatoid arthritis

Treatment

Adults
- **Ibuprofen** 1.2–1.8g daily in 3 divided doses after food
- Alternatively:
  - **Aspirin** 300–900 mg after food every 4 hours. Maximum of 4g daily in divided doses in acute conditions
- Review after 7 days
- If not responding: change to an alternative non-steroidal anti-inflammatory drug (NSAID):
  - **Indomethacin** 25 – 50mg every 8 hours after food for another 7 days or
  - **Diclofenac sodium** 25-50mg every 8 hours after food or SR 75mg every 12 hours for another 7 days
  - Consider referral for specialist opinion

Children:
- Always refer to hospital
- Prior to referral, give **Aspirin** 20 mg/kg after food every 6 hours

11.2 Arthritis (septic)
- Always refer to hospital for systemic treatment
- Aspirate the joint for diagnostic and therapeutic purposes
- Surgical drainage may be indicated
- TB septic arthritis is treated as for other forms of extra-pulmonary TB

Treatment

Adults
- **Flucloxacillin** 1g i/v every 6 hours for at least 14 days plus,
- **Ciprofloxacin** 500mg orally every twelve hours
- A further 2-4 weeks of oral antibiotics may be required
Musculoskeletal disorders

Alternatively if penicillin allergic use **Ceftriaxone** 2g i/v daily for 2 weeks
- followed by oral **Erythromycin** 500mg every 6 hours and
- **Ciprofloxacin** 500mg every 12 hours for a duration 2-4 weeks

**Children:**
- **Chloramphenicol** 12.5 mg/kg every 8 hours for at least 14 days, or 4 weeks if there is associated osteomyelitis
- Clinically evident by bone swelling or proven by X-rays after the initial 14 day course

*Alternatively when staphylococcal infection is suspected:*
- **Flucloxacillin** 25 mg/kg i/v every 6 hours for 14 days

### 11.3 Gout

#### 11.3.1 Acute attack
- Rest
- Ensure abundant fluid intake

*Treatment*
- **Ibuprofen** 800mg every 6 hours preferably after food in established cases until attack subsides

*Alternatively:*
- **Indomethacin** 50-75 every 8 hours with food or
- **Diclofenac sodium 25-50mg** every 8 hours preferably after food
- **Colchicine** 1.0mg followed by 0.5mg no more frequently than every 4 hours until pain is relieved or diarrhoea or vomiting starts. Maximum of 6mg per course; course should not to be repeated within 3 days
- **Prednisolone 30 – 50mg/day** for 5-7 days

#### 11.3.2 Prevention of attacks
- Encourage physical exercise
- Encourage reduction in dietary protein (if intake is high)
- Avoid alcohol

*Treatment*
- **Allopurinol** 100 mg daily after food
- Only indicated in recurrent gout attacks.
- Do not start this treatment until an acute attack has completely subsided.
11. Musculoskeletal disorders

- Gradually increase over 1-3 weeks to 300 mg once daily, according to plasma or urinary uric acid concentration
- **Maintenance dose**: Up to 200 -600mg daily; dosage >300 mg to be given in divided doses; may be required life long.

11.4 Musculoskeletal pain and trauma

- Joint pain, lumbago, and chronic musculoskeletal disorders are common in adults

  Adults (symptomatic treatment)
  - Give analgesics

  If pain persistent or severe:
  - Refer to a surgeon or a physiotherapist

11.5 Osteomyelitis

11.5.1 Acute Osteomyelitis

  Adults and Children:
  - Admit to hospital for rest
  - Splint the affected limb as required,
  - Give analgesics

  If pain is severe:
  - Give **Pethidine** 1mg/kg i/m
  - Repeat every 6 hours for a maximum 4 doses
  - Drain pus surgically from the bone and send for culture and sensitivity testing
  - Do not await culture results before starting antibiotic treatment

  Children Over 2 years:
  - **Flucloxacillin** 25 mg/kg up to a maximum of 500 mg every 6 hours, initially i/v, then orally from 48 hours after fever has settled

  Alternatively:
  - **Chloramphenicol** 25 mg/kg up to a maximum of 500mg every 8 hours, initially i/v, then orally from 48 hours after fever has settled

  Children Under 2 years:
  - **Chloramphenicol** 25 mg/kg every 8 hours, initially i/v, then orally from 48 hours after fever has settled
11. Musculoskeletal disorders

Alternatively, if staphylococcal infection is very likely:

- **Flucloxacillin** 25 mg/kg every 6 hours, initially i/v, then orally from 48 hours after fever has settled
- Antibiotic treatment should be continued for 4 weeks under hospital supervision.

11.5.2 Chronic osteomyelitis

Adults and Children:

Treatment

- Surgical treatment by sequestrectomy when an adequate involucrum has formed
- Antibiotic treatment for febrile flare-ups of infection as for acute osteomyelitis (See Section 11.5.1 above)
- Antibiotic cover for surgery as appropriate after culture and sensitivity testing
- Give **Ibuprofen** 1.2 – 1.8g daily in 3 divided doses after food

Alternatively:

- **Aspirin** 10mg/kg orally, preferably after food, every 6 hours up to an adult maximum of 600 mg per dose

11.6 Rheumatic fever

- Always refer to hospital

11.6.1 Acute attack

- **Benzathine penicillin** 1.2MU i/m single dose
  - Children <30 kg: **Benzathine penicillin** 600,000 units

Alternatively, if compliance can be ensured:

- **Phenoxymerthylpenicilllin** 250 mg every 6 hours for 10 days
  - Children: **Phenoxymerthylpenicilllin** 12.5 mg/kg/dose

Alternatively, if penicillin allergy:

- **Erythromycin** 500mg every 8 hours for 10 days

11.6.2 Acute Carditis

- Strict bed rest until carditis has resolved
- **Adults and children:**
  
  Treatment
  
  - **Aspirin** 25mg/kg, preferably after food, every 6 hours
  - Reduce dose if tinnitus or other toxic symptoms develop
Musculoskeletal disorders

- Continue treatment with this until fever and joint inflammation are controlled
- Then reduce dose gradually over a 2 week period

- *If symptoms recur:*
  - Restart full dose

- *In severe carditis with heart failure and not responding to aspirin:*
  - Add **prednisolone** 2 mg/kg once daily
    - Reduce dose gradually after 3-4 weeks
  - Treat heart failure

11.6.3 Chorea

*Treatment*

**Adults and Children:**

- **Haloperidol** 25 micrograms/kg every 8 hours

11.6.4 Prophylaxis of Rheumatic fever

11.6.4.1 Prevention of further attacks

- Continue treatment until at least age 25

*Treatment*

- **Benzathine penicillin** 1.2 MU i/m monthly
  - Children < 30 kg: 600,000 units/dose

*Alternative if compliance can be ensured:*

- **Phenoxyethylpenicillin** 250mg every 12 hours

*Alternative if penicillin allergy:*

- **Erythromycin** 500 mg daily
  - Children <30 kg: **250mg**

11.6.4.2 Prophylaxis of bacterial endocarditis

- Needed to prevent bacterial endocarditis in those with previous rheumatic fever or any heart valve abnormalities of other cause.

11.6.4.3 Before dental extraction

*Prophylaxis in Adults and Children > 30 kg:*

- **Amoxycillin** 3g oral taken 1 hour before the dental procedure

*Alternatively if penicillin allergy:*
11. Musculoskeletal disorders

- **Erythromycin** 1.5g taken 1 hour before the procedure and 500 mg 6 hours later

**Prophylaxis in Children > 30 kg:**
- **Amoxicillin** 50 mg/kg taken 1 hour before dental procedure, and repeated 6 hours later

**Alternatively if penicillin allergy:**
- **Erythromycin** 75mg/kg taken 1 hour before procedure and 25 mg/kg 6 hours later

11.6.4.4 Prophylaxis before other procedures

a) **For genito-urinary surgery or instrumentation:**
- **Amoxicillin** 1g i/v or i/m plus
- **Gentamycin** 2mg/kg i/v or i/m 30 minutes before the procedure, then
- **Amoxicillin** 500mg taken 6 hours later
  - **Alternatively if penicillin allergy:**
  - **Erythromycin** 500mg every 6 hours for 48 hours, instead of amoxicillin

b) **For obstetric and gynecological procedures:**
- Not required except for those with prosthetic heart valves who should receive prophylaxis as for dental procedures

11.7 Tropical pyomyositis

- Treatment is both medical and surgical
- Medical treatment may prevent abscess formation at the start of infection, when the muscle is swollen, hot and painful
- Immobilize and give:

  **Treatment**

  **Adult and children:**
  - **Flucloxacillin** 1g i/v every 6 hours for at least 14 days plus,
  - **Ciprofloxacin** 500mg orally twice daily

  **If penicillin allergic**
  - **Ceftriaxone** 2g i/v daily for 2 weeks
  - Give surgical treatment (abscess drainage) when the swelling becomes fluctuant.
12. Obstetric and Gynaecological Conditions

12.0 Obstetric and Gynaecological Conditions

12.1 Abnormal Vaginal Bleeding

- Bleeding which deviates from the normal menstrual pattern in terms of the amount, duration or interval

a) In young adolescents

- It is mainly physiological and pathology is very rare. Manage conservatively
  - Heavy, irregular menses will cause anaemia which may be serious
  - Exclude complications of pregnancy

Treatment

- Treat anaemia see Section 1.2. page 1
- Give low-oestrogen combined contraceptive tablets for a minimum of 6 months

If bleeding is very heavy:

- Give 2 tablets daily for 10 days then 1 tablet daily for 2-6 months

Note:

- Low-oestrogen combined contraceptive is contraindicated if there is migraine or raised BP
  - Refer to Hospital.

If heavy menses return:

- Refer to hospital

b) In women of child-bearing age:

- Causes: complication of pregnancy, including ectopic pregnancy, use of hormonal method of contraception or an intra-uterine device (IUD), fibroids, choriocarcinoma, cervical cancer.
- Consider visual inspection of cervix after applying 3-5% acetic acid (VIA).
- Refer to hospital

Investigate always persistent bleeding after delivery or abortion

- If all pathology has been excluded then the bleeding is dysfunctional.

Treatment

- Cyclical Progesterone 5-10 mg daily for 14 days in the 2nd phase of the menstrual cycle for 3 months

Alternatively
12. Obstetric and Gynaecological conditions

- **Low oestrogen combined contraceptive**: 1 tablet for 14 days in the 2\textsuperscript{nd} phase of the menstrual cycle for 3 months
- If no improvement, refer for specialist care.

c) **In post-menopausal women:**
- Always investigate vaginal bleeding
- Important causes are endometrial cancer and cervical carcinoma
- Always refer for hospital treatment

  **At hospital**
  - Perform a thorough vaginal examination including speculum exam, endometrial thickness scan if greater than 4 mm then consider dilatation and curettage and send sample for histology assessment

12.2 **Ante-and Post-natal care**

*Refer to Reproductive Health Guidelines*

- Check on tetanus immunization status see Section 12.3 below

  **During pregnancy and for 6 weeks after delivery:**
  - **Folic acid** 5 mg once daily
  - **Ferrous sulphate** 200 mg once daily
  - **SP 3** tablets stat at the first antenatal visit after quickening
    - Repeat at an interval of at least 4 weeks (1 month)
    - HIV infected pregnant women must have 3 courses of SP

*Pregnant women who are HIV-positive and are also taking daily cotrimoxazole prophylaxis should NOT be given SP.*

- **Vitamin A** (retinol) 200,000 units single dose, ideally day 2 after delivery, or anytime within the first 2 months after delivery
- Check haemoglobin antenatally. If ≤ 9g/dl refer to hospital. If ≥9 g/dl give **Ferrous sulphate** and **Folic acid** as above. If no response then refer.

  **At the hospital**

  - The following tests should be done
    i. Full blood count
    ii. Stool and urine analysis
    iii. Peripheral blood film
    iv. Malaria parasite check
    v. HIV test
### 12.3 Tetanus Toxoid Vaccination (TTV)
- All pregnant women should receive TTV

#### Table 21: Schedule of TTV Doses

<table>
<thead>
<tr>
<th>TTV</th>
<th>Dose</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT1 (1st dose)</td>
<td>0.5 ml s/c or i/m</td>
<td>Give at any contact with woman of child bearing age (15-45 years) including at 1st antenatal visit</td>
</tr>
<tr>
<td>TT2 (2nd dose)</td>
<td>0.5 ml s/c or i/m</td>
<td>At least 4 weeks after TT1</td>
</tr>
<tr>
<td>TT3 (3rd dose)</td>
<td>0.5 ml s/c or i/m</td>
<td>At least 6 months after TT2 or during a subsequent pregnancy</td>
</tr>
<tr>
<td>TT4 (4th dose)</td>
<td>0.5 ml s/c or i/m</td>
<td>At least 1 year after TT3 or during a subsequent pregnancy</td>
</tr>
<tr>
<td>TT5 (5th dose)</td>
<td>0.5 ml s/c or i/m</td>
<td>At least 1 year after TT4 or during a subsequent pregnancy</td>
</tr>
</tbody>
</table>

### 12.4 Vaginal Candidiasis (moniliasis)
- Common infection occurs more frequently in patients taking antibiotics, pregnancy, HIV/AIDS patients and patients with diabetes.

**Treatment**

**Adults:**
- **Clotrimazole** 500mg intravaginally as single dose or **Clotrimazole** 200mg intravaginally once daily for 3 days

Alternatively
- **Miconazole 200mg** intravaginally once daily for 3 days or
- **Fluconazole 150mg** orally as single dose (contra-indicated in pregnancy) or
- **Nystatin pessary 100,000 IU** vaginally every 12 hours for 7 days

To avoid re-infecting her partner, the male partner should:
- Apply **aqueous gentian violet paint** 0.5% to the penis every 12 hours for 7 days
- Recurrent vulvalvaginal candidiasis should be referred to hospital

### 12.5 Dysmenorrhoea

**Treatment**
- **Mefenamic acid** 500mg every 8 hours during menses for not more than 7 days

Alternatively
- Other analgesics see Section 24.1 page 196
12. Obstetric and Gynaecological conditions

If no response:
- Cyclical courses of **low oestrogen combined contraceptive** tablets once daily for 3 – 6 months

If there is still no improvement
- Refer to hospital

12.6 Hypertensive disorders in pregnancy

- Blood Pressure ≥ 140/90mmHg
- Repeat Blood Pressure check after 4-6 hours

If still raised:
- Refer to hospital

At the hospital
- Admit
- Exclude pre-eclampsia

12.6.1 Pregnancy Induced Hypertension (PIH)

- **Symptoms and signs**: raised BP ≥ 140/90mmHg, ± oedema, proteinuria ≥+ dipstick, gestation ≥ 20 weeks

**Treatment**

a) **If no signs of pre-eclampsia then**
- **Methyldopa** 500mg – 1g every 8 hours until BP settles
- Review weekly

b) **If more than two signs of pre-eclampsia refer patient to hospital**

At the hospital
- Admit, evaluate and take full history,
- Check for signs of imminent eclampsia, check weight, urine dip stick daily, and BP every 4 hours
- Evaluate well being and gestation. Do ultrasound

If diastolic BP >90mm Hg and <110mm Hg then
- **Methyldopa** 500 - 1g every 8 hours review daily

If diastolic >110mm Hg
- Do not lower BP abruptly
- **Hydralazine** 5mg i/v slowly over 5 min.
- Repeat every 20 minutes until diastolic pressure is below 110 mm Hg.
12. Obstetric and Gynaecological conditions

- Then give **Hydralazine** 40mg i/v in 1 litre over 8 hours to maintain BP at below 110 mmHg

*Alternatively*
- **Nifedipine** 10mg. Recheck BP in 20 minutes. Repeat nifedipine if diastolic ≥110mmHg. Consult specialist.
- Watch carefully for eclampsia: If this develops see section for eclampsia for treatment
- **Consider delivery regardless of gestational age if:**
  - BP is difficult to control
  - Urine output is decreasing
- Critical signs/symptoms persist (suggesting severe pre-eclampsia)
- Develops eclampsia

12.6.2 Pre-eclampsia

- **Symptoms/Signs:** Bp> 150/100, marked oedema, proteinuria ++/+++, headache, blurred vision, epigastric pain, oliguria, hyper-reflexia
- Refer to hospital any woman with severe preeclampsia accompanied by nurse incase the patient starts convulsing

If >34 weeks gestation:
- Stabilize patient
- Deliver within 24 hours either by induction, if cervix is favourable, or by caesarean section

If<34 weeks gestation:
- Inform CO/MO/Specialist
- Assess fetal well being using Ultrasound scan or Cardiotocograph
- Give **Dexamethasone** 6mg every twelve hours i/m for 4 doses
  - Alternatively
    - **Betamethasone** 12mg i/m once daily for a total of 2 doses

Check
  - i. Full blood count, Urea & creatinine in serum
  - ii. Liver function tests
  - iii. Electrolytes: sodium, potassium, and chloride

If diastolic BP >90mmHg
- **Methyldopa** 500mg – 1 g every 8 hours
- Give oxygen by mask
- Ensure close monitoring of vital signs and fetal heart
12. Obstetric and Gynaecological conditions

- Strictly monitor fluid intake, and record output (through a Foley’s catheter)
- Consider delivery after administering corticosteroids

Note:
- a) Consider prophylactic magnesium sulphate use for severe preeclampsia
- b) If need arises for prophylactic magnesium sulphate, delivery must be effected within the next 48-72 hours.
- c) Diuretics are discouraged in pregnancy except for cardiac disease

**If the patient convulses treat as eclampsia**

### 12.6.3 Eclampsia

- Convulsions in a woman with pre-eclampsia. Convulsions can occur prior to labour, intrapartum or postpartum.
- Convulsions also do occur without previous symptoms
- Before starting treatment for eclampsia, be absolutely sure to exclude:
  - Epilepsy
  - Meningitis
  - Cerebral malaria

**Initial management:**
- Prevent the patient from hurting herself
- Secure airway, aspirate secretions or vomitus
- Control convulsions with magnesium sulphate see dose below
- Refer to hospital as soon as possible accompanied by a nurse
- Give adequate oxygen supply by nasal prongs or face mask

**Treatment**
- At health centre give loading dose of magnesium sulphate 4 g of 20% solution in 500 ml of normal saline infused over 10 minutes plus 5 g of 50% solution in each buttock deep i/m
- Refer immediately
- Closely monitor the respiratory rate (not less than 16), patella reflexes and urinary output should not be less than 25mls an hour.
- Continue magnesium sulphate for 24 hours post delivery or 24 hours after the last convolution whichever was the last
- **Maintenance dose:** Magnesium sulphate 5 g of 50% solution every 4 hours deep i/m till 24 hours post-delivery or 24 hours after the last convolution which ever was the last.
  {Addition of 1.0ml of 2% lidocaine minimizes discomfort}
12. Obstetric and Gynaecological conditions

Note:

a) Once magnesium sulphate is administered a decision must be made to deliver the pregnant woman within 12 hours

- **If magnesium sulphate is not available give:**
  - Loading dose of **Diazepam** 10mg i/v slowly over 2 minutes
  - Maintenance dose of **Diazepam** 40mg in 500mls of normal saline or ringer's lactate
  - Do not give more than 100mg in 24 hours
  - Refer the patient to hospital

**In case of magnesium sulphate toxicity administer calcium gluconate 1gm as i/v stat dose and stop magnesium sulphate**

Mode of delivery:

- Carry out an obstetric assessment to decide on appropriate mode
- Only allow assisted vaginal delivery if labour is progressing quickly
- Consider caesarean section if unlikely to deliver in 6-12 hours regardless of gestational age
- Give **Oxytocin** 10 IU (1mL amp) by i/v push in the 3rd stage
- Do not use ergometrine

Monitoring:

- Continue careful observation (and treatment if necessary) for at least 48 hours after delivery

### 12.7 Prelabour rupture of membranes

- Rupture of the membranes before labour has begun
- **Symptoms/Signs:** Watery vaginal discharge

(a) **If gestation less than 34 weeks**

- No digital vaginal examination should be done
- When the diagnosis is in doubt, perform sterile speculum examination
- Check temperature 4 hrly, inspect liquor daily, assess fetal heart rate
- Give prophylactic antibiotics:
  - **Erythromycin** 250 mg orally every 8 hours for 7 days
  - **Metronidazole** 400 mg orally every 8 hours for 7 days
- Give corticosteroids:
12. Obstetric and Gynaecological conditions

- **Betamethasone** 12 mg i/m, 2 doses 24 hours apart;  
  *Alternatively*  
  - **Dexamethasone** 6 mg i/m 4 doses 12 hours apart  
  - If still draining, deliver at 34 weeks if there are no other contraindications  
  - *If signs of intra-uterine infection develop* (temperature 37.5 °C or more, purulent or offensive liquor, fetal tachycardia), inform the most senior person available, who should plan urgent delivery regardless of gestational age

**(b)** If gestation 34 weeks or greater

- Do sterile speculum exam to confirm draining and rule out cord prolapse  
- If membranes have been ruptured for more than 18 hours, give prophylactic antibiotics:  
  - **Ampicillin** 2 g i/v every 6 hours  
  *Alternatively*  
  - **Benzylpenicillin** 2 million units i/v every 6 hours until delivery  
  - Stop 48 hour after delivery unless there are signs of sepsis  
  - If labour does not begin spontaneously within 24 hours, assess the cervix and induce labour, if no contraindication to vaginal delivery. If unsuccessful deliver by caesarean section  
  - If signs of intra-uterine infection develop (temperature 37.5 °C or more, purulent or offensive liquor, fetal tachycardia), inform the most senior person available, to decide on mode of delivery

12.8 Chorioamnionitis

- Intra-uterine infection  
  **Symptoms/Signs:** foul-smelling vaginal discharge after 28 weeks of pregnancy, fever/chills, abdominal pain, fetal tachycardia  
  **Treatment**  
  - **Benzylpenicillin** 2.5 MU i/v stat and/or  
  - **Chloramphenicol** 500 mg i/v stat

Refer to hospital  
**At hospital**  
- Give **Metronidazole** 500mg i/v 8 hourly, and  
- **Benzylpenicillin** 2 MU i/v every 6 hours and
12. Obstetric and Gynaecological conditions

- **Gentamycin 240** mg i/m single dose daily or **Chloramphenicol** 500mg 6 hourly
- Continue for 48 hrs after the fever subsides, but not less than 5 days.
- Deliver urgently. Induce or accelerate labour with **Oxytocin**; do caesarean section if necessary.
- If mother has amnionitis or if membranes were ruptured for more than 18 hours before delivery, start newborn on
  - Benzylpenicillin 50,000 IU/kg/dose i/m every 12 hours and
  - Gentamycin 5 mg/kg i/m once daily for 5 days if birth weight >1500 g).

### 12.9 Mastitis

**General Measures**
- Apply hot compresses and a constriction bandage to support the breast and relieve pain.
- Maintain lactation in the infected breast if there are no nipple fissures to prevent stasis
- In severe cases, avoid engorgement by reducing milk production

**Treatment**
- Flucloxacillin 500 mg every 6 hours for 7 days
- Doses should be taken at least 30 minutes before meals
  **Alternatively**
  - Erythromycin 500mg 8 hourly for 5 – 7 days
  - Aspirin 600 mg after food every 6 hours as needed

### 12.10 Breast abscess

- If breast abscess forms, drain surgically.
- Change dressing everyday
- Give treatment as above

### 12.11 Postpartum haemorrhage (PPH)

- Blood loss from the genital tract of more than 500ml after delivery of a baby.
- Causes: uterine atony, retained products of conception, Genital tract trauma, coagulation problems, ruptured uterus
- Always actively manage the 3rd stage of labour

**Treatment**
• **Oxytocin** 10 units im given after delivery of the anterior shoulder and controlled cord traction for delivery of placenta

### 12.11.1 Primary PPH

- Abnormal vaginal bleeding within 24 hours of delivery
- Resuscitate: *Refer to Section 1.2 page 1*
  - Set up an i/v line and empty bladder
  - Replace blood loss with i/v fluids / blood
- Identify and treat the cause
  - *If uterine atony:*
    - Rub up a contraction
    - Set up **Oxytocin** 40 units infusion
    - Give **Misoprostol** 1000mcg rectally
    - Refer to hospital with nurse
  - *If retained placenta*
    - Attempt manual removal
    - Refer to midwife if this fails

### 12.11.2 Secondary PPH

- Abnormal bleeding 24 hours or more after delivery
- Not common but is as serious as primary PPH
- *Causes*: retained products, often with infection
  - **Treatment**
    - Set up an i/v line
    - Empty bladder
    - Rub up a contraction
    - **Oxytocin** 10 units i/m
    - Replace blood loss with i/v fluids/blood (*see Section 1.1 page 1*)
    - Refer immediately for evacuation of the uterus

**Supportive measures**

- **Amoxycillin** 500 mg every 8 hours plus **Metronidazole** 400 mg every 8 hours
  - *Alternatively if penicillin sensitive*
    - **Erythromycin** 250 mg every 6 hours
    - Assess the need for blood transfusion
    - Give i/v fluids to sustain a high degree of perfusion
    - *If the patient is toxic* start i/v antibiotics as follows:
12. Obstetric and Gynaecological conditions

- **Metronidazole** 400 mg every 8 hours plus
- **Gentamycin** 4.0mg/kg body weight i/m stat
- **Benzyl penicillin** 2 MU i/v every 6 hours

### 12.11. Post-abortal haemorrhage

- Assess patient, record vital signs
- Insert i/v line
- Resuscitate and stabilize the patient *(see Section 1.1 page 1)*
- Carry out vaginal examination
- Remove products of conception and/or foreign bodies
- **Oxytocin** 10 units i/m
- Perform (or if not possible refer) evacuation or manual vacuum aspiration (MVA) if gestation < 12 weeks
  
  If septic treat as in Section 12.12 below

### 12.12 Post abortal or puerperal sepsis

- Maintain hydration: set up an i/v line and give i/v fluids *(see Section 1.1 page 1)*
- **Paracetamol** 1 g stat
- **Benzyl penicillin** 5 MU i/v stat
- **Oxytocin** 10 units i/m to contract uterus
- Counsel the patient
- Refer for evacuation of the uterus to hospital with the midwife, blood samples, patient’s records

At hospital:

- Give analgesic for pain *(see Section 24.1 page 196)*
- Repeat as required to maintain uterine contraction
- Give antibiotic treatment for 7 days as follows:

  **For sepsis:**
  - **Metronidazole** 400 mg every 8 hours plus
  - **Gentamycin** 4.0mg/kg body weight i/m stat
  - **Benzyl penicillin** 2 MU i/v every 6 hours
  - Consider uterine evacuation in some cases

  If not improving:
  - Reassess and consider the appropriate intervention:
  - Change of antibiotics
12. Obstetric and Gynaecological conditions

- Re-evacuation
- Laparotomy
- Referral to central hospital

12.13 Contraceptives

- Types: combined hormonal contraceptives, progestogen only contraceptive, contraceptive devices, emergency contraceptive, barrier methods.

12.13.1 Combined hormonal contraceptive (COCs)

- Most effective preparations for general use.
- Contain an oestrogen and a progestogen.
- Choose a preparation with the lowest oestrogen and progestogen content which gives good cycle control and minimal side effects in the individual woman.

