UGANDA

CLINICAL GUIDELINES

2010

National Guidelines on Management of Common Conditions
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Note

Every effort has been made to ensure that the information in this booklet is accurate, complete and conforms with current therapeutic practice. However, the publisher, editor and contributors cannot be held responsible for any errors, omissions, individual patient responses to recommended therapies or other consequences which may arise from its use.
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<th>Description</th>
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<tr>
<td>ACE</td>
<td>Angiotensin Converting Enzyme</td>
</tr>
<tr>
<td>ACT</td>
<td>Artemisinin Combined Treatment</td>
</tr>
<tr>
<td>ANC</td>
<td>Antenatal care</td>
</tr>
<tr>
<td>APH</td>
<td>Ante-partum haemorrhage</td>
</tr>
<tr>
<td>ARB</td>
<td>Adrenagic Receptor Blocker</td>
</tr>
<tr>
<td>ASOT</td>
<td>Antistreptolysin O titre</td>
</tr>
<tr>
<td>b/f</td>
<td>Breastfeed(ing)</td>
</tr>
<tr>
<td>BP</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>bpm</td>
<td>Beats/breaths per minute (depending on context)</td>
</tr>
<tr>
<td>CCB</td>
<td>Calcium Channel Blocker</td>
</tr>
<tr>
<td>CCF</td>
<td>Congestive cardiac failure</td>
</tr>
<tr>
<td>C&amp;S</td>
<td>Culture &amp; sensitivity</td>
</tr>
<tr>
<td>C/S</td>
<td>Caesarean section</td>
</tr>
<tr>
<td>CNS</td>
<td>Central nervous system</td>
</tr>
<tr>
<td>COAD</td>
<td>Chronic obstructive airways disease</td>
</tr>
<tr>
<td>CPD</td>
<td>Cephalo-pelvic disproportion</td>
</tr>
<tr>
<td>CSF</td>
<td>Cerebro-spinal fluid</td>
</tr>
<tr>
<td>CVP</td>
<td>Central venous pressure</td>
</tr>
<tr>
<td>CT</td>
<td>Computed tomography</td>
</tr>
<tr>
<td>DIC</td>
<td>Disseminated intravascular coagulation</td>
</tr>
<tr>
<td>DOTS</td>
<td>Direct observed Treatment Service</td>
</tr>
<tr>
<td>DVT</td>
<td>Deep venous thrombosis</td>
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<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>ECT</td>
<td>Electroconvulsive Therapy</td>
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<tr>
<td>EMLU</td>
<td>Essential Medicine List of Uganda</td>
</tr>
<tr>
<td>ESR</td>
<td>Erythrocyte sedimentation rate</td>
</tr>
<tr>
<td>FB</td>
<td>Foreign body</td>
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<tr>
<td>FFP</td>
<td>Fresh Frozen Plasma</td>
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<table>
<thead>
<tr>
<th>Abbreviation</th>
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<td>FP</td>
<td>Family planning</td>
</tr>
<tr>
<td>GIT</td>
<td>Gastro-intestinal tract</td>
</tr>
<tr>
<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
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<tr>
<td>HCT</td>
<td>Hematocrit</td>
</tr>
<tr>
<td>HCW</td>
<td>Health Care Worker</td>
</tr>
<tr>
<td>HGB</td>
<td>Heamoglobin</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>hr/s</td>
<td>hour/s</td>
</tr>
<tr>
<td>HSD</td>
<td>Health Sub-district</td>
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<tr>
<td>IM</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>IMPAC</td>
<td>Integrated Management of Pregnancy &amp; Childbirth</td>
</tr>
<tr>
<td>INR</td>
<td>International normalised ratio</td>
</tr>
<tr>
<td>IPT</td>
<td>Intermittent presumptive treatment (of malaria)</td>
</tr>
<tr>
<td>IUCD</td>
<td>Intra Uterine Contraceptive Device</td>
</tr>
<tr>
<td>IU</td>
<td>International Units</td>
</tr>
<tr>
<td>IUGR</td>
<td>Intraterine growth retardation</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous(ly)</td>
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<td>IVP</td>
<td>Intravenous pyelogram</td>
</tr>
<tr>
<td>JVP</td>
<td>Jugular Venous Pressure</td>
</tr>
<tr>
<td>LBW</td>
<td>Low birth weight</td>
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<tr>
<td>LP</td>
<td>Lumbar puncture</td>
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<tr>
<td>LRTI</td>
<td>Lower respiratory tract infection</td>
</tr>
<tr>
<td>Max</td>
<td>Maximum</td>
</tr>
<tr>
<td>min/s</td>
<td>Minute/s</td>
</tr>
<tr>
<td>MPs</td>
<td>Malaria parasites</td>
</tr>
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<td>Mth/s</td>
<td>Month/s</td>
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MU Mega Unit = 1,000,000 IU
NGT Nasogastric tube
NF National Formulary
NND Neonatal death
OP Out Patient
PEM Protein Energy Malnutrition
PET Pre-eclampsic toxaemia
PIH Pregnancy-induced hypertension
PMTCT Prevention of mother-to-child transmission of HIV
PPF Procaine penicillin fortified injection
PPH Postpartum haemorrhage
PROM Premature (early) rupture of membranes
PSBI Possible serious bacterial infection
prn as required
PT Prothrombin time
RBC Red blood cells
RDP Random Donor Platelets
RH Rhesus
RPR Rapid plasma reagin
RTA Road traffic accident
RTI Respiratory tract infection
SB Stillbirth
SD Standard Deviation
SC Subcutaneous(ly)
SP Sulfadoxine Pyrimethamine
Stat Immediately
STI Sexually Transmitted Infections
TB Tuberculosis
TL Tubal ligation
TIG  Tetanus Immunoglobulin Human
TTV  Tetanus toxoid vaccination
UCG  Uganda Clinical Guidelines
UHSPS  Uganda Health Sector Programme Support
URTI  Upper respiratory tract infection
US  Ultrasound
UTI  Urinary tract infection
VCT  Voluntary counselling & testing (for HIV infection)
WB  Whole blood
WBC  White blood cells
WFA  Weight for age
yr/s  Year/s
UNITS OF MEASUREMENT

kg  = 1,000g

g   = gram = 1,000mg = 0.001kg

mg  = milligram = 1,000µg = 0.001g

µg  = microgram = 0.001mg

L   = litre = 1,000mL

mL  = millilitre = 0.001L
The Uganda Clinical Guidelines (UCG) has evolved out of the National Standard Treatment Guidelines 1993 and is designed to provide updated, practical and useful information for both upper and lower level health facilities on the diagnosis and management of common conditions presenting in Uganda.

The guidelines are also intended to establish a strong foundation for the appropriate and cost-effective use of essential medicines.

Inadequate annual budgetary provisions for medicines and medical supplies together with continuing medicine supply management deficiencies mean that required essential medicine for public sector health facilities may sometimes be in short supply or even out-of-stock.

Compounding this problem is the fact that even the few medicine which may be available are often not properly used by health professionals and patients. Thus even the meagre resources available may be wasted and the patient suffers from inadequate, inappropriate or complete lack of treatment.

In some cases, the patient may be given a prescription for medicines to be bought at a private pharmacy or drug shop at an unaffordably high cost.

These issues are of great concern to the Ministry of Health and its partners in the sector.
Consequently sustained and intensive efforts are being made to address these problems with the aim of ensuring both the regular availability of, and equitable access to, required essential medicines and the appropriate use of these by health professionals, patients and the public in general.

Appropriate use of medicines means that patients receive medicines which satisfy their clinical needs, in doses which meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and the community.

By providing:

- information on the essential elements of clinical diagnosis
- guidance on required basic investigations
- details of cost-effective treatment and relevant alternatives
- guidance on when to refer and admit patients, the UCG should become a vital tool in the day-to-day work of health professionals.

It should, however, also prove equally useful to all other health practitioners working in both the private-not-for-profit and private commercial health sectors who are strongly encouraged by the Ministry of Health to ensure that they also take care with their diagnoses and make the most appropriate use of the medicines available to them.

Although the UCG provides details of recommended treatment regimes, as always **clinical judgement and experience** will still be required to adjust these to meet the particular needs of specific individuals.
The UCG is meant to be used together with the **Essential Medicine List of Uganda (EMLU)** which provides guidance on the appropriate selection of medicines for each level of health care/facility.

In the near future these documents will be joined by a **National Formulary (NF)** which will provide detailed information on all the medicines used in the UCG. The correct utilisation of the information provided by these three publications will facilitate the appropriate selection and utilisation of essential medicines, thereby minimising waste and maximising potential health benefits.

As with earlier therapeutic guidelines, the compilation of the UCG has only been possible through a prolonged process of consultation with key prescribers and subsequent detailed discussion. The UCG also had the benefit of thorough review and approval at a special national consensus workshop organised by the Ministry of Health.

I would like to thank the core team for their careful, thorough and dedicated work and indeed all those who contributed to the preparation of this excellent publication. Your efforts are recognised and greatly appreciated.

Therapeutics is a dynamic area. It is therefore important that national guidelines like the UCG are subjected to constant review and are regularly updated to take account of currently accepted therapeutic practices. Thus your continuing feedback on the usefulness, relevance and accuracy of UCG information is vital in making any decisions on future modifications and improvements.
It is the strong hope and indeed expectation of the Ministry of Health that familiarisation with and daily use of these guidelines by our health professionals will lead to greatly improved diagnosis and prescribing practices. This is coupled with improvements in the medicines supply system and dispensing practices will ensure that our patients receive the best service possible.

Dr. Stephen O. Mallinga MP
Minister of Health
Kampala, August 2009
PREFACE

The UCG has evolved directly from the National Standard Treatment Guidelines 1993 which were the first such guidelines published in Uganda. Before then individual guidelines existed for the management of a limited number of specific conditions.

This edition of UCG continues to emphasise current information on diagnosis and management of common conditions in Uganda. This information has been included in response to numerous comments and suggestions received from clinical staff in the field and its inclusion significantly extends and enhances the usefulness of the publication to clinicians in their day-to-day work.

The UCG is aimed at both upper and lower levels of the public and private health system.

The content of the UCG has been completely updated and also expanded through the inclusion of additional conditions. The level of information and detail provided for the management of each condition has been expanded. Furthermore, introductory sections such as history taking, investigations, diagnosis and prescribing practices have all been updated.

Readers are therefore strongly recommended to familiarise themselves with the content and layout of the UCG in order to facilitate location of the different types of information which may be required and thereby maximise its potential usefulness in daily clinical practice.

The UCG does not constitute a full clinical text but it does provide in an easily accessible form all the key points which would need to be considered when making decisions on how to manage the various conditions. The treatments recommended in the
UCG are regarded as nationally recognised standard treatments and in many cases they are the same as, or directly derived from, those recommended in current evidence-based WHO guidelines.

In producing the UCG, the opportunity has been taken not only to improve the comprehensiveness and completeness of the content but also to improve the presentation of the information so as to make the booklet easier to use. This has been done through improved formatting and design, for example by selective use of different bullets, use of italic and bold text and by re-arranging the information into more logical sections. The size of the booklet has been maintained in a portable dimension in order to make it available for consultation in any circumstances and locations.

It has been stated elsewhere that clinical guidelines such as the UCG are subject to rapid information and technological change due to the dynamic nature of therapeutic practice. Thus, in order to maintain the relevance and practical usefulness of the UCG, it is vital that feedback be obtained from users of the guidelines based on actual practice and experience in the field.

In order to facilitate this process an amendment form has been included at the back of the UCG which can be used to propose changes to the publication.

The revision of UCG was due and long awaited, the Ministry of Health, and all those involved in revision of the UCG sincerely hope that the waiting was worthwhile and that it will make a significant contribution to ongoing efforts to improve national therapeutic services and medicines utilisation.
The objective of these combined efforts is to ensure that the patient always receives good service and optimum treatment and that the credibility and reputation of the public sector health service is restored to and maintained in its rightful place.

Dr. Sam Zaramba

*Director General of Health Services*

*Ministry of Health*
Introduction to Uganda Clinical Guidelines 2010

This new edition and fully updated publication replaces the 2003 UCG and is being circulated free of charge to all public, private sector prescribers, pharmacists and regulatory authorities in the country. Most of those who receive the UCG should also receive a carefully designed orientation training to introduce the UCG, its contents, the presentation of information and how to use it to best effect.

For now, the main features of the UCG will be explained so that you can begin using it immediately and routinely in your daily clinical work.

1. What is the aim of the UCG?

The UCG aims to provide easy to use, practical, complete and useful information on how to correctly diagnose and manage all common conditions you are likely to encounter. This in turn will ensure that patients receive the best possible clinical services, obtain prompt and effective relief or cure of their complaint and thereby make the most appropriate use of scarce diagnostic and clinical resources including medicines.

2. Why is the UCG necessary?

Support supervision experience and data gathered over the years throughout the districts clearly shows that too often patient management is far from ideal. Diseases are misdiagnosed or missed, incorrect or incomplete treatment regimes are prescribed and the patient is inadequately counselled on how to adhere to correct treatment and how to prevent similar problems happening in future. By providing all the required information in an easily accessible form, it is hoped that regular
use of the UCG will help to address these problems and thereby greatly improve the quality of patient care provided.

3. How can I quickly get to know the UCG?
Follow these steps:
3.1 Read Contents which gives a quick summary of what is in the UCG - also get used to the roman page numbering system in the introductory sections
3.2 Read the Foreword by the Hon. Minister of Health which mentions problems facing effective provision of health care and describes the place of UCG and other medicines and therapeutic information documents in helping to solve these problems
3.3 Read the Preface which gives further background on UCG development and intended use
3.4 Read Presentation of information which explains how information in the UCG is arranged and gives important notes on dose expressions
3.5 Turn to the Index and skim through these pages to get an idea of the range of conditions covered in the UCG
3.6 Pick any condition in the index and turn to that page to have a look at an individual section (monograph) of the UCG dealing with that condition. Most other sections follow the same pattern. Practice quickly locating other conditions
4. How can I use the UCG to improve the quality of care of my patients?

Follow these steps:

4.1 Carefully read *How to Diagnose & Treat in Primary Care* which gives the recommended approach to correctly managing patients and conducting effective consultations in the primary care setting. Check this against the approach you currently use. Are you adequately covering all the required steps? Can you find ways of improving your approach through making some simple but important changes?

4.2 Get used to the idea of the ‘golden minute’ to make the best use of the short contact time you have with each patient.

4.3 Ask yourself the questions in the section *How to make time for quality care*. Are there any ways you can rearrange your health centre to increase its capacity and efficiency?

4.4 Carefully read *Prescribing Guidelines*. Remind yourself of the essential elements of good prescribing. See how you can improve the way you prescribe. Ask yourself the following questions:

   a) Do I use the Prescribing Checklist before writing any prescription?

   b) Am I overprescribing placebos?

   c) Are all my prescriptions clear, correct and complete?

   d) Am I looking out for and reporting Adverse Medicine Reactions?

   e) Am I correctly prescribing for my paediatric patients?
f) Am I considering medicine reactions when prescribing?

g) Am I giving the patient adequate counselling to ensure adherence to prescribed therapy?

4.5 Read **Chronic Care** and check if you are managing these patients in the most effective way. Identify ways in which you can improve their care

5. **How can I use the UCG to improve the care of individual patients?**

Follow these steps:

- Keep the UCG with you for easy access as you carry out your clinical duties
- Refer to the UCG regularly and frequently throughout each working day
- Encourage your prescriber colleagues to do the same
- Familiarise yourself with management of all the most common conditions by carefully reading through the relevant monographs
- Approach management of each patient/condition in a systematic way. Try not to miss out important steps:
  - ask about relevant symptoms
  - look for key physical signs
  - carry out physical examinations and diagnostic tests when considering the differential diagnosis
  - ensure correct selection of medicines and doses
  - adequately counsel the patient
  - make necessary follow-up arrangements

5.1 Make notes to remind you of key points not to miss using blank pages at the back of UCG.
6. **How can I ensure that the UCG remains useful and up to date?**

Guidelines like the UCG are very dynamic and need to be regularly updated and improved based on clinical experience from use in the field. This UCG should have a lifespan of about 3 years and then be replaced with a new edition. In order to ensure this is even more useful and relevant to your work, we need to have feedback from you on suggested improvements, amendments, additions, etc. Use the amendment form indicated at the back of this book and contact information on page i.

7. **How can I get more copies of the UCG?**

If any of your prescribing colleagues do not have a copy of UCG, contact the MoH Quality Assurance Department to obtain additional copies, giving details for whom they are required, so that this information can be compiled for the distribution of the next edition.

Finally, effective use of the UCG depends on the reliable availability and accessibility of the essential medicines required for treating the various conditions. The Ministry of Health is therefore continually striving to improve financing and procurement of medicines, and medical supply management systems in order to ensure better health service delivery. Please report any problems with medicine supply and availability through your HSD in-charges to the office of the District Health Officer for prompt follow-up.

I hope you value and enjoy using the UCG and that its regular and systematic use leads to significant improvements in management of common conditions, in your job satisfaction and improved satisfaction of our clients (the patients) in the quality of the clinical services we provide.
The revised UCG has been produced by the Ministry of Health with financial assistance from Government of Uganda, Uganda Health Sector Programme Support (UHSPS III) funded by DANIDA and WHO.

Special thanks go to the following members who worked tirelessly on the revision of the UCG (2003 and 2005) and produced the 2009 edition:

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PRESENTATION OF INFORMATION

Note: words in the text which are underlined are defined in the Glossary at the back of UCG.

1. General arrangement of sections

Conditions have been arranged into sections by body system, except for 1. Infections, 2 Parasitic Diseases, 5. Injuries and Trauma, 15. HIV and STIs, 18. Miscellaneous Conditions, 19. Poisoning, 23. Childhood Illness and 24. Family Planning.

Within each section, conditions are generally arranged alphabetically and are each the subject of an individual monograph which follows a standard format.

2. Title/description

Each condition is given a title and where relevant an alternate familiar name (in parentheses) by which it may be also be known, e.g. Human trypanosomiasis (Sleeping sickness), Haemorrhoids (Piles).

This is followed by a brief description of the condition, e.g. ‘A chronic disease transmitted to human beings by several species of tsetse fly’

3. Cause

Listed here are the pathological organisms, circumstances or reasons which are involved in the transmission of the disease or occurrence of the condition. Where relevant any pre-disposing factors will also be given in this part of the monograph.

4. Clinical features

Listed here are the main signs and symptoms which characterise the disease or condition together with an indication of any particular
groups of patients which may be more susceptible, e.g. children, the elderly

Where relevant, complications which may result from having the condition (usually in a serious or chronic form) are also given

5. **Differential diagnosis**

This part gives any other conditions which may produce similar signs and symptoms, and which should therefore be considered and excluded in making an initial diagnosis

6. **Investigations**

The most important diagnostic tests and investigations which would be needed to help reach a possible definitive diagnosis are indicated. Available tests may be limited at lower levels of the health system

7. **Management**

The therapeutic and other patient management measures necessary to deal satisfactorily with the particular condition are given in a logical sequence of steps.

These measures may or may not involve prescribing of specifically-indicated medication

7.1 **Alternative drugs and multi-drug treatments**

Where more than one drug may be used to treat a given condition, these are shown as alternatives indicated by the word *or*. The first listed drug is the recommended 1st line drug, the second listed is the 2nd line and so on.

Where multiple drugs are necessary to treat a given condition, these are indicated by the word *plus* before each drug after the first one listed
7.2 Dose regimes

<table>
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<tr>
<th>Note:</th>
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<td>Unless otherwise indicated, all dose regimes are for adults and are by oral route.</td>
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Where medication is necessary, the individual dose regimes are stated in a standard format as follows:

**Generic name** (in bold letters): this is the officially recommended name of the medication as listed in EMLU 2007) which should be used in all prescribing, dispensing, medicines administration and medication record procedures.

In some cases, in addition to the name, the strength of a particular medication may be stated, e.g. adrenaline injection 1 in 1,000, tetracycline eye ointment 1%, glucose infusion 5%

**Dose size:** this is the size of each individual dose of the medicine and is usually expressed as a quantity of the particular medicine, either as a weight (e.g. 100mg, 250mg, 500 micrograms) or, for certain medicines whose strength is expressed in terms of international units (IU) as a number of units (e.g. 20,000 IU, 2MU). In some cases, the dose may be expressed as a particular volume of a liquid of particular strength (e.g. IV infusions).

**Paediatric doses:** (for patients of 12 yrs or less) where applicable, these are specifically indicated. Whenever possible and where relevant, the dose size is stated in terms of body weight (e.g. 5mg/kg) so that a precise dose may be accurately determined to suit individual patients. In other cases, a fixed dose...
may be related to a particular age range (e.g. 
<5yrs: 125mg; 5-12 yrs: 250mg).

Where weighing is not possible but the age is 
known, age/weight charts may be used to 
estimate the weight of the child.

Where weighing is not possible, and specific 
paediatric doses are not indicated, suitable 
paediatric doses may be approximated in terms 
of the normal adult dose as follows:

<5yrs: ¼ of adult dose
5-8yrs: ½ of adult dose
9-12yrs: ¾ of adult dose

**Route of administration:** the oral route is to 
be used unless otherwise indicated. Approved 
abbreviations are used for parenteral routes

**Dose frequency:** in most cases, this is 
expressed in terms of the number of hours 
(interval) between doses (e.g. 8-hourly, every 
4-6 hours)

For many medicines this is more appropriate 
than expressing as a stated number of times 
per day. In the latter case, the dose interval 
may vary and this may have adverse effects on 
blood levels of the medicine and consequent 
therapeutic effectiveness of the medicine.

**Duration of treatment:** where applicable the 
recommended period for which treatment 
should be continued is indicated as a number of 
days, weeks, etc. Where the duration is not 
stated treatment should be continued for as 
long as necessary to obtain the desired 
therapeutic outcome, e.g. until the patient is 
cured or the condition resolves
Special instructions: these give further information on the correct administration of the medication and, where relevant, should be written on any related prescription, e.g. taken after food, applied sparingly, given slowly over a 4 hour period, etc.

7.3 Level of management

The appropriate level of health service facility at which a particular condition or a step in the sequence of treatment of a condition may be adequately managed is indicated by the code (in bold letters) on the right margin as follows:

**HC** Health centre of the level indicated by (i.e. HC2, HC3, HC4)

**H** Hospital (General or Referral)

**Ref** Referral hospital only

Note: in some treatments, although the actual medicine recommended may be available at a lower level than indicated, the management of the condition requires the capacity, available skills, etc. of the higher level shown.

8. Prevention

Practical measures which can be taken to avoid the particular condition occurring or prevent it developing are given.

These should be clearly communicated to the patient as part of the counselling which should be a vital and routine part of patient management.
REFERENCES

*British National Formulary (BNF 41)*, British Medical Association and Royal Pharmaceutical Society of Great Britain, 2001


*Rabies Post-Exposure Treatment Guidelines*, Veterinary Public Health Unit, Ministry of Health, Uganda, 2001

*Syndromic Management of Common Sexually Transmitted Diseases*, STD/AIDS Control Programme, MoH

*Guidelines for the Diagnosis and Treatment of Malaria*, Malaria Control Programme, MoH Uganda, 2001

*Management of Childhood Illness*, MoH, Uganda, 2000

*National Standard Treatment Guidelines*, Uganda Essential Drugs Management Programme, 1993
**How to Diagnose & Treat in Primary Care**

**Introduction**

Most health workers have been taught how to do a full history and examination suitable for hospital wards but have not been taught how to do a primary care consultation properly and may have developed inappropriate short cuts and bad habits on the job.

In order to arrive at a reasonable diagnosis, the basic principles are the same whether a health worker is at a Health Centre or at a Hospital. Start by taking a history of the illness by enquiring specifically about the main complaint and other complaints. Establish their duration. These complaints are usually not very many. Write them down and attach the duration, you may re-arrange them when writing your notes e.g. fever, cough, chest pain and difficult in breathing in sequence or occurrence. Explore each complaint (symptom) always in relation to what you know about diseases affecting the system which is most likely to be affected. Always follow the history with a proper physical examination and relevant diagnostic tests. Guessing and assuming can easily lead to pitfalls in making a reasonable diagnosis.

"Listen to the patient; he is telling you the diagnosis". Sir William Osler, a distinguished Physician of the 19th Century once said. It is mandatory that a patient is provided with a copy of summary of clinical notes and prescription after consultation.

Generally, important symptoms can be asked about, signs checked for, diagnosis made, illness explained and treatment provided in about 5-10 minutes.

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The Seven Steps in a Primary Care Consultation

1. Greet the patient.

2. Observe the patient as he/she walks into your room for degree or state of illness.

3. Ask about the main complaint or complaints usually they are not very many. Establish duration of each complaint. Then explore each complaint (symptom) by asking relevant but not leading questions. Always recall that residual knowledge about the diseases which might affect the system is affected.

4. Physical examination involves looking (inspection), feeling (palpation), percussion and listening (auscultation)

5. Write down your findings. Remember as you take the history and carrying out the examination you may begin to have a clue as to the diagnosis. Making this probable diagnosis is dependent on the index of suspicion, previous experience and knowledge acquire from textbooks. Think about other possible diagnoses and come down to the most probable diagnosis. At this point, think about diagnostic tests.
   a) Tests to confirm your diagnosis.
   b) Tests to exclude other likely diagnoses

6. Explain the diagnosis and treatment to the patient, including:
   a) What you think is wrong
   b) The dose of the prescribed treatment, and how often and for how long to take it.
   c) When to come back urgently
d) The date of the follow up appointment if needed

7. Give specific preventive messages

1. **Greet the patient**
   Greet/welcome the patient. Offer a seat to help the patient feel relaxed and able to tell you properly about their symptoms. Check the patient’s name, age and home. Ensure the privacy of the patient, use curtains. Protect yourself from possible temptations and complaints by examining women in the presence of a female nurse always.

2. **Look for danger signs**
   In primary care start the examination as soon as the patient enters the room. In all patients, look out for any danger signs requiring urgent attention and referral, e.g.
   - Severe breathing distress
   - Lethargy or unconsciousness
   - Severe pain
   - Severe breathing distress, cyanosis, anaemia

   *If any general or specific danger signs are present:*
   - urgently assess the patient
   - give pre-referral treatment
   - arrange for urgent referral to hospital

3. **Ask about symptoms**
   Ask why they have come and, in young children also ask the mother about general danger signs:
   - not able to drink or breastfeed
   - vomiting everything
   - convulsions (has now or had previously)
While asking about symptoms you will hear a story which you may recognise having heard or read about it before.

To hear more details of the story, ask him/her:

a) Tell me more about your symptoms

b) What type of symptoms (e.g. type of pain) do you have? For how long? In which places? Have you had it before?

c) What other symptoms do you have?
   - ask about other symptoms related to the presenting symptoms, e.g. if diarrhoea, ask also about vomiting

d) Is there anything else you are worried about?

e) Ask about key symptoms to check if other body systems are affected, e.g. cough or difficult breathing

f) Have you already taken any treatment? If so name it or obtain the previous prescription/treatment or forms.

g) If relevant, ask about allergy and past medical, social or family history

By the end of these questions, the story or pattern of symptoms may already suggest one or another illness (the beginning of a differential diagnosis). Ask about symptoms related to these illnesses.

Then ask about key symptoms from each body system. For example, if the patient has diarrhoea, also ask about cough, difficult breathing, fever and skin rashes.

When you suspect particular conditions, you will need to ask specific questions such as:
• The date of the last period in women 15-45 years
• Social history, for example if chest problems, ask about cigarette smoking, and if abdominal and mental problems ask about how much alcohol they drink
• Allergy (always ask about this before giving an antibiotic like penicillin)
• Family history, e.g. of diabetes, hypertension, contacts with TB spouse with HIV/AIDS

As you listen to the answers observe speech, appearance and behaviour. These may express peculiar ideas which suggest hallucinations or delusions or the patient may appear miserable, 'low' or depressed. If so, ask more questions to help you decide if they have a mental problem.