  *Indications*
  - Contraception
  - Menstrual disturbances

12.13.2 Progestogen only contraceptive

- Suitable alternative when oestrogens are contraindicated
- Have a higher failure rate than COCs.
- Suitable for hypertensive women, migraine, valvular heart disease and diabetes mellitus.
- Menstrual irregularities (oligomenorrhoea, menorrhagia) are more common but tend to resolve on long term treatment.

  *Dose*
  - 1 tablet daily at same time each day starting on day 1 of the menstrual cycle

12.13.3 Parenteral progestogens

- Injectable preparations e.g. Depo-Provera®
- Implant preparations e.g Jadelle® and Norplant®

12.13.4 Intrauterine progestogens

  *Indications*
  - Contraception
12. Obstetric and Gynaecological conditions

- Menstrual disturbances

### 12.13.5 Non hormonal intrauterine contraceptive device

- Increased risk of PID

#### Indications

- Contraception after delivery, after an abortion and evacuation, at the end of menstruation and emergency contraception
- Examples: Copper T 380®

### 12.13.6 Emergency Contraception

- Effective if taken within 72hrs of unprotected intercourse.
- Give Lofeminol® 4tablets every 12 hours for 24 hrs.
- If vomiting occurs within 3hrs of taking hormonal tablet, give replacement dose and anti-emetics can be considered.
- Explain the following:
  - The next period may be early or late
  - A barrier method needs to be used until the next period.
  - Patient should return promptly if lower abdominal pains develop to rule out ectopic pregnancy or of any problems.
  - An intrauterine contraceptive device can be inserted up to 5 days of unprotected sexual intercourse.
13. Ophthalmic conditions

13.0 Ophthalmic Conditions

13.1 Conjunctivitis

- Bacterial or viral conjunctivitis is highly contagious and personal hygiene is important in prevention and treatment
- Advise the patient to:
  - Use only his/her own towels
  - Wash the face and cleanse the eyes frequently
  - Wash hands thoroughly before applying eye ointment
- Treat unilateral conjunctivitis with special care to avoid spread of infection to the other eye

Treatment
- Apply **Tetracycline eye ointment** 1% every 8 hours for 7 days
- For neonates, see Section 13.3 below

13.2 Foreign body in the eye (superficial injury)

- Detect foreign body with 1 drop of **Fluorescein eye drops** 1%

Treatment
- Apply 1 drop of **Amethocaine eye drops** 1% to anaesthetize the eye
- Remove foreign body carefully with a cotton bud
- Apply **Tetracycline eye ointment** 1% every 8 hours for 7 days

13.3 Ophthalmic neonatorum

Treatment
- **Gentamycin** 4 mg/kg i/m single dose
- Carefully clean away any discharge from the eyes
- Apply **Tetracycline eye ointment** 1% to each eye every 6 hours for 3 days

Alternatively
- Instill 1-2 drops of **Gentamycin eye drops** 0.3% into each eye every 2 hours
- Reduce the frequency as the infection is controlled
- Continue for 48 hours after condition is cleared
- Combined topical therapy may be used as follows:
  - Instill **Gentamycin eye drops** 0.3% during the daytime
  - Apply **Tetracycline eye ointment** 1% at night
  - Continue for 48 hours after condition is cleared
13. Ophthalmic conditions

13.4 Trachoma

Treatment

- Tetracycline eye ointment 1% every 8 hours for 6 weeks
14. Oral and Maxillofacial Conditions

14.1 Candidiasis/Oroesophageal

- **Nystatin oral suspension/ pessaries** 100,000 units every 6 hours for 10-14 days
  
  **Note:** pessary should be sucked and taken after food
  - Review after 14 days
  - Paint **Gentian violet** aqueous solution 0.5 % on the lesions 3 times daily for 7 days
  - **Clotrimazole troches** 10 mg every 8 hours for 4 weeks (children)

  Alternatively
  - **Chlorhexidine** 0.2 % mouth rinses three times a day (should **not** be used together with **Nystatin**)

  *If not resolved after 7 days:*
  - Continue with above treatment and add
  - **Ketoconazole** 200-400 mg twice a day for 10-14 days
    - Children: 1-4 years: **Ketoconazole 50** mg every twelve hours for 10 – 14 days
    - Children: 5-12 years: **Ketoconazole 100** mg every twelve hours for 10 -14 days

  **Note:**
  Ketoconazole interacts with the following ARVs: Nevirapine, protease inhibitors and Didanosine

  Alternatively
  - **Adults**
    - **Fluconazole** 50-100 mg every 6 hours for 14 days
  - **Children**
    - **Fluconazole** 6 mg/kg on day 1, then 3 mg/kg every 6 hours for 13 days
  
  **Prophylaxis:**
  - **Adults**
    - **Fluconazole** 100 mg daily for long term
  - **Children**
    - **Fluconazole** 3-6 mg/kg daily for long term

14.2 Caries, Toothache

*Treatment*

- Depends upon the extent of caries and clinical judgment:
14. Oral and Maxillofacial conditions

(a) If minimal and confined to the enamel
   - Apply topical Fluoride
(b) If in enamel and dentine but not involving the pulp
   - Filling
(c) If involving the pulp and there is periapical infection and/or pulp inflammation
   - Root Canal Therapy
(d) If severe
   - Tooth extraction

Note: Antibiotics are not indicated unless there is infection
Reinforce oral hygiene practices including use of fluoridated toothpaste to all patients

14.3 Dental Abscess

Treatment:
- Consider incision and drainage
- Amoxycillin 250-500 mg every 8 hours for 7 days or
- Benzyl penicillin 1-2 MU (Children: 25,000 units/kg/dose) i/m or i/v every 6 hours for 7 days

Alternatively
- Erythromycin 250-500 mg every 6 hours for 7 days (if allergic to penicillins) and
- Metronidazole 200-400 mg (Children: 7.5 mg/kg/dose) every 8 hours for 7 days
- Metronidazole 250-500 mg i/v every 8 hours for 7 days
- Aspirin 300 mg every 8 hours

14.4 Gingivitis

Treatment
- Reinforce oral hygiene practices; i.e., brushing at least twice a day to remove plaque; in the morning after breakfast and in the evening before going to bed
- Conventional therapy; scaling and cleaning to remove all tooth surface adherents
- Antibiotics are not indicated unless one has acute Necrotizing Ulcerative Gingivitis (ANUG) or Linear Gingival Erythema (LGE)
14. Oral and Maxillofacial conditions

14.5 Periodontal abscess

Treatment
- Give antibiotics as for dental abscess
- Reinforce oral hygiene practices
- Scaling and polishing

14.6 Periodontitis

Treatment
- Root planing +/- antibacterial irrigant (tetracycline)
- Reinforce oral hygiene practices
- Antibiotics are **not** indicated unless the following exists:
  - Necrotizing ulcerative Periodontitis (NUP)
  - Exudate discharging from the periodontal pockets
  - Patient is non-responsive to conventional therapy
  - Juvenile Periodontitis
  - Aggressive Periodontitis

14.7 Odontogenic and Maxillofacial infections

Symptoms/Signs: Patients who present rapid progressive swelling, difficulty in breathing, difficulty in swallowing (dysphagia), facial space involvement, elevated temperature, severe jaw trismus (< 10 mm), toxic appearance, compromised host defenses

Treatment
- Incision and drainage
- Removal of the cause
  - Extraction of the offending tooth or
  - Treat the tooth endodontically with root canal therapy
  - Sequestrectomy (removal of necrotic bone)
- Keep patient hydrated
- Give analgesics for pain relief
- Encourage high-calorie food intake
- Prescribe appropriate antibiotics for rapidly progressive swelling as follows:
  - **Amoxycillin** 250-500 mg every 8 hours for 7 days *or* **Benzylpenicillin** 0.5-2.0 MU i/m or i/v every 6 hours for 7 days
  - **Metronidazole** 200-400 mg every 8 hours for 7 days *or* Metronidazole 250-500 mg i/v every 8 hours for 7 days
14. Oral and Maxillofacial conditions

- **Tetracycline** 250 mg every six hours or 500 mg twelve hourly for 7 days
- **Erythromycin** 250-500 mg every 6 hours for 7 days
- **Clindamycin** 150-300 mg

**Note:** Antibiotics are indicated for diffuse swelling, compromised host defenses, involvement of fascial spaces, severe pericoronitis, osteomyelitis

14.8 Local Anaesthesia Toxicity in Dental Surgery

14.8.1 Mild Local Anaesthetic toxicity

- **Symptoms/Signs:** talkativeness, anxiety, slurred speech, confusion

**Treatment**
- Stop administration of local anaesthetic
- Monitor vital signs
- Observe for 1-hour

14.8.2 Moderate Local Anaesthetic toxicity

- **Symptoms/Signs:** stuttering speech, nystagmus, tremors, headache, dizziness, blurred vision, drowsiness

**Treatment**
- Place in supine position
- Monitor vital signs
- Administer oxygen
- Observe for 1-hour

14.8.3 Severe Local Anaesthetic toxicity:

- **Symptoms/Signs:** seizure, cardiac dysrhythmia or cardiac arrest

**Treatment**
- Place in supine position
- If seizures, protect from nearby objects,
- Suction oral cavity if vomiting occurs
- Administer oxygen
- Give **Diazepam** 5-10 mg i/v slowly as stat dose
- Transport to emergency care facility/ Intensive care unit
  - Monitor vital signs
14. Oral and Maxillofacial conditions

- Summon for medical assistance

### 14.9 Mouth Ulcers (Sores)

- If related to HIV infection, please refer to section on *Management of the HIV-Related Diseases*,
- All ulcers in the mouth regardless of the HIV-status, lasting more than three weeks, should be referred for further management
15. Parasitic diseases

15.0 Parasitic diseases

15.1 Malaria

Figure 1: General Plan for Malaria Diagnosis and Treatment

Patient C/O Fever or history of fever (+/- Other symptoms or signs suggestive of malaria).

Yes

Can you test for malaria parasites?

Yes

No

Do a Blood Film or Rapid Diagnostic Test

Parasites seen or RDTs+

No Parasites or RDTs Negative

Is the possibility of malaria still there?

No

Malaria is excluded

Yes

Assess for and treat other causes of fever

This is malaria. Classify malaria according to clinical features

Severe Malaria

➢ Give Quinine IV/IM + General Management
➢ Admit or Refer

Uncomplicated Malaria

Give first line (LA)

If there is still fever after 72 hrs, Repeat Blood film

If parasites are seen, Reclassify Malaria

Uncomplicated Malaria: Give second line antimalarial drug (Amodiaquine+Artesunate)

Severe Malaria:

Patient is well:

No parasites

Discharge, and Educate client on malaria prevention

Patient is well:
15. Parasitic diseases

15.1.1 Malaria, non-severe, uncomplicated

- Refer to the MOHP National Malaria Control Programme publication **Guide for the Management of Malaria, October 2007**, for full details of malaria management
- **Diagnosis**: Made by microscopic examination of blood film wherever possible or alternatively by rapid diagnostic tests (RDTs). Indications for testing for malaria include: fever or recent history of fever, and any illness that can be a malaria complication (coma, convulsions, anaemia, jaundice etc.)
- Indications for repeating a diagnostic test (film or RDT) include:
  a) if the first test was positive and there is persistent fever or worsening condition despite suitable antimalarial treatment.
  b) if the first test was negative and antimalarial treatment was not given, but the patient's fever persists or condition deteriorates.
- Where microscopy or RDT is available, only treat adults for malaria if confirmed by a positive malaria test. When microscopy and RDT are both not available, treat on the basis of presumptive diagnosis
- **Presumptive diagnosis in children < 5 years old**: in the absence of laboratory confirmed diagnosis, consider a (history of) fever in the absence of other causes to be malaria. Additional suggestive signs of malaria include splenomegaly and anemia

**Treatment:**
- First line treatment is **Lumefantrine 120mg / Artemether 20mg (LA)**

**Table 22: Dosage Schedule for Lumefantrine-Artemether (LA -120mg/20mg tablets)**

<table>
<thead>
<tr>
<th>Body weight in Kg (age in years)</th>
<th>No. of tablets at approximate timing of dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day 1</td>
</tr>
<tr>
<td></td>
<td>Start dose</td>
</tr>
<tr>
<td>5-14.9 kg (&lt;3)</td>
<td>1</td>
</tr>
<tr>
<td>15 – 24.9 kg (≥ 3-8)</td>
<td>2</td>
</tr>
<tr>
<td>25 – 34.9 kg (≥9-14)</td>
<td>3</td>
</tr>
<tr>
<td>≥ 35 kg (&gt;14)</td>
<td>4</td>
</tr>
</tbody>
</table>
15. Parasitic diseases

- First dose should be given as DOT. If vomiting occurs within 1 hour, repeat the dose.
- Dose is given according to body weight
- If possible each dose should be taken with milk, which improves the absorption of lumefantrine component of the combination.
- If fever persists beyond 72 hours, do a blood tests (film or RDT), and if the result is positive, give second line treatment.

Table 23: Dosage Schedule for Artesunate-Amodiaquine

<table>
<thead>
<tr>
<th>Weight</th>
<th>Daily dose for 3 days Amodiaquine (153mg)</th>
<th>Daily dose for 3 days Artesunate (50mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 – 6.4 kg</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>6.5 – 11.4 kg</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12.0 – 24.9 kg</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>25.0 – 34.9 kg</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>≥ 35.0 kg</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

15.1.2 Severe Malaria

- Most severe malaria occurs in children under 5 years of age.

Table 24: Clinical manifestations and some laboratory findings

<table>
<thead>
<tr>
<th>Clinical manifestations (Recognizable at Health Centre)</th>
<th>Some laboratory findings at referral hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>❖ Impaired level of consciousness (cerebral malaria)</td>
<td>❖ Severe anaemia: (Hb&lt;5 g/dl)</td>
</tr>
<tr>
<td>❖ Respiratory distress (acidotic breathing)</td>
<td>❖ Hypoglycaemia: (&lt;2.2mmol/l - &lt;40mg/dl)</td>
</tr>
<tr>
<td>❖ Repeated convulsions</td>
<td>❖ Hyperlactataemia (lactic acidosis)</td>
</tr>
<tr>
<td>❖ Circulatory collapse</td>
<td>❖ Hyperparasitaemia: (250,000/l or ring stage&gt; 5% of RBCs)</td>
</tr>
<tr>
<td>❖ Pulmonary oedema</td>
<td>❖ Electrolytes imbalance (e.g. Hyponatraemia)</td>
</tr>
</tbody>
</table>
15. Parasitic diseases

- Although most children with malaria have a (history of) fever, this may be variable in patients who have progressed to severe malaria
- Examine children with suspected severe malaria for other conditions (e.g. pneumonia, meningitis) as a possible cause of their symptoms and, if found, manage appropriately
- If severe malaria is diagnosed in an outpatient, refer the child for hospitalization (see below)

15.1.2.1 Pre-referral treatment at peripheral units

- Refer any patient with severe malaria to the nearest hospital
- Give quinine 20mg (0.2ml) per kg body weight i/m into the upper outer thigh. If the volume to be injected exceeds 3ml (see below), give half into each thigh
- Where there is no scale, weight of the child can be estimated as follows:
  a. For children of 3 months to 12 months old
     \[ \text{Weight (Kg)} = \text{Age (months)} + \frac{9}{2} \]
  b. For children of 1 year to 6 years old
     \[ \text{Weight (Kg)} = \lceil \text{Age (in years)} \times 2 \rceil + 8 \]

- Use a 10ml sterile syringe to draw 5 ml of sterile water for injection, then into the same syringe draw up 300mg (1 ml) from an ampoule of quinine. The syringe now contains 50mg of quinine per ml.
- Give 0.4ml/kg of this solution as the first (loading) dose - this is 20mg/kg. Subsequent (12-hourly) doses should each be 0.2ml/kg (10mg/kg). The dose of quinine for an adult at any one time should not exceed 1,200mg.

  Injectable quinine should be for patients unable to take oral drugs.

<table>
<thead>
<tr>
<th>Table 25: Dosage of Parenteral Quinine per body weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body weight</strong></td>
</tr>
<tr>
<td>Under 5 kg</td>
</tr>
<tr>
<td>5.1 – 7.5 kg</td>
</tr>
<tr>
<td>7.6 – 10.0 kg</td>
</tr>
<tr>
<td>10.1 – 12.5 kg</td>
</tr>
</tbody>
</table>
### 15. Parasitic diseases

<table>
<thead>
<tr>
<th>Weight Range</th>
<th>Fluid Requirement</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.6 – 15.0 kg</td>
<td>3.0 ml</td>
<td>1</td>
</tr>
<tr>
<td>15.1 – 17.5 kg</td>
<td>3.5 ml</td>
<td>2</td>
</tr>
<tr>
<td>17.6 – 20.0 kg</td>
<td>4.0 ml</td>
<td>2</td>
</tr>
<tr>
<td>20.1 – 22.5 kg</td>
<td>4.5 ml</td>
<td>2</td>
</tr>
<tr>
<td>22.6 – 25.0 kg</td>
<td>5.0 ml</td>
<td>2</td>
</tr>
<tr>
<td>25.1 – 27.5 kg</td>
<td>5.5 ml</td>
<td>2</td>
</tr>
<tr>
<td>27.6 – 30.0 kg</td>
<td>6.0 ml</td>
<td>2</td>
</tr>
<tr>
<td>30.1 - 32.5 kg</td>
<td>6.5 ml</td>
<td>3</td>
</tr>
<tr>
<td>32.6 - 35.0 kg</td>
<td>7.0 ml</td>
<td>3</td>
</tr>
<tr>
<td>35.1 - 37.5 kg</td>
<td>7.5 ml</td>
<td>3</td>
</tr>
<tr>
<td>37.6 - 40.0 kg</td>
<td>8.0 ml</td>
<td>3</td>
</tr>
<tr>
<td>40.1 - 42.5 kg</td>
<td>8.5 ml</td>
<td>3</td>
</tr>
<tr>
<td>42.6 - 45.0 kg</td>
<td>9.0 ml</td>
<td>3</td>
</tr>
<tr>
<td>45.1 - 47.5 kg</td>
<td>9.5 ml</td>
<td>4</td>
</tr>
<tr>
<td>47.6 - 50.0 kg</td>
<td>10.0 ml</td>
<td>4</td>
</tr>
<tr>
<td>50.1 - 52.5 kg</td>
<td>10.5 ml</td>
<td>4</td>
</tr>
<tr>
<td>52.6 - 55.0 kg</td>
<td>11.0 ml</td>
<td>4</td>
</tr>
<tr>
<td>55.1 - 57.5 kg</td>
<td>11.5 ml</td>
<td>4</td>
</tr>
<tr>
<td>57.6 - 60.0 kg</td>
<td>12.0 ml</td>
<td>4</td>
</tr>
<tr>
<td>&gt; 60 kg</td>
<td>12.0 ml</td>
<td>4</td>
</tr>
</tbody>
</table>

#### 15.1.2.2 Additional management and supportive measures

- **Reduce fever:**
  - Tepid sponging with lukewarm (not cold) water
  - Give an antipyretic (paracetamol 10 mg/kg; 6 to 8-hourly) as required until fever is reduced. *See dose tables in Section 10.1 page 91*

- **Ensure adequate fluid intake:**
  - if the patient can drink: give ORS 20 mL/kg plus one added teaspoon of glucose powder or sugar
  - if the patient cannot drink: use nasogastric tube to provide this fluid
**15. Parasitic diseases**

Repeat this after 2-4 hours

---

**15.1.2.3 Management of Severe Malaria Patient in Hospital Setting**

Consider the following (8-8-8) points in the management of patients with severe malaria.

---

**Box 1: Take 8 immediate measures:**

1. Start resuscitation, particularly maintenance of a patent airway.

2. Establish i/v line.

3. Make a thick blood smear for immediate malaria parasite count, (if microscopy is not available, an RDT may be useful to indicate whether malaria infection is present or not)

4. Classify the degree of dehydration, assess patient’s fluid requirements and correct accordingly.

5. Control fever if the axillary temperature is 38.5°C or above: *Tepid sponging and oral or rectal paracetamol (15mg/kg every 4 to 6 hours)*

6. Control convulsions: maintain airway, treat with rectal diazepam (0.5mg/kg) or slow IV diazepam (0.3mg/kg, maximum 10mg in an adult), or paraldehyde 0.1ml/kg IM. Remember to correct any hypoglycaemia or hyperpyrexia in a convulsing patient.

7. Detect and treat hypoglycaemia: hypoglycaemia can be induced by high parasitaemia, fasting and quinine therapy. Hypoglycaemia can recur especially in pregnant women and children. If blood glucose ≤3mmol/l or ≤54mg/dl; give 1ml/kg of 50% dextrose IV, diluted with an equal volume of 0.9% saline or 5% dextrose, give slowly over 3-5 minutes, and check blood glucose after 30 minutes and as required after treatment. Follow with 10% dextrose infusion at 5ml/kg/hr. If there is no test for blood glucose, treat as if the patient is hypoglycaemic.

8. Start Quinine i/v or i/m (if i/v not accessible), see below for dosage details.
Box 2: Look for and deal with the following 8 complications:

1. **Shock**: if cold peripheries, delayed capillary refill, or Systolic BP <50mmHg in children 1-5 years or <80 mmHg in >5 years, suspect sepsis. In such cases take blood samples for culture. Give parenteral broad-spectrum antimicrobials. Correct fluid disturbance. Treat with: 30 ml/kg 0.9% Saline IV in 1 hour; then reassess. Give oxygen if possible.

2. **Altered consciousness and/or convulsions**: Check for hypoglycemia, hyperpyrexia and ‘subtle’ seizures. **In a comatose patient, convulsions (seizures) may be ‘subtle’** – i.e. minor movements [flicker of eyelid, mouth or finger] or unusual repetitive movements [a rhythmical cry, unusual breathing, ‘pedalling’ of legs]. If seizure suspected, treat as in item 6 in Box 1.

3. **Severe anaemia**: Consider the need for blood transfusion: Assess the degree of pallor (no pallor, some pallor or severe pallor – look especially at palms of hands, also mucous membranes). Assess signs that increase the danger of severe anaemia - respiratory distress, altered consciousness, shock and hyperparasitaemia. **Note**: The decision to transfuse with blood should not only be based on low laboratory values, but on a full assessment of the patient**. As a guide, all patients with PCV<12% or Hb<4g/dl should be transfused, whatever the clinical state; those with any of the above danger signs may be transfused even if PCV is 13-18% or Hb 4-6g/dl. **Use packed red cells in most cases; in shock or severe acidosis, use whole blood. The volume transfused should be 20 ml/kg.**

4. **Metabolic acidosis** (deep, fast breathing): exclude or treat hypoglycaemia, hypovolaemia and gram negative septicaemia. Give isotonic saline 20 ml/kg of body weight rapidly or screened whole blood 10 ml/kg if PCV <18% or Hb<6g/dl.

5. **Spontaneous bleeding** or coagulopathy: transfuse screened fresh whole blood, give vitamin K. 1 mg/day for infant, 2-3 mg/day for children and 5-10 mg/day for adolescent, or adult. Vitamin K should be given s/c or i/m.

6. **Acute pulmonary oedema** in adults: prevent by avoiding excessive rehydration. Treatment: prop patient up; give oxygen. Stop IV fluids if pulmonary oedema is due to over-hydration, give a diuretic (frusemide i/v 40 mg for adult and 0.5-1 mg/kg/dose for children).

7. **Acute renal failure** in adults: detect this by monitoring fluid balance carefully. Identify and correct any dehydration or hypovolaemia. Maintain strict fluid balance. Consider peritoneal dialysis if oliguria persists beyond a few days.

8. **Common infections** and other conditions that present like severe malaria: Perform urinalysis, lumbar puncture (unless contraindicated), blood culture if possible, and chest x-ray.

Box 3: Monitor the following 8 observations:
*Where possible use Critical Care Pathways (CCPs).*

1. Level of consciousness (using coma score, see annex)
2. Vital signs every 4 hours (temperature, pulse, respiration, blood pressure)
3. Fluid balance (urine volumes, intake volumes – i/v and oral – puffy eyes, chest sounds)
4. Increasing anaemia (pallor, heart failure with increasing liver size)
5. Occurrence of convulsions – see item 2 in Box 2
6. Blood glucose every 4 hours while unconscious and also if convulsions occur.
7. [Hb]/Packed Cell Volume – at least daily, or more often if anaemia is suspected.
8. Ability to suck, drink, eat, sit, walk – measures of overall strength.
### 15.1.2.4 Management of severe malaria in paediatric in-patients

- Initial (‘loading’) dose of quinine 20 mg /kg body weight: inject this dose into 10ml/kg 5% dextrose or half strength Darrows and infuse over 3 – 4 hours.
- If patient has already received quinine for this illness, the first dose i/v infusion should be 10 mg/kg given over 3 – 4 hours without loading dose.
- Subsequent doses of 10 mg/kg every 12 hours should be given in the same way.
- Continue the same i/v fluid (10 ml/kg given over 3 – 4 hours) between doses of quinine.
- Stop intravenous quinine as soon as the patient can drink, and give age/weight appropriate doses of Lumefantrine - Artemether (LA) twice daily for 3 days.

### 15.1.2.5 Management of severe malaria in adult in-patients

- Apart from cerebral malaria and anaemia, in adults other complications may develop such as:
  - Acute renal failure
  - Respiratory distress syndrome (presenting as severe breathlessness)
  - Disseminated intravascular coagulation (DIC) – presenting as prolonged or spontaneous bleeding
  - Jaundice from severe haemolysis or liver cell damage
- Management must be appropriate to each complication that develops. Fluid and antimalarial drugs are given as for children. If the patient cannot be weighed, i/v Quinine should be given as follows:
  - First dose Quinine 20 mg/kg (maximum 1.2 g) given over 3 – 4 hours
  - Subsequent doses Quinine 10 mg/kg every 12 hours given over 3 – 4 hours
  - IV fluids should be 5% dextrose in ½-strength Darrows or Ringer’s lactate, or 5% dextrose, about 3 litres per 24 hours
  - Change to Lumefantrine Artemether (LA) twice daily for 3 days as soon as the patient can take oral medication.

### 15.1.3 Treatment of uncomplicated malaria in pregnancy

- In 1\textsuperscript{st} trimester of pregnancy give oral Quinine 10mg /kg body weight, administered every 8 hours for 7 days.
- In 2\textsuperscript{nd} and 3\textsuperscript{rd} trimester give Lumefantrine Artemether (LA) twice daily for 3 days.
15. Parasitic diseases

**Note:** Pregnant women are susceptible to hypoglycaemia when taking quinine.

### 15.1.4 Treatment of severe malaria in pregnancy

- Manage complication as for any adult
- Give Quinine 20mg/kg body weight loading dose, followed by 10mg/kg 12-hourly for 7 days, as follows:
- Start with i/v quinine in 10% glucose infusion or 5% glucose in normal saline
- If for some reason quinine cannot be given by infusion: give 10mg/kg dosage by i/m injection (table 4) and refer immediately. Make sure you give 10% glucose concentration or one bottle of 5% glucose before administration of quinine; be careful not to induce pulmonary oedema. Random blood sugar should be done before and after quinine administration.
- Shift to oral quinine (during 1st trimester) and LA (in 2nd and 3rd trimester) as soon as the patient can take medicines orally.

### 15.1.5 Malaria: selective chemoprophylaxis

- The appropriate regimen for an individual depends on the circumstances.

#### 15.1.5.1 Risk groups

- The following high risk groups should be given antimalarial chemoprophylaxis:
  - Patients with immunosuppression caused by illness (e.g. Leukaemia, but not HIV infection or malnutrition) or splenectomy
  - Tropical splenomegaly syndrome
  - Under 5s with recurrent febrile convulsions
  - Individuals with sickle cell disease
  - Non-immune visitors (i.e. visitors from non-malarial countries)
  - Pregnant women

#### 15.1.5.2 Antimalarial prophylaxis regimens

- **Mefloquine** (Lariam) 250 mg weekly.
  - Contraindicated in pilots, people with a history of cardiac disease, neurological disease or depression, and in those taking beta-blocking drugs.
- **Atovaquone-proguanil** (‘Malarone’) – one tablet daily. Taken for only one week after exposure ends.
15. Parasitic diseases

- **Chloroquine** 300 mg - 2 tablets weekly. Should be combined with daily proguanil (see below). Chloroquine causes itching in 40% of black people.
  - Contraindicated in persons with psoriasis or epilepsy. Risk of retinal damage if taken every week for more than 6 years - advise a change!
- **Proguanil** (Paludrine®) 200 mg daily. Should combine with an additional drug such as weekly chloroquine.

### 15.1.5.3 Intermittent Presumptive Treatment of Malaria in pregnancy (IPTp)

- Intermittent Presumptive Treatment of malaria in pregnancy (IPTp) is one of the major malaria preventive strategies in Malawi.
- Give at least two doses of Sulphadoxine Pyrimethamine 525mg, 3 tablets for each dose, after the first trimester,
- The two doses should be given at least four weeks apart, under direct observation by health personnel.

### 15.2 Onchocerciasis (River blindness)

- Occurs mainly in highland areas such as Thyolo
  
  **Treatment**
  
  Adults and children > 5 kg:
  - **Ivermectin** 150 mcg (0.15 mg)/kg single dose
  - Children<5 years: Should not receive Ivermectin. Instead give **Albendazole** 200mg
  - Repeat annually or on return of symptoms
  - No food for at least 2 hours before or after dosage
  - Mothers should not breast-feed during treatment

**Table 26: Ivermectin dose table**

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Height (cm)</th>
<th>Age (years)</th>
<th>No. of tabs*</th>
<th>Total (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 64</td>
<td>&gt; 158</td>
<td>&gt; 40</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>45-64</td>
<td>141-158</td>
<td>25-39</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>26-44</td>
<td>120-140</td>
<td>14-24</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>15-25</td>
<td>90-119</td>
<td>5-13</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>&lt;15</td>
<td>&lt;90</td>
<td>&lt;5</td>
<td>n/r</td>
<td>n/r</td>
</tr>
</tbody>
</table>

*ivermectin 3 mg tablets  n/r = not recommended

- Ivermectin is not recommended for
  - Pregnant women (or for those who think they might be) – it is often possible to delay treatment for a few months
15. Parasitic diseases

- Breast-feeding mothers with babied < 1 week old
- Children < 5 years old (i.e. < 15 kg or 90 cm height)
- Seriously ill patients

15.3 Schistosomiasis (Bilharzia)

- Prevention may be achieved through:
  - Health education
  - Vector control
  - Improved sanitation and water supply
  - Modification of the environment, e.g. Clearing of vegetation in certain areas
  - Avoidance of re-infestation

15.3.1 Schistosomiasis haematobium

Treatment

- **Praziquantel** 40 mg/kg as a single dose
- Children below 4 years of age **Praziquantel** 20mg/kg as stat dose

15.3.2 Schistosomiasis mansoni

- Consider this diagnosis in cases of:
  - Unexplained chronic abdominal complaints with hepatosplenomegaly
  - Ascites with splenomegaly
  - Chronic bloody diarrhoea with no fever
  - Paraparesis/paraplegia
- Refer patients with above clinical features
- Treat after laboratory confirmation

Treatment

- **Praziquantel** 40 mg/kg as a single dose.
- Children below 4 years of age **Praziquantel** 20mg/kg as stat dose

15.4 Trypanosomiasis (Sleeping sickness)

- Suspect in any patient presenting with fever from areas near:
  - **Wildlife Reserves**: Vwaza, Nkhotakota, Majete, Mwabvi
  - **National Parks**: Kasungu, Liwonde, Lengwe
  - Phirilongwe (Mangochi), Machinga, Mwanza
  - Lower Shire borders with Mozambique or **from any other areas where** Tsetse fly is found
15. Parasitic diseases

- Suspect in children from these areas who remain sick after presumptive malaria treatment
- Increased suspicion in any sick patient from these areas with a history of:
  - Headache
  - Vomiting
  - Weakness
  - Changes in mood
  - Convulsions
  - Drowsiness
  - Mental slowness
- Travel history is very important
- Suspect also in any patient from these areas where the cause of illness is not otherwise apparent
- Trypanosomiasis can be acute in children (resembling malaria) and can be more chronic in adults
- Early stage trypanosomiasis may cause myocarditis
- Examination may reveal anaemia, lymph gland enlargement and spleen enlargement
- Nearly all cases have a hard and painful subcutaneous nodule (chancre) which is evidence of an infected bite

15.4.1 Procedure at Health Centres

- Refer the patient immediately to the nearest hospital
- Request close family members of the patient to undergo examination at the hospital as they may also be infected

15.4.2 Hospital management

- Request for a thick blood smear
- If negative more tests will be needed to confirm this diagnosis
- If diagnosis is confirmed by blood smear or other blood test: Start Suramin as follows:
  - Day 1: 5mg/kg
  - Day 2: 20mg/kg
  - Day 3: do a lumbar puncture
- If LP is normal (stage 1 trypanosomiasis): give Suramin 20mg/kg on day 3, 10, 17, 24, 31
- If LP is abnormal (stage 2 or CNS trypanosomiasis): stop suramin, start Melarsprolol (Mel-B) as follows:
15. Parasitic diseases

- Day 3: 1.2mg/kg
- Day 4: 2.4mg/kg
- Day 5: 3.6mg/kg
- Day 6: 3.6mg/kg
- Repeat this 4-day melarsprolol cycle after one and two weeks

Notes on treatment regimen

- If any medicine reaction occurs (e.g. skin rash, exfoliative dermatitis, reactive encephalitis) stop treatment and inform the clinical officer or medical officer immediately
- Do a lumbar puncture (LP) on day 3. Subsequent treatment depends on whether this is found to be normal or abnormal
- Freshly reconstitute the Suramin (Sur) 1 g vial of powder with 10 mL water for injection to make a 10% solution (100 mg/mL)
- Add the required dose of 20 mg/kg (0.2 mL of injection/kg) up to a maximum of 1 g (the whole vial) in adults of 50 kg or over to 200 mL of dextrose 5% and infuse over 2 hours. Alternatively give the dose as a slow i/v injection.
- Melarsoprol (Mel B) dose is 3.6 mg/kg (=0.1ml/kg). Give this as a slow i/v push. Take great care to avoid extravasation as the medicine is highly irritant. In adults of 50 kg or over the dose is the maximum permissible 180 mg (i.e. one 5 mL ampoule)
- Prednisolone may be added to melarsprolol with a dose of 40mg once daily. The dose in children is 1 mg/kg once daily
- Control any seizures with Diazepam 5-10 mg slow i/v with or without the addition of Phenytoin 150-300 mg as a single daily dose taken with water
- Anti-trypanosomal treatment may cause abortion in pregnancy, but this must be regarded as an unavoidable risk
- Follow-up: review the patient for repeat blood film and LP at 3, 6, 12 and 24 months post-treatment

15.5 Worm infestations

15.5.1 Ascaris, Enterobius, Ancylostoma, Trichuris Infestation

- Ascaris lumbricoides = roundworm, Enterobius vermicularis = pinworm, Ancylostoma duodenale = hookworm, Trichurus trichiura = whipworm
- Hookworm can contribute considerably to anaemia especially in children
15. Parasitic diseases

Treatment
Adults and Children > 2 years:
- **Albendazole** 400 mg single dose

*Children below 2 years*
- **Albendazole** 200mg

**NOTE:**
- Albendazole (and mebendazole) are contraindicated in pregnancy
- Heavy trichuris infections generally require treatment for 3 consecutive days
- In enterobiasis, all family members must be treated concurrently

### 15.5.2 Strongyloides stercoralis infestation

A hyper-infection syndrome in immunosuppressed persons can occur and may be lethal and therefore requires specialist treatment.

**Treatment**
- **Ivermectin** 200mcg/kg daily for 2 days

*Alternatively*

**Adults**
- **Albendazole** 400 mg daily for 5 consecutive days

*Children < 2 years*
- **Albendazole** 200 mg daily for 3 consecutive days
- Check stool 3 weeks after treatment, at least 3 specimens
- Repeat above treatment if eggs or larvae still found

### 15.5.3 Taenia saginata/solium (tapeworm) infestation

**Treatment**

**Adults**
- **Praziquantel** 10 mg/kg stat

*Children < 2 years*
- **Praziquantel** 10 mg/kg stat
16. Respiratory conditions

16.0  Respiratory Conditions

16.1 Acute respiratory infections (ARI) in children

- Most ARI are mild, self-limiting viral infections
- The Malawi ARI Control Programme emphasizes standard case management as its main strategy. This includes:
  - Early diagnosis
  - Appropriate drug use
  - Timely referral
  - Advice on suitable home care
- Refer to ARI Control Programme Guidelines, MOHP 1998 for more information
- Refer to the WHO’s Management of the Child with Cough or Difficult Breathing for a summary of patient assessment, classification of illness and treatment instructions

**ARI Case Management**

1. Refer all cases for severe disease/pneumonia to hospital for admission after initial i/m doses of recommended antibiotics
2. Treat all pneumonia cases as out-patients with cotrimoxazole or amoxycilin
3. Do not use cough mixtures – they have no role to play in ARI management

16.1.1  Home care of children with ARI

16.1.1.1  Home care of child with ARI (2 mths – 5 yrs)

Advise mother to:

- Watch out for these danger signs (which may indicate pneumonia) and return quickly to the health facility if any occur:
  - Breathing becomes difficult
  - Breathing becomes fast
  - Child cannot drink
  - Child becomes more ill
- Feed the child
  - Continue feeding the child during illness
  - Increase feeding after illness
  - Clear blocked nose if interfering with feeding
- Increase fluids
  - If > 6 months old, offer the child extra fluids to drink
16. Respiratory conditions

- Increase breast-feeding
- Soothe throat and relieve cough
  - Give sips of water or other (preferably warm) fluids
- Treat fever
  - Give paracetamol in the recommended dose every 6 hours until the high fever stops (see Section 10.1 page 91)
  - Increase fluids (see above)
  - Do not overdress or overwrap the child, i.e. keep the child lightly dressed
- Complete prescribed treatment
  - Complete this even if the child becomes better
- Return for follow-up assessment after 2 days if child is being treated for pneumonia.

### 16.1.1.2 Home care of child with ARI (young infant)

Advise mother to:

- Watch out for these danger signs and return quickly to the health facility if any occur
  - Breathing becomes difficult
  - Breathing becomes fast
  - Young infant not able to feed properly
  - Young infant becomes more ill
- Keep the young infant warm
- Breast-feed often
- Clear blocked nose if interfering with feeding

### 16.1.2 Common cold (nasopharyngitis)

- Coughs are commonly associated with colds
- Antibiotics should not be given
- Often causes fever in young children which may last up to 72 hours
- In infants, nasal discharge may interfere with breast-feeding and cause difficult in breathing
- Rule out pneumonia, otitis media, and streptococcal pharyngitis

  ➢ Advise mother on how to correctly provide suitable home care (see Section 16.1.1 page 132)

### 16.1.3 Sinusitis

- Most sinusitis is viral and self-limiting, requiring no antibiotics
16. Respiratory conditions

- Pain in sinusitis is NOT an indicator of severity
- Steam inhalation may help drainage of blocked sinus
- Purulent nasal discharge may be caused by a foreign body in the nose
- Bacterial sinusitis is usually caused by S. pneumoniae or H. influenzae. It is characterized by:
  - Persistent purulent nasal discharge >7 days plus
  - Sinus tenderness and/or
  - Facial or periobital swelling and/or
  - Persistent fever
- Extract tooth under antibiotic cover Benzathine penicillin 1.2g i/m stat or Amoxycillin 3g orally stat 1 hour prior to procedure and Metronidazole 400mg
- Only if there are definite signs of bacterial sinusitis give Amoxycillin 500mg every 8 hours for 7 days or Phenoxymethylpenicillin 500 mg every 6 hours for 7 days
  
  *Alternatively if penicillin hypersensitivity:*
  - Erythromycin 500 mg every 6 hours for 7 days
  
  If there is pain or fever give:
  - Analgesic/antipyretic treatment as required see Section 10.1 page 91

16.1.4 Pharyngitis, tonsillitis and its complications

- Most sore throats are due to viral infections such as adenovirus and CMV, and **should not be treated with antibiotics**
- For pain or fever give analgesic treatment as required see Section 10.1 page 91
- Be sure to rule out streptococcal pharyngitis to prevent acute rheumatic fever and other non-suppurative (endocarditis) and suppurative complications (retropharyngeal and peritonsillar abscesses).
- Signs suggestive of bacterial pharyngitis are abrupt onset of pain, fever, tender, enlarged cervical lymph nodes, white or greyish pharyngeal exudates, absence of lower respiratory tract signs and symptoms absence of signs suggesting viral nasopharyngitis (e.g. rhinorrhoa, conjunctivitis, cough)

Do not use cotrimoxazole as it is not effective

*Treatment*

*Adults:*
16. Respiratory conditions

- **Benzathine penicillin** 1.2 MU single dose i/m
  *Alternatively* (if assured of compliance)
- **Phenoxypermethylpenicillin** 500mg every 6 hours *or* **Amoxicillin** 500mg 8 hourly for 7 days
  *Alternatively in penicillin hypersensitive patients:*
- **Erythromycin** 500mg every 6 hours for 7 days

*Children > 30 kg:*
- **Benzathine penicillin** 1.2 MU single dose i/m
  *Alternatively* (if assured of compliance)
- **Phenoxypermethylpenicillin** 250 mg every 6 hours or
  *Alternatively in penicillin hypersensitive patients:*
- **Erythromycin** 500 mg every 12 hours

*Children < 30 kg*
- **Benzathine penicillin** 600,000 IU single dose i/m
  *Alternatively* (if assured of compliance)
- **Phenoxypermethylpenicillin** 12.5 mg/kg orally every 6 hours or
  *Alternatively in penicillin hypersensitive patients:*
- **Erythromycin** 7.5-12.5 mg/kg orally every 6 hours

If there is pain or fever give analgesic treatment as required *see Section 10.1 page 91*

### 16.1.5 Peritonsillar and retropharyngeal abscesses

- Peritonsillar abscess (quinsy) and retropharyngeal abscess may cause difficulty in swallowing and tenderness at the angle of the jaw
- Consider these conditions if patient is unable to drink at all:
  - a) **Peritonsillar abscess**
    *Treatment*
    **Adults**
    - **Phenoxypermethylpenicillin** 500mg every 6 hours *or* **Amoxicillin** 500mg 8 hourly and
    - **Metronidazole** 400mg every 8 hours
    *Alternatively*
    - **Benzylpenicillin** 2 MU i/v every 6 hours
    - Switch when possible (usually after 48-72 hours) to oral **Phenoxypermethylpenicillin** 500 mg every 6 hours *or* **Amoxicillin** 500mg 8 hourly
16. Respiratory conditions

- Continue for a total of 14 days antibiotic treatment

  Alternatively if penicillin hypersensitivity:
  - **Erythromycin** 500mg every 6 hours

Children

- **Benzylpenicillin** 25,00 units/kg/dose
- Switch when possible (usually after 48-72 hours) to oral **Amoxycillin** 15mg/kg every 8 hours.
- Continue for a total of 14 days antibiotic treatment

  Alternatively if penicillin hypersensitivity:
  - **Erythromycin** 12.5 mg/kg/dose
  - Give analgesic/antipyretic for pain and fever (see Section 10.1 page 91)
  - If pus is present and does not drain spontaneously then carry out incision and drainage
  - If quinsy is present carry out needle aspiration for analgesic and therapeutic effect

b) **Retropharyngeal abscess**

- Surgical drainage is usually necessary

Adults

- **Co-amoxiclav** 625mg every 8 hours (or Co-amoxiclav 375mg plus Amoxycillin 250mg) for 14 days

  Alternatively

  - **Chloramphenicol** 25 mg/kg every 8 hours, initially i/m or i/v later orally for a total of 14 days antibiotic
  - Analgesic for pain and fever (see Section 10.1 page 91)

Children

- **Chloramphenicol** 25 mg/kg every 8 hours, initially i/m or i/v. later orally for a total of 14 days
  - Analgesic/antipyretic for pain and fever (see Section 10.1 page 91)

16.1.6 Bronchitis (acute)

- Cough productive of purulent sputum, not improving after 3 days, without signs of pneumonia

  Treatment

  - **Amoxycillin** 500mg every 8 hours for 5 days or
16. Respiratory conditions

- Doxycycline 200mg on first day followed by 100 mg daily for a further 5 days

16.1.7 Cervical adenitis

- Adenitis may be due to bacterial infection, TB, KS and/or HIV infection among other causes

Treatment

- Amoxycillin 500mg every 8 hours for 10 days
- Alternatively if penicillin hypersensitivity:
  - Erythromycin 500mg every 6 hours or
  - Doxycycline 200mg on first day followed by 100 mg daily for a further 9 days
- For pain or fever give analgesic see Section 10.1 page 91
- If no improvement, do a fine needle aspiration for AFBs

16.2 Lower respiratory tract infections

16.2.1 Asthma (recurrent wheezing)

- Exclude stridor and upper airway obstruction (inspiratory difficulty rather than expiratory wheeze of asthma) before diagnosing and treating for asthma.
- Wheezing can also be a sign of heart failure
- Prevention of attacks is important
- Drugs delivered by metered dose inhaler (MDI) should always be given via a spacer device, especially during acute attacks. This will maximize effective drug delivery and minimize side effects.
- You can make an effective spacer device using a plastic bottle. Cut a small hole in the bottom of a plastic bottle that you can fit the inhaler mouthpiece to with an airtight seal. Shake the inhaler before each puff
- Prime the spacer device with 2 puffs before use
- If a spacer is unavailable, check patient inhaler technique to ensure good delivery of the drug into the lungs, not the throat.
- Antibiotics are not routinely indicated in asthma. They are indicated if there is good evidence of a precipitating respiratory infection (e.g. fever, bronchial breathing)
16. Respiratory conditions

16.2.2 Severe asthma

- Consider other causes of acute severe breathlessness with careful examination: acute left ventricular failure, pneumothorax, pulmonary embolus, upper airway obstruction, massive pleural effusion, severe pneumonia.

- Severe or life threatening asthma in adults is suggested by any of the following:
  - Silent chest
  - Central cyanosis
  - Tachypnoea RR >30, exhaustion, inability to complete sentences
  - Persistent tachycardia >110bpm, bradycardia, hypotension, pulsus paradoxus
  - Use of accessory muscles
  - Confusion, agitation or coma
  - Peak flow < 33% of predicted

- Arrange immediate hospitalization

Treatment

- Set up i/v line and rehydrate with 0.9% normal saline
- High flow oxygen 5l/min
- **Salbutamol nebuliser solution** 5 mg by nebuliser repeated initially as required, then every 6 hours or **Salbutamol** 4 puffs inhaled via spacer device and

- **Hydrocortisone** 200 mg i/v every 8 hours for 3 – 5 days then
  - Change to **prednisolone** 40mg orally as a single daily dose in the morning, with food for another 5 - 7 days
  - If you need to use steroids for more than 10 days, gradually taper the dose for steroids 10mg per week initially, and decrease by 5mg until you stop.

- Give an appropriate antibiotic therapy:
  - **Amoxycillin** 500mg every 8 hours for 5 days or **Doxycycline** 200 mg on first day followed by 100 mg daily for a further 4 days

- Repeat Salbutamol dose via spacer or nebuliser every 15 -30 minutes until improved or reassess after 1 hour

**If no improvement add** only if not already taking theophylline

- **Aminophylline** 250mg slowly over 10 minutes. Beware of acute aminophylline toxicity including cardiac arrhythmias and seizures.

**If no response:**
16. Respiratory conditions

- Give Aminophylline 250 - 500mg an i/v infusion in 1L of 5% dextrose or 0.9% sodium chloride over 12 hours
- Magnesium sulphate 1.2 – 2.0g i/v over 20 minutes
- Adrenaline 0.5-1.0ml of 1:1000 slowly nebulised or i/m
- You may need to rescue the exhausted patient with assisted ventilation
- Reassess continuously until the patient settles

16.2.3 Milder asthma attacks

- Carefully teach and monitor correct inhaler use technique and recommend a spacer device

**Adults:**
- Salbutamol inhaler 2 puffs via a spacer device repeated as required initially, then every 8 hours
- Keep under observation at least for 24 hours after attack

**Alternatively:**
- Salbutamol 2 - 4mg orally every 8 hours
- Antibiotic therapy may be indicated if signs of infection

16.2.4 Maintenance and preventive treatment of asthma - the stepwise approach

- An environment free from cigarette and wood smoke can reduce attacks
- Check compliance and inhaler technique at each step before progressing
- Step up where required due to frequency of exacerbations
- Step down where possible:
  - **STEP 1:** Initial treatment should be with Salbutamol inhaled via a spacer device (see above) as required or tablets if inhalers are unavailable
  - **STEP 2:** If required more than once every day add preventive therapy -inhaled steroid eg Beclamethasone 2 puffs (200mcg) twice a day via a spacer. Increasing to 4 puffs twice a day as required
  - **STEP 3:** Refer for specialist care if no control with steps 1 & 2

**Alternatively** to be used only if the above are NOT available
- Salbutamol tablets 2-4 mg orally 3-4 times daily.
- Aminophylline 100mg twice daily.
- Prednisolone 5 mg orally once daily.
16. Respiratory conditions

Note:
   a. Use for the shortest time possible before reverting to preferred agents
   b. Where asthma is mainly a problem at night, Salbutamol before bed may be sufficient
   c. If asthma is brought on by exercise, adults can take 2 puffs of salbutamol inhaler via a spacer device a few minutes before games or sports
   d. Exercise induced asthma is usually a sign of poor control. If possible introduce an extra level of medication according to the stepwise approach above.
   e. If asthma is brought on by exercise, older children and adults can take 2 puffs of salbutamol inhaler via a spacer device 30-60 minutes before games or sports

16.3 Community Acquired Pneumonia (CAP)

- For all forms of pneumonia HIV testing is required.

16.3.1 Mild to moderate pneumonia

- Usually caused by pneumococcus (sudden onset)
  
  **Treatment**
  
  - Amoxycillin 500mg every 8 hours for 5-7 days
  
  *If Penicillin allergic*
  
  - Erythromycin 500mg orally every 8 hourly for 5-7 days
  
  - Doxycycline 100mg bd for 5 – 7 days

If the patient does not improve, consider alternative diagnoses including

16.3.2 Atypical Pneumonia

- Caused by Mycoplasma pneumoniae and Chlamydia pneumoniae
  
  *Suspect in previously healthy young adult not responding to treatment for CAP*

  **Treatment**
  
  - Give Erythromycin 500mg orally every 6 hours for 5 days

16.3.3 Nosocomial pneumonias

- Caused by Staphylococcus aureus, gram negative rods and Pneumococcus

  **Treatment**
  
  - Co-amoxiclav 1.2g i/v every 8 hours or Ceftriaxone 2g i/v once daily
Followed by oral **Co-amoxiclav** 625mg every 8 hours for 7 days

### 16.3.4 Severe pneumonia

**Symptom and Signs:** Respiratory rate > 30/min, shock (- BP <90/60mmHg), confusion / drowsiness central cyanosis

- Refer to district hospital

**Treatment**

- **Benzyl penicillin** 2-3MU i/v every 6 hours plus **Chloramphenicol** 500mg i/v every 6 hours plus
- **Erythromycin** 500mg every 6 hours or **Doxycycline** 100mg every twelve hours

- Switch to oral medication early

**Alternatively**

- **Co-amoxiclav** 1.2g i/v every 8 hours *plus*
- **Erythromycin** 500mg 6 hourly for a total of 7 days *or*
- **Doxycycline 100mg** every twelve hours for a total of 7 days antibiotic therapy

### 16.4 Suppurative Lung Disease

#### 16.4.1 Lung abscess

- **Co-amoxiclav** 625mg every 8 hours *plus*
- **Metronidazole** 400 mg every 8 hours

*Alternatively to Co-amoxiclav*

- **Erythromycin** 500mg every 6 hours
- **Doxycycline** 100mg every twelve hours

- Continue treatment for 21 to 28 days

#### 16.4.2 Empyema

- Carry out surgical drainage
- Continue antibiotic therapy as for CAP for 21 to 28 days
- Rule out TB

### 16.5 Bronchiectasis

*Symptoms and signs:* Chronic cough and sputum production years after treatment of pulmonary TB

- Physiotherapy to aid postural drainage of secretions every morning
16. Respiratory conditions

- Give prompt antibiotic therapy when secondary infection occurs
- **Co-amoxiclav** 625mg every 8 hours

**Alternatively**

- **Doxycycline** 200mg stat then **Doxycycline** 100mg once daily
- If sputum is foul smelling, add **Metronidazole** 400mg every 8 hours
- Treat for 14 days

### 16.6 Chronic Lung disease / COPD

- Acute exacerbations may present in a similar way to asthma, however the patients will be older, and will often have smoked or been exposed to wood smoke, e.g. cooking at home.
- Not always related to an infection.

**Treatment**

- **Salbutamol** as required.
- Always use a spacer device as described in the section on asthma above.
- **Prednisolone** 40mg po once daily for 10 days

*If there is fever and purulent sputum then*

- **Amoxycillin** 500mg every 8 hours for 7 days
- If a patient has more than 4 exacerbations in a year a trial of regular inhaled Salbutamol via a spacer 2 puffs four times daily, and as required in between can be tried.
- Long term use of oral steroids is **NOT** recommended.

### 16.7 Pulmonary Embolism

- Treat with 6 months **Warfarin** therapy if available, but **only** if INR monitoring and specialist supervision are available.
- Long term treatment may be necessary in certain circumstances, including recurrent cases.
- Look for a triggering cause.
17. Sexually transmitted infections

17.0 Sexually Transmitted Infections (STIs)

- All patients who present with STI symptoms should be offered HIV Testing and Counselling.