Notes on the questions relating to symptoms

General approach to questioning the patient:

The first part of the consultation is the ‘golden minute’, so called because the information gathered is so valuable for good diagnosis.

Encourage patients to express themselves freely using eye contact, a nod of the head and/or words like ‘yes’ or ‘OK. Ask open questions like ‘What kind of pain is it?’ and ‘For how long?’ to encourage the patient to volunteer information on the type, duration and distribution of the presenting symptoms.

Open questions allow the patient to answer in their own way. During this early part of the consultation it is best to avoid asking closed questions which require ‘yes’ or ‘no’ responses as patients may not answer these accurately.
**Question a)** from when you ask this question, encourage the patient to talk freely about their symptoms and concerns

**Question b)** gives the patient an opportunity to express their own ideas about the cause of their illness and any fears they may have, for example HIV, cancer or witchcraft

**Question c)** you need to ask about any treatment taken for the presenting problem. For example a child with fever may have already been given *Homapak* (SP and chloroquine) before coming to the health centre

**Question f)** you often need to ask about the past medical history of similar or other significant illnesses. In each case, ask what medicines they were given. Be specific to ask about previous admissions to any health units or having had an operation and medicines given.

### 4. Look, listen and feel for signs

In all patients you can quickly check for anaemia, jaundice and malnutrition.

During history taking, you will have got some ideas about the system involved and the most probable diagnosis among the possible diagnoses (that is the differential diagnoses). Remember some diseases affect various systems for example Rheumatic fever affects joint, the cardiovascular system and rarely the nervous system.

Carefully examine the affected system and always compare the two sides. One-sided conditions are more likely to be due to disease.

As you examine any system, always look for the *specific danger signs* for that system. If any
5. **Decide on the most likely diagnosis**

The story you hear may be familiar, guiding you to additional questions to ask and signs to look for, which if present will provide you with a diagnosis. You may have heard of, seen or read about this pattern of symptoms and signs before.

Certain signs and symptoms can occur in more than one disease. In order to make the correct diagnosis, you will need to think first of the alternative diagnoses – the *differential diagnosis*. You may need to ask more questions and look for signs for each of the alternative diagnoses.

Use the UCG index to locate these conditions and identify the symptoms to ask about and signs to check. Then decide which of the possible diseases best fits the pattern of signs and symptoms you have identified in the patient.

If the relevant *laboratory test* is available, you can use this to confirm a diagnosis. Test results may also provide a baseline to see if the patient gets better or worse.

However, in cases of doubt or severe illness, the patient should be referred to a doctor for further management.

The UCG includes the *Integrated Management of Childhood Illness (IMCI)* charts to help you classify (diagnose) and manage the main childhood illnesses. It also includes the new *Integrated Management of Pregnancy & Childbirth (IMPAC)* charts to guide you in
classification and management of problems in these areas.

As well as a diagnosis, the signs and symptoms will help you decide on the *prognosis* (the likely course of the disease). This will assist you to decide what to do: for example refer, treat, give symptomatic treatment, and on the need for follow-up.

6. **Explain to the patient**

The patient, or the carer of a child, needs to clearly understand about the illness and its treatment if the patient is to take any prescribed treatment properly and be able to watch out for symptoms and signs of any deterioration. Do not regard patients as passive recipients of advice or information. Instead, depend on the active participation of patients and relatives in treatment and follow-up - they are the home carers.

For all patients, explain:

a) what you think is wrong

b) the dose, frequency and duration of the treatment

c) when to come back urgently

d) the date of any follow-up appointment or further investigation (if needed) and

e) counsel as appropriate

**Remember:** with wide spread health education and internet some patients are knowledgeable about their diseases.

**Notes on explanations**

a) For example, if a child has a high fever & cough, explain that this may be malaria but could also be pneumonia
b) Explain and write down on a piece of paper:
   - the name of each medicine
   - what it is for
   - the size of each dose (for example, number of tablets)
   - the number of times the dose should be taken daily
   - for how many days it should be taken.

Keep commonly used medicines in the consultation room so you can show them in turn to the patient as you give them out.

c) Describe signs of deterioration, for example in a child general signs such as not breastfeeding or drinking, and specific signs (like respiratory infections) like breathing becoming faster or difficult. Also advise the patient on symptoms and signs to look out for in case of the alternative diagnosis or in case the treatment is not effective.

d) Generally if an illness is serious enough to need treatment with drugs like antibiotics, give the patient a follow-up appointment to check if the condition is improving. This is especially important in young children. With serious conditions like pneumonia, arrange for follow-up in two days. For less serious conditions, tell the patient to return if they do not improve, get worse or new symptoms appear. Ensure the patient feels he/she would not be bothering you unnecessarily by returning for follow-up.

e) Counsel the patient if you suspect the problem is related to serious underlying disease such as HIV/AIDS or cancer. Counselling involves a two-way conversation, allowing the patient to
express feelings, explore options available, and decide on the best course of action, like having an HIV test and use of condoms

7. **Give specific preventive messages related to the illness**

When patients have been properly assessed, given treatment and explanation, they will be willing to listen to specific advice on prevention.

Where relevant, guidance on preventive measures is provided in this booklet and messages can be based on these. Such messages will be most effective if given after similar information has been given in the community or in waiting-room group health education sessions.

**Examples:**

a) Patients with malaria: advise on importance of sleeping under insecticide-treated bednets

b) Women between 15-45 years: ask if they are pregnant,
   - if yes, offer antenatal care
   - if no, ask if they want information on family planning
   - Women may also be due for a tetanus vaccination

c) Young children: check if child is due for vaccination, vitamin A, de-worming or advice on feeding
Communication skills in the consultation room

Rather than sitting across the table from the patient, arrange for the patient and yourself to sit either side of one corner. This way means there is no barrier to communication and you will more easily be able to observe signs.

With young children, leave the child on the mother’s lap. Ask the mother to undress them so you can look at the breathing, count the breathing rate and pulse or examine the abdomen. In this way the child is more likely to feel secure and not cry which makes the examination much easier. Leave unpopular actions like looking in the ears to the end of the examination.

**Good communication skills** are essential for making a correct diagnosis, and for explanation or counselling on the illness, its treatment and prevention of future illness.

**Open questions**: are those with no fixed answer and the patient can therefore answer the question in his/her own way. Always start taking a history by using open questions and only move onto more
closed questions later. If the patient appears to be getting into irrelevant details you could advise gently and encourage her/him to focus on relevant areas.

**Closed questions:** are phrased very specifically and require a ‘yes’ or ‘no’ answer. If they are used at the beginning of an interview patients tend to answer quickly without thinking, and say what they think you want to hear. Only use specific closed questions later in the consultation if the patient hasn’t already mentioned something. E.g. In a patient with diarrhoea, ask ‘Is there blood in the stool?’

**Leading questions:** are phrased in such a way that leads the patient to give a particular answer. Therefore avoid them as they can result in misleading information.

For example, if you ask a leading question, such as ‘You have been coughing for more than three weeks?’ the patient may answer quickly without proper consideration and not give the correct ‘yes’ or ‘no’ answer.
**The ‘Golden Minute’**

This first period of contact with the patient (which may be less than half a minute) is the key first stage of any primary care consultation and includes:

- Asking the patient about the presenting complaint. When asking about the presenting complaint (i.e. the symptom), he/she may tell you some of the other key symptoms such as “hot body” (fever) or insects crawling under the skin (numbness) etcetera.

- Listening to the patient’s interpretation of this

- Allowing the patient to express any fears about the cause of the illness

When asking about the presenting problem, give the patient time to tell you about the symptoms they have.

Do not interrupt to ask questions about specific symptoms yet – but encourage them to tell you more about the presenting and other problems they have. Often, when given the chance, the patient will tell you the symptoms you need to know about, e.g. the duration of the symptom, the characteristics, such as whether a chest pain is sharp or tight. They may tell you some of the other key symptoms such as “hot body” (fever).

It is also important for the patient that you hear and know about their interpretation of the cause of the illness and their fears about what is going to happen. This helps them ‘get off their chest’ the ideas about the cause of the symptoms (such as HIV, cancer, witchcraft, etc) which they may have been discussing with family and friends before coming to the health centre. This is so that they
know you will take these interpretations into account in your assessment.

Also, later you can explain your diagnosis and treatment in the light of the patient’s own level of understanding and you may be able to reassure them about (false) interpretations of the cause.
How to diagnose and treat in primary care

How to make time for quality care

Time is needed for diagnosis and explanation of treatment and prevention. Yet often in a health centre there is only one consultation room with only one health worker consulting.

In a hospital OPD there may be few rooms/staff compared with the numbers of patients. Yet there may be underused rooms and staff.

The solution is to increase the use of staff and rooms so that more consultation rooms are used and patients are spread between these thus making more time for quality care.

Ask yourself and your colleagues:

- How many rooms are used for consultations?
- Could other rooms be used for consultations?
- How many health workers are available?
- What are they currently doing?
- Could any more be doing consultations?

If possible rearrange your health centre to increase consultation capacity. Obtain and move in required tables and chairs and start to use additional rooms for consultations.
Evidence-based Guidelines

The UCG has included the latest evidence-based WHO clinical guidelines which utilise a syndromic approach to patient management and cover:

- Sexually Transmitted Infections
- Integrated Management of Childhood Illness (IMCI)
- Integrated Management of Pregnancy & Childbirth (IMPAC)
- Integrated Management of Adolescent Illness

The management of the common adult illnesses as well as other less common conditions in adults, young children and pregnant women have been included in this edition using a traditional (aetiological) approach and listed alphabetically in the relevant chapter.

Use the IMCI and IMPAC charts for all under fives and pregnant women respectively to help you improve the quality of diagnosis, treatment and explanation (counselling). They show clearly when referral is necessary – if symptoms and signs are in the severe classification.

Always look in the pink (top) row of a chart first to check if there are signs and symptoms of severe disease. If these are not enough for this classification, next look in the yellow (second/middle) row of the chart. If not enough for this classification, finally look in the green (bottom) row of the chart. In this way, you will not miss a severe illness needing urgent treatment and referral.
**Example of use of IMCI charts**

**Child with cough or difficult breathing**

Finding chest in-drawing is a sign for severe pneumonia or other severe (e.g. heart) disease. All severe diseases found in the pink (top) row of the chart need pre-referral treatment (e.g. first doses of antimalarial and antibiotic) before urgent referral to hospital. Other patients who are not very ill, but still ill enough to need treatment (e.g. with antibiotics) are in the yellow (middle) row, such as those classified as pneumonia by assessing fast breathing. Other classifications of illness (without signs of a significant illness) are in the green (bottom) row. For example a child with cough and a normal breathing rate and no other signs in the pink (top) or yellow (middle) rows may have a simple cough or cold and not require antibiotic treatment. However these patients still need advice on symptoms of deterioration and on symptomatic home treatment.

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**Quality Care**

Get into the habit of routinely referring to the UCG. Also make full use of the IMCI laminated desk aide which is easy to glance at during a consultation.

Think about the quality of your clinical work:

- What has been done well in the consultation?
- What could be done better next time?
- Were any important points missed?
- How could I better refer to the UCG/IMCI desk aide next time?
- I need to look at the reference in UCG of the presenting disease for updating
CHRONIC CARE

Using good communication skills you may find out from the patients that certain symptoms have either been present for many weeks or ‘on and off’ for a long time.

Sometimes patients will tell you about a chronic problem, such as having ‘blood pressure’. Some patients may use this expression to actually mean ‘headache’. Other patients may have had treatment in the past but stopped either when they felt better or when the medicine was finished.

Firstly, ask more questions to find out what they really mean. Also, if already diagnosed for the chronic condition, find out when and where this was and what treatment was given.

Chronic diseases are those where the patient has to continue with follow-up and treatment for many months or years.

With chronic diseases it is important for health workers to establish a system of making booked appointments with the patient for regular follow-up consultations to review the status of a chronic disease.

At such review consultations:

- Determine whether the patient’s condition is improving, stable or deteriorating (better, the same or worse)
- Assess whether patients are taking prescribed treatments properly (the right medicines, in the right doses, at the right time)
- Confirm that patients are following any other management measures which were prescribed like change of diet or lifestyle (for example, stopping smoking, using condoms, etcetera)
Use the contact opportunity to further motivate them in managing their condition correctly.

Take appropriate action if the patient’s condition is worse.

Many of the important causes of illness and death in adults and adolescents are chronic diseases. In children, apart from malnutrition, chronic diseases are less common.

Common chronic diseases include:

- HIV/AIDS
- Tuberculosis (TB)
- Osteoarthritis (knee, lumbar and cervical spine) plus Rheumatic Disease, Parkinsonism, Migraine, Thyroid diseases
- Mental health problems e.g. depression and schizophrenia
- Epilepsy
- Hypertension (high blood pressure)
- Diabetes
- Cancers

All these diseases share the need for long-term care which is mostly at home, but with regular planned visits to the health centres and hospitals. Admission to hospital may be required:

- For new cases for assessment and starting of treatment
- If the condition relapses, until patients are well enough to continue with care in the community (by the health centre together with the CHW)

Some chronic diseases like hypertension and some mental illnesses continue for life while others get better with time. For people living with HIV, early diagnosis and treatment of infections can gain many years of active and productive life.

"With HIV/AIDS and cancer patients, much suffering, such as from pain, can be relieved with

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correct management”. If pain does not respond to simple analgesics like paracetamol and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), refer to management of severe pain and palliative care for specialized management of pain with oral morphine. With TB, though the condition is curable, treatment needs to be taken for many months to ensure complete cure.

The Chronic Care System

HOSPITAL / HC4

NEAREST HEALTH CENTRE

Patient & family member/s

Community Health Worker/ Volunteer

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Hospital/HC4
The doctor/clinical officer will:
1. See referred cases
2. Assess, diagnose and commence treatment
3. Educate/counsel the patient
4. Decide if the problem is complex or not yet stable:
   if yes: give a follow up appointment at the hospital
   if no: refer to the health centre for continuing care
   - record diagnosis and treatment on a patient card
   - and/or bottom part of the discharge letter and send to the health centre with the patient
5. If there is a relapse or other problem: reassess the patient, revise the treatment plan, and send back details on the revised chronic treatment card or referral letter

Health centre
The clinical officer or nurse will:
1. Identify and treat patients with suspected chronic conditions including those with another (acute) illness
2. Give follow-up care:
   - ask about side-effects
   - check for other problems
   - resupply drugs
3. Inform the local Community Health Worker or volunteer who can, if the patient agrees, visit and support the family carer, e.g. for persons with HIV/AIDS
4. If there is a relapse or other serious problem: refer the patient back to the hospital for reassessment of the condition and revision of treatment plan
How to diagnose and treat in primary care

**Community health worker/volunteer** will:

1. Visit, educate and support patient care by family carers and motivate for adherence to recommended treatment
2. Reinforce education messages on illness & prevention
3. Refer patients to the health centre who have problems with adherence to treatment or who become more ill
4. Link with community groups where relevant, e.g. for provision of HIV/AIDS care

**Family member/s** will:

1. Support and care for the patient in the home
2. Encourage/assist the patient to follow recommended therapy
3. Monitor the patient’s condition and return with the patient to the health centre if this should get worse
1. **Ten-point Prescribing Checklist**

Carefully consider the following key questions *before* writing any prescription:

1.1 *Does the diagnosed condition require drug treatment?*

- Not all patients or conditions need a prescription for medicines (Self limiting)
- Non-medicine treatments and/or giving simple advice may be more suitable in certain situations

1.2 *Is the prescribed treatment likely to have optimum therapeutic effect?*

Good therapeutics depends on:

- accurate diagnosis of the condition
- knowledge of the relevant available medicines
- selection from these of the most appropriate medicine and dose-form
- correctly and completely prescribing the selected medicines stating clearly for each:
  - the dose size
  - the dose frequency
  - the duration of treatment
- ensuring that the patient understands fully purpose of each medicine and how to use it each prescribed medicine.

1.3 *Is the selected dose-form the most appropriate?*

- For systemic medications, always use the oral route if possible as it is the cheapest and least hazardous route

Use the **oral route** whenever possible
Always resist patient demands for you to prescribe injections or other expensive dose forms, for example, capsules and oral liquids where these are not clearly indicated or appropriate.

Injections in particular are associated with several major risks including:

− spread of infections, for example, HIV/AIDS, hepatitis, injection abscesses due to problems with re-use of syringes/needles and difficulties in ensuring sterility
− incorrect route of administration
− poor injection technique, for example, using wrong type/size of needle, wrong location, wrong depth of insertion
− difficulty in finding a vein (for Intravenous route)

Avoid injections unless absolutely necessary

Always explain that these routes of administration may not represent the best form of treatment or even a bad form of treatment

1.4 Am I dealing with a potentially life-threatening situation?
In critical situations, always prescribe the most effective medicine available irrespective of cost or limited availability

1.5 Have I used the correct name for each medicine?
To avoid any possible confusion and to reduce prescribing costs:
Always prescribe medicines by the full **generic name** and not a brand name, e.g. **diazepam** (not **Valium ®**)  
**paracetamol** (not **Panadol ®**)

Avoid using medicine name abbreviations unless officially defined and approved.

**1.6 Can I justify using a combination medicine?**

Do not prescribe combination medicines unless they have a proven significant therapeutic advantage over corresponding single ingredient preparations.

**1.7 Have I taken into account all relevant patient criteria?**

When prescribing any medicine, always take into consideration important patient criteria such as:

- age
- sex
- weight - especially children
- likelihood of side effects (allergies)
- presence of renal or hepatic disease
  - many medicines may have to be used in reduced doses or avoided completely
- any other medicines the patient may be taking
  - these may cause unwanted medicine interactions or adverse effects
- the effect of other diseases present
  - these may significantly affect the action of particular medicines or the considered medicines may affect the other diseases negatively
- pregnancy
  - only use medicines in pregnancy if the expected benefit to the mother is greater
than any risk to the foetus and avoid all medicines if possible during the 1st trimester (the first three months of pregnancy).

- breastfeeding
  - only use medicines which are essential for treatment of the mother. For many medicines there is insufficient information available to provide guidance on breastfeeding.

- the likely degree of compliance with treatment
  - simpler, shorter dosage regimes increase the chance of the patient correctly following prescribed therapy

1.8 Is the prescribed medication likely to clearly benefit the patient?
In all cases consider carefully the expected benefit of a prescribed medication against potential risks

1.9 Am I prescribing unnecessary symptomatic treatment?
Do not overuse symptomatic treatments for treating minor self-limiting conditions for which simple home remedies may often be appropriate and effective

1.10 Do I really need to prescribe more than one medicine?
Do not practice multiple prescribing (polypharmacy), especially when the diagnosis is uncertain. It is a tremendous waste of resources and puts the patient at increased risk without corresponding clear benefit.
2. Prescribing of Placebos

- Avoid placebos whenever possible
  - instead, spend some time reassuring and educating the patient
- If it is absolutely necessary to prescribe a placebo, always choose a safe, cheap medicine which is not essential for treating other important conditions, for example, vitamin B compound tablets
- **Never** prescribe injections as placebos
- **Never** prescribe sedatives or tranquillizers, for example, diazepam, phenobarbitone, as placebos

3. Prescription Writing

No incomplete, inaccurate, illegible or unclear prescription should be dispensed - all such prescriptions should be returned to the prescriber for clarification, completion, or correction before dispensing can proceed.

To avoid such problems and associated delays, follow the guidance below in writing your prescriptions:

All prescriptions should clearly indicate name and address (if available) of the prescriber

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, age, gender and address of the patient, and sign and date the prescription form
3.3 Write the title of the medicine or preparation using its full generic name. Unofficial abbreviations, trade names, and obsolete names should not be used.

3.4 State the strength of the preparation required where relevant:

**NB:** A prescription form is a legal document.

For **solid dose-forms:**

- quantities of one gram or more should be written as 1g, 2.5g, 10g, etcetera
- quantities <1g but >1mg should be expressed in milligrams rather than grams, for example, 500mg and not 0.5g
- quantities <1mg should be expressed in micrograms and not in mg, for example, 100 micrograms rather than 0.1mg or 100mcg
- If decimal figures are used, always write a zero in front of the decimal point where there is no other figure, for example, 0.5mL and not .5mL

3.5 Always state dose regimen **in full**;

- dose size
- dose frequency
- duration of treatment
  
  For example, **doxycycline** 100mg every 12 hours for 7 days

The quantity to be dispensed is calculated from the regimen.

3.6 Avoid use of the instructions like ‘prn’ or ‘to be used/taken as required’ - state instead a suitable dose frequency. In the few cases where ‘as required’ is appropriate, always state the actual quantity of the medicine to be supplied.
3.7 For **oral liquids**:  
- state doses in terms of:  
  - 5mL spoonfuls: for linctuses, elixirs, syrups, and paediatric preparations  
  - 10mL spoonfuls: for adult mixtures  
- doses other than 5mL or 10mL or multiples of these will be diluted to the nearest equivalent 5mL or 10mL quantity before dispensing  
- total volumes of liquid preparations prescribed are usually selected from 50, 100, 200, 300, or 500mL

3.8 For **solid or semi-solid preparations**:  
- total quantities 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, for example, tetracycline eye ointment (3.5g)

3.9 Where relevant, always remember to include on the prescription any special instructions necessary for the correct use of a medicine or preparation, for example ‘before food’, ‘apply sparingly’, etcetera

### 4. In-patient Prescriptions

4.1 Write these prescriptions and records of dispensing and administration of in-patient medicines on in-patient treatment cards

4.2 Only use one card per patient at any one time

4.3 If medicine is to be given ‘as required’ clearly state a suitable dose frequency, or times of administration

4.4 For all medicines prescribed, always state the route of administration
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 right place.

4.6 If the timing of a medicine dosage is critical, ensure that you make suitable arrangements for the medicine to be given at the specific required time(s).

5. Guide to Quantities of Medicines to be supplied

5.1 Oral liquids:
- Adult mixtures (10mL dose):
  - 200mL (20 doses) or 300mL (30 doses)
- Elixirs, linctuses and paediatric mixtures (5mL dose):
  - 50mL (10 doses), 100mL (20 doses) or 150mL (30 doses)

5.2 Preparations used in body cavities, for example, ear drops, nasal drops: 10mL

5.3 External preparations:

<table>
<thead>
<tr>
<th>Part of body</th>
<th>Semi-solids (g)</th>
<th>Liquids (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>5-15</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>
<tr>
<td>Groin &amp; genitalia</td>
<td>10-25</td>
<td>100</td>
</tr>
</tbody>
</table>

Semi-solids: cream, ointment, paste, gel
NB. Paints: normally 10-25mL is supplied
6. Controlled medicine prescriptions

These medicines are covered by the provisions of the National Drug Policy and Authority Statute 1993 which should be consulted for details of the appropriate legal requirements as required.

Medicines covered by the Act and which are used in the UCG 2009 or appear on EMLU 2007.

- Morphine injection
- Morphine oral solution
- Morphine tablet SR (Slow Release)
- Papaveretum + hyoscine injection
- Pethidine injection
- Pethidine tablet

These are all medicines of potential abuse which may result in dependence. All procedures involving them should be carefully recorded in the appropriate record books. They may only be prescribed by authorised prescribers who must observe the following legal requirements:

- Prescriptions must be in the prescriber's own handwriting, signed and dated and with the prescriber's address.
- The name and address of the patient must be stated
- The total amount of the item to be supplied must be stated in words and figures

It is an offence for a prescriber to issue and for a pharmacy to dispense prescriptions for Controlled medicines, unless the requirements of the law are fully complied with.
Notes

- Specialised Palliative Care Nurses and Clinical Officers are authorised to prescribe oral morphine and other medicines used in palliative care.
- Morphine rarely causes psychological dependence when prescribed for severe pain.
- In certain exceptional circumstances, senior nurses in charge of departments, wards, or theatres, and midwives, may also obtain and administer certain specified Controlled Medicines as part of their work.

Consult the relevant sections of the Act for details of the appropriate legal requirements in each case.

- Hospital in-patient prescriptions written on treatment cards or case sheets and signed/dated by the person administering the medicine are considered under the Act as complying with regulations.

7. Adverse Drug Reactions (ADRs)

Nearly all medicines may produce unwanted or unexpected adverse effects, some of which may be life threatening, for example anaphylactic shock, liver failure.

Immediately report any serious or unexpected adverse effect suspected to be due to a medicine to the District Health Officers (DHOs) for onward transmission to the National Drug Authority (NDA).
The 10-point Guide for Prevention of ADRs

1. Never use any medicine without a clear indication
2. Only use medicines in pregnancy if absolutely essential
3. Check if the patient has had any previous reactions to the medicine or to similar medicines
4. Reduce doses when necessary, for example, in the young, the elderly, and if liver or renal disease is present
5. Always prescribe the minimum necessary medicines
6. Carefully explain dose regimes to patients, especially those on multiple medicines, the elderly and anyone likely to misunderstand
7. If possible, always use medicines with which you are familiar
8. Look out for ADRs when using new or unfamiliar drugs
9. Warn patients about likely adverse effects and advise them on what to do if they occur
10. Give patients on certain prolonged treatments, for example, anticoagulants, corticosteroids, insulin, etcetera a small card which they can carry with them giving information about the treatment

8. Paediatric Prescribing

In these guidelines, paediatric medicine doses are usually given according to body weight and not age, and are therefore expressed as mg/kg, etcetera.
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 medicines according to body weight. Moreover, this should encourage the good practice of weighing children whenever possible.

**Note:** paediatric doses calculated using mg/kg should not exceed the normal adult dose

However, as a guide to prescribing by weight when a weighing scale is not available, the two following graphs are provided showing weights of children from 1-24 months and 2-15 years respectively.

Three lines are shown on each graph:
- The middle (50\textsuperscript{th} percentile) line shows weights for average children
- The lower (3\textsuperscript{rd} percentile) line shows weights for children who are very small for their age
- The upper (97\textsuperscript{th} percentile) line shows weights for children who are very large for their age

These graphs can be therefore be used to estimate the weight of a child of known age after assessment of whether the child appears average, small or large size for that age.
Weights of children aged 1-24 months

Example:
Prescribing for an 8 month old baby who is fatter than usual, (i.e. larger than average weight for age):

- Follow the x-axis (age) of the graph to the 8 month mark
- Follow the vertical from there to a point somewhere between the middle (50th percentile) and top (97th percentile) lines on the graph
- From there follow a horizontal line left to cut the y-axis (weight)
- The estimated weight of the child is around 10 kg
Weights of children aged 2-15 years

Example:
Prescribing for an 8½ year old thin child, (i.e. less than average weight for age):
- Follow the x-axis (age) of the graph to midway between the 8 and 9 year marks
- Follow the vertical 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 of the child is around 20 kg
9. Medicines interactions

Before prescribing any medicine, take care to avoid problems of interactions with other medicines by obtaining details of any other medication being taken by the patient, whether the medication is:

- 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 purposes of self-medication at home

Note on interactions with alcohol

If a prescribed medicine interacts with alcohol (for example, metronidazole, diazepam, anti-diabetic medicines, tricyclic antidepressants, etcetera) caution the patient to avoid taking alcoholic drinks during the course of treatment and for 48 hours afterwards.

10. Patient counseling

This vital part of patient management is sadly often neglected with potentially serious consequences for the expected therapeutic outcome of the prescribed treatment.

In cases where the required medicines are not available or medicine treatment is not required or appropriate, it is particularly important to advise the patient on the next steps to take or on alternative forms of therapy, for example adjustment of diet, increased exercise, etcetera.

Although counselling the patient may take time, if done systematically it should only take a few minutes and could make the difference between therapeutic success and failure.
Include the following key components when counselling the patient:

a) explain the diagnosis, the likely cause of the disease or condition and discuss the proposed approach to treatment

b) describe the prescribed medicine therapy in detail including:
   − the medicine name
   − the function of the medicine
   − the dose regime (dose size, dose frequency, duration)
   − any additional instructions on correct use or storage of the medicine
   − any likely side-effects and what to do if they occur
   − advise on important medicine interactions (including with alcohol)

c) give advice on how to contribute to the success of the treatment (for example, rest, diet, fluids, other lifestyle changes) and how to avoid the same problem in future

d) ensure the patient fully understands the information and advice provided - ask him/her to repeat key points to you

e) ensure the patient is satisfied with the proposed treatment and has an opportunity to raise any problems or queries with you
1. INFECTIONS

1.1 BRUCELLOSIS
(Undulant fever, malta fever, abortus fever)
A bacterial infection of acute or insidious onset common as an occupational disease among people working with infected livestock or associated fresh animal products, for example, butchers, farmers, abattoir workers especially contaminated roasted meat (muchomo).

Causes
- *Brucella abortus* (cattle)
- *Brucella canis* (dog)
- *Brucella melitensis* (goats & sheep)
- *Brucella suis* (pigs)

Clinical features
- Intermittent (fluctuating) fever
- Aches and pains
- Orchitis (inflammation of the testes)
- Osteomyelitis of the vertebrae (uncommon but characteristic)

Differential diagnosis
- Typhoid fever
- Malaria
- Trypanosomiasis (sleeping sickness)
- Tuberculosis
- Other causes of prolonged fever

Investigations
- Blood: for compliment fixation test or agglutination test (where possible)
- Isolation of the infectious agent from blood, bone marrow or other tissues by culture

Management

- **Adult and child >8 yrs:**
  - **doxycycline** 100mg every 12 hours for 6 weeks

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- For child:
  - 2mg/kg per dose
  - plus streptomycin 1g IM daily for 2 weeks

- or gentamicin 5-7mg/kg IV daily for 2 weeks

- child: 15mg/kg per dose
- or gentamicin 5-7mg/kg IV daily for 2 weeks

- child: 7.5mg/kg daily in 1-3 divided doses
- or ciprofloxacin 500 mg twice daily for 2 weeks

- Child 8yrs:
- cotrimoxazole 24mg/kg every 12 hours for 6 weeks
- plus gentamicin 7.5mg/kg IV in 1-3 divided doses daily for 2 weeks

Caution

Treatment duration must be adhered to at all times.

- Ciprofloxacin is contraindicated in children below 12 years of age.
- doxycyline, gentamicin: contraindicated in pregnancy

Prevention

- Provide public health education on:
  - drinking only pasteurised or boiled milk
  - Careful handling pigs, goats, dogs, and cattle if a person has wounds or cuts
  - Provide veterinary services for domestic animals

1.2 CANDIDIASIS

An infection usually confined to the mucous membranes and external layers of the skin usually associated with immunosuppressive illness such as HIV/AIDS, diabetics, cancer and its treatment, prolonged antibiotic use and steroids.

Causes

- Candida albicans, transmitted by direct contact

Clinical features

It may present as:

- Oral thrush

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- Intertrigo
- Vulvo vaginitis
- Paronychia (nail infection)
- GIT candidiasis may present with pain on swallowing, vomiting, diarrhoea, epigastrium and retrosternal pain

**Investigations**
- Diagnosis is mainly clinical
- Smear examination with KOH preparations

**Management**

**Oral candidiasis**
- all ages: apply **gentian violet 0.5% paint** HC2 twice daily for 5 days or
- adults: **nystatin tablets** 500,000-1,000,000 IU HC2 every 6 hours for 10 days (chewed then swallowed)
- child <5yrs: **nystatin oral suspension** 100,000 IU as above; 5-12yrs: 200,000 IU per dose
- or **ketoconazole** 200mg daily for 5 days HC3
- child: 5mg/kg per dose

**Vaginal candidiasis**
- Avoid sexual activity while on treatment

- Apply **gentian violet 1% paint** onto the vagina HC2 once daily for 3 days
- or insert one **nystatin pessary** 100,000 IU HC3 each night for 10 days
- or **ketoconazole** 400mg every 12 hrs for 5 days HC3

**Paronychia**
- **griseofulvin** 500mg daily for 6 months HC3 or until the nail appears normal

**Intertrigo**
- **griseofulvin** 500mg daily for 2-4 weeks HC3

**Prevention**
- Early detection and treatment
- Vaginal candidiasis: avoid unprotected sex

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Caution
Griseofulvin: Avoid in pregnancy up to first month of the treatment

1.3 CHICKENPOX

A highly contagious childhood disease

Cause
- *Varicella* virus by droplet infection

Clinical features
- Mild fevers occur 10-20 days after exposure
- Characteristic vesicular rash appears in crops, with faint erythematous macules, rapidly developing into papules and vesicles which rupture easily and become septic
- Lesions of different ages (crops) exist together
- Complications may include septicaemia, pneumonia, fulminating haemorrhagic varicella and meningoencephalitis

Differential diagnosis
- Impetigo
- Multiple insect bites
- Other viral infections with fever and skin rash

Investigations
- Virus isolation possible, but not necessary

Management
- Apply calamine lotion every 12 hours *HC2*
- *plus* chlorphenalamine 4mg every 12 hours for 3 days *plus* an analgesic for the pain

Child <5: (3-day course)
- chlorphenamine 2mg every 12 hours *HC2*
- *plus* paracetamol 10mg/kg every 4-6 hours

Prevention
- Avoid contact between infected persons and immunosuppressed persons
1.4 LEPROSY

A chronic infectious disease caused by *Mycobacterium leprae* - an acid-fast bacillus. It mainly affects the skin and peripheral nerves and can affect all ages and both sexes. It is transmitted from one person to another via the respiratory tract or skin.

**Clinical features**
- Presents with one or more skin patches (which are usually less pigmented than surrounding normal skin) with definite loss of sensation.
- Sometimes cases present with skin nodules or smooth, shiny diffuse thickening of the skin without loss of sensation.
- Damage to peripheral nerves as evidenced by thickening and impairment of function.

*Tuberculoid or Paucibacillary (PB) leprosy*
- 1-5 patches

*Lepromatous or Multibacillary (MB) Leprosy*
- More than 5 patches

**Differential diagnosis**
- Hypopigmentation, for example, birthmark, early vitiligo
- Fungal infections of the skin
- Other nodular conditions for example, Kaposi’s sarcoma and neurofibromatosis
- Other causes of peripheral nerve damage for example, diabetes mellitus

**Investigations**
- In most cases a definite diagnosis of leprosy can be made using clinical signs alone
- At referral centre: stain slit skin smears for Acid Fast Bacilli (AFB)

**Note:** skin biopsies (which may also aid diagnosis) are **not** recommended as a routine procedure.
Management

Recommended treatment is multi-drug therapy (MDT) which is presented in the form of various blister packs for PB leprosy and MB leprosy with special packs for children.

**PB Leprosy**

An adult PB blister pack (1 month treatment) comprises:

- **rifampicin** 300mg cap x 2
- **dapsone** 100mg tab x 28

The total course is 6 packs (i.e. 6 months) taken as follows:

- Once monthly (on day 1):
  - **rifampicin** 600mg (2 caps)
  - **plus dapsone** 100mg (1 tab)
- Once daily (on days 2-28):
  - **dapsone** 100mg (1 tab)

**MB leprosy**

An adult MB blister pack (1 month treatment) comprises:

- **rifampicin** 300mg cap x 2
- **clofazimine** 100mg cap x 3
- **clofazimine** 50mg cap x 27
- **dapsone** 100mg tab x 28

taken as follows:

- Once monthly (on day 1):
  - **rifampicin** 600mg (2 caps)
  - **plus clofazimine** 300mg (3 caps)
  - **plus dapsone** 100mg (1 tab)
- Once daily (on days 2-28):
  - **clofazimine** 50mg (1 cap)
  - **plus dapsone** 100mg (1 tab)
1. Infections

**MB Leprosy Treatment Dose Table**

<table>
<thead>
<tr>
<th>Drug/frequency</th>
<th>0-4 yrs</th>
<th>5-14 yrs</th>
<th>≥ 15 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>dapsone daily</td>
<td>25mg</td>
<td>50mg</td>
<td>100mg</td>
</tr>
<tr>
<td>clofazimine daily</td>
<td>50mg</td>
<td>50mg</td>
<td>50mg</td>
</tr>
<tr>
<td>clofazimine monthly</td>
<td>100mg</td>
<td>200mg</td>
<td>300mg</td>
</tr>
<tr>
<td>rifampicin monthly</td>
<td>50mg</td>
<td>300mg</td>
<td>600mg</td>
</tr>
</tbody>
</table>

Treatment should continue for a full 12 months and wherever possible, up to smear negativity.

**Note:**
- In MB Leprosy, **never** use rifampicin alone, or in combination with dapsone without a third bactericidal drug, because of the high prevalence of primary or secondary dapsone resistance, and the subsequent high risk of the development of rifampicin resistance.
- For the purposes of multi-drug therapy, classify patients who have already been treated as follows:
  a) classify those who would have been in the multibacillary group at the time of diagnosis of their disease as such, irrespective of their current bacterial index.
  b) classify patients who would initially have been in the pauci-bacillary group according to their current clinical and bacteriological status.

**Prevention**
- Early reporting of cases and effective treatment
- BCG vaccination may be helpful
1.5 MEASLES

An acute, highly communicable viral infection characterized by a generalised skin rash, fever and inflammation of mucus membrane.

**Cause**
- Measles virus spread by droplet infection and direct contact

**Clinical features**

*Catatarrhal stage*
- Fever, runny nose, barking cough
- Misery, *anorexia*, vomiting and conjunctivitis
- Koplik’s spots (diagnostic)
- (Later) generalised maculopapular skin rash

*Desquamation stage (later still)*
- Diarrhoea (common)
- Skin lesions peel off
- Rash fades
- Temperature falls

**Complications**
- Secondary bacterial RTI, e.g. bronchopneumonia
- Laryngotraceobronchitis
- Protein Energy Malnutrition (PEM) - especially following diarrhoea
- TB
- Cancrum oris (from mouth sepsis)
- Otitis media
- Corneal ulceration & panophthalmitis - leads to blindness
- Demyelinating encephalitis
- Thrombocytopenic purpura
- Bronchiectasis - because of long term blockage of small bronchi

**Differential diagnosis**
- German measles (Rubella)
- Other viral diseases causing skin rash
1. Infections

Investigations
- Clinical diagnosis is sufficient though virus isolation is possible
- Investigate complications

Management (symptomatic)
- Apply tetracycline eye ointment 1% every 12 hours for 5 days
- Increase fluid intake
- Give vitamin A 200,000 IU
  - 1st dose: at diagnosis
  - 2nd dose: the next day
  - 3rd dose: 2-4 weeks later

Prevention
- Measles vaccination
- Avoid contact between infected persons and uninfected

1.6 MENINGITIS

Meningitis is acute inflammation of the meninges

Causative organisms
- Streptococcus pneumoniae
- Haemophilus influenzae serotype b - mainly in young children
- Neisseria meningitidis
- Cryptococcus neoformans (in the immune-suppressed)
- Mycobacterium tuberculosis
- Enteric bacilli

Clinical features
- Rapid onset of fever
- Severe headache and neck stiffness or pain
- Photophobia
- Haemorrhagic rash - may be present in N. meningitidis infection
- Convulsions
- Cranial neuropathy
- Altered mental state, confusion, coma
1. Infections

**Differential diagnosis**
- Viral meningoencephalitis
- Rare Haemorrhagic fevers for example, Ebola and Marburg diseases
- Brain abscess
- Space-occupying lesions in the brain
- Drug reaction

**Investigations**
- CSF: for white cell count and type, protein, sugar, Indian-ink staining, Gram stain, Culture and Sensitivity
- Blood: for serological studies and haemogram
- Chest x-ray and ultra sound to look for possible primary site

**Management**

| Note: Because of the potential severity of the disease, carry out any required lumbar puncture promptly and initiate ‘appropriate’ antibiotic therapy while awaiting lab results |

Treatment depends on whether:
- a) Causative organisms are not yet identified
- b) Causative organisms are identified

**a) Causative organisms not yet identified (initial appropriate therapy)**

- **ceftriaxone** 2g IV or IM daily in 1-2 divided doses for up to 14 days **HC4**
  - child: 50-100mg/kg daily dose given as above
- Change to cheaper effective antibiotic if and when C&S results become available
  
  *If ceftriaxone not available, and at HC3 level:*

- **Use chloramphenicol** 1g IV every 6 hours for up to 14 days (use IM if IV not possible) **HC3**
  - child: 25mg/kg per dose
  
  *Once clinical improvement occurs:*
1. Infections

change to 500-750mg orally every 6 hours to complete the course 

child: 25mg/kg per dose

b) Causative organisms identified

i) Meningitis due to Cryptococcus neoformans (cryptococcal meningitis)

Caused by a fungus, common in immunosuppressed patients, very difficult to treat. Send patients to a Referral Hospital for treatment with amphotericin B infusion

ii) Meningitis due to Streptococcus pneumonia (10-14 day course)

- benzylpenicillin 3-4 MU IV or IM every 4 hours
  child: 100,000 IU/kg per dose
- or ceftriaxone 2g IV or IM daily in 1-2 divided doses  child: 50-100mg/kg daily dose as above

Notes:

a) severe cases may need up to 21 days treatment
b) patients with S. pneumoniae strains resistant to the above drugs require specialist management

iii) Meningitis due to Haemophilus influenzae (7-10 day course)

- ceftriaxone 2g IV or IM every 12 hours  child: 50-100mg/kg per dose
  -use this drug if available

Only if the isolate is reported to be susceptible to the particular drug:

- Change to chloramphenicol 1g IV every 6 hours
1. Infections

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### child: 25mg/kg per dose

- **or ampicillin** 2-3g IV every 4-6 hours

### child: 50mg/kg per dose

#### (iv) Meningitis due to Neisseria meningitidis:

(up to 14 day course)

- **chloramphenicol** 1g IV every 6 hours
- **child:** 25mg/kg IV per dose
  - - use IM if IV not possible

  Once clinical improvement occurs:
  - change to 500-750mg orally every 6 hours to complete the course
  - **child:** 25mg/kg per dose.

**Note:** consider prophylaxis of patients and close contacts (especially children <5 years):

- **ciprofloxacin** 500mg single dose
  - adults and children, but contraindicated in pregnancy

#### v) Meningitis due to Listeria monocytogenes

(at least 3 weeks course)

- Common cause of meningitis in neonates and immunosuppressed adults
- **benzylpenicillin** 3MU IV or IM every 4 hours
- **or ampicillin** 3g IV every 6 hours

**Notes**

- both medicines are equally effective
- therapy may need to be prolonged for up to 6 weeks in some patients

### vi) TB Meningitis (due to Mycobacterium TB)

See section on Tuberculosis

Treatment is in two phases (doses in table over):

- **HC4**
  - **a) Intensive phase:**
    - 2 months daily course of **streptomycin,** **isoniazid,** **rifampicin** and **pyrazinamide.**
    - - in case of a reaction to **streptomycin,** **ethambutol** can be used instead
b) Continuation phase:  
7 months daily course of rifampicin and isoniazid

Treatment of TB Meningitis: Medicine doses (mg) for different body weight ranges (kg)

<table>
<thead>
<tr>
<th>Medicine</th>
<th>5-10</th>
<th>11-20</th>
<th>21-30</th>
<th>31-50</th>
<th>&gt;50kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptomycin</td>
<td>200</td>
<td>500</td>
<td>500</td>
<td>750</td>
<td>1,000</td>
</tr>
<tr>
<td>Isoniazid</td>
<td>100</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>150</td>
<td>150</td>
<td>300</td>
<td>450</td>
<td>600</td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td>500</td>
<td>500</td>
<td>1,000</td>
<td>1,500</td>
<td>2,000</td>
</tr>
<tr>
<td>Ethambutol</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>800</td>
<td>1,200</td>
</tr>
</tbody>
</table>

Notes:
- **streptomycin**: max. dose in patients >50 yrs is 750mg (not 1g) because of a danger of deafness
- **streptomycin**: avoid wherever possible in pregnancy because of a danger of deafness in neonates
- **ethambutol**: use with caution in children <5 because of the risk of optic neuritis

Prevention
- Avoid overcrowding
- Improve sanitation

Neonatal meningitis

Note: organisms causing this are similar to those causing neonatal septicaemia and pneumonia, i.e. *S.pneumoniae*, group A & B streptococci, and enteric Gram-negative bacilli. Management is thus similar to that recommended for neonatal pneumonia.
1. Infections

a) Causative organism unknown:
(7-10 day course)

- **ampicillin** 50mg/kg every 8 hours
- neonates <7 days: every 12 hours
- **HC4**
- **plus gentamicin** 2.5/kg IV every 12 hours

Note: meningitis due to *Listeria monocytogenes* is especially common in the 1st week of life, thus **ampicillin** should be included in the regime

b) Meningitis due to group B streptococci

Note: these organisms often colonise the vagina and rectum of pregnant women, can be transmitted to babies during labour and cause infection. Meningitis and septicaemia during the 1st week after birth may be particularly severe.

- **benzylpenicillin** 50,000-75,000 IU/kg IV **HC4**
  every 4-6 hours
- neonates <7 days: 50,000 IU/kg IV every 8 hours
- **plus gentamicin** 2.5mg/kg IV every 12 hours
- continue treatment for a total of 3 weeks

1.7 SYSTEMIC MYCOSES

Chronic infections caused by inhalation of fungal organisms (spores) found in dust/soil in endemic areas which start in the lungs causing usually mild or no symptoms but may spread to other parts of the body

**Causes**

Fungal organisms
- *Aspergillus fumigatus*
- *Blastomyces dermatidis*
- *Coccidioides immitis*
- *Cryptococcus neoformans*

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1. Infections

Clinical features
- Allergic reactions with wheezing, cough, chest pain, fever, abscess, headache and muscle pain
- Pneumonia
- Meningitis
- Sinusitis
- Osteomyelitis
- Empyema
- Lymphadenopathy
- Ulcerated papules
- Subcutaneous nodules

Differential diagnosis
- Tuberculosis
- Trypanosomiasis
- Lymphoma
- HIV/AIDS

Investigations
- Blood: full haemogram
- X-ray: chest
- CSF: using Indian ink stain
- Isolate causative organism from sputum, bone marrow, urine, blood or CSF or from lymph node, liver or lung biopsy

Management
- Refer to hospital

1.8 PLAGUE
Severe acute bacterial infection with high fatality rate transmitted by infected rodent fleas

Cause
- *Yersinia pestis* (a coccobacillus) transmitted from ground rodents to man by bites from infected fleas
- It may also be spread from person to person by droplet infection and may occur in epidemics
**Clinical features**

*Bubonic plague*
- Involves lymph nodes (usually femoral and inguinal)
- Rapidly rising temperature with rigors
- Headache

*Pneumonic plague*
- Very infectious and highly fatal
  - Death occurs within 2 days, if not treated early
- Infection is localised in the lungs, with fever, general malaise, headache and frothy blood stained sputum
- May be complicated by respiratory and cardiac distress

*Septicaemic plague*
- A complication of the primary infection due to toxins
- There is high fever, nose bleeding, diarrhoea, heart failure, disseminated intravascular coagulation, skin necrosis and shock

**Differential diagnosis**
- Malaria
- Typhoid
- Lymphogranuloma venereum
- Pneumonia

**Investigations**
- Bubo aspirate: for microscopy, C&S
- Blood and sputum: examine to demonstrate presence of the bacilli

**Management (14-day course)**
- *doxycycline* 100mg every 12 hours for 7 days
  - *HC2* child >8 yrs: 2mg/kg per dose
  - *contraindicated in pregnancy*
- Alternatives:
  - *chloramphenicol* 500mg orally or IV every 6 hours for 7-10 days
  - *gentamicin* 1.7mg/kg (adult and child)
1. Infections

IV or IM every 8 hours for 7 days
- contraindicated in pregnancy
or streptomycin 1g every 12 hours for 7-10 days
child: 15mg/kg per dose
- contraindicated in pregnancy

Prevention
- Health education
- Improved housing
- Destruction of rats (rodents) and fleas
- Early detection and treatment to reduce further spread

1.9 POLIOMYELITIS

An acute viral infection characterised by acute onset of flaccid paralysis of skeletal muscles. It is transmitted primarily by person to person through the faecal-oral route.

Cause
- Polio virus (enterovirus) types I, II and III

Clinical features
- Majority of cases are asymptomatic
  - only 1% result in flaccid paralysis
- Minor illness of fever, malaise, headache, and vomiting
- May progress to severe muscle pain
- Paralysis is characteristically asymmetric
- Paralysis of respiratory muscles is life threatening (bulbar polio)
- Aseptic meningitis may occur as a complication
- Strain and intramuscular injections precipitate and may worsen paralysis

Differential diagnosis
- Guillain-Barre syndrome
- Traumatic neuritis
- Transverse myelitis
- Pesticides and food poisoning
**1. Infections**

- Isolation of the virus from stool samples
- Viral culture

**Management**

**Acute stage**

Polioymelitis in this stage without paralysis is difficult to diagnose

- If paralysis is recent, rest the patient completely
  - **Note:** do not give IM injections as they make the paralysis worse
- Refer the patient to a hospital
- After recovery (if partially/not immunised) complete the recommended immunization schedule

**Chronic stage**

- Encourage active use of the limb to restore muscle function

**Prevention**

- Isolate for nursing and treatment
- Caretaker should wash hands each time after touching the child
- Proper disposal of children’s faeces
- Immunization

---

**1.10 RHEUMATIC FEVER**

A systemic connective tissue disease which follows a streptococcal upper respiratory tract infection. It involves the heart, joints, skin, subcutaneous tissue and CNS.

The first attack usually occurs between ages of 3-15

**Causes**

- Hypersensitivity reaction to group A streptococcal throat infection

**Clinical features**

- Arthritis (migrating polyathritis accompanied by fever)
- Acute rheumatic carditis, signs of cardiac failure, murmurs and pericarditis
1. Infections

- Subcutaneous nodules
- Chorea (involuntary movements of limbs)

**Differential diagnosis**
- Any form of arthralgia (joint pains)
- Pyrexia with cardiac failure

**Investigations**
- Throat swab for haemolytic streptococcus
- Blood: haemogram (raised ESR)
- Chest X-ray
- ECG if available
- Endocardiology (cardiac catheterisation)
- Echocardiography
- Antistreptolysin O titre (ASOT)

**Management**
- **Phenoxymethylpenicillin** 250mg every 6 hours for 7 days  *child*: 125mg per dose
- **Plus aspirin** 600-900mg every 8 hours for 5 days  *child*: 300-600mg per dose
- **Plus magnesium trisilicate compound** 2-4 tablets every 8 hours until the inflammation subsides
  - taken 30 minutes after the aspirin tablets

**Prevention**
- Early diagnosis and treatment of group A streptococcus throat infection
- Avoid overcrowding
- Good nutrition
- Good housing

### 1.11 Septicaemia

*(before sensitivity results are known)*

**Cause**

Blood infection due to various bacteria which may be associated with infection in specific sites (for example, lungs, urinary tract, GI tract) or there may be no specific focus
1. Infections

**Organisms commonly involved**
*Staphylococcus aureus*, *Klebsiella*, *Pseudomonas*, *Staphylococcus epidermidis*, fungal (*Candida spp*), *Coliforms* and *Salmonella spp*, *Pneumococci*, *Proteus spp*

**Clinical features**
- Fever
- Hypotension
- Prostration (extreme tiredness)
- Sometimes anaemia
- Toxic shock is a complication
- Occurs more commonly in the immunosuppressed

**Differential diagnosis**
- Severe cerebral malaria
- Meningitis
- Typhoid fever (enteric fever)
- Infective endocarditis

**Investigations**
- Look for possible source of infection
- Blood: for WBC count, C&S

**Management**
- Give a starting dose of antibiotics: 
  *Adult*: *gentamicin* 5-7mg/kg IV every 24 hours
  or 1.5-2mg/kg IV or IM every 8 hours
  ☠ contraindicated in pregnancy
  *plus either* *cloxacillin* 2g IV every 4-6 hours
  or *chloramphenicol* 750mg IV every 6 hours
  *Child*: *gentamicin* 3.5-4mg/kg IV every 8 hours
  (neonate: every 8-12 hours)
  *plus either*: *ampicillin* 50mg/kg IV every 8 hours
  (<7 days old: every 12 hours)
  or *cloxacillin* 50mg/kg IV every 4-6 hours
  or *benzylopenicillin* 50,000 IU/kg IV every 4-6 hours
- Refer to hospital
1. Infections

Prevention of sepsis
- Protect groups at risk, for example, immunosuppressed and post-surgical patients
- Follow strictly aseptic surgical procedures

1.12 TETANUS

Bacterial disease characterised by intermittent spasms (twitching) of voluntary muscles

Cause
- The exotoxin of *Clostridium tetani*
- Tetanus spores enter the body through deep penetrating skin wounds, the umbilical cord of the newborn, ear infection, or wounds produced during delivery and septic abortions

Clinical features
- Stiff jaw (trismus)
- Generalised spasms induced by sounds, strong light characterised by grimace (risus sardonicus)
- Arching of back (opisthotonus) with the patient remaining clearly conscious

Differential diagnosis
- Meningoencephalitis, meningitis
- Phenothiazine side-effects
- Febrile convulsions

Management

**HC4**

*General measures:*
- Nurse patient intensively in a quiet isolated area
- Maintain close observation and attention to airway (intubate if necessary), temperature and spasms
- Insert nasogastric tube (NGT) for nutrition, hydration and medicine administration
- (Neonate) have a mucous extractor or other suction available for use as required
- Maintain fluid balance/adequate hydration - initially IV if required, later by NGT
- Prevent aspiration of fluid into the lungs
1. Infections

- Maintain adequate nutrition - in the neonate use expressed breast milk via NGT
- Avoid IM injections as much as possible - use alternative routes (for example, NGT, rectal) where possible
- Change from parenteral to oral medication as soon as possible and keep patient handling to a minimum to avoid provoking spasms
- Clean and wounds and remove necrotic tissue
- (Neonate) thoroughly clean umbilical area

**Specific treatment:**
- Give antibiotic: **benzylpenicillin** 1-2 MU every 6 hours for 10 days
  - child: 50,000-100,000 IU/kg per dose
  - neonate: 100,000 IU/kg every 12 hours
- Control spasms: **chlorpromazine** 100mg
  - (child: 12.5mg-25mg) alternating with **diazepam** 2-3mg (child: 0.5-1mg/kg) by NGT every 4-6 hours (see chart below).
  - continue for as long as spasms/rigidity lasts
- **Metronidazole** 400 mg 8 hourly for five days

**Example of 6 hourly alternating regimen**

<table>
<thead>
<tr>
<th></th>
<th>06h-09h</th>
<th>09h-12h</th>
<th>12h-15h</th>
<th>15h-18h</th>
<th>18h-21h</th>
<th>21h-24h</th>
<th>24h-03h</th>
<th>03h-06h</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DZ</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

**CP** = chlorpromazine  **DZ** = diazepam  **h** = hours
- = drug to be given  ■ = drug not to be given

- Neutralise toxin: give **tetanus immunoglobulin human (TIG)** 150 IU/kg IM into multiple sites or (only if TIG is not available) **tetanus antitoxin (anti-tetanus serum)** give 20,000 IU as IV single dose (after test dose of 1,500 IU SC)
  - child: 10,000 IU given IM or IV
- Prevent future tetanus (see Tetanus prevention):
  - **Neonate/child**: after recovery ensure full course of immunization with DPT vaccine
1.13 TETANUS PREVENTION

a) Childhood immunization
   - Immunise all children against tetanus during routine childhood immunization
     - see Immunization Schedule

b) Prophylaxis against neonatal tetanus
   - Immunise all pregnant women/women of childbearing age (15-45yrs) against tetanus
   - Give **tetanus toxoid vaccine (TT)** 0.5mL IM into the upper arm or upper outer thigh as follows:

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT1 (1st dose)</td>
<td>at first contact with the woman, e.g. at the 1st antenatal visit, or as early as possible during pregnancy</td>
</tr>
<tr>
<td>TT2 (2nd dose)</td>
<td>at least 4 weeks after TT1</td>
</tr>
<tr>
<td>TT3 (3rd dose)</td>
<td>at least 6 months after TT2 or as early as possible during a subsequent pregnancy</td>
</tr>
<tr>
<td>TT4 (4th dose)</td>
<td>at least 1 year after TT3 or as early as possible during a subsequent pregnancy</td>
</tr>
<tr>
<td>TT5 (5th dose)</td>
<td>at least 1 year after TT4 or as early as possible during a subsequent pregnancy</td>
</tr>
</tbody>
</table>

- Ensure hygienic deliveries including proper cutting and care of umbilical cords

**Notes**
1. Refer to Immunization Schedule, for general information on administration, storage and handling of vaccines
2. Store TT at +2°C to +8°C. Do **not** freeze TT
c) Prophylaxis in patients at risk of tetanus as a result of contaminated wounds, bites and burns

**General measures**
- Ensure adequate surgical toilet and proper care of wounds

**Passive immunization**
- Give IM tetanus immunoglobulin human (TIG):
  - child <5 yrs: 75 IU
  - child 5-10 yrs: 125 IU
  - child >10 yrs/adult: 250 IU

  **Note:** double the dose if heavy contamination suspected or if >24 hours since injury was sustained

  **Alternative - only if TIG not available:**
  - Tetanus antitoxin (antitetanus serum)
    1,500 IU deep SC or IM

**Active immunization**
- Unimmunised or never fully immunised patients:
  - Give a full course of vaccination: three doses of TT 0.5mL deep SC or IM at intervals of 4 weeks

- Fully immunised patients but last booster >10 years ago:
  - Give one booster dose of TT 0.5mL deep SC or IM

  **Note:** Fully immunised patients who have had a booster dose within the last 10 years do **not** need treatment with tetanus antitoxin (anti-tetanus serum) or antitetanus immunoglobulin, human or tetanus toxoid vaccination

  **Note:** Giving TIG or TT to a fully immunised person may cause an unpleasant reaction, e.g. redness, itching, swelling, fever, but with a severe injury this is justified
1.14 TYPHOID FEVER (Enteric fever)

Bacterial infection characterised by fever and spread through contaminated food and water. Following treatment about 10% of patients relapse and up to 3% become chronic carriers of the infection.