**Prompt and effective treatment of STIs helps prevent spread of HIV infection**

*General Management*

- Ensure adequate privacy in patient management.
- Establish a correct diagnosis whenever possible.
- Make efforts to trace, treat and counsel all sexual contacts.
- Provide health education and counseling on each return visit.
- Advice on ‘safer sex’ practices to prevent re-infection, i.e. abstinence, correct use and storage of condoms, mutual faithfulness of uninfected partners, decrease in number of sexual partners, use of non-penetrative sexual techniques and the importance of partner notification and treatment.
- Offer a supply of condoms at each patient visit

**Periodically check the patient’s understanding of the above issues by asking him/her to repeat the information given**

17.1 Syndromic management of STIs

- The syndromic approach is based on the fact that most common causes of an STI infection generally present with certain groups of signs and symptoms (syndrome) and treatment given is supposed to target the commonest possible causes of that syndrome.
- Common STI syndromes:
  - Genital ulcer disease (GUD) *Section 17.1.1 page 144*
  - Urethral discharge *Section 17.1.2 page 145*
  - Genito-urinary symptoms in women *Section 17.1.3 page 145*
  - Lower abdominal pain (women) *Section 17.1.4 page 146*
  - Acute scrotal swelling *Section 17.1.5 page 149*
  - Enlarged inguinal lymph nodes (bubo) *Section 17.1.6 page 149*
  - Balanitis/balanopostitis *Section 17.1.7 page 150*
17. Sexually transmitted infections

17.1.1 Genital ulcer disease (GUD)

Common Causes: genital herpes, chancroid and syphilis may be present concurrently.
- Genital herpes is the most prevalent amongst the three.
- Treat patients with GUD for the above three infections

General Management
- Aspirate fluctuant lymph nodes (buboes) through adjacent normal (i.e. not inflamed) skin.
- Do not incise.
- Ask patients to return if non-fluctuant nodes become fluctuant

Treatment
- **Ciprofloxacin** 500mg orally stat and
- **Benzathine penicillin** 2.4 MU i/m stat
- **Acyclovir 800mg** every 12 hours orally for 7 days
- Tell patient to return for follow-up care in 7-10 days, see below

Note: Acyclovir is indicated only in symptomatic GUD clients

If patient allergic to penicillin:
- **Erythromycin** 500mg every 6 hours for 15 days plus
- **Acyclovir** 800mg orally every 12 hours for 7 days

If patient allergic to penicillin/Ciprofloxacin and pregnant or lactating:
- **Erythromycin** 500mg every 6 hours for 15 days and acyclovir 800mg every 12 hours for 7 days
- Infants born to mothers treated for GUD with Erythromycin alone:
  - **Benzathine Penicillin** 500,000 IU/kg as a single dose

Follow-up care of GUD
- Inform the patient to return 7-10 days after starting treatment.
- **If the ulcers have not healed or are getting worse**, repeat GUD treatment if there is evidence of noncompliance.
- If the client complied fully and there is no improvement:
  - Give **Azithromycin** 2g stat.
  - Review in further 7-10 days
  - If no improvement, refer for specialist opinion
  - If improved, follow patient’s progress until completely healed
  - No further antibiotics are required at this time
- **If the ulcers have improved but not completely healed:**
  - Repeat chancroid treatment **Ciprofloxacin** 500mg single dose
  - Review in further 7-10 days
17. Sexually transmitted infections

- Subsequent action as above
  - If the ulcers have completely healed:
    - Reinforce counseling and patient education
    - Promote/provide condoms

17.1.2 Urethral Discharge/Urethritis in Men (UD)

Symptoms/Signs: discharge or dysuria

- Common causes: Neisseria gonorrhoea, Chlamydia trachomatis and trichomonas vaginalis.
- Common in males

Note: If there is dysuria but no discharge and no sexual contact in the last 2 weeks, seek other causes, like urinary tract infection, prostates or schistosomiasis

Treatment

- Gentamycin 240mg i/m stat plus
- Doxycycline 100mg every 12 hours with food for 7 days
- Metronidazole 2g stat

Alternative to Doxycline in pregnancy/lactation:

- Erythromycin 500mg every 6 hours for 7 days
- Review after 7 days

If symptoms persist or recur:
  - Rule out re-infection
  - Assess compliance
  - Retreat as above if noncompliant or there is evidence of reinfection
  - Review after further 7 days

- If symptoms still persist, refer for further investigation

17.1.3 Abnormal Vaginal Discharge in Women (AVD)

Causes: vaginal infection, cervical infection, endometrial infection/pelvic inflammatory disease (PID)

- Common causes of vaginal infections: trichomonas vaginalis, candida albicans and bacterial vaginosis.
- Common Causes of cervical infections: neisseria gonorrhoeae and chlamydia trachomatis.

Note: Vaginal discharge is normal during and after sexual activity; at various points through-out the menstrual period; and during pregnancy and lactation.
General Management

- Do risk assessment to identify women at risk of cervical infection
  - treat for vaginitis to those with negative risk assessment
  - treat for cervicitis and vaginal infection to those with positive risk assessment.
- Treat all women with vaginal discharge and a positive risk assessment for *gonococcus* and *Chlamydia infection*, plus *trichomoniasis* and *bacterial vaginosis* t should be.
  - If the discharge is white and curd-like also treat for *candidiasis*.
- Treat all women with vaginal discharge and a negative risk assessment for *trichomoniasis* and *bacterial vaginosis*
  - If the discharge is white and curd-like, also treat for *candidiasis*.

Treatment

- If vaginal discharge is present and the risk assessment is positive:
  - **Gentamycin** 240mg i/m stat plus
  - **Doxycycline** 100mg orally every 12 hours for 7 days, *plus*
  - **Metronidazole** 2g orally single dose

- If the discharge is white or curd-like add 1 Clotrimazole Pessary 500mg inserted intra-vaginally stat

- If vaginal discharge is present and risk assessment is negative:
  - **Metronidazole** 2g orally single dose stat

- If the discharge is white or curd-like add 1 Clotrimazole Pessary 500mg inserted intra-vaginally STAT

- If no discharge is found and risk assessment is positive:
  - **Gentamycin** 240mg i/m stat plus
  - **Doxycycline** 100mg orally every 12 hours for 7 days

- If no discharge is found and risk assessment is negative:
  - Reassure client, counsel, educate and provide condoms.
  - Advise client to come back if symptoms persist.
  - Offer HIV testing after providing information and counselling

Examination of GUS in women should *never* be omitted only for convenience of the health worker

17.1.4 Lower abdominal pain in women (LAP Syndrome)

- A serious condition which should be considered in every woman with lower abdominal pain.
  
  **Note:** Not every woman with lower abdominal pain has PID.
17. Sexually transmitted infections

Be sure to include any conditions which require immediate surgical or gynaecological treatment

- **Symptoms/Signs**: fever, lower abdominal pain, pain on discharge, vaginal discharge, cervical tenderness, and often adnexal tenderness or masses on bimanual examination.

- **Symptoms/Signs of acute illness requiring immediate gynaecological/surgical attention**: Missed or overdue or delayed period; recent abortion, delivery or miscarriage; metrorrhagia; abdominal guarding or rebound tenderness; Active vaginal bleeding.

**General Management**

- **If the patient has a missed/overdue period or abnormal vaginal bleeding:**
  - Consider referral see Section 17.1.4.1 page 148 for in-patient treatment
  - When referring, ensure patient’s general condition is stable

- **If the patient is very ill, bleeding heavily or in stock:**
  - Set up an iv drip and commence resuscitation measures

- **If the patient does not have missed/overdue period or abnormal vaginal bleeding but does have any of the following:**
  - Recent delivery; Recent/suspected abortion; Rebound tenderness; Abdominal guarding
  - Give first dose of treatment for PID.
  - Refer immediately for hospital admission after resuscitating the patient should this be required.
  - See Section 17.1.4.1 page 148 for in-patient treatment

- **Admit if the patient**: is obviously sick; is pregnant; vomits oral medication or if adequate follow-up care cannot be provided.

**Treatment**

- If the patient does not have missed/overdue period or abnormal vaginal bleeding, does not have any of the signs/symptoms listed in b) but does have cervical excitation tenderness or fever:
  - **Gentamycin** 240mg i/m stat,
  - **Doxycline** 100mg 12 hourly and
  - **Metronidazole** 400mg 12 hourly for 10 days.
  - Remove any IUCD if any and offer other means of contraception
  - Treat partner for gonococcal and chlamydial infection
  - Review patient after 72 hours:
    - **If improved**, complete 10-day course of treatment for PID
    - **If not improved**, refer for gynaecological or surgical consultation
17. Sexually transmitted infections

- See Section 17.1.4.1 below for in-patient treatment
- If the patient does not have missed/overdue period or abnormal vaginal bleeding, does not have any of the signs/symptoms listed in b), and not have cervical excitation tenderness or fever:
  - Determine whether the patient has any other genitourinary complaint/syndrome and manage as per appropriate syndrome:
  - Ask her to return if the abdominal pain persists

17.1.4.1 Lower Abdominal Pain in Women (PID): In-patient treatment

- Signs or symptoms of acute PID requiring admission: Failure to respond to syndromic treatment regime Section 17.4.1 page 153 within 72 hours; Presence of tender pelvic mass which may be an abscess or an ectopic pregnancy; History or suspicion of recent induced abortion, delivery or miscarriage; Active vaginal bleeding; Missed, overdue or delayed period; pregnancy; Metrorrhagia; Vomiting of oral medication.

The patient should be admitted if follow-up care cannot be guaranteed

Treatment

If toxic:
  - i/v fluids and parenteral antibiotics.
  - Gentamycin 1.5 mg/kg slow i/v or i/m every 8 hours plus
  - Chloramphenicol 500mg i/v every 6 hours
  - Metronidazole 500mg i/v every 8 hours

When improved and able to swallow:
  - add Doxycycline 100mg every 12 hours and
  - switch from parenteral to oral Metronidazole 400mg every 12 hours for 10 days

For pain and fever
  - Analgesic (see Section 24.1 page 196)

If pain is severe:
  - Pethidine 100 mg i/m or orally
  - Repeat every 3-6 hours, as required
  - Note: Acute PID may be due to puerperal or post-abortion sepsis. Admit treat with parenteral antibiotic therapy.
  - Evacuate the uterus within 12 hours of antibiotic therapy regardless of the patient’s temperature

- Provide supportive care such as blood transfusion, iv fluids and
17. Sexually transmitted infections

- Closely monitor vital signs.

### 17.1.5 Acute scrotal swelling or pain

#### General Management

- Distinguish from scroll swelling/pain due to:
  - *Other long-standing causes*, e.g. Scroll hydrocele, varicocele, inguinal hernia
  - *Recent/acute illness*, e.g. Testicular torsion or trauma, inguinal hernia

<table>
<thead>
<tr>
<th>Thorough history and physical examination are necessary to exclude potentially life-threatening conditions and to determine whether immediate surgical attention is required</th>
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#### Treatment

- **Even if the presumptive diagnosis is an STI**, treat all patients and partners for gonorrhoea and chlamydia infection:
  - **Gentamycin** 240mg i/m stat and
  - **Doxycline** 100mg every 12 hours for 7 days.
  - In pregnant or lactating mothers **Doxycline** should be replaced with **Erythromycin** 500mg every 6 hours for 7 days.
  - Additional therapy for the patient:
    - bed rest with the scrotum elevated
    - cold compresses to help reduce swelling
  - **If there is no evidence of painful and/or swollen scrotum**, look for signs of another STI and if present treat appropriately

### 17.1.6 Enlarged inguinal nodes (bubo)

- Both chancroid and lymphogranuloma venereum (LGV) can cause bubo.

Excluding other conditions which may also cause enlarged inguinal lymph nodes: septic skin lesions on thigh, foot, leg, toes, buttock, anus, perineum, scrotum, penis, labia, vulva and vagina, systemic infections e.g. Hepatitis B. HIV infectious, mononucleosis, syphilis, TB, other infections e.g. bubonic plague, cat scratch fever, trypanosomiasis, lymphoma, leukemia, Kaposi’s sarcoma.

Exclude other conditions which may cause groin swelling unrelated to enlarged lymph nodes including: inguinal hernia, lipoma, a boil in overlying skin.

- Confirm presence of bubo by careful examination

| All patients with bubo should be carefully examined for signs of other STIs |

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Treatment

• *If bubo present and genital ulcer present,* treat as for genital ulcer disease syndrome

• *If bubo present, and painful, fluctuant or recent onset (under 2 weeks) and no genital ulcer present:* treat patient and partner for LGV

• **Doxycycline** 100mg every 12 hours with food for 14 days
  
  Alternatively in pregnancy/lactation

• **Erythromycin** 500mg every 6 hours for 14 days

• If bubo fluctuant, aspirate through adjacent normal skin (do not incise)

• *If enlarged inguinal lymph node present, but not painful, fluctuant or of recent onset (under 2 weeks) and no genital ulcer present:* look for other causes of inguinal swelling:
  
  o e.g. generalized lymphadenopathy (rule out secondary syphills and HIV), hernia, tumour.

• Refer for biopsy if indicated

• *If bubo not present but other signs of STI found,* treat accordingly

• *If bubo not present and other signs of STI not found,* reassure, educate/counsel the patient

• Promote/provide condoms

### 17.1.7 Balanitis/balanopostitis (BA Syndrome)

• *Cause:* fungal infection, trichomonal infection and medicine reactions

• Common and persistent in persons with *diabetes* and with *immunosuppression* caused by HIV infection

  [The most common reason for balanitis is poor genital hygiene]

**General Management**

• Ask patient about any recent topical application of medicines (including traditional medicines)

• Ask patient if partner/s have vaginal itching or discharge – this may indicate *candidiasis* or *trichomoniasis*

• Examine the patient carefully for presence of genital ulcers and urethral discharge

**Treatment**

• *If the foreskin is retractable and ulcer/s present,* or *if the foreskin is not retractable:*
  
  o Treat as for genital ulcer Disease syndrome.

• *If the foreskin is retractable, no ulcer, but urethral discharge present:*
  
  o Treat as for urethral discharge
17. Sexually transmitted infections

- **If the foreskin is retractable, no ulcer, no urethral discharge, but erythema or erosions present:**
  - Treat for candida infection
    - Apply **Gentian Violet 1% aqueous solution** to glans penis daily for 7 days.
  - Treat partners with **Clotrimazole pessary** 500mg inserted vaginally once.
  - Advise on genital hygiene, including frequent washing of penis with soap and water
  - Review patient in 7-10 days:
- **If symptoms persist:**
  - Treat patient and partner for trichomoniasis with **Metronidazole 2g stat.**
  - Advise client to avoid alcohol during treatment and for 48 hours after dose
- **If symptoms resolved and no signs of STI:**
  - Reassure, educate/counsel
  - Promote/provide condoms
- **If foreskin is retractable, no ulcer, no urethral discharge, no erythema or erosions and no signs of STI:**
  - Reassure, educate/counsel
  - Promote/provide condoms

### 17.2 Genital warts

- Distinguished from *condyloma* of secondary syphills, and *molluscum contagium*
- Besides local caustic applications, surgical removal or electrocautery may be used for treatment:
  - For more extensive growth
  - When topical applications have failed
  - When topical application are contra-indicated

**Treatment**

- Apply **Compound Podophyllin Paint** to the lesions at weekly intervals
- Apply **Yellow Soft Paraffin** to avoid normal tissue
- Use only for scattered growth
- When applied to vulval mucosa or to meatal warts, allow to dry before coming back into contact with normal epithelium
- Remove the paint by washing off after 1-4 hours

**Note:** Do not use this therapy during pregnancy
17. Sexually transmitted infections

- If no effect after 4-6 weeks, stop treatment and consider alternative methods of removal
  
  Alternatively to Podophyllin Paint, and for treating vulvar warts:
  - Apply **Silver Nitrate Stick (pencil)** once daily

### 17.3 Neonatal Conjunctivitis

- These serious conditions rapidly progress and threaten sight
- Admit patient to hospital
- Closely monitor until the infection has resolved
- Give antimicrobial therapy without delay
- Irrigate the eyes frequently with normal saline

| At birth give all neonates a single prophylactic application of tetracycline eye ointment |

**Treatment**

**Adults and all parents of infected babies:**

- **Gentamycin** 240 mg i/m single dose

**Infants with signs of conjunctivitis:**

- Isolate immediately
- Institute a rigorous system of barrier nursing with careful attention to hygiene
- **Gentamycin** 5mg/kg i/m once (7.5mg /kg if the infant is older than 7 days) and
- **Erythromycin** 12.5mg/kg orally every 6 hours for 14 days.

Alternatively for Gentamycin,
- **Cefotaxime** 50mg/kg i/m as a single dose (maximum 125mg)
- **Tetracycline eye ointment** 1% applied in each eye every 6 hours for 3 days
  - Clean away any discharge before application
- Wash eyes with clean water/saline ideally every 2 hours until the purulent discharge is cleared
- **Treat Father with**
  - **Gentamycin** 240mg i/m stat, and
  - **Doxycycline** 100mg every 12 hours for 7 days
- **Treat Mother with:**
  - **Gentamycin** 240mg i/m stat, and
  - **Erythromycin** 500mg every 6 hours for 7 days

Alternative topical agent:
- **Gentamycin eye drops 0.3%**, 1.2 drops into each eye every 2 hours
• Reduce dose frequency as the infection is controlled
• Continue for 48 hours after healing

17.4 Syphilis

• Use this regime for patients with syphilis confirmed by laboratory testing
• In treatment of secondary syphilis, a Herxheimer reaction (malaise, fever, headache, rigors) may sometimes occur within 6-12 hours of initial treatment

_Treatment_
• Treat this with Aspirin 600mg every 6 hours

17.4.1 All syphilis except neurosyphilis

• Includes:
  o Early syphilis: primary (ulcer), secondary (generalized skin rashes, condylomata lata) or latent syphilis of not more than 2 years duration
  o Late syphilis: benign, cardiovascular and latent syphilis of more than 2 years; syphilis of indeterminate duration
  o Congenital syphilis in children
• Treat as late syphilis all patients with a positive RPR or VDRL and no documented syphilis serology in the last 2 years.

17.4.1.1 Early syphilis in adults

_Treatment_
• Benzathine Penicillin one dose of 2.4 MU i/m
  o Divide as 1.2 MU into each buttock
_Altimately, if hypersensitivity to penicillin:_
• Doxycycline 100mg every 12 hours for 15 days
**Note:** In pregnancy/lactation, substitute Doxycycline with Erythromycin 500mg every 6 hours for 15 days

17.4.1.2 Late syphilis in adults

_Treatment_
• Benzathine Penicillin 3 doses of 2.4 MU i/m at weekly intervals
  o Divide each weekly dose 1.2 MU into each buttock: total (3 doses) is 7.2 MU
_Altimately, if hypersensitivity to penicillin:_
• Doxycycline 100mg orally every 12 hours for 30 days
• **Note:** In pregnancy/lactation, substitute Doxycycline with Erythromycin 500mg every 6 hours for 30 days
Notes for pregnant patients

- Any history of penicillin hypersensitivity must be reliable as these patients are put at serious disadvantage because they cannot be given tetracyclines.
- The child must be treated for congenital syphilis at birth as Erythromycin does not readily cross the placenta.

17.4.2 Congenital syphilis in children

- Treat with a single dose of Benzathine penicillin 50 000 IU/kg i/m in all infants born to sero-positive mothers whether or not the mothers were treated during pregnancy (with or without penicillin) unless they have features of congenital syphilis.
- Thoroughly examine for congenital syphilis all infants born to women with reactive serologic tests: look for ascites, oedema, jaundice, hepatosplenomegaly, rhinitis, nasal discharge, hoarse cry, skin rash, and/or pseudoparalysis of any extremity.
- Treat infants with these symptoms as early congenital syphilis:
  **Treatment**
  - Benzylpenicillin 50 000 IU/kg/dose i/v every 12 hours, during the first 7 days of life and every 8 hours thereafter for a total of 10 days.
  - Children with late congenital syphilis (more than 2 years) are treated as follows:
    - Benzylpenicillin 50 000 IU/kg/dose i/v every 4 to 6 hours 10 to 14 days.
  
  **Alternatively, in penicillin allergic children**
  - Give Erythromycin syrup 12.5mg 6 hourly for 30 days.
- The risk of penicillin hypersensitivity in the 1st month of life can be safely discounted.

17.4.3 Neurosyphilis

- Higher penicillin doses are necessary to ensure that levels in the CSF do not fall below required amount throughout the course of treatment.

  **Treatment**
  
  **Adults:**
  - Benzylpenicillin 4MU i/v every 6 hours for 14 days then
  - Benzathine Penicillin 2.4 MU i/m once weekly for 3 consecutive weeks
  
  **Alternatively if confirmed hypersensitivity to penicillin:**
  - Doxycycline 200mg every 12 hours for 30 days.
17. Sexually transmitted infections

**Note:** In pregnancy: substitute Doxycycline with Erythromycin 500mg every 6 hours for 30 days

### 17.5 Trichomoniasis, vaginal

- Coincident bacterial vaginosis reduces the effectiveness of single dose Metronidazole treatment
- Asymptomatic male partners should also be treated

**Treatment**

- **Adults:**
  - See AVD Syndrome (Section 17.1.3 page 145)
- **Infants with symptomatic trichomoniasis or urogenital colonization persisting after the 4th month**
  - Metronidazole 5 mg/kg every 8 hours for 5 days

### 17.6 Management of Children and Adolescents Victims of Sexual Assault and Rape

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|   | • Assess and treat serious injuries first  
   | • Obtain verbal consent to conduct physical examination  
   | • Take full history and document all findings (use appendix 2 – “examination record” as recording framework)  
   | • Conduct full physical examination and document all findings  
   | • Document all facts regarding the assault  
|   | Manage physical effects of the assault such as wounds and bruises – including antibiotics to prevent wound infection, tetanus booster if required, medication for pain relief or anxiety  
|   | Provide emergency contraception if the victim has started menarche and presents within 72 hours post-assault  
   | • Postinor-2 – take 1 tablet orally, to be repeated after 12 hours or  
   | • Lo-Femenal 4 tabs to be repeated after 12 hours  
|   | Treat presumptively for STIs (or conduct laboratory investigations if available):  
   | • Benzathine Penicillin < 25 kg: 600,000 IU stat.  
   |   |   | > 25 kg 1,200,000 IU stat  
   | • Gentamycin 6mg/kg single dose  
   | • Erythromycin 12.5mg/kg every 6 hours for 7 days  
   | • Metronidazole 5mg/kg every 8 hours for 7 days  
|   | Provide HIV Testing and Counselling  
|   | Conduct an HB baseline reading (if available)  

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### 17. Sexually transmitted infections

- **If the victim presents within 72 hours of penetrative assault, and is HIV negative upon initial testing, and consents to PEP treatment** -
- Provide HIV PEP
- **If the victim has HB ≤ 8 g/dl** Duovir must be replaced with LamivirS

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<tr>
<th>Duovir - BD * 30 days OR ELSE</th>
<th>Lamivir S - BD * 30 days</th>
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<tbody>
<tr>
<td>&lt; 14 kg - ¼ tablet</td>
<td>25-35 kg – ¾ tablet</td>
</tr>
<tr>
<td>15-24 kg – ½ tablet</td>
<td>&gt; 35 kg – 1 tablet</td>
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</tbody>
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- 6
  - Provide counselling on post-traumatic stress to victim and guardian
  - Assess safety of the victim
  - Refer to other support services, such as the Victim Support Unit in the Police

- 7
  - Advise on dates for follow up visits
  - Record Findings and treatment in “Examination Record” and provide copy to the victim for submission to the police, if appropriate
  - Record all findings and treatment in health passport
18. Skin conditions

18.0 Skin conditions

18.1 Bacterial skin infections

18.1.1 Impetigo, Folliculitis, Furunculosis and Carbuncles

- **Causes**: Staphylococcal aureus and Streptococcal pyogenes.

*General management*

- Keep infected areas clean - wash daily with soap and water
- For children, instruct the mother
- Prevent spread to others – take care with towels and clothes and change/clean bedding frequently
- Remove crusts with warm water

*Treatment*

- Apply **Gentian Violet** paint 0.5 % on wet lesions

*Alternatively*

**Adults**

- **5% Salicylic acid with 5% Sulphur**

**Children**

- **2% Salicylic acid with 5% Sulphur ointment**
- If extensive or involving hairy areas: **Flucloxacillin** 125-500mg every 6 hours for 5-7 days *or*
- **Erythromycin** 125-500mg every 8 hours for 5-7 days.

*If no response, refer to hospital*

- For furunculosis and carbuncle – clean the affected area with water and soap.
- Do incision and drainage if fluctuant
- Give systemic antibiotics as above.

18.1.2 Ecthyma

- An ulcerative streptococcal pyogenes skin infection which can easily be confused with impetigo.
- Only recognized upon removal of a scab where a punched out ulcer may be seen.

*General Management*

- Remove crusts
- Give systemic antibiotics for 14 – 28 days
18. Skin conditions

18.1.3 Neonatal Pustulosis/ Bullae

- **Causes:** Staphylococcal aureus or Streptococcal pyogenes, syphilis (Treponema pallidum)

**Treatment:**
- **Potassium permanganate** baths
- **Benzylpenicillin** 50,000 units/kg i/m or i/v every 12 hours for 5 days plus
- **Gentamycin** 2.5mg/kg i/m or i/v every 12 hours for 5 days
- Check the mother’s VDRL or TPHA – if positive treat *see Section 17.4 page 153*

18.1.4 Erysipelas

- Well demarcated, erythematous superficial skin lesion with some blisters.
- Commonly caused by a beta- haemolytic group-A streptococci.

**Treatment**
- **Benzyl Penicillin** 2MU i/m every 6 hours
  - When temperature drops or when condition improves change to **Erythromycin** 500mg every 6 hours for 5-7 days.
- Apply **GV paint** every twelve hours

18.1.5 Cellulitis

- Poorly defined erythematous lesion.
- This is bacterial infection of the deeper part of the dermis and the upper part of the subcutaneous tissue

**Treatment**
- **Flucloxacillin** 125 -500mg every 6 hours for 7 – 10 days
  *If penicillin hypersensitive give*
- **Erythromycin** 500mg every 6 hours for 7 -10 days
  *If the patient is systemically unwell, then give*
- **Benzyl Penicillin** 2 MU i/m every 6 hours for 7 – 10 days or oral antibiotics
- Elevate the leg(s) on a pillow to reduce swelling.

18.1.6 Staphylococcal Scalding Skin Syndrome – Lyell’s disease

- A febrile, rapidly evolving generalized and blistering desquamative skin condition in which the skin exfoliates in sheets.
- Commonly affects neonates and young children, rare in adults unless one is immune compromised

*General Supportive Measures*
18. Skin conditions

- Replace fluid
- **Flucloxacillin** or **Cloxacillin** 250 – 500 mg every 6 hours for 7 days.
- Cortico-steroids are contra indicated

### 18.2 Erythema Multiforme/Steven Johnson’s Syndrome

#### 18.2.1 Erythema multiforme – Minor (Iris Type)

- Prodromal symptoms are generally absent and there is relative sparing of the mucus membrane and the trunk
- Target lesions (Iris) are characterized by dark centre and inner pale ring and an erythematus type outer border.