Causes
- *Salmonella typhi* and *S. paratyphi A & B*

Clinical features
- Gradual onset of chills and malaise, headache, anorexia, epistaxis, backache and constipation - usually occurring 10-15 days after infection
- Abdominal pain and tenderness are prominent features
- Temperature rises in steps
- Relative bradycardia is common
- Delirium and stupor (common)
- Tender splenomegaly (common)
- Complications may include perforation of the gut

Investigations
- Stool: culture
- Blood: culture
- Widal’s agglutination reaction
  - check weekly for rising antibody titres

NB. A single positive screening does not indicate presence of infection.

Management
- **cotrimoxazole** 960mg every 12 hours for 3 days
  - child: 24mg/kg per dose
- or chloramphenicol 1g IM, IV or oral **HC4**
  - every 6 hours for 10-14 days
  - child: 25mg/kg per dose
- or ciprofloxacin 500-750mg every 12 hours **HC4**
  - for 5-14 days (contraindicated in pregnancy)
  - child: 10-15mg/kg per dose
1. Infections

**Chronic carriers (treat for 4-6 weeks)**
- **ciprofloxacin** 500-750mg every 12 hours  
  (contraindicated in pregnancy)  
  child: 10-15mg/kg per dose  
  or **amoxicillin** 250mg every 8 hours  
  child: 25mg/kg per dose (max: 250mg)

**Prevention**
- Early detection, isolation, treatment and reporting
- Proper faecal disposal
- Use of safe clean water for drinking
- Personal hygiene especially hand washing
- Good food hygiene

### 1.15 TYPHUS FEVER

Infection caused by Rickettsia

**Causes**
- Epidemic louse-borne typhus fever:  
  - caused by *Rickettsia prowazeki*  
  - the common type in Uganda which is transmitted to man (the reservoir) by lice
- Murine (endemic) typhus fever: caused by *Rickettsia typhi* (*mooseri*) and transmitted by rat fleas  
  - rats and mice are the reservoir
- Scrub typhus fever (mite-borne typhus): caused by *R. tsutsugamushi* and transmitted by rodent mites

**Clinical features**
- *Louse borne typhus* presents with  
  - headaches, fever, chills  
  - severe weakness  
  - general pains  
  - macular rash which appears on the 5th day on the rest of the body except the face, palms and soles  
  - toxaemia (usually pronounced)
- *Murine typhus* has a similar picture but is less severe
Differential diagnosis
- Any cause of fever, for example, malaria, HIV, UTI, typhoid, etcetera

Investigations
- Blood: for Weil-Felix reaction

Management
- 7-10 day course or for 48 hours after resolution of fever
  - doxycycline 100mg every 12 hours
    - child ≥8yrs: 2mg/kg per dose
    - contraindicated in pregnancy
  - or chloramphenicol 500mg orally or IV every 6 hours
    - child: 15mg/kg per dose

Prevention
- Personal hygiene
- Destruction of lice and rodents
2. PARASITIC DISEASES

2.1 ASCARIASIS (Roundworm)
A worm infestation of the small intestines generally associated with few or no symptoms

**Cause**
- *Ascaris lumbricoides* (roundworm)
  - spread by ingesting infective eggs from contaminated soil and uncooked food

**Clinical features**
- Patient may pass out live worms through the anus, nose or mouth
- Loeffler’s syndrome (pneumonitis)
- Heavy infestations may cause nutritional deficiencies
- Worms may also cause obstruction to bowel, bile duct, pancreatic duct or appendix

**Differential diagnosis**
- Other causes of cough
- Other causes of obstruction and nutritional deficiency

**Investigations**
- Stool examination for *Ascaris* ova

**Management**
- mebendazole 500mg single dose
  - child <2yrs: 250mg

**Prevention**
- Proper faecal disposal
- Personal and food hygiene
- Regular deworming of children every 3-6 months

2.2 DRACUNCULIASIS (Guinea worm)
An infestation of the subcutaneous and deeper tissue with the guinea worm
2. Parasitic diseases

Cause
- *Dracunculus medinensis*, transmitted to man by drinking water containing cyclops (water flea or small crustacean) infected with larvae of the guinea worm

Clinical features
- Adult worm may be felt beneath the skin
- Local redness, tenderness and blister (usually on the foot) at the point where the worm comes out of the skin to discharge larvae into the water
- There may be fever, nausea, vomiting, diarrhoea, dyspnoea, generalised urticaria and eosinophilia before vesicle formation
- Complications may include cellulitis, septicaemia and aseptic or pyogenic arthritis; tetanus may also occur

Differential diagnosis
- Cellulitis from any other causes
- Myositis

Investigations
- Recognition of the adult worm under the skin
- X-ray may show calcified worms

Management
There is no known drug treatment for guinea worm. All patients:
- To facilitate removal of the worm slowly and carefully roll it onto a small stick over a period of days
- Dress the wound occlusively to prevent the worm passing ova into the water
- Give analgesics for as long as necessary

If there is ulceration and secondary infection give:
- **cotrimoxazole** 960mg every 12 hours for 5 days
  - *child*: 24mg/kg per dose
2. Parasitic diseases

Prevention
- Filter or boil drinking water
- Infected persons should avoid all contact with sources of drinking water

2.3 ECHINOCOCCOSIS (Hydatid disease)

Tissue infestation by larvae of *Echinococcus granulosus*

Clinical features
- Liver cysts may be asymptomatic but may also give abdominal pain or palpable mass and jaundice (if the bile duct is obstructed)
- Rupture of cysts may cause fever, urticaria or anaphylactic reaction
- Pulmonary cysts can be seen on chest X-ray and may rupture to cause cough, chest pain and haemoptysis

Differential diagnosis
- Amoebiasis
- Hepatoma
- Other causes of liver mass and obstructive jaundice
- Tuberculosis (TB)

Investigations
- Skin test
- Ultra sound
- X-ray: chest - for pulmonary cysts
- Serological tests
- Needle aspiration under Ultra-sound Sonography (US) or CT-scan guidance for protoscolites

Management
- Surgical excision
  
  *Prior to surgery or in cases not amenable to surgery:*
- mebendazole 1.5g every 8 hours for 6 months
  * contraindicated in pregnancy

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2.4 ENTEROBIASIS (Threadworm)

A common helminth infection affecting mainly children

**Cause**
- *Enterobias vermicularis*
  - transmitted by faecal-oral route

**Clinical features**
- Intense itching at the anal orifice where the female usually lays the ova

**Differential diagnosis**
- Trichuriasis
- Other causes of anal itch

**Investigations**
- Stool - for adult worms and ova
- Cellotape test

**Management**
- mebendazole 500mg single dose
  - *child* <2yrs: 250mg

**Prevention**
As for ascariasis

2.5 HOOKWORM

A chronic parasitic infestation of the intestines by hookworms

**Cause**
- *Necator americanus* and *Ancylostoma duodenale*
  - by penetration of the skin by larvae from the soil

**Clinical features**
- Dermatitis (ground itch)
- Cough and inflammation of the trachea (tracheitis)
  - common during larvae migration phase
- Iron-deficiency anaemia
- Reduced blood proteins in heavy infestations
2. Parasitic diseases

**Differential diagnosis**
- Strongyloidiasis
- Loeffler’s Syndrome
- Other causes of iron-deficiency anaemia

**Investigations**
- Stool examination for ova

**Management**
- **mebendazole** 500mg single dose  
  *child <2yrs: 250mg*

**Prevention**
- Avoid walking barefooted
- Ensure proper faecal disposal
- Deworm children every 3-6 months

2.6 LEISHMANIASIS

A chronic systemic infectious disease

**Cause**
- Flagellated protozoa *Leishmania donovani*  
  (Visceral Leishmaniasis or Kala-azar)
- Transmitted through the bite of infected sand fly  
  (phlebotomus)

**Clinical features**
*Visceral Leishmaniasis (Kala-azar)*
- Chronic disease characterized by fever,  
  hepatosplenomegaly, lymphadenopathy, anaemia  
  (with leucopenia), progressive emaciation and  
  weakness
- Fever of gradual onset, irregular with 2 daily  
  peaks and alternating periods of apyrexia
- Fatal if not treated
- After recovery from Kala-azar, skin (cutaneous)  
  leishmaniasis may develop

*Cutaneous and Mucosal Leishmaniasis (Oriental sore)*
- Starts as papule, enlarges, becomes an indolent ulcer
- Secondary bacterial infection is common
2. Parasitic diseases

Differential diagnosis
- Other causes of chronic fever, e.g. brucellosis
- (for dermal leishmaniasis) other causes of cutaneous lesions, e.g. leprosy

Investigations
- Stained smears from bone marrow, spleen, liver, lymph nodes, or blood to demonstrate Leishman Donovan bodies
- Culture of the above materials on appropriate media to isolate the parasites
- Serological tests, e.g. indirect fluorescent antibodies
- Leishmanin skin test (negative in Kala-azar)

Management

Cutaneous Leishmaniasis (all patients):
Frequently heals spontaneously but if severe or persistent, treat as for Visceral Leishmaniasis below

Visceral Leishmaniasis (Kala-azar) (all patients):
- **pentamidine isethionate** 4mg/kg daily deep IM
  3 times/week for 5-25 weeks or longer
  or **sodium stibogluconate** injection 10%
  20mg/kg daily IM for minimum of 20 days (skin lesions are treated for 10 days)

Note:
- Continue treatment until no parasites detected in 2 consecutive splenic aspirates taken 14 days apart
- **sodium stibogluconate**: patients who relapse after a 1st course of treatment should be immediately re-treated with the same daily dose

Prevention
- Case detection and prompt treatment
- Residual insecticide spraying
- Elimination of breeding places
  (environmental management)
2.7 MALARIA

Malaria is an acute febrile illness. It is caused by infection with malaria parasites of the genus *Plasmodium* and is normally transmitted from person to person by female mosquitoes of the genus *Anopheles*.

There are four species of malaria parasites which infect humans namely: *Plasmodium falciparum*; *Plasmodium vivax*; *Plasmodium ovale*; and *Plasmodium malariae*. Of these, *P. falciparum* is the most virulent malaria parasite in the world and also the most common malaria parasite in Uganda.

The effect of the presence of malaria parasites in the body varies from person to person. There may be no symptoms (asymptomatic infection), mild illness (uncomplicated malaria) or severe illness (severe malaria). If uncomplicated malaria is not recognised early and treated promptly it is likely to deteriorate to severe malaria. A patient with severe malaria is in immediate danger of death and, therefore, severe malaria is a medical emergency.

UNCOMPLICATED MALARIA

Clinical features of Uncomplicated Malaria

Fever is the most characteristic symptom of malaria. The fever in malaria is intermittent; that is it comes and goes many times. Three phases can be distinguished in a typical attack of malaria:

- **the cold stage** is when the patient feels cold and shivers.
- **the hot stage** is when the patient feels hot.
- **the sweating stage** is associated with sweating and relief of symptoms.

When people are frequently exposed to malaria, they develop partial immunity. In such people (with partial immunity) the above classical stages of a malaria attack may not be observed. Also in people
who have had partial treatment with antimalarial medicines those classical stages may not be pronounced.

**Common symptoms of uncomplicated malaria**

<table>
<thead>
<tr>
<th>Children under 5 years</th>
<th>Older children</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Fever (raised temperature detected by thermometer or touch) or a history of fever</td>
<td>a. Fever (raised temperature detected by thermometer or touch) or a history of fever</td>
</tr>
<tr>
<td>b. Loss of appetite</td>
<td>b. Loss of appetite</td>
</tr>
<tr>
<td>c. Weakness</td>
<td>c. Weakness</td>
</tr>
<tr>
<td>d. Lethargy</td>
<td>d. Lethargy</td>
</tr>
<tr>
<td>e. Vomiting</td>
<td>e. Nausea</td>
</tr>
<tr>
<td>f. Vomiting</td>
<td>g. Headache</td>
</tr>
<tr>
<td>g. Headache</td>
<td>h. Joint and muscle pains</td>
</tr>
<tr>
<td>h. Joint and muscle pains</td>
<td></td>
</tr>
</tbody>
</table>

**Physical examination**

Always take the temperature, weigh the patient and carry out a general examination. Common signs of uncomplicated malaria are listed in Box 2.

**Common signs of uncomplicated malaria**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Raised body temperature (above 37.5°C as taken from the axilla)</td>
<td></td>
</tr>
<tr>
<td>b. Mild anaemia (mild pallor of palms and mucous membranes); occurs commonly in children</td>
<td></td>
</tr>
<tr>
<td>c. Dehydration (dry mouth, coated tongue and sunken eyes). In adults, sunken eyes are usually a sign of severe dehydration.</td>
<td></td>
</tr>
<tr>
<td>d. Enlarged spleen (in acute malaria it may be minimally enlarged, soft and mildly tender)</td>
<td></td>
</tr>
</tbody>
</table>
COMPLICATED MALARIA
Caused by *P. falciparum* infection.
It is an immediate threat to life and is therefore a medical emergency.
Malaria is regarded as severe if there are asexual forms of *P. falciparum* in blood plus one or more of the following complications:
- change of behavior, confusion or drowsiness
- altered level of consciousness or coma
- convulsions
- hypoglycemia
- acidosis
- difficulty in breathing
  - pulmonary oedema or respiratory distress syndrome
- acute renal failure
- severe anaemia
  - haematocrit <20%, Hb <6g/dL
  - dizziness, tiredness, pallor
- shock
- haemoglobinuria
- oliguria with very dark urine (coca-cola or coffee-colour)
- jaundice
- bleeding tendency
- prostration
- hyperparasitaemia
  (≥100,000 parasites/μL, MPs +++ or above)
- hyperpyrexia ≥40°C
- severe vomiting
- threatening abortion
  - uterine contractions, vaginal bleeding, etcetera
2. Parasitic diseases

Danger signs of severe illness

| a. | convulsions or fits within the last two days or at present |
| b. | not able to drink or breastfeed |
| c. | vomiting everything |
| d. | altered mental state (lethargy, drowsiness, unconsciousness or confusion) |
| e. | prostration or extreme weakness (unable to stand or sit without support) |
| f. | severe respiratory distress or difficult in breathing |
| g. | severe anaemia (Severe pallor of palms and mucous membranes) |
| h. | severe dehydration (sunken eyes, coated tongue, lethargy, inability to drink) |

Differential diagnosis

| a. | respiratory tract infection |
| b. | urinary tract infection |
| c. | meningitis |
| d. | Otitis media |
| e. | tonsillitis |
| f. | abscess |
| g. | skin sepsis |
| h. | measles or other infections with rashes |

If there are no danger signs and no other diseases a patient with fever is considered to be a case of uncomplicated malaria and treated accordingly.
Parasitological diagnosis of malaria
Parasitological diagnosis of malaria requires examination of blood smear for the presence of malaria parasites. Blood is examined by using a microscope or by Rapid Diagnostic Tests (RDTs).

Microscopic examination of a blood smear for malaria parasites
The 'gold standard' of malaria diagnosis is the examination of blood smear for malaria parasites. Where laboratory facilities exist, blood examination for malaria parasites must be done for the following groups of patients:

- patients who present with clinical features of severe malaria
- patients who have taken antimalarial treatment for 2 days and symptoms persist
- children aged less than four (4) months with symptoms of uncomplicated malaria
- pregnant women with symptoms of uncomplicated malaria

Note:
- Thick blood film: detection & quantification of parasites
- Thin blood film: species identification
- Other investigations guided by history & physical examination
Management

The Uganda National malaria treatment policy

<table>
<thead>
<tr>
<th>i. Treatment of uncomplicated malaria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The recommended first line medicine is Artemether/Lumefantrine. Antesunate + Amodiaquine is the alternative that may be used when Artemether/Lumefantrine is not available,</td>
</tr>
<tr>
<td>• The recommended second line medicine is oral quinine for all patients.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ii. Treatment of severe and complicated malaria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Parenteral quinine is the recommended treatment for the management of severe malaria for all patients. Parenteral Artemisinin derivatives may be used if quinine is contraindicated or not available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>iii. Intermittent preventive treatment (IPT) of malaria in pregnancy:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sulfadoxine/Pyrimethamine (SP) is the recommended medicine for IPT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>iv. Treatment of uncomplicated malaria for special groups:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Pregnant women:</strong> ACTs are contraindicated during the first trimester, Quinine should be used instead. Artemether/Lumefantrine or other Artemisinin Combined Treatment (ACTs) can be used after the first trimester.</td>
</tr>
<tr>
<td>• <strong>Children below 4 months of age:</strong> Artemether/Lumefantrine or other ACTs are not recommended for children below 4 months of age or 5 kg body weight. Such children should be treated with quinine.</td>
</tr>
</tbody>
</table>
2. Parasitic diseases

Dosage of Coartem tablets (Artemether 20 mg & Lumefantrine 120 mg)

<table>
<thead>
<tr>
<th>Weight (Kg)</th>
<th>Age</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 14</td>
<td>From 4 months up to 3 years</td>
<td>1 tablet twice a day/12 hourly</td>
<td>1 tablet twice a day/12 hourly</td>
<td>1 tablet twice a day/12 hourly</td>
</tr>
<tr>
<td>15-24</td>
<td>From 3 years up to 7 years</td>
<td>2 tablets twice a day/12 hourly</td>
<td>2 tablets twice a day/12 hourly</td>
<td>2 tablets twice a day/12 hourly</td>
</tr>
<tr>
<td>25 – 34</td>
<td>From 7 years up to 12 years</td>
<td>3 tablets twice a day/12 hourly</td>
<td>3 tablets twice a day/12 hourly</td>
<td>2 tablets twice a day/12 hourly</td>
</tr>
<tr>
<td>&gt;35</td>
<td>From 12 and above</td>
<td>4 tablets twice a day/12 hourly</td>
<td>4 tablets twice a day/12 hourly</td>
<td>4 tablets twice a day/12 hourly</td>
</tr>
</tbody>
</table>

The WHO recommended dosage for Artesunate (AS) + Amodiaquine (AQ) is the following:

<table>
<thead>
<tr>
<th>Age</th>
<th>Artesunate</th>
<th>Amodiaquine</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-11 months</td>
<td>25 mg (=1/2 tab)</td>
<td>76 mg (=1/2 tab)</td>
</tr>
<tr>
<td>1-6 years</td>
<td>50 mg (=1 tab)</td>
<td>153mg (=1 tab)</td>
</tr>
<tr>
<td>7-13 years</td>
<td>100mg (=2 tabs)</td>
<td>306mg (=2 tabs)</td>
</tr>
<tr>
<td>&gt;13yrs</td>
<td>200mg (=4 tabs)</td>
<td>612mg (=4 tabs)</td>
</tr>
</tbody>
</table>

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Dosage of Quinine tablets
(1 Quinine tab = 300mg salt)

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight</th>
<th>Dose (to be given every 8 hours for 7 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months up to 1 year</td>
<td>5kg up to 10kg</td>
<td>75mg (=1/4 tab)</td>
</tr>
<tr>
<td>1 year up to 5 years</td>
<td>10kg up to 18kg</td>
<td>150mg (=1/2 tab)</td>
</tr>
<tr>
<td>5 years up to 7 years</td>
<td>18kg up to 24 kg</td>
<td>225mg (=3/4 tab)</td>
</tr>
<tr>
<td>7 years up to 10 years</td>
<td>24kg up to 30 kg</td>
<td>300 mg (=1 tab)</td>
</tr>
<tr>
<td>10 years up to 13 years</td>
<td>30kg up to 40 kg</td>
<td>375 mg (1 1/4 tab)</td>
</tr>
<tr>
<td>13 years up to 15 years</td>
<td>40kg up to 50 kg</td>
<td>450 mg (1 1/2 tab)</td>
</tr>
<tr>
<td>15 years and over</td>
<td>over 50 kg</td>
<td>600 mg (=2 tabs)</td>
</tr>
</tbody>
</table>

Treatment with IV Quinine

This is used for treatment of severe malaria:

- **IV line:** establish an IV infusion line
- **Fluids:** correct dehydration by assessing and administering fluid requirements according to body weight
- **Antipyretic:** reduce body temperature if >38.5°C:
  - paracetamol 10mg/kg every 6 hours
    - adult dose = 1g, adult max = 4g/day
  - tepid sponging or fanning
- **Anticonvulsant:** treat detectable causes (e.g. hypoglycaemia, hyperpyrexia) then if necessary, give an anticonvulsant, e.g. diazepam 200 micrograms (0.2mg)/kg (max: 10mg) rectally, IV or (in adults) IM
2. Parasitic diseases

- **IV antimalarial:**
  At a health unit **without** admission and IV drug administration facilities:
  - Give a pre-referral dose of quinine hydrochloride 10mg/kg IM diluted to a strength of 100mg/mL and administered as described in the notes below
  - Refer for further management

At a health unit **with** admission and IV drug administration facilities:

  - Give quinine hydrochloride 10mg/kg
    - give IV infusion in 5-10mL/kg of glucose 5% and run over a 4 hour period
    - NB. Do **not** give a 20mg/kg loading dose of quinine
  - Continue with doses of 10mg/kg every 8 hours until patient improves and can take oral medication
  - Then change to **oral quinine** 10mg/kg every 8 hours (see notes below) and continue quinine treatment for at least 72 hours

**After 72 hours:**

  - *Either* continue with quinine to complete a full 7 days quinine treatment (from start of IV quinine)
    - *or* give an alternative to oral quinine such as Sulfadoxine Pyrimethamine-SP.

i) **IM quinine (dose dilution)**

  For pre-referral doses or if it is not possible to give quinine IV:
  - dilute to a concentration of 100mg/mL
  - give the dose IM (10mg/kg every 8 hours)
    - For example, for an ampoule of 600mg/2mL, add 4mL of water for injection to get 600mg in 6mL (=100mg/mL)
2. Parasitic diseases

If the diluted volume for the required dose is >3ml:
- give half the volume into the anterior right thigh and the other half into the anterior left thigh
- repeat the procedure every 8 hours until the patient can take oral medication then change to oral quinine

2.8 Management of complications of severe malaria

- **Hypoglycaemia:** give glucose 50%
  0.5-1mL/kg as an IV bolus diluted with an equal volume of water for injections
  - give glucose dose by NGT if IV route not possible
  - monitor blood glucose frequently
  - ensure patient is feeding
- **Acidosis:** correct fluid & electrolyte balance
  If there is severe acidosis without sodium depletion:
  - give sodium bicarbonate 8.4% infusion 50mL IV
  - monitor plasma pH
- **Pulmonary oedema:**
  - regulate the IV infusion
  - prop up the patient
  - give oxygen
  - give furosemide
- **Acute renal failure:**
  Urine output: <17mL/hr (adult) or <0.3mL/kg/hr (child)
  - check to ensure that the cause of oliguria is not dehydration or shock
  If due to acute renal failure: give a challenge dose of furosemide 40mg IM or slow IV (child: 1mg/kg)
  If this fails: arrange for peritoneal or haemodialysis
2. Parasitic diseases

- **Severe anaemia**
  - do blood grouping and cross-matching
  - transfuse patient with packed cells 10-15mL/kg
    or whole blood 20mL/kg especially if the anaemia is also causing heart failure
  - repeat Hb/PCV before discharge and preferably on day 28 days after discharge
- **Shock**: if systolic BP <80mm Hg (adult) or <50mm Hg (child) or if peripheral pulse absent and capillary refill is slow (>2 seconds):
  - raise the foot of the bed
  - give sodium chloride 0.9% by fast IV infusion
  - review fluid balance and urinary outputs
  - look for evidence of haemorrhage or septicaemia and treat accordingly
- **Haemoglobinuria (intravascular haemolysis):**
  - Investigate and treat the cause
  - Discontinue any suspect medicine
  - Steroids may be of value
- **Bleeding tendency:** transfuse patient with whole fresh blood to provide lacking clotting factors
- **Convulsions:** give diazepam 200 micrograms (0.2mg)/kg (max: 10mg) rectally, IV or (in adults) IM
  If they still persist: give phenobarbitone 200mg IM
  (child: 10-15mg/kg) then 2.5mg/kg once or twice daily if still necessary
- **Coma:** provide intensive nursing care with:
  - IV drip (for rehydration and IV medication
  - NGT (for feeding and oral medication)
  - Urethral catheter (to monitor urine output)
  - Turning of patient frequently to avoid bedsores
- **Hyperpyrexia:** give paracetamol 1g every 6 hours (child: 10mg/kg) + tepid sponging + fanning
2. Parasitic diseases

Criteria for referral to regional/tertiary hospital
- Persistent renal failure needing dialysis
- Any complication that cannot be managed locally

2.9 Malaria prophylaxis

Not recommended for all those living in a highly endemic area like Uganda. However, it is recommended for certain high-risk groups but is not 100% effective.