**Treatment (Symptomatic)**

- **Potassium Permanganate** baths twice a day
- **Calamine lotion** if vesicular origin or popular eruptions
- Identify the cause and treat. If the cause is medicine, stop the medicine
- **Chlorpheniramine 4mg** 8 hourly for 7 days

#### 18.2.2 Steven Johnson’s Syndrome/Vesicobullous type

- Potentially fatal condition
- Often caused by hypersensitivity to medication.
- Always ask for use of antiretroviral therapy (nevirapine), sulfa drugs, and penicillines. These need to be stopped immediately

**Treatment (Symptomatic)**

- **Normal Saline a must** – put up i/v line.
- Add **Dextrose**
- Identify the cause and treat. If the cause is medicine, stop the medicine
- **Prednisolone** 60 – 80mg once daily for 7 days; 40mg once daily for 3 days; 30mg once daily for 3 days; 20mg once daily for 3 days; 10mg once daily for 3 days; 5mg once daily for 3 days
- Keep patient warm
- **Potassium Permanganate** baths twice daily
- **GV Paint** on fresh lesions
- **Acyclovir** course if of viral origin
- Give **Ceftriaxone** 2g i/v once daily
18. Skin conditions

18.3 Toxic Epidermal Necrolysis (TEN)

- Management is like in Steven Johnson’s Syndrome.
- Often caused by hypersensitivity to medication. Always ask for use of antiretroviral therapy (nevirapine), sulfa drugs, and penicillines. These need to be stopped.
- Refer to the hospital

_Treatment_

- **Prednisolone** 80mg once daily for 1 week; 70mg once daily for 3 days; 60mg once daily for 3 days; 50mg once daily for 3 days; 40mg once daily for days; 30mg once daily for days; 20mg once daily for days; 10mg once daily for days; 5mg once daily for 3 days – Stop
- **Normal Saline** a must – put up i/v line.
- Identify the cause and treat.
- Give **Ceftriaxone** 2g i/v once daily
- High protein diet is recommended.

18.4 Fixed Medicine Eruption

- Diagnosis is clinical and in relation to history
- Stop the offending medicine
- Use potent topical steroids e.g. **Betamethasone cream** twice daily
- **If severe:**
  - **Chlorpheniramine** 4-8mg at bed time for 7 -14 days

18.5 Urticaria

- If deep dermis and subcutaneous tissues are involved it is called angioedema.

_General Management_

- Explain the condition to the patient
- Remove the cause if known

_Treatment_

- Give antihistamines – **Promethazine** 25mg i/m or orally at night or every 8 hours or at night for 1 to 2 weeks or till 48 to 72 hours after submission of the wheals
  _Alternatively_
  - **Chlorpheniramine** 4-8mg at night or every 8 hours for 1-2 weeks
  - **Albendazole** 400mg stat
  - **Calamine lotion** at night or twice daily
18. Skin conditions

- **Adrenaline** 0.5ml sub-cutaneously in severe urticaria with tracheal angioedema

18.6 Eczema (dermatitis)

- An inflammatory itchy skin condition.
- **Types:** Atopic (*seborrhoeic (indigenous)*), Allergic (*irritant contact eczema (exogenous)*)

**Treatment**

- Determine the type of eczema
- Eczemas are often secondarily infected (impetigo), systemic antibiotic treatment should be added if indicated
- **In HIV (+) children, extensive seborrhoeic dermatitis may occur.**
  - o **Potassium Permanganate** baths twice a day.
  - o And topical steroidse.g. **Hydrocortisone 1%** cream or ointment or **Sulphur 5%**with emulsifying ointment twice a day.
  - o If no response, give second line topical steroids or group 3 e.g. **Betamethasone creams**.

- **If secondary bacterial infection occurs:**
  - o Treat with systemic antibiotics: **Flucloxacillin** or **Erythromycin**.

**General Management**

- Counsel the patient on the condition.
- Treatment depends on the texture of the affected skin.
- Remove any obvious precipitating factors (allergic or contact eczema) ask about soaps detergent, vaseline, cosmetics, clothings etc.
- Use antihistamine to relieve itching.

**Treatment**

**Adults:**

- **Promethazine** 25 mg orally at night.

**Children:**

- **Promethazine** 1 mg/kg.

**Alternatively**

- **Chlorpheniramine** 4-16mg at night for 2 weeks.
- Use antibiotics for secondary infection.
- Give systemic antibiotic treatment only if lesions are infected or signs of systemic infection are present

**Note:** First line treatment failures can do better with Betamethasone cream/ointment or Crude coal tar 5% ointment.
18. Skin conditions

### 18.6.1 Acute eczema
- Sudden eruption with erythema, vesicles and sometimes bullae, often with serous exudates (wet appearance)

**Management**
- Wet or oozing lesions - dry them first with **Calamine lotion** 2 times a day
- Give **Chlorpheniramine** 4mg at night for 7 days

### 18.6.2 Subacute eczema
- Lesions take several days to erupt, are red but not wet or may be slightly wet. Few vesicles.

**Management**
- Normal or slightly wet lesions - use **Hydrocortisone 1% cream** twice a day
- Give **Chlorpheniramine** 4mg at night for 7 days

### 18.6.3 Chronic eczema
- Develops after months/years, thickened dry and scaly skin, (lichenification), deep cracks (can bleed) scratch marks, sometimes infected

**Management**
- Dry skin lesions
  - **Hydrocortisone ointment** 2 times daily
  - *Alternative*
    - Potent steroid e.g. **Betamethasone 0.1%**

### 18.7 Fungal skin infections

#### 18.7.1 Tinea
- *Types:* Capitis, corporis, pedis, cruris, unguium.
- Instruct patients on the importance of treatment compliance in order to eradicate the infection

**Treatment**
- *For wet lesions*
  - Dry by soaking or mopping with **Potassium Permanganate**
  - *Alternatives*
    - **Calamine Lotion** or **Gentian violet Paint**
    - Then, **Compound benzoic acid ointment** or **Clotrimazole cream**
- *In chronic or extensive cases and those involving hairy areas:*
18. Skin conditions

- Add Griseofulvin 500mg orally daily with food, single dose or in 2 divided doses, 4-6 weeks
- Children: 10mg/kg/dose

**Notes:**
- Tinea corporis, cruris, pedis treat for 4 weeks
- Tinea capitis treat for 6 weeks
- Tinea unguium of the fingernails treat for 12 months
- Tinea unguium of the toenails treat for 2 years.

**Alternative systemic antifungals**
- Ketoconazole and Fluconazole.
- In HIV (+) patients all Tineas may be extensive.

18.8 Viral skin infections

18.8.1 Herpes simplex

- **Types:** Type 1 (affects lips), Type 2 (affects genitals but can interchange due to oral sex)

**Treatment**
- In case of bacterial superinfection see Section 18.1 page 157
- Use salt mouth wash or chlorhexidine solution
- Acyclovir Cream or GV Paint or Silver Sulphadiazine Cream Application twice a day
- Aspirin 300mg or Paracetamol (avoid Aspirin in children as it may cause Reye’s syndrome)
- In severe conditions give Acyclovir 200-400mg every 8 hours for 5 to 7 days and consider checking HIV.

18.8.2 Varicella (Chicken pox)

- Refer to Section 9.8 page 75

18.8.3 Herpes zoster (shingles))

- **Causes:** varicella zoster virus.
- A common presentation in HIV(+) patients

**Treatment**
- Acyclovir 800mg 5times a day for 5-7 days; best within 24 - 72hours from onset of the lesions.
18. Skin conditions

- **Calamine lotion** or **Acyclovir cream** bd on intact lesions till they break or
- **GV paint**, or **topical antibiotic** cream twice a day
- For pain relief refer to *Section 24.4 page 197*
- *For ophthalmic herpes zoster* treat as above and refer to eye department.
- Refer for HIV Testing

18.9 Prurigo/Pruritus

- **Symptoms/Signs:** itching.
- **Causes:** Iron deficiency, anaemia, lymphoma, leukaemia.

*Treatment*

- Adults and Children (symptomatic treatment):
- Apply **Calamine Lotion** 2-3 times daily
- **Promethazine** 25mg single dose at night or
- **Chlorpheniramine** 4-8mg at night for 2 weeks
  - Children: 1 mg/kg/dose
- Emollients like **Emulsifying plain ointment** applications or baths b.d. may help reduce itching
- Investigate the cause, and treat accordingly

18.10 Scabies

- Secondary infection is common and may mask the condition.
- Treat the whole family and any other close contacts

*Treatment*

- Wash the whole body with mild soap and water, preferably at night, and dry up
- Apply **Benzyl Benzoate Application** 25% to the whole body from the neck down
- Ensure all parts of the skin are covered
- Allow the medication to dry and to remain on the skin for at least 10 hours or over night
- Next morning wash off the application with soap and water
- Wash all contaminated clothes, beddings and towels and use already washed clothes
- Repeat the above treatment on day 5

*Alternative for benzyl benzoate application*

- **Lindane 1% lotion**, single dose applied as above.

*Note:*
18. Skin conditions

- Avoid Lindane in children less than 2 years old
- In children under 1 year, also treat the face (except the area surrounding the eyes)
- For children under 5 years, Use 12.5% benzyl benzoate application
- Prepare this by diluting one part 25% benzyl benzoate application with an equal part of water

In cases of severe or extensive infection, especially with secondary bacterial infection:
- Give a systemic antibiotic see Section 18.1 page 157
  - 5% Salicylic acid and sulphur ointment twice a day
  - Consider checking HIV.

If itching is problematic:
- Give reassurance
- Itching may persist for up to 2-3 weeks

If severe:
- Chlorpheniramine 4-8 mg at night for 2-3 weeks

18.11 Tropical ulcer

- Improve nutrition and diet

Treatment
- Clean ulcer with Hydrogen peroxide solution (20 vol)

Alternatively:
- Cetrimide 15% + Chlorhexidine solution 1.5% diluted 1 in 20 or Potassium permanganate soaks 1ml in 10,000mls of water
- Debride the wound if necrotic
- Daily Potassium permanganate soaks or cleaning
- Dress the wound with Zinc paste with sulphur regularly till healed
- Rest with leg elevated
- Do a skin graft if wound is clean and shows granulation

If local infection presents:
- Phenoxy methylpenicillin 500mg every 6 hours for 7 days or
- Erythromycin 250mg every 6 hours for 7 days
  - Children 12.5 mg/kg body weight in 4 divided doses
- If possible, carry out culture and sensitivity testing to determine suitable antibiotic therapy
- Refer the patient to the hospital
18. Skin conditions

18.12 Onchocerciasis

Refer to Section 15.2 page 127

18.13 Buruli Ulcer

- This is an ulcerative skin condition caused by Mycobacterium ulcerans

Treatment

- Depends on stage of condition, but if ulcerated
  - Daily wound dressing with saline
  - Medicine therapy is disappointing
  - Surgery

18.14 Leprosy

Refer to Section 9.2 page 68
19. Vaccinations

19.0 Vaccinations

- For tetanus toxoid vaccination (TTV) see Section 12.3 page 100

Table 27: Vaccination schedule for children

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>BCG 0.05 ml intradermically</td>
</tr>
<tr>
<td></td>
<td>- Children &gt; 1 year 0.1 ml</td>
</tr>
<tr>
<td></td>
<td>Polio 0: 2 drops orally (= “zero dose”)</td>
</tr>
<tr>
<td>6 weeks</td>
<td>PENTAVALENT 1: 0.5 ml IM</td>
</tr>
<tr>
<td></td>
<td>Polio 1: 2 drops orally</td>
</tr>
<tr>
<td>10 weeks</td>
<td>PENTAVALENT 2: 0.5 ml IM</td>
</tr>
<tr>
<td></td>
<td>Polio 2: 2 drops orally</td>
</tr>
<tr>
<td>14 weeks</td>
<td>PENTAVALENT 3: 0.5 ml IM</td>
</tr>
<tr>
<td></td>
<td>Polio 3: 2 drops orally</td>
</tr>
<tr>
<td>6 months</td>
<td>Oral Vitamin A</td>
</tr>
<tr>
<td>9 months</td>
<td>MEASLES: 0.5 ml deep S/C</td>
</tr>
<tr>
<td>12 months</td>
<td>Oral Vitamin A</td>
</tr>
</tbody>
</table>

PENTAVALENT = DPT, Hepatitis B and Hemophilus influenza type B

Notes:

a) Aim to complete this schedule within the first year of life
b) BCG vaccination: give this as early as possible in life, preferably at birth – complications are uncommon. BCG is contraindicated in symptomatic HIV infection
c) Measles vaccination: normally give this when a full 9 months of age is reached.
d) Can give an extra dose which is recommended for groups at high risk of measles death, such as children in refugee camps, HIV- positive infants and during outbreaks of measles
e) Pentavalent/Polio : the minimum interval between doses is 4 weeks
f) Tetanus toxoid vaccination: give a full course of this:
   o To all women see Section 12.3 page 100
   o After administration of anti-tetanus serum (ATS) to any previously unimmunised patient
   o If over 10 years has elapsed since the last booster dose
20. Bites, burns and wounds

20.0 Bites, Burns and Wounds

20.1 Animal Bites

- Avoid suturing any kind of bite wound
- Thorough cleansing and debridement of the wound is essential
- The combination of local wound treatment, passive immunization with rabies immunoglobulin (RIG), and vaccination with anti-rabies vaccine is recommended for all severe exposures to rabies (see Table 28 page 169)
- Since prolonged rabies incubation periods are possible, persons who present for evaluation and treatment even months after having been bitten should be treated in the same way as if the contact occurred recently

| Thorough prompt local treatment of all bite wounds and scratches which may be contaminated with rabies virus is very important as elimination of the rabies virus at the site of infection by chemical and physical means is the most effective method of protection |

- As part of local treatment in all cases of possible exposure, carefully instill rabies immunoglobulin RIG, if available, in the depth of the wound and infiltrate around the wound. See Table 28 page 169 for dose information
- Avoid contact with the patient’s saliva which is potentially infective. If possible, wear eye protection as patients may spit and infection through the conjunctiva can occur

Treatment

Adults and Children:

- Give Tetanus Toxoid Vaccination (TTV) see Section 12.3 page 100
- Flush and cleanse (scrub) the wound with cetrimide 15% + chlorhexidine solution 1.5% diluted 1 in 20 with water

Alternatively:

- Wash with Hydrogen peroxide solution (10 vol) or soap or detergent
- Rinse with normal saline and dress with a weak iodine solution or iodine cream
- Give Anti-Rabies Vaccine, only if necessary according to the recommendations in Table 28 page 169.
- Give Co-amoxiclav 625mg every 8 hours plus
- Metronidazole 400mg every 8 hours
- If possible, capture and observe the animal for 10 days. If the animal is still alive after this time period, it does not have rabies
• Human bites should be managed as animal bites except for the use of anti-rabies vaccine.

20.1.1 Post-exposure immunization
• Give anti-rabies vaccines to all patients unvaccinated against rabies, together with local wound treatment, and in severe cases, rabies immunoglobulin (see Table 28 page 169)

20.1.2 Administration of anti-rabies vaccine
• Use intra-dermal injection regimes for Anti Rabies Vaccine whenever possible
• Give a 0.1 ml dose of Anti Rabies vaccine intradermally in either the forearm or upper arm, on days 0, 3 and 7
• Then give 0.1 ml of Anti Rabies vaccine at one site on days 30 and 90

Alternative intramuscular regime:
• Give one 1 ml dose of Anti Rabies vaccine i/m on days 0, 3, 7, 14 and 30

Suitable injection sites
• In adults: always inject the anti-rabies vaccine into the deltoid area of the arm
• In young children: the anterolateral area of the thigh may also be used. Never use the gluteal area for vaccination as it is then much less effective.

Table 28: Recommendations for Anti-Rabies Vaccination

<table>
<thead>
<tr>
<th>NATURE OF EXPOSURE</th>
<th>CONDITION OF ANIMAL</th>
<th>RECOMMENDED ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Saliva in contact with skin, but no skin lesion</td>
<td>Healthy at time of exposure, Healthy 10 days later</td>
<td>Do not vaccinate</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rabid</td>
<td>Do not vaccinate</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rabid</td>
<td>Do not vaccinate</td>
</tr>
<tr>
<td>2. Saliva in contact with skin that has lesions, minor bites on trunk or proximal limbs</td>
<td>Healthy at time of exposure, Healthy 10 days later</td>
<td>Do not vaccinate</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>Do not vaccinate</td>
</tr>
<tr>
<td></td>
<td>Rabid</td>
<td>Vaccinate</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>Vaccinate, but stop course if animal healthy after 10 days</td>
</tr>
<tr>
<td></td>
<td>Rabid</td>
<td>Vaccinate</td>
</tr>
<tr>
<td></td>
<td>unknown</td>
<td>Vaccinate</td>
</tr>
<tr>
<td>3. Saliva in contact with domestic or wild animal</td>
<td>Domestic or wild</td>
<td>Vaccinate, and give</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20. Bites, burns and wounds

<table>
<thead>
<tr>
<th>Serious bites (face, head, fingers, or multiple bites)</th>
<th>Rabid animal or suspect</th>
<th>Antirabies serum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy domestic animal</td>
<td>Vaccinate, but stop course if animal healthy after 10 days</td>
<td></td>
</tr>
</tbody>
</table>

### 20.1.3 Post-exposure immunization in previously vaccinated patients

- In persons known to have previously received full pre-or post-exposure treatment with rabies vaccine within the last 3 years:
  - Give one booster dose of 0.1 ml **Anti Rabies Vaccine** intradermally on days 0 and 3

*Alternative intramuscular regime:*

- Give one booster dose of 1 ml **Anti Rabies Vaccine** i/m as above
- If completely vaccinated more than 3 years before or if incompletely vaccinated, give a complete post-exposure vaccination course

### 20.2 Burns

- Remember the ABCs of life support
- Assess the severity of the burn (see table below)
- Refer patients with burns of more than 15% (children: > 10%) of body surface area (BSA) to hospital on iv fluid therapy for resuscitation and burns dressing
- Refer all deep burns or burns of the face, neck or hands and perineum for further assessment
- Burns across joints should be immobilized and later encourage passive movement to prevent from contractures
- *If the burn is more than 40%, mortality is almost 100% therefore referral to a tertiary hospital may not be necessary*
- *Circumferential* burns of the limbs and trunk require immediate bed side escharotomy (see diagram of the site of incisions)

- Burns by nature are usually initially sterile. The aim of treatment is to speed healing while minimizing the risk of infection
20. Bites, burns and wounds

- In the sick burned patient (fever+diarrhoea+/- a rash):
- Have a high index of suspicion of toxic shock syndrome
- Naso gastric tube insertion is helpful as gastric dilatation is common
- Give anti-acids to prevent gastric stress ulcers (see Section 7.6 page 52)
- Do a blood culture and malarial parasites
- Start intravenous flucloxacillin

20.2.1 Calculation of Body Surface Area Affected check with group that did this to get a better picture
20. Bites, burns and wounds

**Adults and Children:**
- Give i/v fluid replacement according to the calculation below
- With mild burns (< 15% adults BSA burned or < 10% children) give oral fluid replacement therapy using as much ORS as the patient will tolerate

**Adults:** With 15% or more and children with 10% or more require i/v fluid resuscitation.
- Calculate according to Parkland formula:-
  - Adults: 4mls per /kg body wt/ TBSA
  - Children: 3mls per kg body wt/TBSA + maintenance
- Maintenance for children

### 20.2.2 Calculation of i/v fluid replacement

- The object is to maintain normal physiology as reflected by urine, vital signs and mental status
- Use **Ringer’s lactate** i/v infusion or (if this is not available) **normal saline**, adding to each 1L 100 ml of dextrose 50% ml/kg x % BSA burned of solution for plasma expansion (eg. Haemaccel ®)
- A general formula and dosage schedule that may be used for the first 24 hours is:
  - Total volume of i/v infusion required (before above additions) = 4 ml/kg x % BSA burned plus normal daily requirement
- Give 50% of this total in the first 8 hours calculated from the time of burn
- Give 50% in the next 16 hours
- Give analgesic treatment *(Section 24.1 page 196)*
- Strong analgesia (e.g. Morphine or Pethidine) will be required for the first 48 hours
- Under aseptic conditions, gently cleanse the lesion with **cetrimide 15% + chlorhexidine 1.5%** diluted 1 part in 20 parts water

**Alternative:** Cleanse with **hydrogen peroxide solution** (10 vol) or soap and water
- Never use alcohol-based solutions
- Repeat the cleansing each day debriding the lesion and removing necrotic tissue as necessary
- Give tetanus toxoid vaccination *(see Section 12.3 page 100)*

**If patient is developing signs of tetanus**
- Give **tetanus antitoxin** (ATS) 1,500 units s/c or i/m

*Once the lesion is clean/clear of necrotic tissue:*
20. Bites, burns and wounds

- Refer for skin grafting, if necessary, otherwise
- Dress the burn with paraffin gauze dressing
- Cover this with dry gauze dressing thick enough to prevent seepage through to the outer layers
- Change the dressing after 2-3 days, and then as necessary

If the burn becomes infected:
- Apply silver sulphadiazine cream 1% twice daily
- Before application, completely remove any old topical medication
- Cover with sterile gauze

If the patient becomes ill after burn infection:
- Carry out culture and sensitivity testing on the exudates
- Treat with systemic antibiotic(s) according to findings

20.3 Open wound

Management
- Clean and suture fresh wound (ie. > 6 hours old)
- Any skin damage overlying a fracture makes it an open fracture

Note: It is important to ascertain the cause of the wound. Do not suture penetrating wound.
Refer to the hospital.
- Clean fresh wounds with Cetrime 15% + Chlorhexidine solution 1.5% diluted 1 in 20 parts water

Alternatively
- Hydrogen peroxide solution (10 vol)
- For local infiltration or as a peripheral nerve block use Lignocaine hydrochloride injection 1% maximum dose: adults 25ml; children 0.4 ml/kg

Alternatively
- Lignocaine 1% + adrenaline 1:200,000 injection Maximum dose: adults 40 ml, children 0.7 ml/kg

Note: Do not use anaesthetics containing adrenaline for anaesthesia in digits or appendages due to risk of ischaemic necrosis
20. Bites, burns and wounds

- Always remember to give **Tetanus Toxoid Vaccination** *(Section 12.3 page 100)*
- If patient has signs of tetanus give **Tetanus Antitoxin Serum** (ATS) 1,500 IU s/c or i/m
- If wound is grossly contaminated give **Tetanus Antitoxin Serum** 3,000 IU s/c or i/m

20.4 Insect stings and bites

20.4.1 Envenomation by insects

- Bees, wasps: Usually benign, but may provoke either laryngeal oedema or anaphylactic shock *(see Section 5.1.1 page 29)*
- Spiders, scorpions: The majority of spiders are benign. If a truly toxic species is thought to be responsible apply first aid and supportive measures as for snake bite *(see Section 20.5 below)*

20.4.2 Snake bite

- Venom diffuses mainly via the lymphatics, not via blood vessels, tourniquets are thus of little use

**a) First Aid Treatment**

- Cleanse the wound with **Cetrimide + Chlorhexidine solution 15% + 5% diluted 1 in 20**
- Hydrogen peroxide solution *(10 vol)*
- Apply film constant pressure to the site of the bite
- Apply a crepe bandage firmly to the entire limb
- Immobilize the patient for 12 hours observation
- Reassurance

**Administration of Snake Anti-venom**

- Ensure that the anti-venom solution is clear
- Draw up 0.5 ml of adrenaline 1/1000 injection in a syringe ready for use s/c if needed
- Give 100 ml of the polyvalent antivenom as an iv infusion, diluted in 300 ml of normal saline
20. Bites, burns and wounds

- Children: dilute in 0.4 ml/kg of saline
- Give the infusion slowly for the first 15 minutes (most reactions occur within this period
- Thereafter increase the rate gradually until the whole infusion is completed within 1 hour

If there is a history of allergy:
- The patient may still need to be given anti-venom because of systemic poisoning, but take particular care

If a reaction occurs:
- **Hydrocortisone** may need to be administered in addition to adrenaline

If there is no clinical improvement by the end of the infusion:
- Repeat the same dose as above

Note: Reserve **Polyvalent snake antivenom (anti-snakebite serum)** for patients with one or more of these signs and symptoms, hypotension, vomiting, neurotoxicity, haemotoxicity.

b) Supportive therapy
- Give reassurance – most snake bites are not dangerous
- Treat shock if any (see Section 5.1.1 page 29)
- Give an antihistamine:
  - **Promethazine** 25 mg/day or up to 8 hourly
  - **Children > 6 months:**
    - 1 mg/kg/day given in divided doses every 12 hours
  - Give **Tetanus Toxoid Vaccination** (Section 12.3 page 100)

If patient is developing signs of tetanus:
- Give **Tetanus Antitoxin (ATS)** 1,500 IU s/c or i/m
- **Benzyl penicillin** 2.4 MU once daily for 5 days
  - Children: 25,000 units/kg daily
- Eventually excise sloughs and graft skin early

20.5 Superficial injury, bruise, minor cut

**General management**
- Cleanse the wound with **Cetrimide 15% + Chlorhexidine solution 1.5%** diluted 1 in 20 parts water

Alternatively
20. Bites, burns and wounds

- **Hydrogen peroxide solution (10 vol)**
  If the patient is unimmunised or not fully immunized and the wound is grossly contaminated:

- **Tetanus Toxoid Vaccination** *(Section 12.3 page 100)*
  If the wound is dirty
- **Benzylpenicillin** 2.4 MU i/m stat
  Children 25,000 units/kg

*Then*

- **Phenoxybenzylpenicillin** 250 mg every 6 hours for 5 days
  (Children 25,000 units/kg)
- *If Penicillin hypersensitivity:*
- **Erythromycin** 250 mg every 6 hours for 5 days
21. Renal conditions

21.0 Renal Conditions

- Starts with upper complicated then acute lower Urinary tract conditions

21.1 Cystitis/Urethritis

Treatment

- Ensure adequate fluid intake
- For acute uncomplicated (all nonpregnant women, symptoms duration less than 1 week, not men or catheterized patients) give **Ciprofloxacin** 250mg orally every 2 hours for 3 days
  
  Alternatively
  - **Nitrofurantoin** 100mg every 6 hours with food for 7 days
  - Consider urine microscopy, culture and sensitivity if no response or recurrent infections to guide treatment

21.2 Complicated Urinary tract Infections

- Includes men, pregnant women, catheterized patients, patients with abnormal urinary tracts and those with symptoms > 1 week

Treatment

- Give **Ciprofloxacin** 250mg orally twice a day for 5 days or
- **Co-amoxiclav** 375 mg 8hourly for 7 days
  
  Alternatively
  - Give **Gentamycin** 240mg i/m or i/v stat
  - Followed by any of the above oral antibiotics
  - Consider urine microscopy, culture and sensitivity if no response or recurrent infections to guide treatment

21.3 Upper Urinary tract Infections

- Pyelonephritis:
  - Significant fever, rigors, vomiting, flank pain

Treatment

- **Ciprofloxacin** 250mg orally twice a day for 10-14 days or
- **Co-amoxiclav** 375 mg 8hourly for 10-14 days
  - i/v fluids if clinically indicated
  
  Alternatively
  - **Gentamycin** 240mg i/m or i/v stat
  - Followed by any of the above oral antibiotics for 10-14 days
  - Refer patients with recurrent UTI for further investigations
21. Renal conditions

21.4 Acute nephritic syndrome

- Most often occurs as a complication of a streptococcal infection
- Usually manifests itself 1-5 weeks after an episode of pharyngitis, impetigo, or infected scabies
- Affects mainly children <3 years old, and adults, who should be referred to a doctor

General measures:
- Monitor BP, urine output, weight
- Avoid added salt
- Treatment is usually supportive

Adults:
- **Phenoxymethylpenicillin** 500 mg every 6 hours for 7 days

If oedematous:
- **Frusemide** 40-80 mg once daily

If hypertension is present:
- Treat accordingly *(Section 2.3 page 9)*

21.5 Nephrotic syndrome

- Confirm the diagnosis: proteinuria, hypo-albuminaemia, edema, high cholesterol
- Investigate a possible cause

General measures:
- Adequate protein intake
- Restrict salt intake
- Monitor fluid intake and output
- Daily weight measurements

Treatment

Adults
- **Frusemide** 40-80 mg as a single dose each morning
- **Enalapril** 10-20 mg once daily (use with caution, stop if renal function deteriorates)
- A trial of steroids is indicated (responsiveness to steroids in adults is less than in children). **Prednisolone** 50-60 mg once daily for up to two months, tapering off is required after response.