1 In pregnancy
- endemic areas carry MPs in her blood or placenta which are detrimental to Give intermittent presumptive treatment (IPT)
- which assumes all pregnant women in the well being of her and the foetus
  - SP single dose (3 tabs) in 2nd and 3rd trimesters
    - give first dose between weeks 16-24
    - give second dose between weeks 28-36
  - In HIV +ve patients: give IPT on three occasions between weeks 16-36 with at least 4 weeks between doses

- Ensure doses are taken under supervision by the health provider as directly observed therapy (DOT)
- Record doses on the patient’s card and treatment register and summarise further in the delivery book and monthly returns

2 Sickle-cell disease patients
- Chloroquine 300mg base weekly
  - child: 5mg(base)/kg weekly

3 Non-immune visitors/tourists
- Mefloquine 250mg once weekly
  - child: 5mg/kg weekly
Alternative for non-immune visitors:

- **Chloroquine** 300mg base weekly
  - *child*: 5mg(base)/kg weekly
- **plus proguanil** 200mg daily
  - *child*: 3mg/kg daily

### 2.10 Malaria prevention and control

- **Give effective treatment and prophylaxis**
  - eliminate parasites from the human population by early diagnosis and effective treatment
  - protect vulnerable groups with chemoprophylaxis
  - give IPT to all pregnant women

- **Reduce human-mosquito contact**
  - use insecticide-treated materials (e.g. bed nets)
  - destroy adult mosquitoes by residual spraying of dwellings with insecticide or use of knock-down sprays
  - screen houses
  - carefully select house sites avoiding mosquito-infested areas
  - wear clothes which cover the arms and legs and use repellent mosquito coils and creams/sprays on the skin when sitting outdoors at night

- **Control breeding sites**
  - eliminate collections of stagnant water where mosquitoes breed, e.g. in empty cans/containers, potholes, old car tyres, plastic bags, footprints, etc. by disposal, draining or covering with soil, sand, etc
  - destroy mosquitoe larvae by dosing stagnant water bodies with insecticides or with biological methods (e.g. larvae-eating fish)

- **Give public health education** on the above measures

### 2.11 ONCHOCERCIASIS (River blindness)

Chronic filarial disease
2. Parasitic diseases

Cause
- *Onchocerca volvulus* transmitted by a bite from a female black fly (*Simulium damnosum*, *S. naevi* and *S. oodi*, etc) which breeds in rapidly flowing and well-aerated water

Clinical features

Skin
- Fibrous nodules usually in pelvic girdle and lower extremities (due to adult worms)
- Intense pruritic rash, altered pigmentation, oedema and atrophy (due to microfilariae)
- Loss of elasticity leading to hanging groin and sometimes hernia

Eye
- Visual disturbances and blindness

Differential diagnosis
- Other causes of skin depigmentation e.g. yaws, burns, vitiligo
- Other causes of fibrous nodules in the skin e.g. neurofibromatosis

Investigations
- Skin snip after sunshine to show microfilariae in fresh preparations
- Excision of nodules for adult worms
- Pressure of microfilariae in the anterior chamber of the eye

Management of onchocerciasis and other filariasis
- **ivermectin** 150 micrograms/kg once yearly  
  - see also dose table below
  - not recommended in children <5yrs or nursing mothers
  - no food or alcohol to be taken within 2 hours of a dose

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2. Parasitic diseases

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 158</td>
<td>12mg</td>
</tr>
<tr>
<td>141-158</td>
<td>9mg</td>
</tr>
<tr>
<td>120-140</td>
<td>6mg</td>
</tr>
<tr>
<td>90-119</td>
<td>3mg</td>
</tr>
<tr>
<td>&lt; 90</td>
<td>do not use</td>
</tr>
</tbody>
</table>

2.12 PEDICULOSIS

Infestation by lice

**Cause**
- *Pediculosis humanus capitis* (head lice),
- *Pediculosis humanus corporis* (body lice),
- *Phthirius pubis* (pubic lice)
- Usually transmitted directly by person-to-person contact but may also be transmitted indirectly via the clothing, towels and bedding of infested persons

**Clinical features**
- Severe itching of affected areas, scratch marks
- Secondary bacterial infection

**Differential diagnosis**
- Scabies

**Management**

- Preferably shave the affected area
- Paint the affected body surface with benzyl benzoate application (BBA) 25%
- Repeat after 24 hours
- Treat all household contacts at the same time

**Note:**
- *Head lice:*
  - Do not use BBA in children <2 years - it is very irritant to the eyes
  - If the head is not shaved, ensure that the BBA is
2. Parasitic diseases

- Massaged well into the scalp
- Soak all brushes and combs in BBA for at least 2 hours

*Pubic lice:*
- Treat all sexual partners at the same time

**Prevention**
- Health education on improving personal hygiene by regular bathing, washing of clothes,

### 2.13 SCHISTOSOMIASIS (Bilharziasis)

Disease of the large intestine and the urinary tract due to infestation by a Schistosoma blood fluke

**Causes**
- *Schistosoma haematobium* (urinary tract)
- *S. mansoni* (gut)
- *S. japonicum* (gut)
- The larvae form (cercariae) of *Schistosoma* penetrate the skin from contaminated water

**Clinical features**
- *S. haematobium* (urinary tract)
  - Painless blood stained urine at the end of urination - terminal haematuria
  - Frequency of urinating (cystitis & fibrosis)
  - Hydronephrosis, pyonephrosis, hypertension, uraemia *S. mansoni* (GIT)
  - Abdominal pain, frequent stool with bloodstained mucus
  - Palpable liver (hepatomegally), signs of portal hypertension and haematemesis
  - It can also be a carrier for Salmonella

*S. japonicum*
- Not common in Uganda

**Differential diagnosis**
- Cancer of the bladder (*S. haematobium*)
- Dysentery (*S. mansoni*)

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2. Parasitic diseases

**Investigations**
- History of staying in an endemic area
- Urine examination (for *S. haematobium* ova)
- Stool examination (for *S. mansoni* ova)
- Rectal snip (for *S. mansoni* and *S. japonicum*)
- Bladder X-ray for calcification
- IVP or ultrasound for urinary tract and liver.

*Complications (not routine)*
- Cystoscopy

**Management**
- Praziquantel 40mg/kg single dose

**Prevention**
- Avoid urinating or defecating in or near water
- Avoid washing or stepping in contaminated water
- Effective treatment of cases
- Clear bushes around landing sites

2.14 STRONGYLOIDIASIS

*Strongyloides stercoralis* infestation of the human intestine

**Clinical features**
- Skin symptoms: itchy eruption at the site of larval penetration
- Intestinal symptoms may occur e.g. abdominal pain, diarrhoea and weight loss
- Lung symptoms due to filariform larvae in the lungs e.g. cough and wheezing,
- Specific organ involvement, e.g. meningoencephalitis
- Hyperinfection syndrome:
  - occurs when immunity against auto-infection fails, e.g. in immunosuppressed cases

**Differential diagnosis**
- Other worm infestations

**Investigations**
- Stool examination for motile larvae and adult worms - several specimens should be examined
2. Parasitic diseases

➢ Blood for serological tests (not routine)

Management

➢ mebendazole 500mg single dose  \text{HC2}
  \textit{child} <2yrs: 250mg

➢ \textit{or} ivermectin 150micrograms/kg single dose  \text{HC3}
  \textit{child}: see dose table in 2.8 Onchocerciasis,

Prevention

• Avoid walking barefoot
• Ensure proper faecal disposal
• Deworm children regularly every 3-6 months

2.15 TAENIASIS (Tapeworm infestation)

Causes/types

• \textit{Taenia saginata} (from undercooked beef)
• \textit{Taenia solium} (from undercooked pork)
• \textit{Diphyllobothrium latum} (from undercooked fish)

Clinical features

\textit{T. saginata}

• Usually asymptomatic but live segments may be passed
• Epigastric pain, diarrhoea, sometimes weight loss

\textit{T. solium}

• Usually asymptomatic but live segments may be passed
• Heavy larvae infestation causes cysticercosis (muscle pains, weakness, or fever)
• CNS involvement may cause meningo-encephalitis or epilepsy

\textit{D. latum}

• Usually asymptomatic but mild symptoms may occur
• Megaloblastic anaemia may occur as a rare complication

Investigations

➢ Stool: for eggs, proglottids and rarely scolex
2. Parasitic diseases

Management
- mebendazole 500mg single dose  
  child <2yrs: 250mg  
  or niclosamide 2g single dose  
  child <2yrs: 500mg  
  2-6yrs: 1g  
  >6yrs: 2g  
  - the tablet(s) should be chewed at breakfast  
  - give a purgative 2 hours after the dose, e.g.  
    bisacodyl 10mg  
    child: 5mg

Prevention
- Avoid uncooked or undercooked pork, beef, or fish

2.16 TRICHURIASIS (Whipworm infestation)

Infestation of the human caecum and upper colon by Trichuris trichiura (whipworms)

Clinical features
- May be symptomless
- Heavy infestation may cause bloody, mucoid stools and diarrhoea
- Complications include anaemia and prolapse of the rectum

Differential diagnosis
- Other worm infestations
- Other causes of bloody mucoid stools

Investigations
- Stool examination
- Sigmoidoscopy

Management
- mebendazole 500mg single dose  
  child <2yrs: 250mg

Prevention
- Ensure personal hygiene
- Ensure proper faecal disposal
- Deworm children regularly every 3-6 months
2.17 HUMAN AFRICAN TRYPANOSOMIASIS  
(Sleeping sickness)

A disease transmitted to humans by several species of tsetse fly belonging to the genus Glossina

**Cause**
- Two types of trypanosomes (a protozoa) spread through the bite of tsetse fly:
  - *Trypanosoma rhodesiense* (mostly in the Central and Eastern regions)
  - *Trypanosoma gambiense* (mostly in West Nile region)

**Clinical features**
- May be history of tsetse fly bite
- May be swelling at site of bite after 7-14 days
- Headache not responding to common analgesics
- Fever
- Lymphadenopathy (generalised)
- Weight loss
- At later stage: sleepiness (*T. gambiense*)
- Coma and death if not treated

**Differential diagnosis**
- Malaria
- TB
- Meningitis
- AIDS

**Investigations**
- Blood: slides for trypanosomes
- CSF: for trypanosomes
- Aspirate from chancre or lymph node: for trypanosomes

**Management**
This is based on the findings of the CSF analysis. To determine the drug of choice, the disease is divided into two stages: **early** and **late stage**
2. Parasitic diseases

Management of early stage
CSF is normal, i.e.
- Lymphocytes 5 cells/cubic millimetre
- Total protein <37mg/dL (by dye-binding protein assay) or <25mg/dL (by Double Standard & Centrifuge Method)
- Absence of trypanosomes (by Double Standard and Centrifuge Method)

Treatment for early stage

T. rhodesiense:
- suramin IV

T. gambiense:
- suramin IV
  - in onchocerciasis-free areas
    - or pentamidine 4% or 10% IM
  - in onchocerciasis-endemic areas
    - or if the drug has not been used locally for prophylaxis

Treatment schedule for early stage

T. rhodesiense or T. gambiense (adult 50kg and over)

<table>
<thead>
<tr>
<th>Day</th>
<th>Suramin IV</th>
<th>Pentamidine 4% IM</th>
<th>Pentamidine 10% IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>250mg (test dose)</td>
<td>200mg (5mL)</td>
<td>200mg (2mL)</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>200mg</td>
<td>200mg</td>
</tr>
<tr>
<td>2</td>
<td>500mg</td>
<td>200mg</td>
<td>200mg</td>
</tr>
<tr>
<td>3</td>
<td>Do LP</td>
<td>200mg</td>
<td>200mg</td>
</tr>
</tbody>
</table>

If no trypanosomes give five 1g doses as follows:

| 4   | 1g | 200mg | 200mg |
| 5   | - | 200mg | 200mg |
| 6   | - | 200mg | 200mg |
| 10  | 1g | - | - |
| 16  | 1g | - | - |
| 22  | 1g | - | - |
| 28  | 1g | - | - |

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2. Parasitic diseases

**Management of late stage** (CSF is abnormal) - see table below for detailed dose regime

*T. rhodesiense:*
- day 0 and 2: **suramin** IV
- then from day 4:
  - **melasoprol 3.6%** IV
  - plus oral **corticosteroids**

*T. gambiense:*
- preferably (if available) day 0 and day 2 start with: **suramin** IV
  - or (in onchocerciasis-endemic areas):
    - **pentamidine** IM (day 0, 1 and 2 - as in Table above)
- then from day 4 give:
  - **melarsoprol 3.6%** IV
  - plus oral **corticosteroids**

**Note:**
- **suramin**: do not use this drug for early or late-stage *T. gambiense* treatment in onchocerciasis-endemic areas as it may cause blindness in any onchocerciasis-infected patients by killing the filariae in the eye
  - use **pentamidine** instead
- **corticosteroids**: should be given to patients with late trypanosomiasis on melarsoprol who may have hypoadrenalism - the steroids may also reduce any drug reactions

**Prevention**
- Trapping of tsetse flies
- Clearing of bushes around homes and paths
- Early detection and treatment of cases
- Provision of latrines so that people do not go into the bush where they are likely to come into contact with tsetse flies
**Cortisone:**
- do not give this after day 24 even though the melarsoprol treatment is not yet complete
- if prednisolone is used instead of this, the anti-inflammatory action is similar but the correction of the hypoadrenalism will be much less marked

**Treatment schedule for late stage**
*T. rhodesiense* or *T. gambiense* (adult 50kg and over)

<table>
<thead>
<tr>
<th>Day</th>
<th>Suramin IV or Melarsoprol 3.6% IV</th>
<th>Cortisone oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>suramin 250mg (test dose)</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>suramin 500mg</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Do LP</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>If trypanosomes present, on day 4, continue with:</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>melarsoprol 0.5mL</td>
<td>50mg</td>
</tr>
<tr>
<td>5</td>
<td>melarsoprol 1mL</td>
<td>50mg</td>
</tr>
<tr>
<td>6</td>
<td>melarsoprol 1.5mL</td>
<td>50mg</td>
</tr>
<tr>
<td>7-10</td>
<td>-</td>
<td>50mg</td>
</tr>
<tr>
<td>11-13</td>
<td>-</td>
<td>37.5mg</td>
</tr>
<tr>
<td>14</td>
<td>melarsoprol 2mL</td>
<td>37.5mg</td>
</tr>
<tr>
<td>15</td>
<td>melarsoprol 2.5mL</td>
<td>37.5mg</td>
</tr>
<tr>
<td>16</td>
<td>melarsoprol 3mL</td>
<td>37.5mg</td>
</tr>
<tr>
<td>17</td>
<td>-</td>
<td>37.5mg</td>
</tr>
<tr>
<td>18-22</td>
<td>-</td>
<td>25mg</td>
</tr>
<tr>
<td>23</td>
<td>melarsoprol 3.5mL</td>
<td>25mg</td>
</tr>
<tr>
<td>24</td>
<td>melarsoprol 4mL</td>
<td>25mg</td>
</tr>
<tr>
<td>25-30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>31-33</td>
<td>melarsoprol 5mL</td>
<td>-</td>
</tr>
</tbody>
</table>
2. Parasitic diseases

Child doses: calculate using body weight as follows:
- suramin: 20mg/kg
- pentamidine: 4mg/kg
- melarsoprol: weight (kg)/60 x adult dose
3. RESPIRATORY DISEASES

3.1 ASTHMA

A chronic inflammatory disease of the airways involving many cells which leads to muscle spasm, mucus plugging, and oedema resulting in recurrent wheezing, cough, breathlessness and chest tightness.

Acute attacks may be caused by URTI (e.g. flu) and exposure to irritant substances, e.g. dust, exercise, cold.

Causes
- Not known but associated with allergies, inherited and environmental factors

Clinical features
- No fever (if fever present, refer to Pneumonia),
- Difficult breathing with chest tightness and may be use of accessory muscles. May not appear very distressed in severe attack
- Wheezing, rhonchi
- Cough - usually dry, may be intermittent, persistent or acute

Differential diagnosis
- Heart failure
- Other causes of chronic cough
- Bronchiolitis
- Bronchiectasis

Investigations
- Diagnosis is mainly by clinical features

Specialized investigations:
- Lung function: peak flow rate
- Sputum: for eosinophilia, Gram stain for bacteria (when available)

If evidence of bacterial infection:
- X-ray: chest
- Blood: haemogram
3. Respiratory diseases

### 3.1.1 Management of acute asthma attacks

- Regard each emergency consultation as being for **acute severe asthma** unless shown otherwise
- Failure to respond adequately **at any time** requires immediate referral to hospital

#### a) Adults and children >12

**Uncontrolled asthma**

**Clinical features**
- Speech normal
- Pulse <110 bpm
- Respiration <25 breaths/minute
- Peak flow >50% of predicted or best

**Management**

- Treat as an out-patient [HC3](#)
- Give salbutamol 5mg by nebuliser or inhaler 2 puffs (200µg) every 10 minutes for a 30-60 minutes.
- Monitor response 30 minutes after the dose

*If peak flow 50-75% of predicted or best or patient says s/he feels better, give:*

- **Prednisolone** 30-60mg as single dose, or in 2-3 divided doses
- *and* step up the usual treatment

*Alternatively, if peak flow >75% of predicted or best:*

- Step up the usual treatment
- Review within 48 hrs
  - monitor symptoms & peak flow
  - arrange self-management plan
  - adjust treatment according to guidelines for chronic asthma

**Acute severe asthma**

**Clinical features**
- Cannot complete sentences
- Pulse ≥110 bpm
3. Respiratory diseases

- Respiration ≥ 25 breaths/minute
- Peak flow <50% of predicted or best

**Management**
- Seriously consider hospital treatment if >1 of the above features are present
- **oxygen** 40-60%
- Give **salbutamol** 5mg by nebuliser or inhaler 2 puffs (200µg) every 2-5 minutes for 20 puffs
- **prednisolone** 30-60mg single dose
  - or **hydrocortisone** 200mg IV bolus stat
- Monitor response 30 minutes after nebulisation

**If any signs of acute asthma persist:**
- Refer for admission to hospital
- While waiting for ambulance, repeat the salbutamol 5mg by nebuliser
  - or give **aminophylline** 250mg slow IV bolus
  - but **not** if taking an oral theophylline

*Alternatively, if symptoms have improved, respiration & pulse are settling and peak flow >50%:*  
- Step up the usual treatment
- **and** continue with **prednisolone**
- Review within 24 hrs
  - monitor symptoms & peak flow
  - arrange self-management plan
  - adjust treatment according to guidelines for chronic asthma

**Life-threatening asthma**
- Silent chest
- Cyanosis
- Bradycardia or exhaustion
- Peak flow <33% of predicted or best

**Management**
- Arrange for **immediate** hospital referral and admission

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While waiting for the ambulance:
- Immediately give **prednisolone** 30-60mg single dose
  or **hydrocortisone** 200mg IV bolus stat
- **oxygen** 40-60%
- **salbutamol** 500 micrograms SC
  or **aminophylline** 250mg slow IV bolus - but **not** if taking an oral theophylline
- Stay with the patient until the ambulance arrives

**Notes**
- Patients with severe or life-threatening asthma may not be distressed and may not have all the clinical features listed; the presence of **any** should alert the clinician.
- If the patient says they feel very unwell, listen to them!
  ✗ Do **not** give bolus aminophylline to any patient already taking an oral theophylline, e.g. aminophylline

**b) Children <12**

**Clinical features**

**Acute mild asthma attack**
- Mild dyspnoea
- Diffuse wheezes
- Adequate air exchange
- Peak flow meter reading is ≥ 80% of normal

**Acute severe asthma:**
- Too breathless to talk or feed
- Respiration:
  - child <5 yrs: >50 bpm child ≥5yrs: 40 bpm
- Pulse:
  - child <5 yrs: >140 bpm child ≥5yrs: 120 bpm
- Use of accessory muscles of breathing (young children)
- Peak flow ≤ 50% of predicted or best (older children)
Life-threatening asthma:
- Cyanosis
- Silent chest or poor respiratory effort
- Fatigue or exhaustion
- Peak flow <33% of predicted or best (older children)

Management

Mild-moderate acute episode
- Treat as an out-patient HC3
- **salbutamol tablets**
  
  *child*: <2yrs: 100 micrograms/kg
  2-6yrs: 1-2mg
  6-12yrs: 2mg
  - only use tablets when inhaler or nebuliser solution are not available

  **or salbutamol inhaler** 100 micrograms (1 puff) HC4 every 30 seconds
  - repeat prn up to 10 puffs until symptoms relieved (preferably give doses using a large volume spacer, and face mask in the very young if available)
  
  **or salbutamol nebuliser solution** 2.5mg by nebuliser
  - if initial response is poor, repeat after 15 minutes
  - review after every 3-4 hours and continue if necessary with the above dose every 3-4 hours

- Review after 3-4 hours

If response is favourable, i.e.
- **Respiratory rate** ↓
- **Use of accessory muscles** ↓
- **Improved ‘behaviour’ pattern**

- Repeat **salbutamol** doses above every 3-4 hours (consider doubling the dose of any inhaled corticosteroid if the patient was taking this prior to the attack)
If salbutamol still required every 3-4 hours after 12 hours of treatment:
- Give 1-3 day course of prednisolone:
  - child <1yr: 1-2 mg/kg/day
  - 1-4yrs: up to 20mg daily
  - 5-15yrs: up to 40mg daily

If unresponsive or relapse within 3-4 hours:
- Refer immediately to hospital
- Increase frequency of salbutamol doses:- give as often as required
- Start prednisolone (doses as above)
- Give high-flow oxygen via face-mask or nasal cannula

3.1.2 Management of chronic asthma

- **Follow a stepped approach**
  - start at the step most appropriate to initial severity

- **Rescue course**
  - give a 1-3 days ‘rescue course’ of prednisolone at any step and at any time as required to control acute exacerbations of the asthma at a dose of:
    - child <1 yr: 1-2mg/kg daily 1-5 yrs: up to 20mg daily
    - 5-15 yrs: up to 40mg daily adult: 40-60mg daily for up to 3 days, then taper off during the next 4 days

- **Stepping down**
  - review treatment every 3-6 months
  - if control of asthma is achieved, stepwise reduction may be possible
  - if treatment started recently at Step 4 (or contained corticosteroid tablets), reduction may take place after a short interval; in other patients 1-3 months or longer of stability may be needed before stepwise reduction can be done

- **Always check compliance and inhaler technique** before stepping up
3. Respiratory diseases

a) Adults and children >5

**Step 1: occasional relief bronchodilator**
- Inhaled short-acting beta₂ agonist
  - eg. *salbutamol* inhaler 1-2 puffs
  - (100-200 micrograms) when necessary up to *once* daily
    - move to Step 2 if more than this needed or there are night-time symptoms
  - or *salbutamol* tablets: 2-4mg as above
    - only use if inhaler not available as less effective

**Step 2: regular inhaled preventer therapy**
- *salbutamol* inhaler 1-2 puffs prn
  - plus regular standard-dose inhaled corticosteroid, eg. *beclomethasone* 100-400 micrograms every 12 hours
    - higher dose may be needed initially to gain control
    - doubling of the regular dose may be useful to cover exacerbations

**Step 3: regular high-dose inhaled corticosteroids**
- *salbutamol* inhaler 1-2 puffs prn up to 2-3 hourly
  - usually 4-12 hourly
- *plus beclomethasone* (inhaler) 0.4-1mg every 12 hours

**Step 4: regular corticosteroid tablets**
- *salbutamol* (as in Step 3)
- *plus regular high-dose beclomethasone* (as in Step 3)
- *plus regular prednisolone* 10-20mg daily after breakfast

b) Children <5
- If available, use a large-volume spacer for inhaler doses
- Avoid oral corticosteroids in children below 12 years
Step 1: occasional relief bronchodilator
- short-acting beta₂ agonist (not more than once daily) eg. salbutamol inhaler 1-2 puffs (100-200 micrograms) - this is the preferred route as it is more effective and has less side-effects
  or salbutamol tablets:
  child <2: 100 micrograms/kg 2-5yrs: 1-2mg
- Move to Step 2 if more than this needed or there are night-time symptoms

Step 2: regular inhaled preventer therapy
- salbutamol prn (doses as in Step 1)
- plus regular standard paediatric dose inhaled corticosteroid, eg. beclomethasone inhaler
  50-100 micrograms (1-2 puffs) 2-4 times daily
  - initial dose depends on age, weight and severity of asthma
  - assess effect after 1 month and adjust the dose prn;
  if control not adequate, consider doubling the dose for 1 month

Step 3: increased-dose inhaled corticosteroids
- salbutamol prn (doses as in Step 1)
- plus regular high paediatric dose inhaled corticosteroid, eg. beclomethasone inhaler
  100-200 micrograms
  (2-4 puffs) 2-4 times daily
- Consider a short ‘rescue’ course of oral prednisolone

Step 4: regular higher-dose inhaled corticosteroids + regular bronchodilator
- salbutamol prn (doses as in Step 1)
- plus regular higher-dose inhaled corticosteroid, eg. beclomethasone up to 2mg daily in divided doses
- Consider:
  - a short ‘rescue’ course of oral prednisolone
  - nebulised salbutamol:
3. Respiratory diseases

**child >18 mths:** 2.5mg up to 4 times daily
(increase to 5mg/dose if necessary)

*If there is suspicion of infection (fever, purulent yellow sputum)*, add 7-10 day course of an antibiotic:

- **amoxicillin** 500mg every 8 hours
  - *child:* 15mg/kg per dose
  - *or cotrimoxazole* 480mg every 12 hours
  - *child:* 24mg/kg per dose

**Alternative in severe infection:**

- **benzylpenicillin** 1-2 MU IV or IM every 6 hours
  - for 5 days  *child:* 50,000 IU/kg per dose

**Caution**

- **Do not** give drugs such as morphine, propranolol or other B-blockers to patients with (family history of) asthma as they cause worsening of respiratory problems
- **Do not** give sedatives to children with asthma even if they are restless

**Prevention**

- Avoid precipitating factors, eg.
  - cigarette smoking
  - aspirin
  - known allergens such as dust, pollens, animal skins
  - exposure to cold air
- Exercise can precipitate asthma in children, advise them to keep an inhaler handy during sports and play
- Effectively treat respiratory infections

### 3.2 BRONCHIOLITIS

Acute inflammatory obstructive disease of small airways (bronchioles) common in children <1 year

**Causes**

- Mainly viral
- Mycoplasma

UCG 2010
Clinical features
- Disease of infants, sudden onset
- Fever
- Cough
- Difficulty in breathing, wheezing
- Mucoid nasal discharge

Differential diagnosis
- Asthma
- Pneumonia
- Foreign body inhalation
- Heart failure
- Whooping cough

Investigations
- By clinical features
- X-ray: chest
- Blood: haemogram

Management
Bronchiolitis is viral but if there is suspicion of secondary bacterial infection, then an antibiotic can be given

**Mild-moderate:**
- wheezing, 50-60 breaths/minute, no cyanosis
  - Treat the symptoms (possibly as an out-patient)
  - PPF 20,000 IU/kg IM once daily for 5 days  
  
**Severe:**
- wheezing, fast breathing >60 breaths/minute, cyanosis
  - Admit
  - Give nasal oxygen
  - benzylpenicillin 50,000-100,000 IU/kg IV or IM  
    every 6 hours for 5 days
  - or chloramphenicol 25mg/kg IV or IM every 6 hours for 5 days
  - salbutamol 1mg every 8 hours until wheezing controlled
    - may not be useful in non-recurrent wheezing and in the very young
3. Respiratory diseases

- Give as much oral fluids as the child will take:
  eg. **ORS**
  - give basic total fluid requirement of 150mL/kg/24hrs plus extra to cover increased losses due to illness (see also Dehydration.