If Schistosomiasis is diagnosed or suspected as cause:
- **Praziquantel** 40 mg/kg single dose
21. Renal conditions

If presentation is acute:
- **Phenoxymethyl penicillin** 500 mg every 6 hours for 7 days
- Refer to Nephrologist

### 21.6 Renal colic

**Treatment**
- Intravenous fluids
- Either **Morphine** or **Pethidine**. *(Section 24.9 page 199)*
- **Hyoscine butylbromide** 20 mg deep i/m stat
- Repeat after 30 minutes if necessary
- Ensure fluid intake of 3-4 litres/day after the crisis
- Intravenous Pyelography is usually indicated

### 21.7 Renal failure (acute)

- Patients with acute renal failure should be referred to a hospital
- Carefully check the use of any drug in renal failure and reduce drug doses where required, see below

**Symptoms and Signs include:** oliguria, oedema, vomiting
- Look for clues for the cause of renal failure which include, shock, acute glomerulonephritis, use of herbal remedies containing nephrotoxins

**Management**
- Assess the hydration status of the patient
- Patients who are dehydrated will need fluid resuscitation
- Patients who are fluid overloaded will need fluid restriction and/or diuretics
- Restrict salt intake
- Weigh the patient daily
- Carefully monitor fluid intake and output on a chart
- Reduce the rate of rise of urea:
  - Give adequate calories
  - Restrict protein in the diet
- Treat hyperkalaemia:
  - Restrict potassium intake by restricting fruits, vegetables, meat and fizzy drinks
  - If potassium is > 6.5mmol/l give **Insulin** 10 Units in 50ml of 50% dextrose infusion over 30mins
  - Give a **potassium binding resin** 30-60g orally
- Refer patient for dialysis if not responding to measures above
21. Renal conditions

Indications for dialysis include:
- Hyperkalaemia
- Fluid overload
- Metabolic acidosis
- Pericarditis
- Confusional state (encephalopathy)

Note:
- Treat complications of renal failure such as convulsions, hypertension
- Do an HIV and Hepatitis B test before referral for dialysis

21.7.1 Use of medicines in renal failure/impairment

Note: Take great care when prescribing any medicine and carefully check medicine prescribing information (e.g. in BNF, MNF) regarding use in renal failure /impairment

Usually safe medicines:
- Doxycycline
- Erythromycin
- Penicillin
- Phenytoin
- Rifampicin

Use with care in reduced doses:
- Amoxycillin
- Chloramphenicol (avoid in severe impairment)
- Cotrimoxazole
- Diazepam
- Digoxin
- Insulin
- Isoniazid-containing medicines
- Pethidine (increase dose interval, avoid in severe impairment)
- Phenobarbital
- Propranolol
- Antiretroviral medicines

Avoid using:
- ACE inhibitors (eg. Captopril)
- Aspirin and other NSAIDS (eg. Ibuprofen, Indomethacin)
21. Renal conditions

- Codeine
- Ethambutol
- Gentamycin
- Nalidixic acid
- Nitrofurantoin
- Streptomycin
22. Poisoning

22.0 Poisoning

22.1 General principles of treatment

- Determine details of the poisoning:
  - What was the poison?
  - When did the poisoning take place?
  - What kind of poisoning took place? e.g. by swallowing, inhalation, contact with the skin or eyes
  - How much was taken?
- Prevent further exposure to the poison (if possible)
  - Remove contaminated clothing
  - Wash contaminated skin with soap and lots of cold water

Management

- Conserve body heat (if necessary)
- Maintain respiration
- Clear the airway
- Breathing-Maintain ventilation – use artificial respiration if necessary, patient may need ventilation
- Maintain BP/treat shock
  - Correct hypotension
  - Elevate the legs
  - Correct hypertension
  - In refractory shock discuss with anesthetist
- Maintain fluid balance
- Monitor fluid intake and output

22.2 Swallowed poisons

Treatment

- Prevent gut absorption
- Empty the stomach (if appropriate)
  - Only do this if within 4 hours of the poisoning and if the patient is conscious
- Do not empty the stomach if:
  - A corrosive substance was swallowed, e.g. strong acid or alkali, bleach
  - Paraffin or a petroleum product was swallowed
  - The patient is unconscious or convulsing
  - The subsistence is not known
22. Poisoning

- Treat any complications as necessary
  - E.g. hypothermia, hypoglycaemia, convulsions, electrolyte or acid/base disturbances

### 22.2.1 Methods of emptying the stomach

1. **Induction of vomiting**
   - Give *Ipecacuanha* emetic mixture
     - Children < 18 months: 10ml.
     - Children > 18 months: 15ml
     - Adults: 15-30 ml.
   - Repeat after 20 mins if ineffective
   - Follow this with 15 ml/kg of water

**Note:** It is essential to prevent any vomit from entering the lungs

2. **Stomach wash-out (gastric lavage)**
   - Should only be done by staff familiar with the procedure
   - Lie the patient head down on the left side
   - Pass a wide gauge soft rubber tube (Ryle’s tube) into the stomach
   - Tube should be wide enough to allow large particles to pass through. e.g. tablets
     - Pour 300ml tap water down the tube
     - For children > 5 years: use 100-200 ml water
     - For children < 5 years: use normal saline instead of water
     - Aspirate with the patient in the head down position, taking special note of the airway
     - Repeat lavage until aspirated fluid is clear

### 22.2.2 Use of activated charcoal

- 50-100g activated charcoal will prevent absorption of most medicines given within 1 hour of ingestion
- Only effective if given within 4 hours of poisoning when most of the poison is still in the stomach
- Only give activated charcoal after vomiting (induced or otherwise) has ceased
- Do not use ordinary charcoal – it will have no effect
- Do not use activated charcoal in the following situations:
  - If the patient is unconscious, drowsy or having fits, because of the risk of choking
- At the same time as, or just before giving, ipecacuanha or any oral antidote as it may bind these and prevent them working
- For poisoning by acids, alkalis, alcohol, iron and petroleum products

### 22.2.2.1 Administration of activated charcoal

- Add 50 g (children: 1 g/kg) to 400 ml water in a bottle
- Mix well by shaking until all the powder is wet
- Administer by the gastric lavage tube (unless the patient agrees to drink the charcoal slowly)
- Repeat if required after 4-6 hours

### 22.3 Paraffin, petrol and other petroleum products

- Includes paint thinners, organic solvents, etc
- The main danger from these is damage to lung tissue and liquid pneumonitis following aspiration

**General measures**

- Take great care to prevent the substance entering the lungs
- Do not make the patient vomit
- Do not do gastric lavage except:
  - Where the amount of paraffin, etc, swallowed was high (> 10 ml/kg) as these levels may cause brain damage
  - Only after endotracheal intubation under anaesthesia
- Treat any pulmonary oedema and pneumonia as required
- Giving un absorbable oral liquid, e.g medicinal liquid paraffin

### 22.4. Iron poisoning

- A dose of 20 ml/kg of iron syrup or 2-3 iron tablets/kg may be fatal in children. Abdominal X-ray may show the number of tablets swallowed
- In severe cases there are risks of vomiting and gut haemorrhage in the acute stage and liver necrosis and shock after 1-2 days. Therefore observe the patient for at least 48 hours
- Remove any tablets by inducing vomiting and/or by gastric lavage

**In less serious cases:**

- Desferrioxamine 5-10g orally or by nasogastric tube in 50-100 ml of sodium bicarbonate solution 5%

**In serious cases:**
22. Poisoning

- **Desferrioxamine 15 mg/kg**/hour by i/v infusion in dextrose 5% or normal saline solution
  - Max: 80 mg/kg in each 12 hour period
- Continue until free of symptoms for 24 hours

### 22.5 Salicylate (Aspirin) poisoning

- Gastric emptying is delayed
- Always empty the stomach
- Give repeated doses of **activated charcoal** to delay absorption of any remaining poison (See Section 22.2.2.1 page 184)
- Watch for and treat hypoglycaemia, convulsions and metabolic acidosis
- In severe cases:
  - **Darrow’s ½ strength in dextrose 5%** infusion with added **sodium bicarbonate** (30 mmol/litre) may be needed to increase renal excretion or ringers lactate

### 22.6 Organophosphate or carbamate poisoning

- Very toxic chemicals found in insecticides and pesticides, eg. Some rat poisons
- Poisoning may be by ingestion, inhalation or absorption through the skin
- Presents with anxiety, restlessness, small pupils, increased secretions and bradycardia

**Management**

- Remove any contaminated clothing
- Establish and maintain airway
- Artificial respiration with oxygen may be required at any stage during the first 24 hours after poisoning
- Empty the stomach if poison swallowed
- If there is skin contact with the poison, wash them thoroughly
- Wear rubber gloves to prevent contamination
- Do not rub the skin
- Shave hair if heavily contaminated
- Give **Atropine** 1.2mg i/v or i/m (children: 0.05 mg/kg)
- Then give 0.6 mg (children: 0.05 mg/kg) every 10 minutes as required to achieve and maintain atropinisation (hot dry skin, dry mouth, widely dilated pupils, fast pulse)

**In severe organophosphate poisoning:**

- Give an initial **Atropine** dose of 4-6mg (children: 2 mg)
22. Poisoning

- Repeat 2 mg every 10 minutes as required to achieve and maintain full atropinisation
- Total needed in first 24 hours is usually < 50 mg
- High dose **Atropine** may be required for several days

In severe organophosphate poisoning only and in cases not responding to atropine:

- Give **Pralidoxime mesylate** 1-2g concurrently with **Atropine**
  Children: 20-40 mg/kg
- Administer by slow i/v (over 15-30 minutes) as a 5% solution in water for injections
- If i/v not possible: give i/m or s/c
- Repeat once or twice at 4-6 hour intervals if needed
- If possible: monitor treatment by determination of blood-cholinesterase concentrations

**Do not give pralidoxime (or other oximes) in carbamate poisoning**

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22.7 Paracetamol poisoning

- Paracetamol is an ingredient of many over the counter pain cold flu remedies
- A dose over 150 mg/kg (ie. approx 10 g in an adult) may cause severe liver and (less frequently) kidney damage within hours of ingestion
- In the first 24 hours there may be nausea and vomiting or there may be no sign of poisoning
- Persistence of these symptoms and associated right subcostal pain and tenderness usually indicates hepatic necrosis
- Liver damage reaches a maximum 3-4 days after poisoning and may be fatal

**Even if there are no significant early symptoms, overdose patients should be urgently transferred to hospital**

*If overdose occurs within 4 hours of admission:*

- Empty the stomach to remove ingested medicine
- If respiration is depressed: do not use emesis – use airway protected gastric lavage instead
- Keep patient warm and quiet
- Observe carefully for at least 3-4 days
- Monitor fluid, electrolytes, blood glucose, liver and kidney function
22. Poisoning

- Give supportive care and correct fluid and electrolyte balance as required

If within 24 hours of overdose with over 10g of paracetamol:
- Give the specific antidote N-acetylcystine as an i/v infusion in Glucose 5%
  - Initially give 150mg/kg in 200ml over 15 minutes
  - Then give 50 mg/kg in 500 ml over 4 hours
  - Then give 100mg/kg in 1 over 16 hours

If a serious reaction occurs:
- Stop the infusion
- Treat the reaction (see Section 5.1.1 page 29)
- Restart the infusion
23.0 Nutritional disorders (adults)

23.1 Definition of malnutrition

Adults:
- Severe malnutrition = BMI<16 or presence of bilateral oedema with MUAC <21.9cm (oedema should be assessed by a clinician for medical causes) or MUAC < 19cm (to be used only if BMI cannot be taken)
- Moderate malnutrition = BMI 16-16.9 or MUAC 19 - 21.9cm (to be used only if BMI cannot be taken)

Pregnant and lactating women
- Severe malnutrition = MUAC <19cm
- Moderate malnutrition (where SFP is not present) = MUAC 19 - 21.9cm

Adolescents 12-18 years
- Severe malnutrition = Weight/Height <70% or presence of bilateral oedema (oedema should be assessed by a clinician for medical causes)
- Moderate malnutrition = Weight/Height between 70-79%

Children
- Severe malnutrition - child who is < 70% of expected weight for age, or <80% but with generalized oedema or MUAC <11 cm for a child who is > 6/12
- Moderate malnutrition – child who is > 70% of expected weight for age, or <80% but with mild edema of the feet or MUAC 11-11.9cm.
- Mild malnutrition - child who is failing to gain weight for 3 months or who is below the green path (< 85% expected weight for age)

23.2 Management of Malnutrition in Adolescents and Adults

- Refer to Government of Malawi, Ministry of Health, Interim Guidelines for the Management of Acute Malnutrition in Adolescents and Adults
- All ambulatory adults and patients should be treated as outpatients
- The ready to use therapeutic food (RUTF) should be used in combination with a normal diet

23.2.1 Treatment of severe malnutrition

- 2 pots of Ready to use therapeutic food (RUTF) (260g, 2700 kcal) per day
- 6 sachets of RUTF (92g, 3000 kcal) per day
23. Nutritional disorders

- If patients achieve BMI of 17 or MUAC of 22cm (in adolescents weight/height >70%) then treat as moderate malnutrition (see Section 23.2.2 below)

### 23.2.2 Treatment of moderate malnutrition

- 1 pot of RUTF (260g, approx 1500 kcal) per day OR
- 3 sachets RUTF (92g per sachet, 1500 kcal) per day OR
- 9kg of Likuni Phala (containing 10% sugar) and one litre of vegetable oil per month (1500 kcal per day)

### 23.2.3 Outpatient follow up

- Follow up patients monthly.
- Plot their weight gain.
- All patients not responding after three months should be reviewed by a clinician.
- If not medically indicated, treatment can continue for up to six months after initiation, or if HIV infected up to three months after commencing ART.

### 23.2.4 Use of milk based formulations F75 and F100

- Patients requiring NG feeding cannot tolerate RUTF or are severely ill require milk based formulations F75 and F100 feeds.
- Milk based formulations are given in two phases.
- Patients should be weighed twice weekly.

#### 23.2.4.1 Phase 1

- Use F75 to stabilize patient
- Treat infections and other urgent medical problems
- Provide sufficient energy and nutrients to stop further loss of muscle and fat tissue
- Correct fluid and electrolyte imbalance
- Give at least 5-6 feeds per day.
- Night feeds may be helpful, particularly with NG tube feeding.
23. Nutritional disorders

How to prepare F75
- Mix one packet of F75 with 2 litres of cooled boiled water to make 2400ml of formula.
- Give the amounts as in the Table 29 below unless patient is receiving i/v fluids in which case amounts should be reviewed.
- Intravenous fluids are discouraged in severe malnutrition as they have little nutritional value, and can cause fluid overload.

Table 29: Amounts of F75 given to patients in Phase 1

<table>
<thead>
<tr>
<th>Class of weight (kg)</th>
<th>8 feeds per day ml for each feed</th>
<th>6 feeds per day</th>
<th>5 feeds per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.0-19.9</td>
<td>260</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>20.0-29.9</td>
<td>300</td>
<td>350</td>
<td>450</td>
</tr>
<tr>
<td>30.60</td>
<td>350</td>
<td>400</td>
<td>500</td>
</tr>
</tbody>
</table>

- Patients should not eat any other foods or fluids, during Phase 1 unless they have diarrhoea.
- Patients with diarrhea should be given ORS (Resomal).

23.2.4.2 Transition Phase
- Change to F100 as soon as the patients appetite returns
- Control the amount of F100 during the transition phase to avoid the risk of heart failure.
- RUTF may be introduced at this stage in addition to F100 so patients are familiar with it when they reach Phase 2.
- Give 1 pot (or 3 sachets) of RUTF over the 2 day transition period as a taste dose.
- The patient is not required to finish the RUTF.
- The number of feeds, their timing and the volumes given remains exactly the same.
F100 (100ml = 100kcal) is used in the transition phase.
- Patients should normally move to Phase 2 after 2 days on Transition phase.
- Patients with NG feeding tubes should remain on transition phase quantities but these should be reviewed if NG feeding continues for more than two weeks

How to prepare F100
23. Nutritional disorders

- Mix one packet of F100 with 2 litres of cooled boiled water to make 2400ml of formula.
- Give the amounts as in the Table 30 below to each patient unless receiving i/v fluids in which case amounts should be reviewed.

Table 30: Amounts of F75 given to patients in Phase 1

<table>
<thead>
<tr>
<th>Class of weight (kg)</th>
<th>8 feeds per day ml for each feed</th>
<th>6 feeds per day</th>
<th>5 feeds per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19.9</td>
<td>260</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>20-29.9</td>
<td>300</td>
<td>350</td>
<td>450</td>
</tr>
<tr>
<td>30-60</td>
<td>350</td>
<td>400</td>
<td>500</td>
</tr>
</tbody>
</table>

23.2.4.3 Phase 2

- Aim of phase 2 is to achieve rapid weight gain and rebuild lost tissues and this requires more energy, protein and micronutrients than were needed for Phase 1.
- F100 without iron is given during this phase.
- Give the amounts as in Table 31 below to each patient

Table 31: Amounts of F100 given in Phase 2

<table>
<thead>
<tr>
<th>Class of weight (kg)</th>
<th>500</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.0-19.9</td>
<td>550</td>
<td>650</td>
</tr>
<tr>
<td>&gt;20</td>
<td>750</td>
<td>900</td>
</tr>
</tbody>
</table>

- Give one tablet of Fefol 200mg or Ferrous sulphate 200mg per day in phase 2 if clinically indicated.
- If inpatient is well and can tolerate solid food, RUTF should be used in Phase 2 instead of F100.
- RUFT treatment is the same as per for outpatients and should be used alongside a normal diet.
- Give the amounts below until patients BMI reaches 17
  - 2 pots of RUTF (260g, 2700 kcal) per day
  - 6 sachets of RUTF (92g, 3000 kcal) per day
- Once patient achieves a BMI of 17 or MUAC 22cm (if BMI can not be taken), or
  Weight/Height>80% they should be transferred to treatment for moderate malnutrition
23. Nutritional disorders

23.2.5 Discharge criteria (when to stop treatment of malnutrition)

- **Adults** - BMI of 18.5 and bilateral oedema has gone for 10 consecutive days or MUAC 23cm (to be used only if BMI can not be taken)
- **Pregnant and lactating women up to 6 months after delivery** - MUAC 23cm
- **Adolescents 12-18 years** - Weight/Height >85% and bilateral oedema has gone for 10 consecutive days

23.3 Malnutrition (protein-energy) in Children

23.3.1 Mild malnutrition

- Do a full assessment, especially looking for underlying disease such as TB, HIV infection, etc
- Ensure weekly attendance at nutrition clinic
- Give food supplements
- Give **Vitamin A** 100,000 units as a single dose

23.3.2 Moderate malnutrition

- Refer to Supplementary Feeding Programme centre.
- Do a full assessment, especially looking for underlying disease such as TB, HIV infection, etc.
- Give **Vitamin A** 200,000 units
  - Child < 1 year: 100,000 units
  - **Ferrous sulphate** paediatric mixture 2.5 mL
  - **Folic acid** 5 mg daily
  - **Albendazole** 400 mg stat

23.3.3 Severe malnutrition

- Must be admitted to hospital
- Do a full assessment, especially looking for underlying disease such TB, HIV infection, etc
- Assess **dehydration** (see Section 7.5.1.4 page 46)
  - Skin turgor is not a reliable sign in these children
  - Look for tears, sunken eyes or fontanelle
  - Assess urine output.
Prevent and/or correct dehydration (see Section 6.1 page 36)

- The fluid tolerance of these children is limited. ReSoMal and especially i/v solutions may cause fluid overload and heart failure.

Avoid fluid overload in severe malnutrition

- Non-dehydrated children with mild diarrhea should continue milk feeds to prevent dehydration – they do not need ReSoMal.
- Whenever possible, rehydrate these children orally using ReSoMal.
- If i/v rehydration is necessary, limit this to a few hours. Continue feeding and rehydrate orally as soon as possible.
- Start an intensive feeding regime with high energy milk:
  - Administration via NGT is necessary in many children with poor appetite.
  - Start with 2-hourly feeds then reduce to 3-hourly.
  - Start with F-75 refer to severe malnutrition manual.
  - Move to F-100 when the child is stable refer to severe malnutrition manual.

Frequent feeds spaced throughout the whole 24 hours are essential to prevent hypoglycaemia

Provide antibiotic cover for 5 days
- **Cotrimoxazole** 24 mg/kg every 12 hours
  - Alternatively if sepsis suspected or child very ill:
  - **Benzylpenicillin** 50,000 units/kg i/m or i/v every 6 hours, and
  - **Gentamycin** 6 mg/kg i/m or i/v once daily
  - Alternatively to Gentamycin:
    - **Chloramphenicol** 25 mg/kg i/m or i/v every 8 hours
      - If the child improves, then switch to oral Ciprofloxacin for 5 days.

Give supplements:
- **Vitamin A (retinol)** 200,000 units on days 1, 2 and 8
- Children < 1 yr :100,000 units (½ capsule)
- **Give Multivitamin syrup** 5 mL daily for 1 week
- **Potassium** 1 mmol/kg every 6 hours for 2 weeks mixed with feeds
  - To prepare a stock solution: add 7.5g of potassium chloride to 1L of pure water. This gives 1 mmol potassium chloride/mL
  - One potassium chloride slow-release (Slow K ® tablet = 13 mmol of K+)
23. Nutritional disorders

From day 7:

- **Ferrous sulphate** paediatric mixture 2.5 mL every 12 hours for 2 weeks plus **Folic acid** 5mg daily for 5 days
- **Albendazole** 400 mg single dose, when recovering
  - Children<2 give 200 mg
- **Treat complications:**
  a) Hypothermia:
  - Re-warm
  - Consider the possibility of sepsis or hypoglycaemia
  b) Hypoglycaemia:
  - Give **Dextrose 50%**
    - See Section 5.4 page 33 for dilution, dose, administration
  - Then give F_75 orally or via NGT as soon as possible and recheck the blood sugar after 1 hour.

| Hypothermia and hypoglycaemia are frequently signs of sepsis. Consider sepsis treatment if present |

- **Cardiac failure**:
  - Frusemide 1-2 mg/kg i/v or i/m
  - Digoxin is contraindicated in kwashiorkor
- **Severe anemia**:
  - Transfuse 10 mL/kg packed cells
- e) **Mouth ulceration**:
  - If not severe use **GV paint**.
  - If severe like cancrum oris use:
    - Benzylpenicillin 25,000 units/kg per dose i/m every 6 hours and
    - Metronidazole 7.5 mg/kg every 8 hours for 7 days
- f) **Skin ulcers**:
  - Soak lesion with **potassium permanganate 1% solution** for 10-15 minutes then
  - Apply a **paraffin gauze** dressing

23.4 **Pellagra**

- Usually multiple vitamin deficiency is present and other vitamins may therefore be necessary
23. Nutritional disorders

- **Nicotinamide** 50 mg every 8 hours for 28 days

23.5 Vitamin A deficiency, xerophthalmia

- **Vitamin A** is a prophylactic vitamin A supplementation to all children 6 months-5 years old (every 6 months) nursing mothers and to risk groups at every available opportunity

  Xerophthalmia is a medical emergency

_Treatment_

**Adults**

- **Vitamin A** 200,000 units/ dose on days 1, 2, and 8

**Children**

- **Vitamin A** < 1:100,000 units/ dose (=½ capsule) on days 1, 2, and 8
24.0 Pain management and Palliative care

- Palliative care is an approach that improves the *quality of life* of patients and their families facing the problems associated with *life threatening illness*, through the *prevention and relief of pain and suffering* by means of *early identification* and *impeccable assessment and treatment of pain* and other problems — *physical, psychosocial and spiritual*

24.1 Principles of analgesic use for chronic pain

- By the clock
  - Regular analgesia is necessary as patients require prevention therapy towards their persistent pain
  - Medication given when required for chronic pain does not work.
- By the mouth: oral medication is the standard preferred in chronic pain.
- By the ladder
  - Three step analgesic ladder with treatment moving up as pain increases should be used when prescribing analgesics.

- By the patient: Dosage is determined on an individual basis.

24.2 Mild Pain

- **Paracetamol** 500mg - 1g very 4-6 hours (max 4g daily)
- NSAIDS anti – inflammatory effects are good for metastatic bone and soft tissue pains.
- **Aspirin** 300-900mg every 4-6 hours,
24. Pain management and palliative care

- **Ibuprofen** 1.2-2.4g daily in 3-4 divided doses (max 2.4g daily), children >7kg 20mg/kg (max 40mg/kg/day)

**Note:**
- a) Do not give NSAIDS to children under 16 years because of the risk of Reye's syndrome.
- b) Aspirin causes gastric irritation and ulceration, therefore administer with food and milk
- c) Do not use aspirin or other NSAIDs (e.g. ibuprofen, indomethacin, diclofenac) in patients with symptoms suggesting gastritis or peptic ulcer disease, pregnancy or bleeding disorders.
- d) Do not use two NSAIDS at the same time, but where pain control with paracetamol or an NSAID alone is inadequate, a combination of the two drugs may be effective

### 24.3 Moderate Pain

- **Codeine phosphate** 30-60mg every 4 hours (max 240mg daily), children >1 year 3mg/kg in divided doses every 4 hours.
- Can be combined with non-opiates and/or adjuvants, but not with morphine.
- **Tramadol** 50-100 mg every 8 hours oral.
- Always prescribe codeine with a laxative (not tramadol) e.g. Bisacodyl 10mg at night, unless the patient has diarrhoea.