**Prevention**
- Avoid exposure to cold and viral infections

### 3.3 ACUTE BRONCHITIS

Acute inflammatory disease of the bronchi

**Causes**
- Bacterial:
  - *Streptococcus pneumoniae*
  - *Haemophilus influenzae*
- Predisposing factors:
  - Viral infections of the respiratory tract
  - Whooping cough
  - Dust, smoke
  - Exposure to cold
  - Cigarette smoking

**Clinical features**
- Irritating, productive cough sometimes with scanty mucoid, blood streaked sputum
- Chest tightness sometimes with wheezing
- Fever may be present

**Differential diagnosis**
- Bronchial asthma
- Emphysema
- Pneumonia
- Tuberculosis

**Investigations**
- Diagnosis based on clinical features
- Chest X-ray
- Pulmonary function tests
3. Respiratory diseases

Management
Most cases are viral and mild

- **paracetamol** 1g every 4-6 hours (max: 4g daily)
  - *child*: 10mg/kg (max: 500mg) per dose
- plenty of oral fluids

  *If there is suspicion of bacterial infection or a WBC count shows leucocytosis, give 5-day course of:*

- **doxycycline** 100mg every 12 hours
  - *child >8yrs*: 2mg/kg per dose
  - ✗ contraindicated in pregnancy
- or **cotrimoxazole** 960mg every 12 hours
  - *child*: 24mg/kg per dose
- or **amoxicillin** 500mg every 8 hours
  - *child*: 15mg/kg per dose

Prevention
- Avoid predisposing factors above

3.4 CORYZA (Common cold)

Acute inflammation of the upper respiratory tract

Cause
- Viruses - several types, often rhinoviruses

Clinical features
- Onset usually sudden
- Tickling sensation in nose and sneezing
- Throat dry and sore
- Profuse nasal watery discharge
- Thick purulent nasal discharge - suggests secondary infection

Complications
- Sinusitis
- Lower respiratory tract infection (pneumonia)
- Deafness, otitis media
- Headache
- Earache

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3. Respiratory diseases

**Differential diagnosis**
- Nasal allergy

**Management**

Common cold is a viral disease and so does **not** require any antibiotics. Give **only** symptomatic treatment:
- Increase fluid intake, preferably warm drinks
- Give **analgesics**
  - For breastfeeding children:
    - Continue breastfeeding
    - Clear the nose to ease breathing or feeding
    - Keep the child warm

**Prevention**
- Avoid contact with infected persons
- Include adequate fresh fruits and vegetables in the diet

### 3.5 ACUTE EPIGLOTTITIS

An acute inflammation of the epiglottis, a rare but serious disease of young children. Airway obstruction is always severe and intubation or tracheostomy is often needed

**Cause**
Bacterial infection, almost always *Haemophilus influenzae*

**Clinical features**
- Fever
- Sore throat
- Stridor and cough
- Asphyxia leading to quick death

**Differential diagnosis**
- Laryngeal causes of stridor eg. laryngotracheobronchitis

**Caution**
- Avoid tongue depression examination as this may cause complete airway blockage and sudden death

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3. Respiratory diseases

**Management**

- Admit and treat as an emergency – intubation or tracheostomy may often be needed
- Give **chloramphenicol** 25mg/kg IM or IV every 6 hours for 5 days

**3.6 INFLUENZA (‘Flu’)**

A specific acute respiratory tract illness occurring in epidemics and occasionally pandemics

**Cause**
- Influenza viruses of several types and strains
- Spread by droplet inhalation

**Clinical features**
- Sudden onset
- Headache
- Pain in back and limbs
- Anorexia, sometimes nausea and vomiting
- Fever for 2-3 days with shivering
- Inflamed throat
- Harsh unproductive cough

**Complications**
Due to secondary bacterial infection:
- Tracheitis
- Bronchitis
- Bronchiolitis
- Bronchopneumonia

**Others:**
- Depression
- Toxic cardiomyopathy and sudden death

**Differential diagnosis**
- Other respiratory viral infections

**Investigations**
- Isolation of virus
- Viral serology to identify virus
3. Respiratory diseases

Management

If no complications: treat symptoms

- **paracetamol** 1g every 4-6 hours prn (max daily: 4g)
  - *child*: 10mg/kg per dose

*For nasal congestion:*

- Use steam inhalation prn
  - or **xylometazoline nose drops 0.05%**
    - 2-3 drops into each nostril 3 times daily
    - (max: 7 days)

*In the breastfeeding child:*

- If blockage interferes with breastfeeding: -
  - clean/clear nose with physiological saline
- Keep child warm
- Breast-feed more frequently

*For troublesome cough*

- **simple linctus**: 5mL 3-4 times daily
- Frequent warm drinks
- Check for secondary bacterial infections and manage or refer

**Prevention**

- Avoid contact with infected persons

3.7 LARYNGITIS

An acute non-suppurative infection of the larynx which may involve surrounding structures, eg. pharynx and trachea

**Cause**

- Viruses: para-influenza group, influenza
  - by far the most common cause
- Bacteria: *Mycoplasma pneumoniae*
- Excessive use of the voice, allergic reactions, inhalation of irritating substances, eg. cigarette smoke
3. Respiratory diseases

Clinical features
- Onset similar to any upper respiratory tract infection
- Fever usually mild
- Stridor common
- Airway obstruction with difficulty in breathing
- Suprasternal and intercostal recession on inspiration
- Hypoxia, restlessness, anxiety, cyanosis

Differential diagnosis
- Diphtheria
- Whooping cough
- Laryngotracheobronchitis
- Foreign body aspiration
- Epiglottitis
- Bacterial tracheitis
- Asthma
- Airway compression by extrinsic mass, for example: haemangioma, tumours, cysts

Investigations
- Blood: haemogram
- X-ray: chest
- Laryngeal swab for C&S

Management
- The cause is usually viral for which there is no specific treatment and no need for antibiotics
- Give analgesics
- Use steam inhalations 2-3 times daily
- Rest the voice
  
  If definite signs of bacterial infection :( all 5-day courses)

- **doxycycline** 100mg daily
  - ✖ contraindicated in pregnancy
  - or **cotrimoxazole** 960mg every 12 hours
  - or **amoxicillin** 500mg every 8 hours
3. Respiratory diseases

3.8 ACUTE LARYNGOTRACHEOBRONCHITIS

An acute inflammation of larynx, trachea and bronchi primarily in children <3yrs. Also known as croup

Note: secondary bacterial infection is rare
- therefore antibiotics are rarely needed

Cause
- Measles virus
- Influenza and Parainfluenza type 1 viruses
- Rarely - superinfection with bacteria
  For example: *Haemophilus influenzae*

Clinical features
- Early phase (mild croup)
  - Symptoms of
  - cough - may be paroxysmal
  - common cold
- Late phase (severe croup)
  - Severe Dyspnoea and stridor (noisy breathing)
  - Cyanosis (blue colouration of the baby - especially extremities and mouth)
  - Asphyxia (suffocation)

Management
- Avoid throat examination
  - gagging can cause acute obstruction

  Mild croup:
  - Isolate patient, ensure plenty of rest
  - Keep well hydrated with **oral fluids**
    - use oral rehydration solution
  - Give **analgesics**
  - Do not give antibiotics

  If condition is severe:
  - Admit the patient
  - Ensure close supervision
  - **chloramphenicol** 25mg/kg IV or IM
    - every 6 hours for 5 days

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3. Respiratory diseases

- Give humidified **oxygen** 30-40%
- Keep well hydrated with **IV fluids**
  - use Darrow's solution ½ strength in glucose 2.5%
- Consider use of steroids: **hydrocortisone** slow IV
  - or IM
  - child <1yr: 25mg; 1-5yrs: 50mg; 6-12 yrs: 100mg
  - or **dexamethasone** 300 micrograms/kg IM
- Repeat steroid dose after 6 hours if necessary

*If severe respiratory distress develops:*
- Carry out nasotracheal intubation
  - or tracheostomy if necessary

**Prevention**
- Avoid contact with infected persons
- Isolate infected persons
- Immunise against measles

**3.9 LUNG ABSCESS/ASPIRATION PNEUMONIA**

Localised inflammation and necrosis (destruction) of lung tissue leading to pus formation

**Cause**
- Aspiration of infected material from upper airway
- Infection of lungs with pus forming organisms: eg. *Klebsiella pneumoniae, Staphylococcus aureus*
- Septic pulmonary emboli
- Secondary infection of pulmonary infarct
- Direct extension of liver abscess through the diaphragm
- Complicating bronchogenic carcinoma

**Predisposing factors to aspiration**
- Altered consciousness from various causes:
  - e.g. alcoholism, epilepsy, general anaesthesia, excessive sedation, cerebrovascular accident
- Bronchial obstruction
- Intestinal obstruction

**Clinical features**
- Onset is acute or chronic
3. Respiratory diseases

- Malaise, loss of appetite
- Cough with purulent sputum, foul smelling breath
- Sweating with chills and fever
- Chest pain indicates pleurisy
- Finger clubbing

Complications
- Pus in the pleural cavity (empyema)
- Coughing out blood (haemoptysis)
- Septic emboli to various parts of the body: eg. brain (causing brain abscess)
- Bronchiectasis (pus in the bronchi)

Differential diagnosis
- Bronchogenic carcinoma
- Bronchiectasis
- Primary empyema communicating with a bronchus
- TB of the lungs
- Liver abscess communicating into the lung

Investigations
- X-ray: chest
  - Early stages: signs of consolidation
  - Later stages: a cavity with a fluid level
- Sputum: for microscopy and culture

Management

HC4
- **benzylpenicillin** 1-2 MU IV or IM every 4-6 hours
  - *child*: 50,000-100,000 IU/kg per dose (max: 2MU)
- **plus metronidazole** 500mg IV every 8-12 hours
  - *for child*: 12.5mg/kg per dose
  - *Once improvement occurs, change to oral medication to complete a 10-14 day course:*
- **metronidazole** 400mg every 12 hours
  - *child*: 10mg/kg per dose
- **plus phenoxymethylpenicillin**
  - 500-750mg every 6 hours
  - *child*: 10-20mg/kg per dose
- **Postural drainage - surgical drainage is rarely necessary**
3. Respiratory diseases

**Prevention**
- Early detection and treatment of pneumonia
- Avoid situations which lead to aspiration

### 3.10 PERTUSSIS (Whooping cough)

An acute bacterial respiratory infection characterised by an inspiratory whoop following paroxysmal cough

**Cause**
- *Bordetella pertussis*, spread by droplet infection

**Clinical features**
- **Stage 1: Coryzal (catarrhal)**
  - Most infectious stage
  - Running nose, mild cough, slight fever
- **Stage 2: Paroxysmal**
  - More severe and frequent repetitive cough ending in a whoop, vomiting, conjunctival haemorrhage
- **Stage 3: Convalescent**
  - Paroxysmal symptoms reduce
  - Cough may persist

**Complications may include:**

- **Respiratory**
  - Pneumonia
  - Atelectasis
  - Emphysema
  - Bronchiectasis
  - Otitis media
- **Nervous system**
  - Convulsions and coma
  - Intracranial haemorrhage
- **Others**
  - Malnutrition, inguinal hernia, rectal prolapse

**Differential diagnosis**
- Chlamydial and bacterial RTI
- Foreign body in the trachea
3. Respiratory diseases

**Investigations**
- Blood: haemogram
- X-ray: chest

**Management**
Fluids and maintenance of nutrition are crucial in the management of pertussis.

Cough mixtures, sedatives, mucolytics and antihistamines are used in pertussis and should not be given.

Do not use antibiotics unless pertussis is complicated with pneumonia or otitis media.

**General management**
- Maintain nutrition and fluids
- Give oxygen and perform suction if the child is cyanotic
- For the unimmunised or partly immunised, give DPT (three doses) as per immunization schedule

**Prevention**
- Educate parents on the importance of following the immunization schedule
- Ensure good nutrition
- Avoid overcrowding

3.11 PNEUMONIA (Pyogenic)
Infection and inflammation of the lungs - two major types:
- **Bronchopneumonia** involving the bronchi
  - common in children and the elderly
- **Lobar pneumonia** involving one or more lobes
  - common in young people

**Causes**
- Aspiration of secretions from the upper airways and inhalation of droplets small enough to reach
3. Respiratory diseases

the alveoli and containing pathogenic organisms:
- pathogens vary according to age and whether infection acquired in community or hospital (Gram negative are more common in hospital)
- Direct spread from penetrating wound or nearby tissues

Clinical features

Bronchopneumonia

- Rapid breathing

<table>
<thead>
<tr>
<th>Age group</th>
<th>Breaths/minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 months</td>
<td>&gt;60</td>
</tr>
<tr>
<td>2-12 months</td>
<td>&gt;50</td>
</tr>
<tr>
<td>12-60 months</td>
<td>&gt;40</td>
</tr>
<tr>
<td>Adult &amp; children &gt;5 years</td>
<td>&gt;30</td>
</tr>
</tbody>
</table>

- Cough
- Lung crepitations (crackles, rales) heard with a stethoscope
- Fever, cough, flaring of nostrils, purulent sputum, high pulse rate and lethargy

In severe cases:
- Chest indrawing
- Cyanosis

Lobar pneumonia

- Chest (pleural) pain of sudden onset, rigors, vomiting, convulsions, very high temperature, malaise, loss of appetite, aching body, localized pain in the chest
- Tenacious sputum
  - rust coloured occasionally blood stained
- Respiration is rapid, shallow and painful
- Rapid pulse, hot dry skin, cyanosis, herpes labialis
- Bronchial breathing is heard with a stethoscope

Note:
Extrapulmonary features, eg. confusion or disorientation may predominate, and may be the only
3. Respiratory diseases

signs of pneumonia in:
- the elderly
- immunosuppressed patients (eg. HIV/AIDS)
- malnourished children

**Differential diagnosis**
- Malaria
- Lung fibrosis
- Lung infarction
- Pleural effusion
- Heart failure
- Inflammation below the diaphragm, eg. in liver abscess

**Investigations**
- X-ray: chest
- Sputum: for Gram stain, Ziehl-Neelsen (ZN) stain, culture for AFB, guinea-pig culture
- Blood: full haemogram

3.11.1 Pneumonia in an infant of 1 week up to 2 months

In neonates, not all respiratory distress is due to infection. But as pneumonia may be rapidly fatal in this age group, suspected cases should be treated promptly and referred for parenteral treatment with antimicrobials

**Causes**
The most likely pathogens are:
- *Streptococcus pneumonia*
- Group B streptococci
- *Escherichia coli*
- Enterobacteriaceae
- *Chlamydia trachomatis*
- Severe cases may be caused by *Staphylococcus aureus*

**Clinical features**
- Rapid breathing (60+ breaths/minute)
3. Respiratory diseases

- Severe chest indrawing, grunting respiration
- Inability to breastfeed
- Convulsions
- Drowsiness
- Stridor in a calm child, wheezing
- Fever may or may not be present
- Cyanosis and apnoeic attacks

**Management**

- Treat for at least 5 days
- Continue treatment for 3 days after the child is well
- *If meningitis is suspected*, continue for 14 days
- *In premature babies*, the doses below may need to be reduced

  ▶ Give a first dose of:  
  - **HC2**  
    - *benzylpenicillin* 50,000 IU/kg IM  
    - *plus chloramphenicol* 40mg/kg IM  
  ▶ Refer immediately  
  - *If referral is not possible:*  
  - Continue with the above drugs every 6 hours for at least 5 days  
  
  **After referral and admission:**

  ▶ **ampicillin** 25-50mg/kg IV every 6 hours  
  ▶ *plus gentamicin* 2.5mg/kg IV every 8 hours  
  - *neonates <7 days old*: give doses every 12 hours  
  - continue both drugs for at least 5 days  

  **Alternative (only use if above not available):**

  ▶ **chloramphenicol** 25mg/kg IV every 12 hours for at least 5 days  
  - contraindicated in premature babies and neonates <7 days old  
  
  **In severely ill infants:**

  ▶ **ceftriaxone** 100mg/kg IV once daily for 5 days  
  - if available at higher referral levels, this may be the drug of choice  
  - if septicemia is suspected: continue treatment for 10 days
3. Respiratory diseases

**Note**
- Keep the baby worm
- Breastfeeding should be continued and more frequent
- If the baby cannot suckle, give expressed breast milk

### 3.11.2 Pneumonia in a child of 2 months-5 years (60 months)

**Causes**
- Usually due to *S.pneumoniae* or *H.influenzae*
- Occasionally due to *Staphylococcus aureus*, which should be suspected if there is:
  - clinical deterioration despite treatment with chloramphenicol or other appropriate antibiotic or
  - presence of pneumatocele or empyema
  - see for management

**a) Pneumonia**

**Clinical features**
- Cough with difficulty in breathing
- May be signs of chest indrawing
- Rapid breathing: 2-12 mths: >50 breaths/minute
  12-60 mths: >40 breaths/minute
- Fever

**Management of pneumonia**
- Give vitamin A to all children with pneumonia:
  6-11mths: 100,000 IU single dose
  1-6yrs: 200,000 IU single dose
- Treat fever:
  - paracetamol 10mg/kg every 8 hours for 3 days
  - Cotrimoxazole 24mg/kg every 12 hrs for 5 days HC2
  - or PPF 50,000 IU/kg IM daily for at least 3 days HC3
  - once clinical improvement occurs, amoxicillin
    15-25mg/kg may be used to complete the course of at least 5 days
  - or amoxicillin 15-25mg/kg every 8 hrs for 5 days HC4

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3. Respiratory diseases

*If wheezing present:*

- **salbutamol** 100 micrograms (0.1mg)/kg every 8 hours until wheezing stops
- Reassess child for progress

**b) Severe pneumonia**

**Clinical features**

- Cough or difficult breathing with one or more of:
  - chest indrawing
  - nasal flaring
  - grunting (in young infants)
- Other clinical signs include:
  - chest crepitations
  - bronchial breathing
  - pleural rub

**Management of severe pneumonia**

- At lower levels, give the 1st dose of antibiotic: **cotrimoxazole** or if patient cannot swallow: **benzylpenicillin** 50,000-100,000 IU/kg IV or IM
- Refer immediately for further management
- Give **oxygen** by nasal catheter
- Continue **benzylpenicillin** 50,000 IU/kg IV or IM every 6 hours
- Monitor and record as in very severe pneumonia on

*Once the patient improves:*

- Switch to oral **amoxicillin** 15mg/kg every 8 hours for 5 days to complete a total of a least 5 days of antibiotics

*If no improvement in 2 days or condition deteriorates:*

- Switch to **chloramphenicol** 25mg/kg IV every 6 hours until the child improves then continue with oral **chloramphenicol** for a total of 10 days
- Give **supportive care** as outlined for very severe pneumonia on
3. Respiratory diseases

c) Very severe pneumonia

Clinical features
- Cough or difficult breathing with one or more of:
  - central cyanosis
  - severe respiratory distress
  - inability to breastfeed or drink
  - vomiting everything
  - convulsions, lethargy or unconsciousness

Management of very severe pneumonia

- Admit the child
- Give **chloramphenicol** 25mg/kg IV or IM every 6 hours until the child has improved then continue with oral chloramphenicol for a total course of 10 days

*If chloramphenicol is not available:*
- Give **benzylpenicillin** 50,000 IU/kg IV or IM every 6 hours
- **plus gentamicin** 2.5mg/kg every 12 hours for a total course of 10 days
- Give **oxygen**
- Offer **supportive care** including:
  - **paracetamol** 10mg/kg every 4-6 hours for high fever
  - a bronchodilator for wheezing, eg. **salbutamol** 100 micrograms (0.1mg)/kg every 8 hours until wheezing stops
  - gentle suction of thick secretions from upper airway
  - daily maintenance fluids,

*If convulsions present:*
- **diazepam** 500 micrograms (0.5mg)/kg orally or rectally, repeated pm after 10 mins (rectal) or 30 mins (oral) or 50-200 micrograms (0.05-0.2mg)/kg IV or IM
  - repeat after 10 minutes if necessary and then pm for a maximum of 3 doses
3. Respiratory diseases

If convulsions are continuous:

- Give a long-acting anticonvulsant, eg. phenobarbitone 10-15mg/kg IM as a loading dose then depending on response repeat this dose after 12 hours or switch to oral maintenance dose of 3-5mg/kg every 8-12 hours

- Monitor and record:
  - Respiratory rate (every 2 hours)
  - Body temperature (every 6 hours)
  - Improvement in appetite and playing
  - Use of accessory muscles of respiration
  - Ability to breastfeed, drink and eat

If not improved in 2 days:

- Switch to gentamicin 2.5 mg/kg every 12 hours
- plus cloxacillin 50 mg/kg IV or IM every 6 hours for possible staphylococcal pneumonia

- Continue treatment for 2 weeks

If facilities are available:

- Do a chest X-ray and look for complications, eg:
  - Pneumothorax, pyothorax
  - Pneumonitis suggestive of pneumocystis carinii pneumonia (PCP)
  - Pneumatocoeles suggestive of staphylococcal pneumonia

d) Pneumonia in severely malnourished child

- May present with cough or difficult breathing or be asymptomatic
- Is usually caused by the organisms that commonly cause pneumonia in other children (pneumococci, Haemophilus influenzae and S.aureus)

Assess for:

- Respiratory rate (may be normal)
- Note signs of respiratory distress if any
- Listen to the chest for air entry and added sounds
3. Respiratory diseases

- Complete the examination and do a chest X-ray
- If there is evidence of pleural effusion investigate for tuberculosis and pyothorax

**Management**
- Administer antibiotics parentally (IV/IM)
- Give **chloramphenicol** 25mg/kg every 6 hours for 10-14 days
  - *If chest X-ray suggests Staphylococcal pneumonia:*
  - Give **cloxacillin** 50mg/kg every 6 hours
  - **plus gentamicin** 2.5 mg/kg every 12 hours for 10-14 days
- Give **oxygen** if:
  - breathing >70 breaths/minute
  - cyanosis

*In respiratory distress (eg. use of accessory muscles of respiration):*
- Attend to fluid needs depending on level of dehydration
- Manage severe malnutrition

### 3.1.1.3 Pneumonia in children >5yrs and adults

**Causes**
- Most important pathogen in this age group is *S.pneumoniae*, followed by atypical bacteria, eg. *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, *Legionella* spp. and *Coxiella burnetti*

**Clinical features**

*Moderate*
- Cough
- Rapid breathing
- No chest indrawing
- Fever

*Severe*
- As in moderate pneumonia **plus**
- Chest indrawing
3. Respiratory diseases

- Pulse >120/minute
- Temperature >39.5°C
- Low BP <90/60 mmHg

**Predisposing/risk factors**
- Malnutrition
- HIV infection
- The elderly
- Pre-existing lung disease or heart disease
- Renal failure
- Diabetes
- Alcohol dependence

**a) Management of moderate pneumonia (ambulatory patients)**

- **cotrimoxazole** 960mg every 12 hours for 5 days **HC2**
  - *child:* 24mg/kg per dose
  - *or doxycycline*** 100mg every 12 hours for 7-10 days
    - *child >8yrs only:* 2mg/kg per dose
    - ✗ contraindicated in pregnancy
  - *or amoxicillin*** 500mg every 8 hours for 5 days
    - *child:* 15mg/kg per dose
  - *or erythromycin*** 500mg every 6 hours for 5 days
    - 14 days in cases of atypical pneumonia
    - *child:* 10-15mg/kg per dose
  - *or PPF*** 20,000 IU/kg IM once daily for 5 days **HC3**

**b) Management of severe pneumonia (hospitalised patients)**

- At lower levels, give 1st dose of antibiotic:
  - **benzylpenicillin** 2MU IV or IM daily every 4-6 hours for 5 days
  - *(child: 50,000-100,000 IU/kg per dose)*
  - *or chloramphenicol*** 1g IV every 6 hours for 7 days
    - *child:* 25mg/kg per dose (max: 750mg)
  - Refer immediately for continuation of treatment
  - Give nasal **oxygen**

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3. Respiratory diseases

Alternative 7-day regimes:

- **benzylpenicillin** 2MU IV or IM daily every 4-6 hours
- **child**: 50,000-100,000 IU/kg per dose
- **plus gentamicin** 5-7mg/kg IV daily in divided doses
  - **child**: 7.5mg/kg IV daily in 1-3 divided doses
  - **contra**indicated in pregnancy
- **ceftriaxone** 1g IV or IM every 12-24 hours
  - **child**: 50mg/kg per dose (max: 1g)

**Note:** for pneumonia due to *Staph. aureus*

### 3.11.4 Atypical pneumonia (ambulatory patients)

Eg. due to *Mycoplasma pneumoniae*

- **doxycycline** 100mg every 12 hours for 7-10 days
  - **child**: >8yrs: 2mg/kg per dose
  - **contra**indicated in pregnancy
- or **erythromycin** 500mg every 6 hours for 5 days
  - **child**: 10-15mg/kg per dose

### 3.11.5 Klebsiella pneumonia

- **gentamicin** 5-7mg/kg IV daily in divided doses
- or **ciprofloxacin** 500mg every 12 hours
  - **child**: **chloramphenicol** 25mg/kg every 6 hours
    - give a 5-day course
    - amend therapy as guided by C&S results

### 3.11.6 Pneumococcal pneumonia

- **benzylpenicillin** 50,000 IU/kg IM every 6 hours for 2 days
  - Then **PPF** 800,000 IU IM once daily for 5 days
3. Respiratory diseases

3.11.7 Pneumocystis carinii pneumonia (PCP)

- **cotrimoxazole** 80mg/kg every 6-8 hours for at least 14 days
  - in an adult >60kg = 10 tablets of 480mg per dose
  - extend duration to 21 days if necessary depending on response
  - or (in patients who cannot tolerate or do not respond to cotrimoxazole):
    - **pentamidine** 4mg/kg by IV infusion daily
      - reduce dose in renal impairment
      - avoid direct bolus injections whenever possible, but if unavoidable, **never** give rapidly
- **plus prednisolone** 2mg/kg daily in 3 divided doses for 5 days then reduce dose to complete 21 days treatment
  - ideally start at the same time as the anti-PCP therapy above and certainly not more than 72 hours later

*Alternative regime (21-day course) if above not available/tolerated:*

- **clindamycin** 300-450mg every 6 hours
  - very severe cases: up to 600mg per dose
  - discontinue treatment if diarrhoea occurs
- **plus primaquine** 15mg every 6 hours

**Prophylaxis**

Give to all patients with history of PCP infection and consider also for severely immunocompromised patients

- **cotrimoxazole** 960mg daily or on alternate days
  - continue until immunity recovers sufficiently
3. Respiratory diseases

### 3.11.8 Pneumonia due to Staph. aureus

This form is especially common following a recent influenza infection.