### 24.4 Severe Pain

- Use these along with non-opioids for severe pain
- Oral **Morphine** (1 mg/ml) solution starting dose 2.5ml 4 hourly titrating upwards every 12 hours to achieve pain control
- In opiate naïve patients where no oral morphine solution is available start with Morphine 10mg tablets twice daily and titrate upwards (take 24-28 hours to reach steady state level).
- May be given together with step 1 drugs (non-opioids) and/or adjuvants.
- Always prescribe a laxative e.g. Bisacodyl 10mg at night unless the patient has diarrhea.
- Nausea and vomiting are common side effects and may require medical management, see below.
- Morphine does not have a ceiling effect and must be titrated up to gain effective control of pain

**Note:**
Pethidine is no longer recommended for use in chronic pain due to its short duration of action and its side effects.

### 24.5 Adjuvant analgesics

- Miscellaneous group of drugs which relieve pain in specific circumstances.
- Generally given in addition with analgesics from the ladder.

#### 24.5.1 Corticosteroids

- Can be helpful in reducing tumour related oedema e.g. liver capsule pain, nerve compression. Combination of a steroid and opioid is usually effective.
- **Dexamethasone** 4 - 8mg in divided doses daily for a minimum of 10 days or **Prednisolone** 30 - 50mg daily for 10 days
- Then reduce gradually to lowest effective dose, depending on prognosis.

#### 24.5.2 Anti-depressants and Anti-convulsants

- Helpful for neuropathic pain, which may present as burning, pricking, allodynia, paraesthesia or sharp, shooting pain.
- **Amitryptiline** 25mg at night. Dose can be increased slowly up to 75mgs.
- **Phenytoin** 100mg every twelve hours; maybe increased slowly to 100mgs tds.
- **Carbamazepine** 100 - 200 mg every 8 hours.

#### 24.5.3 Antispasmodics

- Helpful in relieving visceral distension pain and colic.
- **Hyoscine butylbromide** 10-20mg every 8 hours tds orally or i/m..

#### 24.5.4 Muscle relaxants

- Helpful in painful muscle spasms (cramps) and myofascial pain.
- **Diazepam** 2.5mg every 8 hours may be beneficial.

### 24.6 Management of neuropathic pain

- **Causes:** HIV infection, diabetes mellitus, drug side effects i.e. (isoniazid, stavudine, vincristine) and other chemotherapeutic agents.
- Start with simple analgesia e.g. **Ibuprofen** 200-400mg every 8 hours
- If the patient is taking isoniazid start **Pyridoxine** 50 mg every 8 hours for the duration of treatment;
24. Pain management and palliative care

- In patients on T30 and TB treatment Pyridoxine 25 mg should be started prophylactically, at the start of TB treatment
- Add **Amitryptilline** 12.5mg-25mg (up to 75mg) at night if pain is not controlled
- Add oral **Morphine** liquid 2.5mg four hourly if pain is not controlled and titrate upwards until pain is controlled
- If severe peripheral neuropathy with motor deficit occurs on ARVs (stavudine is the commonest offender) refer to the MOH ART guidelines

**Note:** Neuropathic pain may not respond fully to opiates in which case the oral morphine may be continued and an alternative adjuvant e.g. Carbamazepine 100mg every twelve hours should be tried

### 24.7 Nausea and Vomiting

- Identify cause and treat
- Review drug treatment and stop unnecessary drugs
- Treat pain adequately using the analgesic ladder antiemetics
- **Metoclopramide** 10mg every 8 hours – given 30 minutes before eating – can speed gastric emptying
- **Promethazine** 25mg every 8 hours
- If ineffective use **Haloperidol** 0.5-1.5mg at night, or trial of steroids: **Prednisolone** 30mg daily or **Dexamethasone** 4mg daily for 5 days

### 24.8 Hiccup

- Look for treatable causes such as uremia and raised intra-cranial pressure.

**Treatment**

- **Chlorpromazine 25mg** every twelve hours or when required during attacks (although its sedative effect may distress the patient).
- **Metoclopramide** 10mg every 8 hours or when required.
- **Haloperidol** 0.5mg every twelve hours orally or 1.5mg i/m during attacks.

### 24.9 Management of acute pain

- Paracetamol and NSAIDs (aspirin and brufen) are effective in many cases,
- For doses and other information see Section 10.1 page 91 on chronic pain.
- Inhaled **Nitrous oxide** provides fast onset and short acting analgesic effect and therefore has a special role in, for example, obstetrics and wound dressing.
24. Pain management and palliative care

- **Ketamine** is used for emergency analgesia and anaesthesia.
- Opioids are first line treatment for severe acute pain including procedures related pain

**Dose**

**Adults:**
- **Pethidine** 50-100mg i/m 4 hourly; restrict use to 48-72 hours duration.
- **Morphine** 10mg i/m; 2.5mg i/v every 4 hours, oral morphine liquid (1mg/ml) 2.5ml every 4 hours

**Children:**
- 1-12 months **Morphine** s/c or i/m 200ug/kg,
- 1-5 years **Morphine** s/c or i/m 2.5-5mg,
- 6-12 years **Morphine** s/c or i/m 5-10mg 4 hourly,
  Oral morphine liquid 200ug/kg every 4 hours

**Note:**
- a) Concomitant use of laxatives and anti-emetics is recommended to avoid constipation
- b) Addiction is not a problem with opioid use in acute pain.
- c) Respiratory depression may occur if opiates are given to patients without pain or at too high a dose.
- d) Key principle for safe and effective use of opioids is to titrate the dose against the desired pain relief and minimize unwanted effects.
- e) If the patient is still complaining of pain after all of the drug has been delivered and absorbed then it is safe to give another, usually smaller, dose.
- f) If the second dose is also ineffective repeat the process or change the route of administration to achieve faster control.
- g) Delayed release formulations, e.g MST tablets should not be used in acute pain

24.10 Local anaesthetic blocks

- Regional anaesthesia (epidural, caudal, or specific LA blocks) can provide useful post-operative pain relief,
- It should be performed by trained staff who are aware of the risks and dose requirements.
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## 1. Anaesthetics

### 1.1 General anaesthetics

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Strength/Concentration</th>
<th>Volume/Container</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Halothane</td>
<td>inhalation</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>2</td>
<td>Ketamine HCl</td>
<td>inj, 50 mg/mL, 10 mL amp</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>3</td>
<td>Thiopentone sodium</td>
<td>injection, 0.5 g vial PFR</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>4</td>
<td>Ether, anaesthetic</td>
<td>inhalation</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>5</td>
<td>Nitrous oxide</td>
<td>medical gas</td>
<td></td>
<td>CEB</td>
</tr>
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</table>

### 1.2 Local anaesthetics

<table>
<thead>
<tr>
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<th>Description</th>
<th>Strength/Concentration</th>
<th>Volume/Container</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lignocaine HCl</td>
<td>injection, 1%, 25 ml vial</td>
<td></td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Lignocaine HCl</td>
<td>dental cartridges,</td>
<td></td>
<td>HEA</td>
</tr>
<tr>
<td></td>
<td>+ adrenaline</td>
<td>2% + 1/80,000, 2.2 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lignocaine HCl</td>
<td>injection, heavy spinal,</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td></td>
<td>+ glucose</td>
<td>5% + 7.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Lignocaine HCl</td>
<td>gel, 2%, 30 g tube</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>5</td>
<td>Lignocaine HCl</td>
<td>injection, 2%, 20 mL vial</td>
<td></td>
<td>CVB</td>
</tr>
<tr>
<td>6</td>
<td>Lignocaine HCl</td>
<td>spray, 10%</td>
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<td>CEB</td>
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### 1.3 Preoperative medication

<table>
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<tr>
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<th>Description</th>
<th>Strength/Concentration</th>
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<tbody>
<tr>
<td>1</td>
<td>Atropine sulphate</td>
<td>injection, 600 micrograms/mL</td>
<td>1 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>2</td>
<td>Diazepam</td>
<td>inj, 5 mg/mL, 1 mL amp</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>3</td>
<td>Morphine sulphate</td>
<td>inj, 15 mg/mL, 1 mL amp</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>4</td>
<td>Pethidine HCl</td>
<td>inj, 50 mg/mL, 2 mL amp</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>5</td>
<td>Diazepam</td>
<td>tablet, 5 mg</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>6</td>
<td>Promethazine</td>
<td>tablet, 25 mg</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>7</td>
<td>Promethazine HCl</td>
<td>elixir, 5 mg/5 mL</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>8</td>
<td>Promethazine HCl</td>
<td>inj, 25 mg/mL, 2 mL amp</td>
<td></td>
<td>DEA</td>
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<tr>
<td>9</td>
<td>Morphine sulphate</td>
<td>tablet, slow-release, 10 mg</td>
<td></td>
<td>DVB</td>
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</table>

## 2. Analgesics, antipyretics, and related agents

### 2.1 Non-opioid analgesics, antipyretics

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Strength/Concentration</th>
<th>Volume/Container</th>
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<tr>
<td>1</td>
<td>Aspirin</td>
<td>tablet, 300 mg</td>
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<tr>
<td>2</td>
<td>Paracetamol</td>
<td>tablet, 500 mg</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>3*</td>
<td>Diclofenac sodium</td>
<td>tablet, 25 mg</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>4*</td>
<td>Ibuprofen</td>
<td>tablet, 200 mg</td>
<td></td>
<td>DEA</td>
</tr>
<tr>
<td>5</td>
<td>Indomethacin</td>
<td>tablet, 25 mg</td>
<td></td>
<td>DEA</td>
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</tbody>
</table>

1 Max. supply at H level = 6 tablets only 9except when used for arthritis)
### 2.2 Opioid analgesics and antagonists

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Name</th>
<th>Formulation</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Morphine sulphate</td>
<td>inj, 15 mg/mL, 1 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>2</td>
<td>Pethidine HCl</td>
<td>inj, 50 mg/mL, 2 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>3</td>
<td>Codeine phosphate</td>
<td>tablet, 15 mg</td>
<td>DEA</td>
</tr>
<tr>
<td>4*</td>
<td>Dihydrocodeine tartrate</td>
<td>tablet, 30 mg</td>
<td>DEA</td>
</tr>
<tr>
<td>5</td>
<td>Naloxone HCl</td>
<td>injection, neonatal, 20 micrograms/mL, 2 mL amp</td>
<td>DEA</td>
</tr>
<tr>
<td>6</td>
<td>Morphine sulphate</td>
<td>tablet, slow-release, 10 mg</td>
<td>DVB</td>
</tr>
<tr>
<td>7</td>
<td>Morphine sulphate</td>
<td>solution, 5mg/5ml, PFR</td>
<td>DVA</td>
</tr>
<tr>
<td>8</td>
<td>Tramadol</td>
<td>capsule, 50mg</td>
<td>DEB</td>
</tr>
</tbody>
</table>

### 3. Antiallergics

#### 3.1 Antihistamines

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Name</th>
<th>Formulation</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chlorpheniramine maleate</td>
<td>tablet, 4 mg</td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Chlorpheniramine maleate</td>
<td>injection, 10mg/ml, amp</td>
<td>DVA</td>
</tr>
<tr>
<td>3</td>
<td>Promethazine</td>
<td>tablet, 25 mg</td>
<td>DEA</td>
</tr>
<tr>
<td>4</td>
<td>Promethazine HCl</td>
<td>elixir, 5 mg/5 mL</td>
<td>DEA</td>
</tr>
<tr>
<td>5</td>
<td>Promethazine HCl</td>
<td>inj, 25 mg/mL, 2 mL amp</td>
<td>DEA</td>
</tr>
<tr>
<td>6</td>
<td>Cetirizine</td>
<td>tablet, 10mg</td>
<td>DEB</td>
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### 6.2 Medicines used in nasal allergy

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Name</th>
<th>Formulation</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Beclomethasone dipropionate nasal spray</td>
<td>50micrograms/spray</td>
<td>DEB</td>
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</tbody>
</table>

### 4. Antidotes and other medicines used in poisonings

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Name</th>
<th>Formulation</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ipecacuanha</td>
<td>emetic mixture, paediatric</td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Atropine sulphate</td>
<td>inj, 600 micrograms.ml 1 ML amp</td>
<td>DVA</td>
</tr>
<tr>
<td>3*</td>
<td>Acetylcysteine</td>
<td>inj, 200 mg/mL, 10 mL amp</td>
<td>DVB</td>
</tr>
<tr>
<td>4*</td>
<td>Activated charcoal</td>
<td>powder</td>
<td>DVB</td>
</tr>
<tr>
<td>5*</td>
<td>Desferrioxamine</td>
<td>injection, 500 mg vial (PFR)</td>
<td>DVB</td>
</tr>
<tr>
<td>6</td>
<td>Pralidoxime mesylate</td>
<td>inj, 200 mg/mL, 5 mL amp</td>
<td>DVB</td>
</tr>
</tbody>
</table>

### 5. Antiepiletics and anticonvulsants

<table>
<thead>
<tr>
<th>No.</th>
<th>Product Name</th>
<th>Formulation</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paraldehyde</td>
<td>injection, 10 mL amp</td>
<td>HVA</td>
</tr>
<tr>
<td>2</td>
<td>Phenobarbitone sodium</td>
<td>tablet, 30 mg</td>
<td>HVA</td>
</tr>
</tbody>
</table>

---

2 At H level, for use in epilepsy only
3 Phenobarbitone sodium inj, 200 mg/mL, 1 mL amp³ HVA
4 Diazepam inj, 5 mg/mL, 2 mL amp DVA
5 Magnesium sulphate inj, 500 mg/mL, 2 mL amp DVA
6 Phenytoin sodium tablet, 100 mg DVA
7 Phenytoin sodium inj, 50 mg/mL, amp DVA
8 Carbamazepine tablet, 200 mg DEB
9 Sodium valproate tablet, 200 mg CVB
10 Ethosuximide capsule, 250 mg CEB

6. **Anti-infectives**

6.1 **Anthelmintics**

6.1.1 **Intestinal anthelmintics**

1 Albendazole tablet, 200 mg HEA
2 Niclosamide tablet, chewable, 500 mg DEB

6.1.2. **Antifilarials**

1 Ivermectin tablet, 6 mg DVB

6.1.3 **Antischistosomals**

1 Praziquantel tablet, 600 mg HEA

6.2 **Antibacterials**

6.2.1. **Penicillins and cephalosporins**

1 Benzathine injection, 1.44 g vial PFR HVA
   Benzylpenicillin (=2.4 MU)
2 Benzylpenicillin inj, 4 g vial PFR (=5 MU) HVA
3 Phenoxymercaptoacillin tablet, 250 mg HVA
4 Amoxycillin capsule, 250 mg DVA
5 Amoxicillin elixir, 125 mg/5 mL DVA
6 Amoxicillin + clavulanic acid tablet, 500 + 125mg CEA
7 Ampicillin sodium inj, 250 mg vial PFR DVA
8 Flucloxacillin capsule, 250 mg DVA
9 Flucloxacillin elixir, 125 mg/5 mL DVA
10 Flucloxacillin inj, 250 mg vial PFR DVA
11 Cefotaxime inj, 500 mg PFR DVA
12 Cephalexin capsule, 250 mg DVA
13 Cloxacillin capsule, 250mg DEA

³ At H level, for use in convulsions only
14 Ceftriaxone inj, 1g PFR DVA
15 Procaine penicillin injection, 4.8 MU vial CVB

6.2.2 Other antibacterials

1 Chloramphenicol sodium Succinate injection, 1 g vial PFR HVA
2 Co-trimoxazole (Sulphamethoxazole + Trimethoprim) tablet, 480 mg (400 mg + 80 mg) HVA
3 Doxycycline tablet, 100 mg HVA
4 Erythromycin tablet, e/c, 250 mg base HVA
5 Gentamicin injection, 40 mg (as sulphate) mL, 2 mL vial HVA
6 Metronidazole tablet, 200 mg HVA
7 Chloramphenical capsule, 250 mg HVA
8 Erythromycin ethyl succinate susp, 125 mg/5 mL (of erythromycin base) DVA
9 Metronidazole inj, 5 mg/mL, 100 mL vial (for i/v infusion) DVA
10* Metronidazole suspension, 200 mg/5 mL DVA
11 Nalidixic Acid tablet, 500 mg DVA
12 Chloramphenicol suspension, 125 mg/5 mL DEA
13 Gentamicin paediatric injection, 10 mg (as sulphate)/mL, 2 mL vial DEA
14 Nitrofurantoin tablet, 50 mg DEA
15 Ciprofoxacin tablet, 250 mg CVB
16* Nitrofurantoin suspension, 25 mg/5 mL CVB
17 Sodium fusidate tablet, 250 mg CVB
18 Azithromycin capsule, 250mg CEA

6.2.3 Antileprosy medicines

1 Clofazimine capsule, 50 mg DVA
2 dapsone tablet, 100 mg DVB
3 Rifampicin capsule, 150 mg DVB

6.2.4 Antituberculosis medicines

1 Ethambutol HCl tablet, 400 mg DVA
2 Isoniazid (INH) tablet, 100 mg DVA
3 Isoniazid + ethambutol tablet, 150 mg + 400 mg (fatol *) DVA
4 Pyrazinamide tablet, 400 mg DVA
5 Rifampicin + isoniazid tablet, 100 mg + 50 mg DVA
6 Streptomycin sulphate injection, 5 g vial PFR DVA
7 Capreomycin injection 1g, vial PFR CVA
8 Kanamycin injection 1g vial PFR CVA
9 Amicacin injection 1g vial PFR CVA
10 Ethionamide tablet 250mg CVA
11 Ofloxacin tablet, 400mg CVA
12 Cycloserine tablet 250mg CVB

6.3 Antifungals (oral/parenteral/vaginal)

1 Nystatin pessary, 100,000 units⁴ HVA
( with applicator)
2 Clotrimazole vaginal tablets, 100mg DEA
3 Gentian violet paint, aq, 0.5%, 500 mL HEA
4 Ketoconazole tablet, 200 mg DVA
5* Ketoconazole suspension, 100 mg/5 mL DVA
6 Griseofulvin tablet, 125 mg DEA
7 Fluconazole capsule, 250 mg DVA
8 Fluconazole i/v infusion, 2 mg/mL, 25mL DVA
9 Fluconazole oral liquid, 50mg/ml DVA

6.4 Antiprotozoal medicines

6.4.1 Antiamoebics

1. Metronidazole tablet, 200 mg HVA
2* Metronidazole suspension, 200 mg/5 mL DVA

6.4.2 Antimalarials

1 Artemether+ Lumefantrine tablet, 20mg + 120mg HVA
2 Artesunate + Amodiaquine tablet, DVA
3 Sulfadoxine + Pyrimethamine tablet, 25 mg + 500 mg (SP) HVA
4 Quinine dyhydrochloride inj, 300 mg/mL, 2 mL amp HVA
5 Proguanil HCl tablet, 100 mg DVA
6 Quinine sulphate tablet, 300 mg DVA
7 Chloroquine phosphate tab, 250 mg (150 mg base) DEB
8* Halofantrine suspension, 100 mg/5 mL CVB
9 Mefloquine hydrochloride tablet, 250mg CEB

6.4.3 Antitrypanosomals

1 Melarasoprol B inj, 3.6% solution, 6 mL amp DVB

⁴ May be used for oral thrush (pessary is sucked)
2 Suramin sodium injection, 1 g vial PFR DVB

6.4.4 Anti-toxoplasmosis medicines

1 Co-trimoxazole tablet, 480 mg HVA

6.5 Antiviral medicines

6.5.1 Antiherpes medicines

1 Acyclovir tablet, 200mg HVA
2 Acyclovir cream HVA

6.5.2 Antiretrovirals

6.5.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors

1 Didanisone (ddI) tablet, chewable, 50mg
2 Stavudine (d4T) tablet, 30mg
3 Lamivudine (3TC) tablet, 150mg
4 Tenofovir (TDF) tablet, 300mg
5 Abacavir (ABC) tablet, 300mg
6 Zidovudine (AZT) tablet, 300mg

6.5.2.2 Non nucleoside/Nucleotide reverse transcriptase inhibitors

1 Efavirenz (EFV) tablet, 600mg
2 Nevirapine (NVP) tablet, 200mg HVA

6.5.2.3 Non nucleoside/Nucleotide reverse transcriptase inhibitors

1 Lopinavir + Ritonavir (LPV/r) capsule 133.33mg + 33.3mg

6.5.2.4 Fixed dose combinations

1 Stavudine (d4T) + Lamivudine (3TC) + Nevirapine (NVP) tablet, 30mg + 150mg +200mg
2 Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP) tablet, 300mg + 150mg + 200mg
3 Zidovudine (AZT) + Lamivudine (3TC) tablet, 300mg + 150mg

7. Anti-migraine medicines

1 Propranolol HCl tablet, 40 mg DVA
### 8. Antineoplastic and immunosuppressant medicines

<table>
<thead>
<tr>
<th>No.</th>
<th>Medicine</th>
<th>Formulation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Actinomycin D</td>
<td>inj, 500 microgram vial PFR (with mannitol)</td>
<td>CVB</td>
</tr>
<tr>
<td>2</td>
<td>Busulphan</td>
<td>tablet, 2 mg</td>
<td>CVB</td>
</tr>
<tr>
<td>3</td>
<td>Cyclophosphamide</td>
<td>injection, 200 mg vial PFR</td>
<td>CVB</td>
</tr>
<tr>
<td>4</td>
<td>Vincristine sulphate</td>
<td>injection, 1 mg vial PFR</td>
<td>CVB</td>
</tr>
<tr>
<td>5</td>
<td>Chlorambucil</td>
<td>tablet, 2 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>6</td>
<td>Cyclophosphamide</td>
<td>tablet, 50 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>7</td>
<td>Melphalan</td>
<td>tablet, 2 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>8</td>
<td>Methotrexate</td>
<td>tablet, 2.5 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>9</td>
<td>Methotrexate</td>
<td>inj, 2.5 mg/mL, 1 mL amp</td>
<td>CEB</td>
</tr>
</tbody>
</table>

### 9. Antiparkinsonism medicines

<table>
<thead>
<tr>
<th>No.</th>
<th>Medicine</th>
<th>Formulation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Benzhexol HCl</td>
<td>tablet, 5 mg</td>
<td>DEA</td>
</tr>
<tr>
<td>2</td>
<td>Bromocriptine</td>
<td>tablet, 2.5 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>3</td>
<td>Levodopa + carbidopa</td>
<td>tablet, 250 mg + 25 mg</td>
<td>CEB</td>
</tr>
</tbody>
</table>

### 10. Medicines affecting the blood

#### 10.1. Antianaemics

<table>
<thead>
<tr>
<th>No.</th>
<th>Medicine</th>
<th>Formulation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ferrous sulphate + Folic acid</td>
<td>tablet, 200 mg + 0.5 mg</td>
<td>HVA</td>
</tr>
<tr>
<td>2</td>
<td>Ferrous sulphate</td>
<td>mixt, paediatric, 60 mg/5 mL</td>
<td>HEA</td>
</tr>
<tr>
<td>3</td>
<td>Folic acid</td>
<td>tablet, 5 mg</td>
<td>HEA</td>
</tr>
<tr>
<td>4</td>
<td>Iron sorbitol</td>
<td>injection, 5% (50 mg/mL) 2 mL amp</td>
<td>DVB</td>
</tr>
<tr>
<td>5</td>
<td>Hydroxocobalamin</td>
<td>inj, 1 mg/mL, 1 mL amp</td>
<td>CVB</td>
</tr>
</tbody>
</table>

#### 10.2. Medicines affecting coagulation

<table>
<thead>
<tr>
<th>No.</th>
<th>Medicine</th>
<th>Formulation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phytomenadione</td>
<td>injection, 1 mg/0.5 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>2</td>
<td>Phytomenadione</td>
<td>inj, 10mg/mL 1mL amp</td>
<td>CEA</td>
</tr>
<tr>
<td>3</td>
<td>Warfarin sodium</td>
<td>tablet, 1 mg</td>
<td>CVB</td>
</tr>
<tr>
<td>4</td>
<td>Heparin sodium</td>
<td>inj, 5,000, IU/mL, 5 mL vial</td>
<td>CEB</td>
</tr>
<tr>
<td>5</td>
<td>Protamine sulphate</td>
<td>inj, 10 mg/mL, 5 mL amp</td>
<td>CEB</td>
</tr>
</tbody>
</table>

#### 10.2. Medicines to treat hyperkalaemia

<table>
<thead>
<tr>
<th>No.</th>
<th>Medicine</th>
<th>Formulation</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Potassium binding resin</td>
<td>powder (sodium polystyrene sulfonate)</td>
<td>DVA</td>
</tr>
</tbody>
</table>
11. Blood products and plasma substitutes

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gelatin (as polygeline)</td>
<td>i/v infusion, 500 mL pack (Haemaccel®)</td>
</tr>
</tbody>
</table>

12. Cardiovascular medicines

12.1 Antianginal drugs

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prapranolol HCl</td>
<td>tablet, 40 mg</td>
</tr>
<tr>
<td>2</td>
<td>Glycerol trinitrate</td>
<td>tablet, 500 micrograms</td>
</tr>
<tr>
<td>3*</td>
<td>Isosorbide dinitrate</td>
<td>tablet, 10 mg</td>
</tr>
<tr>
<td>4</td>
<td>Nifedipine</td>
<td>capsule, 10 mg</td>
</tr>
<tr>
<td>5</td>
<td>Nifedipine</td>
<td>tablet, slow-release, 20 mg</td>
</tr>
</tbody>
</table>

12.2 Antidysrhythmic medicines

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Propranolol HCl</td>
<td>tablet, 40 mg</td>
</tr>
<tr>
<td>2</td>
<td>Lignocaine HCl</td>
<td>inj, 1%, 25 mL vial</td>
</tr>
</tbody>
</table>

12.3 Antihypertensives

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hydralazine HCl</td>
<td>injection, 20 mg amp PFR</td>
</tr>
<tr>
<td>2</td>
<td>Prapranolol HCl</td>
<td>tablet, 40 mg</td>
</tr>
<tr>
<td>3</td>
<td>Reserpine</td>
<td>tablet, 250 micrograms</td>
</tr>
<tr>
<td>4</td>
<td>Hydralazine HCl</td>
<td>tablet, 25 mg</td>
</tr>
<tr>
<td>5</td>
<td>Methyldopa</td>
<td>tablet, 250 mg</td>
</tr>
<tr>
<td>6</td>
<td>Reserpine</td>
<td>inj, 1 mg/mL, 1 mL amp</td>
</tr>
<tr>
<td>7</td>
<td>Captopril</td>
<td>tablet, 12.5 mg</td>
</tr>
<tr>
<td>8</td>
<td>Nifedipine</td>
<td>capsule, 10 mg</td>
</tr>
<tr>
<td>9</td>
<td>Nifedipine</td>
<td>tablet, slow-release, 20 mg</td>
</tr>
<tr>
<td>10</td>
<td>Prazosin</td>
<td>tablet, 1 mg</td>
</tr>
<tr>
<td>11</td>
<td>Enalapril</td>
<td>tablet, 2.5 mg</td>
</tr>
<tr>
<td>12</td>
<td>Amlodipine</td>
<td>tablet, 5 mg</td>
</tr>
<tr>
<td>13</td>
<td>Atenolol</td>
<td>tablet, 50 mg or 100 mg</td>
</tr>
</tbody>
</table>

12.4 Antihypotensive medicines

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ephedrine sulphate</td>
<td>inj, 30 mg/mL, 1 mL amp</td>
</tr>
<tr>
<td>2</td>
<td>Dopamine HCl</td>
<td>inj, 40 mg/mL, 5 mL amp</td>
</tr>
<tr>
<td>3</td>
<td>Methoxamine HCl</td>
<td>inj, 20 mg/mL, 1 mL amp</td>
</tr>
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</table>
### 12.5 Cardiac glycosides

<table>
<thead>
<tr>
<th></th>
<th>Drug</th>
<th>Formulation</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digoxin</td>
<td>tablet, 250 micrograms</td>
<td>DVA</td>
</tr>
<tr>
<td>2</td>
<td>Digoxin</td>
<td>inj, 250 micrograms/mL 2 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>3</td>
<td>Digoxin</td>
<td>tab, paed, 62.5 micrograms</td>
<td>DVA</td>
</tr>
<tr>
<td>4</td>
<td>Digoxin</td>
<td>elixir, 50 micrograms/mL</td>
<td>DVA</td>
</tr>
</tbody>
</table>

### 13 Dermatological medicines

#### 13.1 Antifungals (topical)

<table>
<thead>
<tr>
<th></th>
<th>Drug</th>
<th>Formulation</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Benzoic acid + Salicylic acid</td>
<td>ointment, 6% + 3%, 500 g</td>
<td>HEA</td>
</tr>
<tr>
<td>2*</td>
<td>Clotrimazole (or equivalent alternative)</td>
<td>cream, 1%, 20g</td>
<td>DEA</td>
</tr>
<tr>
<td>3</td>
<td>Sodium thiosulphate</td>
<td>lotion, aq., 10%, 500 mL</td>
<td>DEA</td>
</tr>
</tbody>
</table>

#### 13.2 Anti-infectives and cleansing agents

<table>
<thead>
<tr>
<th></th>
<th>Drug</th>
<th>Formulation</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calamine lotion + Sulphur 2%</td>
<td>lotion, aqueous, 500 mL</td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Gentian violet</td>
<td>paint, aq., 0.5%, 500 ml</td>
<td>HEA</td>
</tr>
<tr>
<td>3</td>
<td>Potassium permanganate</td>
<td>3%, 500 mL (for dilution)</td>
<td>HEA</td>
</tr>
<tr>
<td>4</td>
<td>Salicylic acid + Sulphur</td>
<td>ointment, 5% + 5%, 500g (in YSP base)</td>
<td>HEA</td>
</tr>
<tr>
<td>5</td>
<td>Iodine</td>
<td>solution, weak, 500 mL</td>
<td>DEA</td>
</tr>
<tr>
<td>6</td>
<td>Zinc ointment + Sulphur 5%</td>
<td>ointment, 500 g</td>
<td>DEA</td>
</tr>
<tr>
<td>7</td>
<td>Zinc paste compound + Sulphur 5%</td>
<td>paste, 500 g</td>
<td>DEA</td>
</tr>
<tr>
<td>8</td>
<td>Hydrogen peroxide</td>
<td>solution, 20 volume, 500 mL</td>
<td>DEB</td>
</tr>
<tr>
<td>9</td>
<td>Salicylic acid + Sulphur</td>
<td>ointment, 5% + 5%, 500 g (In EO base)</td>
<td>CEB</td>
</tr>
<tr>
<td>10</td>
<td>Silver sulphadiazine</td>
<td>cream, 1%, 500 g</td>
<td>CEB</td>
</tr>
<tr>
<td>11</td>
<td>Brilliant green</td>
<td>paint, 0.1%, 500 mL</td>
<td>CEB</td>
</tr>
</tbody>
</table>

#### 13.3 Anti-inflammatories and antipruritics

<table>
<thead>
<tr>
<th></th>
<th>Drug</th>
<th>Formulation</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calamine lotion + Sulphur 2%</td>
<td>lotion, aqueous, 500 mL</td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Hydrocortisone</td>
<td>ointment, 1%, 15 g</td>
<td>DEA</td>
</tr>
<tr>
<td>3</td>
<td>Betamethasone (as valerate)</td>
<td>ointment, 0.15, 15 g</td>
<td>CEB</td>
</tr>
</tbody>
</table>
4  Calamine  lotion, aqueous, 500 mL  CEB

13.4 Keratoplastics and keratolytics

1  Podophyllum resin  paint, alcoholic, 15%, 20 mL (compound benzoin tincture)  DEA
2* Benzoyl peroxide  gel, 5%, 30 g  DEA
3  Salicylic acid  lotion, 5%, 500 mL (in alcohol 70%)  DEA
4  Salicylic acid  ointment, 5%, 500 g (in YSP base)  DEA
5  Salicylic acid 2% + Coal tar solution 15% + Sulphur 2%  shampoo, 500 mL (in soap spirit base)  DEA
6* Salicylic acid  collodion, 12%  DEA
7  Coal tar  crude coal tar, 500 g  CEB
8  Dithranol 0.5% in zinc + Salicylic acid paste  paste, 500g  CEB
9  Salicylic acid (crude coal tar 5%)  ointment, 500 g (in YSP base)  CEB
10 Zinc paste compound + Crude coal tar 5%  paste, 500 g  CEB

13.5 Scabicides and pediculocides

1  Benzyl benzoate  application, 25%, 500 mL  HEA
2  Lindane  cream/lotion 1%  CEB

13.6 Other topical preparations

1. Emulsifying ointment  ointment, 500 g  HEA
2* Ethyl Chloride  spray  HEA
3  Zinc oxide (in EO base0  ointment, 15%, 500 g  HEA
4* Silver nitrate  stick (pencil) toughened  DEA
5  Yellow soft paraffin  ointment  DEA

14. Diagnostic agents

14.1 Ophthalmic diagnostic agents

1  Fluorescein sodium  eye drops, 1% (Minims)  DEA

14.2 Radiocontrast media
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Barium sulphate oral powder for suspension, 98%, 340 g pack</td>
<td>DEA</td>
</tr>
<tr>
<td>2</td>
<td>Barium sulphate oesophageal cream, 70%, 800 g tube</td>
<td>DEA</td>
</tr>
<tr>
<td>3</td>
<td>Barium sulphate enema</td>
<td>DEA</td>
</tr>
<tr>
<td>4</td>
<td>Sodium diatrizoate + Meglumine diatrizoate injection, 10% + 66%</td>
<td>DEB</td>
</tr>
<tr>
<td>5</td>
<td>Barium sulphate dispensable enema, 93%, 400 g pack</td>
<td>CEB</td>
</tr>
<tr>
<td>6</td>
<td>Effervescent agent (carbex) granules, 25 g sachet</td>
<td>CEB</td>
</tr>
<tr>
<td>7</td>
<td>Effervescent agent (carbex) solutions</td>
<td>CEB</td>
</tr>
<tr>
<td>8</td>
<td>Lopanoic acid tablet, 500 mg</td>
<td>CEB</td>
</tr>
<tr>
<td>9</td>
<td>Iopamidol injection, 6.12 g/10 mL amp</td>
<td>CEB</td>
</tr>
<tr>
<td>10</td>
<td>Meglumine iothalamate injection, 60%, 50 mL bottle</td>
<td>CEB</td>
</tr>
<tr>
<td>11</td>
<td>Meglumine ioglycamate i/v infusion, 17%, 100 mL vial</td>
<td>CEB</td>
</tr>
<tr>
<td>12</td>
<td>Propyliodone susp, aq, 50%, 20 mL vial</td>
<td>CEB</td>
</tr>
<tr>
<td>13</td>
<td>Sodium diatrizoate + Meglumine diatrizoate solution, aq. Hypertonic,</td>
<td>CEB</td>
</tr>
<tr>
<td>14</td>
<td>Sodium iothalamate injection, 70%, 20 mL amp</td>
<td>CEB</td>
</tr>
<tr>
<td>15</td>
<td>Magnevist (gadopentetate dimeglumine)</td>
<td>CEB</td>
</tr>
<tr>
<td>16</td>
<td>Gadolinium</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Mei optonix screen cleaner</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Ultravist 370/300 mg/ml</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Xenetix 300</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>X-prep (bowel Evacuant)</td>
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</tr>
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### 14.3 Test substances

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Albustix</strong> ® (for protein in urine)</td>
<td>reagent strip, 50 strips</td>
</tr>
<tr>
<td>2</td>
<td><strong>Clinistix</strong> ® (for glucose in urine)</td>
<td>reagent strip, 50 strips</td>
</tr>
<tr>
<td>3</td>
<td><strong>Ketostix</strong> ® (for ketones in urine)</td>
<td>reagent strip, 50 strips</td>
</tr>
<tr>
<td>4</td>
<td>Blood group test serum (Anti-A)</td>
<td>dropper bottle 5 mL</td>
</tr>
<tr>
<td>5</td>
<td>Blood group test serum (Anti-B)</td>
<td>dropper bottle 5 mL</td>
</tr>
<tr>
<td>6</td>
<td>Blood group test serum (Anti-AB)</td>
<td>dropper bottle 5 mL</td>
</tr>
<tr>
<td>7</td>
<td>Blood group test serum (Anti-D) (Rho)</td>
<td>dropper bottle 5 mL</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>8</td>
<td>Glucostx ® (for blood glucose) reagent strip, 50 strips</td>
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</tr>
<tr>
<td>9</td>
<td>VDRL carbon antigen (VD 24, 25) test reagent, 50 mL bottle</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pregnancy test latex slide test kit</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bovine albumin soln, dropper bottle, 5 mL</td>
<td></td>
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</tbody>
</table>

### 15. Disinfectants

<table>
<thead>
<tr>
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<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cetrimide + chlorhexidine solution, 15% + 1.5% (For dilution)</td>
<td></td>
<td>HVA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Black disinfectant solution 9 for dilution)</td>
<td></td>
<td>HVA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Glutaraldehyde solution, buffered, 2%</td>
<td></td>
<td>DEA</td>
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</table>

### 16. Diuretics

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hydrochlorothiazide tablet, 25 mg</td>
<td></td>
<td>DVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Or Bendrofluazide tablet, 5 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Frusemide tablet, 40 mg</td>
<td></td>
<td>DVA</td>
<td></td>
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<tr>
<td>3</td>
<td>Frusemide inj, 10 mg/mL, 2 mL amp</td>
<td></td>
<td>DVA</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Mannitol inj, 20%, 250 mL bottle</td>
<td></td>
<td>DEA</td>
<td></td>
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<tr>
<td>5</td>
<td>Spironolactone tablet, 25 mg</td>
<td></td>
<td>DEA</td>
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</table>

### 17. Gastrointestinal medicines

#### 17.1 Antacids and other antiulcers medicines

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Magnesium trisilicate co tablet, chewable</td>
<td></td>
<td>HEA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cimetidine tablet, 400 mg</td>
<td></td>
<td>CVB</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ranitidine tablet, 150 mg</td>
<td></td>
<td>CEB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bismuth chelate liquid, 120 mg/5 mL, 560 mL (tripotassium dictratobismuthate)</td>
<td></td>
<td>CEB</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Omeprazole tablet, 10mg</td>
<td></td>
<td>DVA</td>
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#### 17.2 Antiemetics

<table>
<thead>
<tr>
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<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Metoclopramide HCl inj, 5 mg/mL, 2 mL amp</td>
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<td>DEA</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Promethazine HCl tablet, 25 mg</td>
<td></td>
<td>DEA</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Promethazine HCl elixir, 5 mg/5 mL</td>
<td></td>
<td>DEA</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Promethazine HCl inj, 25 mg/mL, 2 mL amp</td>
<td></td>
<td>DEA</td>
<td></td>
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#### 17.3 Antihaemorrhoidals

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bismuth subgallate co. suppository</td>
<td></td>
<td>DEA</td>
<td></td>
</tr>
</tbody>
</table>
17.4 Antispasmodics

1. Atropine sulphate inj, 600 micrograms/mL 1 mL amp  DVA
2. Hyoscine butylbromide inj, 20 mg/mL, 1mL amp  DEA
3. Propantheline bromide tablet, 15 mg  DEA

17.5 Cathartics

1. Bisacodyl tablet, 5 mg  DEA
2. Glycerol suppository (child) 2 gDEA
3. Magnesium sulphate enema, 50%, 130 mL  DEB

17.6 Medicines used in diarrhoea

17.6.1 Oral rehydration preparations

1. Oral rehydration salts low osmolarity powder in sachet for 1 litre  HVA
   (ORS) (WHO citrate formula)
2. ReSoMal powder for 1 litre  DVA

17.6.2 Medicines for diarrhoea in children

1. Zinc tablets, 20mg  HVA

17.6.2 Antimotility drugs

1. Codeine phosphate tablet, 15 mg  DEA
2* Loperamide HCl tablet, 2 mg  DEA

18. Hormones and other endocrine medicines

18.1 Adrenal hormones and synthetic substitutes

1. Hydrocortisone inj, i/v, 50 mg/mL, 2 mL amp (as sodium succinate)  DVA
2. Prednisolone tablet, 5 mg  DVA
3. Dexamethasone inj, 5 mg/mL, 5mL vial (as sodium phosphate) DVA
4. Dexamethasone tablet, 500 micrograms  DEA
5 Hydrocortisone acetate tablet, 20 mg CVB
6 Hydrocortisone acetate injection, aqueous susp, 25 mg/mL, 5 mL vial CVB
7 Fludrocortisone acetate tablet, 100 micrograms CVB
8 Bromocriptine tablet, 2.5 mg CEB

18.2 Oestrogens

1 Oestrogens, conjugated tablet, 625 micrograms CEB

18.3 Insulins and other antidiabetic medicines

1 Glibenclamide tablet, 5 mg DVA
2 Insulin, soluble injection, 100 units/mL DVA
   (Human Actrapid ®) 10 mL vial
3 Insulin zinc suspension injection, 100 units/mL DVA
   (Human Monotard ®) 10 mL vial
4 Metformin HCl tablet, 500 mg DVA

18.4 Contraceptives

18.4.1. Hormonal contraceptives

1 Norgestrel + ethinyl estradiol tablet, 0.3mg + 0.03mg HVA
   Combined, low-oestrogen
2 Medroxyprogesterone inj, aqueous suspension, HVA
   acetate 150 mg/mL, 10 mL vial
3 Norgestrel tablet, 0.75mg HVA
   Progestogen – only
4 Levonorgestrel surgical implant, 75mg DVA
5 Levonorgestrel tablets, 750 micrograms DEB

18.4.2 Intra-uterine devices (IUD)

1 Copper containing IUD wire, 176mg DVB

18.4.3 Barrier contraceptives

1 Condom with spermicide (nonoxinol) HVA

18.5 Ovulation inducers

1 Clomiphene citrate tablet, 50 mg CEB

18.6 Progestogens
1 Norethisterone tablet, 5 mg DEA

18.7 Thyroid hormones and antithyroid agents

1 Iodine aqueous soln, oral, 30 mL (ligol’s iodine) DEA
2 Carbimazole tablet, 5 mg CVA
3 Thyroxine sodium tablet, 100 micrograms CVA

19. Immunologicals

19.1 Immunological diagnostic agents

1 Tuberculin purified injection solution DVA
Protein derivative (PPD) 1 mL amp/vial

19.2 Sera and immunoglobulins

1 Anti D (RHo) inj, 250 micrograms/mL, DVA
Immunoglobulin (Human) 1 mL amp
2 Antirabies serum injection, 1,000 IU/5 mL vial DVA
3 Diphtheria antitoxin injection, 20,000 IU/vial DVA
4 Tetanus antitoxin injection, 20,000 IU/vial DVA
5 Tetanus antitoxin injection, 1,500 IU/vial DVA
6 Gas-gangrene antitoxin injection, 25,000 IU/vial DEB
Mixed

19.3 Vaccines

19.3.1 Vaccines for universal immunisation

1 BCG vaccine injection, 20 dose vial PFR HVA
2 Diphtheria-pertussis- inj, 20-dose (10 mL) vial HVA
tetanus (DPT) vaccine (triple vaccine)
(adsorbed)
3 Measles vaccine, live inj, 10-dose (5mL) vial HVA
PFR
4 Poliomyelitis vaccine oral suspension, 20-dose HVA
live dispenser
5 Tetanus vaccine injection, 10 mL vial HVA
6 Pentavalent vaccine injection, 2 dose vial HVA
(vaccine (diphtheria, tetanus, pertussis
Hepatitis B, haemophilus
Influenza))
19.3.2 Vaccines for specific individuals

1 Rabies vaccine inj, 1-dose (0.5 mL) vial (PFR + diluent amp) DVA
2 Yellow fever vaccine inj, 10-dose (5 mL) vial (PFR + diluent amp) CEB

20 Muscle relaxants (peripherally acting) and cholinesterase inhibitors

1 Suxamethonum chloride inj, 50 mg/mL, 2 mL amp DVA
2 Edrophonium chloride inj, 10 mg/mL, 1 mL amp CVB
3 Alcuronium chloride inj, 5 mg/mL, 2 mL amp CEB
4 Neostigmine methylsulphate inj, 2.5 mg/mL, 1 mL CEB
5 Vecuronium bromide injection, 10 mg vial PFR CEB

21. Ophthalmological preparations

2.1 Anti-infectives

1 Tetracycline HCl eye oint, 1%, 3.5 g tube HVA
2 Chloramphenicol eye oint, 1%, 3.5 g tube DVA
3 Gentamicin eye drops, 0.3%, 5 mL DVA
4 Chloramphenicol eye drops, 0.5%, 5 mL CEB
5 Idoxuridine eye drops, 0.1%, 5 mL CEB
6 Miconazole eye drops, 1%, 10 mL CEB

21.2 Anti-inflammatories

1 Dexamethasone eye drops, 0.1%, 5 mL CVA
2 Methylprednisolone acetate inj, 40 mg/mL, 2 mL vial for sub-conjunctival CEB

21.3 Local anaesthetics

1 Amethocaine HCl eye drops, 1%, 10 mL DEA

21.4 Miotics and antiglaucoma drugs

1 Acetazolamide tablet, 250 mg DVA
2 Pilocarpine HCl eye drops, 1%, 10 mL CVA
3 Timolol maleate eye drops, 0.25% 5 mL metered dose unit CVA
4  Acetazolamide injection, 500 mg vial PFR  CEB
5  Glycerol oral solution, 50%  CEB

21.5  Mydriatics and cycloplegis

1  Atropine sulphate eye oint, 1%, 3.5 g tube  DVA
2  Cyclopentolate HCl eye drops, 0.5%, 5 mL  DEA
3  Tropicamide eye drops, 0.5%, 5 mL  CEB

21.6  Diagnostic agents

1  Fluorescein sodium eye drops, 1%, 5ml  DEA

22 Obstetric medicines

22.1  Oxytocics

1*  Ergometrine maleate + inj, 500 micrograms + HVA
    Oxytocin (syntometrine ®)
2  Oxytocin inj, 10 IU/mL, 1 mL amp  DVA
3  Dinoprostone vag, gel, 200 micrograms/mL CVB
    2.5. mL (500 micrograms)
4  Dinoprostone vaginal tablet, 3 mg  CEB

22.2  Myometrial relaxants

1  Salbutamol sulphate tablet, 4 mg  HVA
2  Salbutamol sulphate inj, 1 mg/mL, 5 mL amp  DVA

22.3  Medicines used in severe PIH and eclampsia

1*  Magnesium sulphate inj, 500 mg/mL, 2 mL amp  DVA

22.3  Medicines used in primary PPH

1  Misoprostol tablet, 200micrograms  DVA

23 Peritoneal dialysis solutions

1  Dianeal + dextrose 1.5% intraperitoneal dialysis CVB
   Soln, 1 L bottle
2  Dianeal + dextrose 4.25% intraperitoneal dialysis CVB
### Psychotherapeutic medicines

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Form</th>
<th>Details</th>
<th>Bottles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chlorpromazine HCl</td>
<td>inj, 25 mg/mL</td>
<td>2 mL amp</td>
<td>HEA</td>
</tr>
<tr>
<td>2</td>
<td>Chlorpromazine HCl</td>
<td>tablet, 25 mg</td>
<td></td>
<td>HEA</td>
</tr>
<tr>
<td>3</td>
<td>Amitriptyline HCl</td>
<td>tablet, 25 mg</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>4</td>
<td>Amitriptyline HCl</td>
<td>injection, 10 mg/mL</td>
<td></td>
<td>CEB</td>
</tr>
<tr>
<td>5</td>
<td>Chlorpromazine HCl</td>
<td>tablet, 100 mg</td>
<td></td>
<td>DVA</td>
</tr>
<tr>
<td>6</td>
<td>Diazepam</td>
<td>inj, 5 mg/mL</td>
<td>2 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>7</td>
<td>Fluphenazine decanoate</td>
<td>inj, oily, 25 mg/mL</td>
<td></td>
<td>DVA</td>
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<td>8</td>
<td>Diazepam</td>
<td>tablet, 5 mg</td>
<td></td>
<td>DEA</td>
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<tr>
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<td>Chlorpromazine HCl</td>
<td>capsule, 192 mg base</td>
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<td>DEA</td>
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<td>10</td>
<td>Haloperidol</td>
<td>tablet, 1.5 mg</td>
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<td>DEA</td>
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<td>Haloperidol</td>
<td>tablet, 1.5 mg</td>
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<td>DEA</td>
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<td>12*</td>
<td>Carbamazepine</td>
<td>tablet, 200 mg</td>
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<td>13*</td>
<td>Haloperidol decanoate</td>
<td>inj, oil, 50 mg/mL, 1 mL amp</td>
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<td>CEB</td>
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<td>Pericyazine</td>
<td>tablet, 4 mg</td>
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<td>CEB</td>
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<td>15*</td>
<td>Procyclidine HCl</td>
<td>tablet, 5 mg</td>
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<td>CEB</td>
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<tr>
<td>16*</td>
<td>Procyclidine HCl</td>
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<td>2 mL amp</td>
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<td>Promazine</td>
<td>tablet, 25 mg</td>
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<td>CEB</td>
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<td>Thioridazine</td>
<td>tablet, 100 mg</td>
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<td>CEB</td>
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<td>Fluoxetine</td>
<td>tablet, 20 mg</td>
<td></td>
<td>CVA</td>
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<tr>
<td>20</td>
<td>Imipramine</td>
<td>tablet, 10 mg</td>
<td></td>
<td>CVB</td>
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</table>

### Respiratory system medicines

#### Antiasthmatics

<table>
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<tr>
<th>No.</th>
<th>Name</th>
<th>Form</th>
<th>Details</th>
<th>Bottles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adrenaline</td>
<td>inj, 1/1,000, 1 mL amp</td>
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<td>HVA</td>
</tr>
<tr>
<td>2</td>
<td>Aminophyline</td>
<td>inj, 25 mg/mL</td>
<td>10 mL amp</td>
<td>HVA</td>
</tr>
<tr>
<td>3</td>
<td>Salbutamol sulphate</td>
<td>tablet, 4 mg</td>
<td></td>
<td>HVA</td>
</tr>
<tr>
<td>4</td>
<td>Aminophylline</td>
<td>tablet, 100 mg</td>
<td></td>
<td>HVA</td>
</tr>
<tr>
<td>5</td>
<td>Salbutamol Sulphate</td>
<td>inj, 1 mg/mL</td>
<td>5 mL amp</td>
<td>DVA</td>
</tr>
<tr>
<td>6</td>
<td>Salbutamol Sulphate</td>
<td>aerosol inhalation</td>
<td>100 micrograms/dose, 200 – dose unit</td>
<td>DVA</td>
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<tr>
<td>7</td>
<td>Salbutamol Sulphate</td>
<td>respirator solution, 1 mg/mL</td>
<td>Single dose nebuliser amps</td>
<td>DVA</td>
</tr>
<tr>
<td>8</td>
<td>Beclomethasone</td>
<td>aerosol inhalation,</td>
<td></td>
<td>CVB</td>
</tr>
<tr>
<td></td>
<td>Dipropionate</td>
<td>50 micrograms/dose, 200-dose unit</td>
<td></td>
<td>CVB</td>
</tr>
<tr>
<td>9</td>
<td>Sodium cromoglycate</td>
<td>spincap, 20 mg</td>
<td>(for use with an insufflator)</td>
<td>CEB</td>
</tr>
</tbody>
</table>
## 26. Replacement fluids and electrolytes

### 26.1 Oral preparations

1. Oral rehydration salts, (ORS) powder in sachet for 1 L (WHO low osmolarity) HVA
2. Potassium chloride tablet, slow release, 600 mg DVA

### 26.2 Parenteral preparations

1. Glucose (dextrose) injection, 50%, 20 mL amp HVA
2. Sodium lactate comp i/v infusion, 1L pack HVA (Ringer-lactate or Hartmann’s solution)
3. Water for injections for i/v use, 10 mL amp HVA
4. Glucose (dextrose) i/v infusion, 5%, 1L pack DVA
5. Glucose (dextrose) i/v infusion, 10%, 100 L pack DVA
6. Potassium chloride injection, 20%, 10 mL amp DVA
7. Sodium bicarbonate injection, 4%, 50 mL vial DVA
8. Sodium chloride i/v infusion, 0.9%, 1L pack DVA
9. Sodium lactate + glucose i/v infusion, 1L (adult) pack DVA (Darrow’s ½ strength in dextrose 5%)
10. Sodium lactate + glucose i/v infusion, 200 mL (paed) DVA

## 27. Vitamins and minerals

1. Vitamin A capsule, 200,000 IU (liquid or gel filled) HVA
2. Vitamin B Co. strong tablet HEA
3. Nicotinamide tablet, 50 mg DEA
4. Pyridoxine HCl tablet, 20 mg DEA
5. Thiamine inj, 100mg/ml DEB
6. Vitamins, multiple syrup DEA
7. Vitamins, multiple tablet DEA
8. Calcium gluconate tablet, chewable, 500 mg DEB
9. Vitamins, multiple injection, i/v, high-potency 10 mL (in 2 amps) DEB
10. Calciferol, high-strength tablet, 10,000 IU CVB
11. Calcium gluconate injection, 10%, 10 mL, amp CEA

## 28. Preparations for the ear and oropharynx

### 28.1 Preparations for the ear
1. Gentian violet paint, aq., 0.5%, 500 mL HEA
2. Sodium bicarbonate ear drops, 5%, 25 mL DEA
3. Betamethasone ear drops, 0.1%, 10 mL DEB
   Sodium phosphate (or equivalent)
4. Acetic acid ear drops, 2% HEB

28.2 Preparations for the oropharynx

1. Gentian violet paint, aq., 0.5%, 500 mL HEA
2. Nystatin oral suspension, 100,000 IU/mL, 20 mL DEA
   (with graduated dropper)

29. Medicines used for gout

1. Allopurinol tablet, 100 mg DEA
2. Colchicine tablet, 500 micrograms DVB

30. Laxatives

1. Lactulose solution, 3.1mg/5ml CVA
2. Liquid paraffin solution HVA