**Management**

*Adults & children >5 years:*
- cloxacillin 1-2g IV or IM every 6 hours for 10-14 days
  - child >5yrs: 50mg/kg per dose (max: 2g)

*Children 2mths-5yrs:*
- cloxacillin 25-50mg/kg IV or IM every 6 hours
- plus gentamicin 7.5mg/kg IV in 1-3 divided doses daily
  - continue both drugs for at least 21 days

### 3.12 TUBERCULOSIS (TB)

A chronic infection caused by *Mycobacteria*

For more information on the management of TB see:
- TB Control & Community-based DOTS as an Essential Component of District Health Service
- Manual of the National TB/Leprosy Programme in Uganda
- For spinal TB

**Causes**
- *Mycobacterium tuberculosis*
- *Mycobacterium bovis*
- Transmitted by droplet infection and through drinking of unpasteurised milk

**Clinical features**
- Chronic cough of >3 weeks
- Chest pain
- Purulent sputum occasionally blood-stained
- Fevers with night sweats
- Weight loss
- Loss of appetite
- Generalized enlargement of lymph nodes
3. Respiratory diseases

Complications include
- Massive haemoptysis - coughing up >250mL blood per episode
- Spontaneous pneumothorax
- Pleural effusion
- Gastrointestinal TB (TB peritonitis)
- Tuberculous meningitis
- TB pericarditis
- Bone TB (TB spine, TB joints with deformity)

Differential diagnosis
- Histoplasma pneumonia
- Trypanosomiasis
- HIV/AIDS
- Malignancy
- Brucellosis

Investigations
- Sputum (x3): for AAFBs (ZN stain), culture- if 2 or more +ve treat, otherwise do X-ray
- X-Ray: chest - especially children
- Blood: full haemogram especially ESR, lymphocytes

Management
The country has adopted community-based TB care with DOTS (Directly Observed Therapy Short-Course)

All cases of TB are treated with short course regimens as shown in the table below. Fixed dose combinations are encouraged as they may improve compliance

<table>
<thead>
<tr>
<th>a) Pulmonary TB</th>
<th>HC3</th>
</tr>
</thead>
</table>

Treatment is divided into:
- an Initial (Intensive) Phase of 2-3 months and
- a second Continuation Phase of 4-6 months, depending on the drug combinations used.
Various regimens are available but the following are recommended for use in Uganda. TB treatment regimens are expressed in a standard format, eg. **2 EHRZ/6 EH** where:

− letters represent abbreviated drug names
− numbers show the duration in months / shows the division between treatment phases

Drugs used:

**E** = ethambutol  **H** = isoniazid  **R** = rifampicin  
**S** = streptomycin  **Z** = pyrazinamide

**Short-course TB Treatment Regimes**

<table>
<thead>
<tr>
<th>Patient category (Type of TB)</th>
<th>Initial phase</th>
<th>Continuation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New smear +ve</td>
<td>2 EHRZ</td>
<td>6 EH</td>
</tr>
<tr>
<td>2. Severe smear -ve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Severe extra-pulmonary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Previously treated smear +ve:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>− relapse</td>
<td>2 SEHRZ / 1 EHRZ</td>
<td>5 EHR</td>
</tr>
<tr>
<td>− failure to respond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>− return after interruption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Any form of TB in children</td>
<td>2 HRZ</td>
<td>4 HR</td>
</tr>
<tr>
<td>6. Adult non-severe extra-pulmonary</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3. Respiratory diseases

**Daily drug doses (in mg) by body weight**

<table>
<thead>
<tr>
<th>Drug</th>
<th>5-10</th>
<th>11-20</th>
<th>21-30</th>
<th>31-50</th>
<th>&gt;50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptomycin (S)</td>
<td>250</td>
<td>500</td>
<td>500</td>
<td>750</td>
<td>1,000</td>
</tr>
<tr>
<td>Isoniazid (H)</td>
<td>100</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Rifampicin (R)</td>
<td>150</td>
<td>150</td>
<td>300</td>
<td>450</td>
<td>600</td>
</tr>
<tr>
<td>Pyrazinamide (Z)</td>
<td>500</td>
<td>500</td>
<td>1,000</td>
<td>1,500</td>
<td>2,000</td>
</tr>
<tr>
<td>Ethambutol (E)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>800</td>
<td>1,200</td>
</tr>
</tbody>
</table>

**Notes**

**Streptomycin:** patients >40yrs Recommended for patients in **category 4**
- failure to respond to the recommended regimen after 5 month of treatment
- relapse after full course of treatment
- defaulters - return after interruption of treatment and are found to be sputum smear positive

*2 SEHRZ /1 EHRZ / 5 EHR*
- i.e. 2 months of daily streptomycin + ethambutol + isoniazid + rifampicin + pyrazinamide
- followed by one month of daily ethambutol + isoniazid + rifampicin + pyrazinamide
- and <50kg should be given 750 mg (instead of 1g)

**Ethambutol:** not recommended for children <6yrs

**Re-treatment Regime**
- followed by 5 months of daily ethambutol + isoniazid + rifampicin

**Notes on drug reactions**
- All anti-TB drugs are likely to cause minor or major reactions. For guidelines on how to handle such drug intolerance, including identification of the offending drug and desensitisation of the patient.
3. Respiratory diseases

b) **TB Arthritis**

All patients:

- **2 HRZ / 7 HR**
  - i.e. 2 months intensive phase of daily isoniazid + rifampicin + pyrazinamide
  - followed by 7 months continuation phase of daily isoniazid + rifampicin

(c) **TB Meningitis**

See section on Meningitis.

d) **Miliary TB, TB Pericarditis, TB Peritonitis**

All patients:

- **2 SHRZ / 6 HR** or alternative regime **2 EHRZ / 6 HR**

Prevention

- Early detection of cases, tracing of contacts
- Treatment with short course medicines till cure
- Isolation of sputum-positive cases
- Avoidance of overcrowding
- Drinking pasteurised milk products only
- BCG vaccination at birth
- Good nutrition
4. GASTROINTESTINAL DISEASES

4.1 AMOEBIASIS

A common parasitic infection of the gastrointestinal system acquired through oral-faecal transmission.

**Causes**
- The protozoan *Entamoeba histolytica*

**Clinical features**
It may present as:

*Amoebic dysentery*
- Persistent mucoid/bloody diarrhoea
- Abdominal pain
- Fever/chills

*Amoebic abscess* which can occur in one of the following forms as a result of spread via the bloodstream:
- Liver abscess - swelling/pain in the right sub-costal area
- Brain - presenting as space-occupying lesion
- Lungs - cough and blood stained sputum
- Amoeboma - swelling anywhere in the abdomen especially ascending colon
- Anal ulceration - may occur by direct extension from the intestinal infection
- Chronic carriers - symptomless

**Differential diagnosis**
- Bacillary dysentery
- Any other cause of bloody diarrhoea
- Cancer of the liver
- Other causes of swelling in the liver
- Carcinoma colon

**Investigations**
- Stool: microscopy for cysts and motile organisms
- Ultrasound
4. Gastrointestinal diseases

Management

- Correct any dehydration
- **Metronidazole** 800mg every 8 hrs for 8-10 days HC2
  - *Child*: 10mg/kg per dose
  - *Or* tinidazole 2g daily for 5 days

*Chronic carriers (luminal) and tissue amoebiasis (liver, lung, brain, amoeboma)*

- **Metronidazole** 800mg every 8 hours for 10 days HC2
  - *Child*: 10mg/kg per dose
  - *Or* tinidazole 2g daily for 5 days
  - *Child*: 50mg/kg per dose

Notes:

- **Metronidazole, Tinidazole**: contraindicated in pregnancy; avoid alcohol during treatment and for 48 hours after
- **Metronidazole**: take after food

Prevention

- Educate the public on personal and food hygiene (washing hands before eating), proper faecal disposal
- Ensure proper management of carriers
- Promote use of clean drinking water

### 4.2 APPENDICITIS (Acute)

Inflammation of the appendix

**Causes**

Blockage of the appendix duct with stool or particles, followed by infection by intestinal bacteria

**Clinical features**

- Constipation (common)
- Pain situated around the umbilicus
  - crampy, keeps on increasing in severity
  - after some hours the pain is localised in the right iliac fossa and becomes continuous
- There may be nausea and vomiting
- Locally there is tenderness and rigidity
(guarding) in the right iliac fossa
- Generalized abdominal pain follows rupture when the contents are poured into the abdominal cavity
- Low grade fever
- There are signs of peritonitis

**Differential diagnosis**
- Salpingitis (in females)
- Ectopic pregnancy
- Ovarian cyst
- Kidney infection
- Ureteritis (inflammation of the ureter)
- Intestinal obstruction

**Investigations**
- No special investigations - good history and physical examination are essential for diagnosis
- Complete blood count
- Look for leucocytosis

**Management**
- Emergency surgery

  *If there are signs of peritonitis:*
- Give broad-spectrum antibiotics

### 4.3 BACILLARY DYSENTERY (Shigellosis)

An acute bacterial disease involving the large and small intestine characterised by bloody mucoid diarrhoea

**Cause**
- *Shigella dysenteriae*
- *Shigella flexneri*
- *Shigella sonnei*

All the above are spread by faecal-oral route

**Clinical features**
- Mucoid bloody diarrhoea
- Fever
4. Gastrointestinal diseases

- Nausea, vomiting, abdominal cramps
- Tenesmus (sensation of desire to defecate without production of significant amounts of faeces)
- Toxaemia (sometimes)
- \( S.\ flexneri \) infection may be complicated with Reiter’s syndrome – urethritis, conjunctivitis and arthritis.

**Differential diagnosis**
- Amoebic dysentery
- Other causes of bloody diarrhoea

**Investigations**
- Stool: for C&S, microscopy

**Management**
- Correct any dehydration
- **nalidixic acid** 1g every 6 hours for 5 days  
  or **ciprofloxacin** 1g single dose  
  child >3mths:
- **cotrimoxazole** as above  
  or **ciprofloxacin** 30mg/kg twice daily for 3 days  
- Caution
  
  or **nalidixic acid** 15mg/kg per dose
- **ciprofloxacin, nalidixic acid:**  
  contraindicated in pregnancy  
  – use instead **chloramphenicol** 500mg every 8 hours for 5 days

**Prevention**
- Provide health education of the public on:
  - washing hands before eating food
  - proper disposal of faeces
  - boiling of all drinking water
  - avoiding eating cold foods & roadside foods
4.4 CHOLERA

An acute infection involving the entire small bowel which usually occurs as an epidemic

**Cause**
- *Vibrio cholerae*, spread by faecal-oral route

**Clinical features**
- Incubation period is between 1-3 days

**Sub-clinical form:**
- Mild, uncomplicated diarrhoea

**Acute form:**
- Abrupt
- Severe acute painless watery diarrhoea (rice-water stools)
- Vomiting
- Muscular cramps
- Dehydration
- Oliguria and collapse

**Differential diagnosis**
- Acute bacillary dysentery (shigellosis)
- Viral enteritis
- Acute food poisoning
- Severe falciparum malaria ('algid malaria')

**Investigations**
- Stool culture (fresh stools or rectal swabs)
- Mobile vibrios under microscope

**Management**

Up to 90% of patients with cholera only require prompt oral rehydration. Only severely dehydrated patients need IV fluids and antimicrobials

- Give oral (ORS) or IV fluids IV for Ringers lactate according to degree of dehydration
- **doxycycline** 300mg single dose

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4. Gastrointestinal diseases

- Give Dextrose IV for hypoglycemia
- Give maintenance fluid at least 4 - 5 litres
  - or ciprofloxacin 1g single dose

Child: cotrimoxazole  
  - or doxycycline 2mg/kg single dose (if >8 yrs old)
  - or ciprofloxacin 20mg/kg single dose

  or erythromycin

Caution

* Doxycycline, ciprofloxacin: contraindicated in pregnancy
  - use instead cotrimoxazole 960mg every 12 hours for 5 days

Prevention

Educate the public about:
- Personal and food hygiene
  - eg. washing hands before eating
- Using and drinking clean safe water
- Proper human faeces disposal
- Prompt isolation, treatment and reporting of cases

4.5 CONSTIPATION

A condition characterised by hardened faeces and difficulty emptying the bowels

Causes
- Dietary: lack of roughage, inadequate fluid intake
- In infants: concentrated feeds
- Lack of exercise
- Congenital bowel abnormalities
- Patients being bedridden - especially the elderly
- Certain drugs, eg. Narcotic, analgesics
- Depression

Clinical features
- Abdominal discomfort
- Small hard stools passed irregularly under strain
4. GI Gastrointestinal diseases

4.6 DIARRHOEA

Occurrence of 3 or more loose watery stools in 24 hrs

Note
For management of dehydration

Cause
- Infectious diseases, eg. measles, malaria and other fever-causing conditions
- Bacterial infection, eg. food poisoning
- Protozoal infections, eg. giardiasis
- Worm infestation, eg. strongyloidiasis
- Malnutrition, eg. kwashiorkor
- Drugs, eg. prolonged use of purgatives and broad-spectrum antibiotics
- Viral infections, eg. enteroviruses
- Unhygienic feeding methods
- Malabsorption syndrome
- Lactose intolerance

Clinical features
- Loose watery stools
- Abdominal cramps
- Dehydration - thirst, sunken eyes, loss of skin elasticity, low urine output.
- Signs of malnutrition if diarrhoea persists for >14 days

Management
- High dietary fibre
- Adequate fluid intake
- **bisacodyl** 10mg at night  *child 5-12 years*: 5mg
- Contraindicated in acute abdomen as it aggravates the condition

Prevention
- Diet rich in roughage - plenty of vegetables and fruit
- Plenty of oral fluids with meals
- Increased exercise

Investigations
- X-ray: after barium enema
4. Gastrointestinal diseases

- Blood in stool (in dysentery)

**Investigations**
- Stool: microscopy, C&S
- Other investigations may be necessary according to history and physical examination

**Management**
- Find and treat the cause
- Prevent or correct dehydration
  - **Persistent or chronic diarrhoea:**
    - **Adults only:** as above plus **codeine phosphate**
      - 30mg every 8-12 hours as required
    - **Child:** **vitamin A**
      - 6-11 months: 100,000 IU; 1-6 years: 200,000 IU

**4.7 GASTRITIS**

Acute or chronic inflammation of the gastric mucosa

**Causes**
- **Acute gastritis:**
  - Non-steroidal anti-inflammatory drugs (NSAIDS), eg. aspirin, indomethacin, ibuprofen
  - Alcohol
  - Regurgitation of bile into the stomach
- **Chronic gastritis**
  - Autoimmune gastric ulceration
  - Bacterial infection (**Helicobacter pylori**)

**Clinical features**
- May be asymptomatic or have associated anorexia, nausea, epigastric pain and heartburn

**Differential diagnosis**
- Pancreatitis
- Peptic and duodenal ulcers
- Cancer of the stomach
- Cholecystitis
- Epigastric hernia
Investigations
- Gastroscopy
- Stool for occult blood
- Barium meal for chronic gastritis

Management
- magnesium trisilicate compound HC2
  2 tablets every 8 hours as required
  
  *If there is no response:*
- Give cimetidine 200-400mg every 8 hours
  until symptom-free then reduce to 400mg every 12 hours for a total of 4-6 weeks
  
  *If vomiting:*
- chlorpromazine 25mg deep IM or oral HC4
  (if tolerated) repeated prn every 4 hours
  or metoclopramide 10mg IM
  repeated when necessary up to 3 times daily

Note
- Aspirin and other NSAIDS are contraindicated in patients with gastritis
- Be aware Aspirin has a number of interactions with other medicines

Prevention
- Avoid spices, tobacco, alcohol and carbonated drinks
- Encourage regular, small and frequent meals
- Encourage milk intake

4.8 GIARDIASIS
An infection of the upper small intestine transmitted by faecal-oral route

Cause
- Giardia lamblia (a flagellated protozoan)

Clinical features
- Often asymptomatic
- Prolonged diarrhoea, steatorrhoea
4. Gastrointestinal diseases

- Abdominal cramps, bloating
- Fatigue
- Weight loss
- Malabsorption of fats and fat-soluble vitamins
- Severe giardiasis may cause reactive arthritis, damage to duodenal and jejunal mucosa

**Differential diagnosis**
- Other causes of prolonged diarrhoea
- Other causes of malabsorption

**Investigations**
- Stool: for cysts and trophozoites
- Intestinal biopsy
- String test

**Management**

- **metronidazole** 2g after food daily for 3 days
  - child: 30mg/kg (max: 1.2g) per dose
  - or tinidazole 2g single dose  child: 50mg/kg

**Notes**
- **metronidazole, tinidazole**: contraindicated in pregnancy; avoid alcohol during treatment and for 48 hours after
- **metronidazole**: take after food

**Prevention**

Provide health education on:
- Personal and food hygiene, eg. washing hands before handling or eating food and after using toilets
- Proper disposal of human faeces
- Use of safe clean drinking water

4.9 HAEMORRHOIDS (‘Piles’)

Swelling in the upper anal canal and lower rectum due to engorgement of veins. May be internal or external
4. Gastrointestinal diseases

**Causes**
- Constipation and straining in defecation
- Portal hypertension from any cause
- Compression of pelvic veins: e.g. in pregnancy, abdominal tumours
- Sedentary life style

**Clinical features**
- Painless anal bleeding
- Prolapse of the swelling, especially at defecation
- Mucous discharge at anus
- Pain in passing stool (rare)
- Visible swelling at the anus

**Differential diagnosis**
- Schistosomiasis
- Rectal polyps
- Prolapsed rectum
- Anal tags
- Tumour of rectum
- Anal warts
- Amoeboma

**Management**
- **Establish the cause**
- **Correct any constipation**
- **Insert a bismuth subgallate suppository** rectally every 12 hours for 5 days

**If infected:**
- **Give metronidazole** 400mg every 8 hours for 5 days
- Contraindicated in Pregnancy, and use of alcohol
- **Give analgesics** as required for the pain

**If there is no response:**
- Refer for surgery

**Prevention**
- Maintain high residue (fibre) diet
- Ensure adequate fluid intake
4.10 PEPTIC ULCER

Ulceration of gastro-duodenal mucosa
- tends to be chronic and recurrent

Causes
Hyperacidity due to:
- Drugs, eg. aspirin, corticosteroids
- Irregular meals
- Stress
- Other unknown causes

Clinical features
- Epigastric pain typically worse at night and when hungry (duodenal ulcer)
- Epigastric pain, worse with food (gastric ulcer)
- Vomiting
- Nausea
- Regurgitation

Differential diagnosis
- Pancreatits
- Hepatitis
- Disease of aorta
- Heart disease and lung disease

Investigations
- Gastroscopy
- Biopsy of stomach wall
- X-ray of stomach
- Barium meal
- Gastric analysis of stomach juice for acidity
- Oesophagoscopy on swallowing

Management and Prevention
As for Gastritis
4.11 PERITONITIS

Irritation (inflammation) of the peritoneum

**Causes**

*Infection following:*
- Perforation of the gut and leakage of its contents, eg. burst appendix
- Injury of the abdominal wall which opens into the abdominal cavity, eg. stab wound
- Intestinal obstruction with death of part of the gut or intestine (gangrenous bowel)
- Perforation of the uterus as may occur in criminal abortion
- Perforation of gall bladder, containing infected bile

*Chemical causes:*
- Leakage of urine into the peritoneal cavity if urine is not infected
- Leakage of blood into the peritoneal cavity following damage to abdominal or pelvic organs
- Leakage of bile due to mechanical damage to the gall bladder
- Leakage of stomach contents due to rupture

**Clinical features**
- Severe and continuous pain
  - generalised if the whole peritoneum is affected
- Abdominal swelling (distension)
- Fever, vomiting
- Tender rigid abdomen
- Rebound tenderness - pressure on the abdomen and sudden release causes sharper pain
- Absent bowel sounds

**Investigations**
- Abdominal X-ray
- Blood: white cell count, C&S
- Electrolyte determination
Management

- Monitor temperature
- Monitor BP
- Put up an IV drip
- Pass a nasogastric tube and start suction
- Refer patient to Hospital for further management including possible exploratory laparotomy

In suspected bacterial infection: (minimum 7-day courses)

- **ampicillin** 2g IV or IM every 6 hours
  - *child*: 50mg/kg per dose
  - ✗ omit this in penicillin-allergic patients
- **plus gentamicin** 5-7mg/kg IV daily in divided doses
  - *child*: 2.5mg/kg every 8 hours
- **plus metronidazole** 500mg by IV infusion every 8-12 hours changing when possible to 400mg orally every 8 hours
  - *child*: 12.5mg/kg IV per dose changing when possible to oral route
  - ✗ Contraindicated in pregnancy and use of alcohol.

4.12 REFLUX OESOPHAGITIS

Inflammation of the lower third of the oesophageal mucosa

**Causes**
- Regurgitation of gastric contents into the lower oesophagus

**Predisposing factors**
- Hiatus hernia
- Increased intra-abdominal pressure
- Gastric ulcer

**Clinical features**
- Heartburn: usually brought about by bending or exertion is characteristic. It may also occur on
lying down, keeping the patients awake at night. Sitting up, eating food or alkaline substances relieves the pain.

**Differential diagnosis**
- Peptic ulcer
- Gastritis
- Pancreatitis

**Investigations**
- Gastroscopy
- Barium meal and follow through

**Management**
- **magnesium trisilicate compound** **HC2**
  1-2 tablets every 8 hours
- Modify diet:- avoid precipitating causes and increase milk intake
  
  *If no response:*
  - **cimetidine** 400mg every 6 hours for 4-8 weeks **HC4**

### 4.13 Pancreatitis

Acute or chronic inflammation of the pancreas

**Cause**
- Related to prolonged excessive alcohol intake
- Gall stones
- Biliary tract disease
- Infections, eg. mumps
- Drugs, eg. sulphamides, furosemide
- Peptic/duodenal ulcers

**Clinical features**
- Acute abdominal pain usually in the epigastrium radiating to the back
- Nausea, vomiting, abdominal distension
- Fever
- Tachycardia

**Differential diagnosis**
- Perforated peptic ulcer
4. Gastrointestinal diseases

- Acute cholecystitis
- Inflammation of biliary tract
- Sickle-cell anaemia crisis

**Investigations**
- Blood: serum analysis, cell count

**Management**

- **Acute:**
  - Nil by mouth until signs and symptoms of acute inflammation subside (i.e. cessation of abdominal tenderness and pain, return of hunger and well-being)
  - Pass a nasogastric tube for suction when persistent vomiting or ileus occurs
  - Monitor electrolytes
  - Give **IV fluids** to correct metabolic and electrolyte disturbances and to prevent hypovolaemia and hypotension
  - For severe pain: **pethidine** 25-100mg SC or IM or 25-50mg slow IV
    - repeat prn every 4-6 hours
  - **Do not** give morphine
    - it causes the sphincter of Oddi to contract
  - In case of specific infection, e.g. biliary sepsis, pulmonary infection or UTI:
    - Treat vigorously with appropriate **antibiotic** therapy

- **Chronic:**
  - Relapsing pancreatitis is characterised by:
    - intermittent abdominal pain
    - diarrhoea
    - loss of weight
  - **pethidine** 50-100mg orally as required
  - Avoid alcohol and fatty foods
  - In case of malabsorption:
    - Refer for specialist management
Note
- Look out for diabetes mellitus as a consequence of damage to the pancreas

Prevention
- Reduce alcohol intake - moderate consumption
- Limit use of toxic drugs
- Treat infections comprehensively
5. INJURIES AND TRAUMA

5.1 BITES

Wounds caused by teeth or jaws

Causes
- Animals, reptiles, eg. dog, snake or person

Clinical features
- Depend on the cause

Management

a) First aid:
- Social toilet: clean the wound thoroughly with plenty of clean soap and water immediately - remove any dirt or foreign bodies
- Stop excessive bleeding where necessary
- Rinse the wound and allow to dry
- Apply an antiseptic: chlorhexidine solution 0.05% or hydrogen peroxide solution 6% or povidone iodine solution 10%

Caution: Do not suture bite wounds

b) Supportive therapy:
- Treat shock if any or if swelling is significant
- Give analgesics prn
- Reassure and immobilise the patient

c) Tetanus prophylaxis:

Note: giving TIG or TTV to a fully immunised person may cause an unpleasant reaction, eg. redness, itching, swelling, fever, but with a severe injury this is justified

d) (Prophylactic) antibiotic: Give only for infected or high-risk wounds including:
- moderate to severe wounds
- presentation >8 hours delayed
- puncture wounds unable to be adequately
5. Injuries and Trauma

- debrided
- wounds on hands, feet or face
- wounds with underlying structures involved
- wounds in immunocompromised patients

Base the choice of treatment on Culture&Sensitivity test results

- **PPF** 1.5MU IM daily for 5 days  
  *child*: 50,000 IU/kg per dose
- Followed by **amoxicillin** 500mg every 8 hours for 5 days  
  *child*: 15mg/kg per dose
  *If patient allergic to penicillin*: (all 5-10 days treatment)
- **metronidazole** 400mg every 12 hours  
  *contraindicated in pregnancy*  
  *child*: 10-12.5mg/kg per dose
- **plus either doxycycline** 100mg daily  
  *contraindicated in pregnancy*  
  *child* >8yrs: 2mg/kg per dose  
  *or cotrimoxazole* 960mg every 12 hours  
  *child*: 24mg/kg per dose

**e) Specific treatment: Depending on type of bite**

### 5.1.1 SNAKEBITE

**Clinical features**

- Puncture wounds
- Bleeding, eg. haematuria, oozing from the site, haematemesis - usually mild but may be uncontrollable
- Pain, swelling
- Paralysis
- Excessive salivation
- Other features will depend on the type of snake and poison, i.e. haemolytic, necrotoxic, neurotoxic
5. Injuries and trauma

Management
First aid, tetanus prophylaxis, supportive therapy, antibiotics: as for Bites

- Give chlorphenamine
- **Venom in eyes:**
  - Irrigate eyes with plenty of water
  - Apply **chloramphenicol eye ointment 1%**
  - Cover with eye pads

- **Venom on skin:**
  - Wipe away excess venom
  - Assess wound for fang penetration
  - Clean wound
  - Apply firm crepe bandage to entire limb to ensure constant pressure
  - Immobilise limb with a splint

| Note: 90% of snake bites do not require antivenom |
| Only use antivenom in patients who really need it |

**Criteria for referral for administration of antivenom:**
- Signs of systemic poisoning
- Local damage
- Swelling of hand or foot (site of most bites) within 1 hour of bite
- Swelling of elbow or knee within 3 hours of bite
- Swelling of groin or chest at any time
- Associated bleeding disorder
- Snake size or recognition of venomous snake
- Significant swelling of head or neck
- Muscle weakness or breathing difficulty

*If one or more of the above criteria are satisfied:*

- Refer urgently for administration of **antivenom sera polyvalent (E & C Africa)**
  - check package insert for IV dosage details
  - ensure the solution is clear
  - check patient has no history of allergy

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Injuries and trauma

If there is history of allergy and signs of systemic poisoning: still give the antivenom but be ready to treat possible reactions - see Anaphylactic Shock.

5.1.2 INSECT BITES & STINGS

Causes
- Bees, wasps, hornets and ants:
  - venom is usually mild but may cause anaphylactic shock in previously sensitized persons
- Spiders and scorpions:
  - most are non-venomous or only mildly venomous
- Other stinging insects

Clinical features
- Swelling, discolouration, burning sensation, pain at the site of the sting
- Headache, dizziness
- May be signs of anaphylactic shock

Differential diagnosis
- Allergic reaction

Management
First aid, supportive therapy: if required (eg. if bite is from highly venomous species), give as in Bites.

If the sting remains implanted in the skin:
- remove carefully with a needle or knife blade

If severe local reaction occurs:
- Give chlorphenamine 4mg every 6 hours HC2 (max: 24mg daily) until swelling subsides
  child: 1-2 yrs: 1mg every 12 hours
  2-5 yrs: 1mg every 6 hours (max: 6mg daily)
  6-12 yrs: 2mg every 6 hours (max: 12mg daily)
5. Injuries and trauma

- Cool the affected area, eg. with ice or other cold object
- Apply calamine lotion prn every 6 hours

  If bite/sting causes severe pain, eg. scorpion:
  - Infiltrate 2mL of lignocaine 2% around the area of the bite

**Prevention**
- Clear overgrown vegetation around the home
- Prevent children playing in the bush
- Cover exposed skin while moving in the bush
- Use pest control methods to clear insect colonies

### 5.1.3 HUMAN BITE

**Clinical features**
- Teeth marks
- Bleeding
- Laceration

**Management**
First aid, tetanus prophylaxis, supportive therapy, antibiotics: give as in Bites.

### 5.1.4 ANIMAL BITE

Bite from domestic or wild animal

**Clinical features**
- May result in infection usually by anaerobic bacteria
- May cause complications from tetanus and rabies
- Tooth marks or scratches, puncture wounds, lacerations
- Bleeding, tissue necrosis

**Dealing with the animal**
If the animal can be identified and caught:
- Quarantine and feed it for 10 days
5. Injuries and trauma

If no signs of rabies infection shown within this period:
- Release the animal

If it shows signs of rabies infection:
- Kill the animal, remove its head and send to the Veterinary Department for verification of the infection

Management
For further details refer to Rabies Post-Exposure Treatment Guidelines, Veterinary Public Health Unit, Community Health Dept, Ministry of Health, Sept 2001

First aid, tetanus prophylaxis, supportive therapy, HC2 antibiotics: give as in Bites

Thorough and 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.

- The combination of local wound treatment plus passive immunization with rabies immunoglobulin (RIG) plus vaccination with rabies vaccine (RV) is recommended for all severe exposures to rabies
- 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
- As part of local treatment in all cases of possible exposure, carefully infiltrate RIG (if available) in and around the wound for dose information.
5. Injuries and trauma

Inject IM any remaining RIG at a site distant from the site of RV inoculation
- If it is not possible to give RIG at the start of RV vaccination, it may still be given up to 7 days later even when the wound has started to heal
- Do not suture the wound.
- Avoid contact with the patient's saliva and vomitus which is potentially infective. Observe strict hygiene, and if possible, wear eye protection as patients may spit and infection through the conjunctiva can occur

*If the Veterinary Department confirms rabies infection or if the animal cannot be identified/tested:*

- Give rabies vaccine
  +/- rabies immunoglobulin human
  as per the recommendations in the table below

### Recommendations for Rabies Vaccination

<table>
<thead>
<tr>
<th>NATURE OF EXPOSURE</th>
<th>CONDITION OF ANIMAL</th>
<th>RECOMMENDED ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At time of exposure</td>
<td>10 days later</td>
</tr>
</tbody>
</table>

1. Saliva in contact with skin, but no skin lesion
   - Healthy Healthy: Do not vaccinate
   - Suspect Healthy: Do not vaccinate
   - Rabid Healthy: Do not vaccinate
   - Rabid Suspect: Do not vaccinate
   - Rabid Rabid: Vaccinate

2. Saliva in contact with skin that has lesions, minor bites on trunk or proximal limbs
   - Healthy Healthy: Do not vaccinate
   - Rabid Healthy: Vaccinate
   - Suspect Healthy: Vaccinate; but stop course if animal healthy after 10 days
   - Rabid: Vaccinate
   - Unknown: Vaccinate

3. Saliva in contact with mucosae, serious bites (face, head, fingers, or multiple bites)
   - Domestic or wild rabid animal or suspect: Vaccinate, and give antirabies serum
   - Healthy domestic animal: Vaccinate; but stop course if animal healthy after 10 days
5. Injuries and trauma

Notes:
1. Consumption of properly cooked rabid meat is not harmful
2. The 10-day observation period applies only to domestic dogs and cats. Except for threatened or endangered species, all other domestic or wild animals should be killed humanely and tissues tested for rabies using appropriate veterinary laboratory techniques

Administration of Rabies Vaccine (RV)

The following schedules use:
- Purified VERO Cell Culture Rabies Vaccine (PVRV) which contains one IM immunising dose (at least 2.5 IU) in 0.5mL of reconstituted vaccine

Notes on IM doses
- Doses are given into the deltoid muscle of the arm. In young children the anterolateral thigh may also be used
- Never use the gluteal area (buttock) as fat depots may interfere with vaccine uptake making it less effective

a) Pre-exposure immunization

Offer RV to persons at high risk of exposure such as:
- laboratory staff working with rabies virus
- veterinarians
- animal handlers
- zoologists/wildlife officers
- any other persons considered to be at high risk

- Day 0: one dose IM
  Day 28: one dose IM

Where there is continuing risk of exposure to rabies:
- Give an IM booster dose of RV one year later
  - repeat every 3 years thereafter
b) Post-exposure vaccination

Give RV to all patients unvaccinated against rabies, together with local wound treatment, and in severe cases, rabies immunoglobulin.

**The 2-1-1 intramuscular regime**

This induces an early antibody response and may be particularly effective when post-exposure treatment does not include administration of rabies immunoglobulins.

- Day 0: one dose in right arm + one dose in left arm
- Day 7: one dose
- Day 21: one dose

**Alternative 2-site intradermal regime**

This uses PVRV intradermal (ID) doses of 0.1mL (i.e. one fifth of the 0.5mL IM dose of PVRV).

- Day 0: one dose into 2 sites (left and right deltoid)
- Day 3: one dose into 2 sites (left and right deltoid)
- Day 7: one dose into 2 sites (left and right deltoid)
- Day 28: one dose into 1 site (deltoid)
- Day 90: one dose into 1 site (deltoid)

**Notes on ID regime**

- Much cheaper as requires less vaccine
- Requires special staff training in ID technique using 1mL syringes and short needles
- Compliance with the Day 28 and 90 doses is vital but may be difficult to achieve
- Patients must be followed up for at least 6-18 months to confirm the outcome of treatment
c) Post-exposure immunization in previously vaccinated patients

In persons known to have previously received full pre- or post-exposure rabies vaccination within the last 3 years:

- Day 0: one booster dose IM
  - Day 3: one booster dose IM

If completely vaccinated >3 years earlier or if incompletely vaccinated:
- Give a complete post-exposure vaccination course of RV and passive immunization with rabies immunoglobulin (RIG) if necessary

d) Passive immunization with rabies immunoglobulin (RIG)

Give in all high risk rabies cases irrespective of the time between exposure and start of treatment

Human rabies immunoglobulin (HRIG) or Equine rabies immunoglobulin (ERIG) is used

- HRIG 20 IU/kg or ERIG 40 IU/kg
  - infiltrate as much as possible of this dose around the wound/s
  - give the remainder IM into gluteal muscle
- Follow this with a complete course of RV
  - the first dose of vaccine should be given at the same time as the immunoglobulin, but at a different site

RV and RIG are both very expensive and should only be used when there is an absolute indication

Prevention

- Vaccinate all domestic animals against rabies, eg. dogs, cats, and others
Management of Rabies

Start treatment as soon as possible after exposure but do not withhold from any exposed person whatever time interval has passed since exposure

- Admit
- Give appropriate supportive treatment and care
- Observe strict hygienic precautions
- Counsel caregivers on rabies and likely consequences

5.2 FRACTURES

A fracture is a complete or incomplete break in a bone

Causes
- Trauma, eg. road traffic accident, assault, falls
- Bone weakening by disease, eg. cancer, TB, osteomyelitis, osteoporosis

Clinical features
- Pain, tenderness
- Swelling
- Inability to use/move the affected part
- Deformity
- May be open (with a cut) or closed

Differential diagnosis
- Bone infection
- Bone cancer
- Sickle-cell disease

Investigations
- X-ray: 2 views to enable comparison with normal side

Management (all patients)

General management

Simple fractures

HC2
- Ensure airway is clear
- Treat shock - see p417
- Elevate any fractured limb
5. Injuries and trauma

- Immobilise the affected part with a splint, with special attention to neck or spinal injuries
- Give an analgesic to relieve pain
- Refer for further management
- Do not give pethidine and morphine for rib fractures and head injuries as they cause respiratory depression

**Compound fractures**

**HC4**
Manage in the same way as simple fractures but also:
- Stop any bleeding
- Carry out surgical toilet

*Prophylaxis against tetanus, i.e. if not fully immunised or if the wound is suspected to be contaminated*

*If there is anaemia: manage accordingly*

**Note**
- First aid management of fractures can be done at the **HC2** level and then refer patient as soon as possible
- Check blood circulation beyond the affected part

---

5.3 **BURNS**

Tissue injury caused by thermal, chemical, electrical or radiation energy

**Causes**
- Thermal, eg. hot fluids, flame, steam, hot solids, sun
- Chemical, eg. acids, alkalis and other chemicals
- Electrical, eg. Domestic,(low voltage)
  Transmission in (high voltage) lighting
- Radiation, eg. exposure to excess radiotherapy or radioactive materials

**Clinical features**
- Pain, swelling
- Skin changes (hypraemia, blisters, singed hairs)
- Skin loss (eschar formation, charring)
5. Injuries and trauma

- Reduced use of the affected part
- **Systemic effects** in severe burns include shock, low output, generalised swelling, respiratory insufficiency, deteriorated mental state.

**Differential diagnosis**
- Eczema
- Other conditions causing skin loss, eg. herpes zoster, toxic epidermal necrosis, friction abrasion

**Classification of the severity of burns**
Burn injury may be described as mild, moderate or severe burns depending on the;
- Depth of the burn
- % of total body surface area (TBSA) burnt
- The body parts injured e.g. face, hands, feet, perineum burns are considered severe
- Age /general condition of patient at the time of the burn

i) **Depth of the burn** (a factor of temperature, of agent and of contact with the skin)
- 1<sup>st</sup> Degree burns: superficial epidermal injury with no blisters, main sign is redness of the skin, tenderness or hyper sensitivity, with intact two point discrimination.
- 2<sup>nd</sup> Degree burns: Partial thickness burns is a dermal injury that is sub-classified as superficial, and deep 2<sup>0</sup> burns.
  - In superficial 2<sup>0</sup> burns, blister result and the pink wound is extremely painful.
  - In deep 20 burns, a thin eschar is formed and the pale moist wound is painful
- 3<sup>rd</sup> Degree burns: full thickness skin destruction, leather like rigid eschar. Painless on palpation or pinprick
- 4<sup>th</sup> Degree burns: full thickness skin + fascia, muscles or bone destruction. Lifeless body part
ii) The % of total body surface area (TBSA)
   Small areas are estimated using the open palm of the patient to represent 1% TBSA. Large areas estimated using the "rules of nines" or a Lund-Browder chart

iii) Age and general condition of the patient
   In general, children and the elderly fare worse than young adults and need more care. A person who is sick or debilitated at the time of the burn will be worse affected than one who is healthy. See page 127.

iv) Categorisation of severity of burns
   Using the above criteria, a burns patient may be categorised as follows:

   a) Minor/mild burn:
      - Adult with <15% TBSA affected or
      - Child/elderly with <10% TBSA affected or
      - Full thickness burn with <2% TBSA affected and no serious threat to function

   b) Moderate (intermediate) burn:
      - Adult with partial thickness burn and 15-25% TBSA or
      - Child/elderly with partial thickness burn and 10-20% TBSA
      All above with no serious threat to function and no cosmetic impairment of eyes, ears, hands, feet or perineum.

   c) Major (severe) burn:
      Adult with:
      - partial thickness burn and >25% or
      - full thickness burn and >10% TBSA

      Child/elderly with:
      - partial thickness burn >10% or
      - full thickness burn of >5% TBSA affected
5. Injuries and trauma

Irrespective of age
- Any burns of the face, eyes, ears, hand, feet, perineum with cosmetic or functional impairment risks
- Chemical, high voltage, inhalation burns
- Any burn with associated major trauma

A: Management of mild/moderate burns
HC2 & HC3

a) First Aid
- Stop the burning process and move the patient to safety
  - roll on the ground if clothing is on fire,
- Pour or shower the affected area with cold water especially in the first hour after the burn (this may reduce the depth of injury if started immediately).
- May cleanse the wound with Saline solution or dilute antiseptic solution. Savlon or Dettol.
- Cover the wound with a clean dry cloth and keep the patient warm

b) Health Centre Care

Medication:
- Give oral or IV analgesics as required
- Leave blisters alone - do not puncture
- Expose the patient in a bedcradle
- If wound is infected:
  - apply silver sulphadiazine cream 1% daily
  - use more frequently if volume of exudate is large
- Dress the wound with paraffin gauze dressing
  - place enough dry gauze on top to prevent
- Change the dressing after 2-3 days and prn thereafter

Prophylaxis against tetanus, i.e. if not fully immunised or if the wound is suspected to be contaminated:
Fluid replacement
- Give ORS and/or IV fluids prn depending on the degree of dehydration
  - give as much as the patient can take

Other measures:
- Give appropriate physiotherapy

Wound care:
- Leave blisters alone - do not puncture (except if non-adherent sterile dressing is possible)
- Apply antiseptic cream e.g. Silver Sulphadiazine cream 1%
- Apply layers of saline moistened gauze - place enough dry gauze on top to prevent seepage to outer layers and creep bandage to hold dressings
- Small superficial 2” burns may be dressed with paraffin gauze dressing
- Change the dressings after 1-2 days and as necessary thereafter

Fluid replacement
- Give oral fluids (ORS or others) and/or IV fluids depending on the degree of loss of intravascular fluid
- The fluid requirements are often very high so give as much as possible.

Other measures:
- Give appropriate physiotherapy of joints affected (especially the hand)
- Nutritional support let boost healing
- Counselling and psychosocial support to patient and relatives
- Health education on burns prevention e.g. epileptic control.

B: Management of Severe burns
Treat as for mild/moderate burns with the addition of the following:
Give IV fluid replacement in a total volume per 24 hours according to the calculation in the box below.

- **Use only Crystalloids i.e.** Ringer’s Lactate or Normal Saline (0.9%NaCl),

<table>
<thead>
<tr>
<th>Calculation and Administration of IV Fluid Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The objective is to maintain normal physiology as shown by urine output, vital signs and mental status</td>
</tr>
<tr>
<td>• The total volume of IV solution required in the first 24 hours of the burns is:</td>
</tr>
<tr>
<td>4mU x weight (kg) x % TBSA burned</td>
</tr>
<tr>
<td>Plus the normal daily fluid requirement</td>
</tr>
<tr>
<td>• Give 50% of this the first 8 hours. 50% in the next 16 hours. The fluid input is balanced against the urine output. The normal urine output is; Children (&lt;30kg wt) 1 ml/kg/hr and adults 0.5 ml/kg/hr (30-50mls/hr)</td>
</tr>
</tbody>
</table>

**NB:** The basis of fluid replacement is that fluid is lost from the circulation into the tissues surrounding the burns and some lost through the wounds. Fluid loss is excessive in 18-30 hours of burns. Low intravascular volume results in tissue circulatory insufficiency (shock) with results such as kidney failure and deepening of the burns.

and dextran infusion are not available):

- Give these solutions in a ratio of 2:1
  - i.e. 2 units of Ringer’s lactate (or saline) followed by 1 unit of glucose infusion 5%
  - repeat until total required daily volume is reached

*If burn infected:*

- apply *silver sulphadiazine cream 1%* daily
  - contraindicated in pregnancy and breastfeeding
- give an antibiotic
5. Injuries and trauma

Infected burn
- Bath the patient daily and dress burns frequently till infection controlled
- Use antiseptic cream (silver sulphadiazine 1% cream) on the wound (This cream is contraindicated if pregnancy, breast feeding and premature)
- Give antibiotic only if there are systemic effects of infection

Surgery
- Escharotomy and fasciotomy for circumferential limb or tarsal burns
- Escharectomy to exercise: dead skin off
- Skin grafting to cover deep burn wounds
- Eye protection (temporary tarsorapy)

Notes on severe burns
- Blood transfusion may be required
- There is a risk of systemic inflammatory response syndrome
- With inhalation burns, supplementary oxygen is vital, airway be needed
- With hand / finger burns, early escharotomy and fasciotomy is required

Prevention
- Public awareness of burn risks and first aid water use in cooling burn skin
- Construction of raised cooking fire places as safety measure
- Ensure safe handling of hot water and food, keeping well out of the reach of children
- Particular care of high risk persons near fires, e.g. children, epileptic patients, alcohol or drug abusers
- Encouragement of use of flames, e.g. hurricane lamps
5. Injuries and trauma

CHART FOR ESTIMATING % OF TOTAL BODY SURFACE AREA (TBSA) BURNT

NAME: ____________________________
SEX: ____________________________ IP NO. __________ DATE: __________

LUND AND BROWDER CHARTS

<table>
<thead>
<tr>
<th>REGION</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAD</td>
<td></td>
</tr>
<tr>
<td>NECK</td>
<td></td>
</tr>
<tr>
<td>ANT. TRUNK</td>
<td></td>
</tr>
<tr>
<td>POST. TRUNK</td>
<td></td>
</tr>
<tr>
<td>RIGHT ARM</td>
<td></td>
</tr>
<tr>
<td>LEFT ARM</td>
<td></td>
</tr>
<tr>
<td>BUTTOCKS</td>
<td></td>
</tr>
<tr>
<td>GENITALIA</td>
<td></td>
</tr>
<tr>
<td>RIGHT LEG</td>
<td></td>
</tr>
<tr>
<td>LEFT LEG</td>
<td></td>
</tr>
<tr>
<td>TOTAL BURN</td>
<td></td>
</tr>
</tbody>
</table>

RELATIVE PERCENTAGE OF BODY SURFACE AREA AFFECTED BY GROWTH

<table>
<thead>
<tr>
<th>AREA</th>
<th>AGE 0</th>
<th>1</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>ADULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = ½ OF HEAD</td>
<td>9½</td>
<td>8½</td>
<td>6½</td>
<td>5½</td>
<td>4½</td>
<td>3½</td>
</tr>
<tr>
<td>B = ½ OF ONE THIGH</td>
<td>2½</td>
<td>3½</td>
<td>4</td>
<td>4½</td>
<td>4½</td>
<td>4%</td>
</tr>
<tr>
<td>C = ½ OF ONE LEG</td>
<td>2½</td>
<td>2½</td>
<td>2½</td>
<td>3</td>
<td>3½</td>
<td>3½</td>
</tr>
</tbody>
</table>
5.4 WOUNDS

Any break in the continuity of the skin or mucosa

**Causes**
- Sharp objects, eg. knife, causing cuts, punctures
- Blunt objects causing abrasions, lacerations, bruises
- Infections, eg. abscess
- Bites, eg. insect, animal, human
- Missile and blast injury, eg. gunshot, mines
- Crush injury, eg. RTA, building collapse

**Clinical features**
- Raw area of broken skin or mucous membrane
- Pain
- Swelling
- Bleeding, discharge
- Reduced use of affected part
- Cuts: sharp edges
- Lacerations: irregular edges
- Abrasions: loss of surface skin
- Bruises: subcutaneous bleeding, eg. black eye

**Management**

**Minor cuts and bruises**

First aid, tetanus prophylaxis, supportive therapy:
Antibiotics are not usually required but if the wound is grossly contaminated, give

**Wounds (deep and/or extensive)**

- Identify the cause of the wound or injury if possible
- Clean the wound with chlorhexidine solution 0.05% or hydrogen peroxide solution 6%
- Explore the wound to ascertain the extent of the damage
- Surgical toilet: carry out debridement and cut to freshen the wound
5. Injuries and trauma

If clean and fresh (<12 hours):
- Carry out 1° closure by suturing under local anaesthetic - use lignocaine hydrochloride 2%
  ✗ Do not suture gun shot and bite wounds

If wound is >12 hours old or dirty:
- Carry out delayed 1° closure
  - use this for wounds up to 2-4 days old

If wound >4 days old:
- Carry out 2° closure

Where necessary and if facilities available:
- Carry out 3° closure with a skin flap or graft

Tetanus prophylaxis, supportive therapy, prophylactic antibiotic:

5.5 HEAD INJURIES

Damage to the head tissue causing swelling ± wound ± fracture

Cause
- Road traffic accident
- Assault, fall or a bang on the head

Clinical feature
- May be closed (without a cut) or open (with a cut)
- Headache pain
- Swelling or cut wound on the head
- Fracture of the skull, eg. depressed area of the skull, brain matter may be exposed
- Altered level of consciousness if brain tissue is involved, including coma
- Haematoma

Differential diagnosis
- Poisoning
- Meningitis
- Alcoholic coma - may occur together with a head injury
- Hypoglycaemia
- Other cause of coma

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Management

**WARNING:** Do not sedate any patient with a head injury!

This is based on classification of the head injury using the *Glasgow Coma Score* (GCS) as follows:

a) **Simple:** no loss of consciousness (LOC), GCS = 15
   - Give any necessary first aid
   - Monitor level of consciousness and GCS
   - If satisfactory, send patient home with *analgesics*

b) **Concussion:** LOC <6 hours, GCS = 13-15
   - Give necessary first aid
   - Keep under observation for 24 hours
   - If no deterioration, send patient home
   - If condition deteriorates, refer to hospital immediately for specialist management

c) **Contusion:** LOC >6 hours, GCS = 8-12
   - Treat as for cerebral oedema below

d) **Haemorrhage:** lucid intervals - GCS may be up to 15 but drops off with increasing LOC
   - Treat as for cerebral oedema below

**In all cases:**
- Give any necessary first aid
- If patient able to swallow, give *analgesic* for the pain,
  - Avoid narcotic analgesics because of sedative effects

**If there are signs of cerebral oedema:** HC4
- Give supportive treatment:
  - Nurse in a semi-prone position
  - Keep a head injury chart to record the *Glasgow Coma Score*, pupil size and neurological signs
  - Withhold IV fluids or use with caution
- Give *oxygen* if available
- Refer to hospital as soon as possible for specialist management
5. Injuries and trauma

Open head injury
- Refer immediately to a specialist after giving first aid and an initial dose of antibiotic
  - if at HC3 level or higher give antibiotic as in Meningitis, p10 prior to referral

Closed head injury
- Treat as for cerebral oedema above

Prevention
- Careful (defensive) driving to avoid accidents
- Use of safety belts by motorists
- Wearing of helmets by cyclists, motor-cyclists and people working in hazardous environments
- Avoiding climbing trees
6. ENDOCRINE SYSTEM

6.1 ADDISON’S DISEASE

A condition where the adrenal gland produces insufficient glucocorticoid hormones (adrenal insufficiency)

**Causes**
- Autoimmune (self destruction of the gland)
- TB of the adrenals
- Surgical adrenal removal
- Cancer affecting adrenal glands
- Bleeding into the adrenals
- Necrosis of the adrenals
- HIV/AIDS

**Clinical features**
Acute or chronic:
- General weakness
- Weight loss
- Darkening of the skin and mouth
- Low BP
- Mental changes, eg. irritability and restlessness
- Hypoglycaemic attacks
- Hair loss
- Menstrual disturbance and infertility
- Patient tires easily
- Fever
- Dehydration

**Differential diagnosis**
- HIV/AIDS
- Cancer
- Depression
- Diabetes mellitus
- TB

**Investigations**
- Urine: 17-hydroxycorticoids, 17-ketosteroids
- Plasma cortisol (8.00 am & 6.00 pm)
6. Endocrine system

Management

- **cortisone** 25mg every 8 hours as replacement therapy
  - or **prednisolone** 5mg daily for replacement therapy

6.2 CUSHING’S SYNDROME

Chronic glucocorticoid excess from whatever cause, leads to the constellation of symptom and physical features known as **(CUSHING, SYNDROME)**. Its most common cause is iatrogenic, resulting from chronic glucocorticoid therapy.

**Cause:**
- Iatrogenic
- Excessive ACTH:
- Cushing’s Disease
- Ectopic ACTH production
- Adrenal adenoma
- Adrenal carcinoma

**Clinical Features:**
- Central (Truncal) Obesity
- Moon facies
- Buffalo hump
- Thinning of the skin (Transparent appearance)
- Striae
- Poor wound healing
- Hirsutism and acne (female) due to increased androgens
- Hypertension
- Muscle weakness

**Different Diagnosis**
- Ordinary Obesity
- Down’s Syndrome
- Alcoholism (alcohol-induced pseudo – Cushing’s Syndrome)
- Depression
6. Endocrine system

**Investigation**
- Overnight Dexamethasone Suppression
- Urine free control
- Basal morning and early evening cortisol
- Basal ACTH levels
- High Dexamethasone Suppression

**Management**
This will depend on the cause:
- Potassium replacement
- Treatment of diabetes and early evening cortisol
- Slow withdrawal of hormone source – if iatrogenic
- Surgical Removal of ACTH tumours if feasible

### 6.3 DIABETES MELLITUS
Metabolic disease resulting from insulin insufficiency or ineffectiveness, primarily due to peripheral resistance to the action of insulin.

**Cause**
- Defective insulin production/release or resistance to its action

**Clinical features**
- Excessive thirst, excessive fluid intake (polydipsia)
- Excessive urine production (polyuria)
- Tiredness
- Loss of weight
- Increased appetite (polyphagia)
- Genital itching, impotence
- Poor sight
- Coma

**Complications**
- Blindness
- Impotence
- Amputations
- Strokes
- Kidney failure
- Heart attack
6. Endocrine system

Differential diagnosis
- Diabetes Insipidus
- Other causes of polyuria, polydipsia, weight loss, polyphagia
- Other causes of coma, eg. alcohol poisoning
- HIV/AIDS

Investigations
- Urine: glucose
- Blood: glucose
- HBA1C – Hemoglobin A1C

Management

a) Type 1 Diabetes

**Insulin Dependent Diabetes Mellitus (IDDM)**

- **Insulin zinc suspension** (lente insulin) adult
  - 10-20 IU twice daily SC  
  - Adult:
    - Lente insulin is 2/3 of the 24 hour stabilization soluble insulin requirement and should be used only after this daily requirement has been established.
    - Soluble insulin **40 - 100** IU SC daily in 3 divided doses before meals
  - Child:
    - 40-80 IU as above
  - Conventional insulin therapy often combines the two types of insulin in mixture of 30/70 soluble to lente insulin.

Note:
- Avoid using propranolol or other B-blockers in diabetics because they mask hypoglycaemic symptoms
  - if required, use alternative antihypertensives
6. Endocrine system

**Type 2 Diabetes**

b) **Metformin 500mg B.D at Breakfast and supper**

- **tolbutamide** 0.5-2g daily in 2 divided doses taken pre-breakfast and pre-supper (dose depends on the results of the blood glucose monitoring)
- **or glibenclamide** 5mg once daily with meals initially
- **elderly:** 2.5mg daily initially (but see caution below) adjust according to response up to a max. of 10mg.

**Caution**
- Tolbutamide: contraindicated in breastfeeding mothers,
- glibenclamide: caution in elderly patients because of risk prolonged hypoglycaemia

### 6.4 DIABETIC KETOACIDOSIS

An acute metabolic complication of diabetes mellitus more common in the insulin-dependent (IDDM) type diabetics

**Cause**
- Newly diagnosed diabetes
- Poor control of diabetes mellitus
- Infections and trauma

**Clinical features**
- Excessive thirst, fluid intake and passing of urine
- Tiredness
- Weight loss in new cases
- Abdominal pain, vomiting
- Collapse and unconsciousness
- Sweet, acetone smell on the breath

**Differential diagnosis**
- Other causes of ketoacidosis
- Other causes of acute abdominal pain
- Other causes of coma
Management

- **soluble insulin** 10-20 IU im every hour
- Monitor urine and the blood sugar hourly
- Treat any dehydration (with normal saline or 5% dextrose when blood sugar has fallen below 250 Mg for 5 days)
- **potassium chloride** 1g every 8 hours for 5 days
- Treat any infection present

Prevention

- Early detection
- Good control of diabetes
- Prompt treatment of infections
- General education

6.5: HYPERTHYROIDISM (Thyrotoxicosis)

Excessive production of thyroid hormones

**Causes**

- Grave disease (common in females)
- Neonatal thyrotoxicosis
- Iatrogenic causes
- Tumours of thyroid gland (adenomas, multiple nodules)
- Inflammation of the thyroid gland (thyroiditis)

**Clinical features**

- Weight loss with increased appetite
- Swelling in the neck (goitre)
- Palpitations, tremor of hands
- Irritability, nervousness, inability to rest or sleep
- Irregular scanty menstrual periods
- Profuse sweating, extreme discomfort in hot weather
- High blood pressure
- Protruding eyes (exophthalmos)
- Receiving up lifted finger nails
6. Endocrine system frequent defec tion

Differential diagnosis
- Anxiety states
- Tumours of the adrenal gland (pheochromocytoma)
- Other causes of weight loss
- Other causes of protruding eyes

Investigations
- Blood levels of thyroid hormone (T3, T4, TSH)
- Thyroid scans
- Biopsy of thyroid gland for cytology/histology

Management

The aim is to restore the euthyroid state
- use pulse rate and thyroid function to monitor progress
  - **carbimazole** 10-15mg every 8 hours for 1-2 mths
    - child: 250 micrograms/kg per dose
  - adjust dose according to response
    - (only under specialist management)
  - **propranolol** 40-80mg every 12 hours for at least 1 month
    - to control excessive sympathetic activity
      - child: 250-500 micrograms/kg 3-4 times daily

Once patient is euthyroid:
- progressively reduce **carbimazole** to daily maintenance dose of 5-15mg and continue for 18 months
- Surgery may be required in certain cases, eg. obstruction, intolerance or lack of response to drug treatment
- Radiotherapy may also be used

Caution
- △ N.B. Need for vitamin supplements
- △ Carbimazole: patients treated with this should be advised to report any sore throat immediately because of the rare complication of agranulocytosis

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6.6 HYPOTHYROIDISM (Myxoedema)

A condition resulting from thyroid hormone deficiency. It is 5 times more common in females than in males.

**Causes**
- Autoimmune disease
- Post-therapeutic (especially after radiotherapy or surgical treatment for hyperthyroidism)
- Secondary - due to enzyme defects

**Clinical features**
- Dull facial expression, puffiness, periorbital swelling
- Hoarse voice, slow speech
- Drooping eyelids
- Hair sparse, coarse and dry
- Skin coarse, dry, scaly and thick
- Forgetfulness, other signs of mental impairment
- Gradual personality change
- Bradycardia
- Constipation (often)
- Parasthesia (numbness) of hands and feet
- Anaemia (often)

**Differential diagnosis**
- Myasthenia gravis
- Depression

**Investigations**
- Blood levels of thyroid hormone (T3, T4, TSH)

**Management**
- Thyroxine 100 micrograms initially once daily before breakfast
  - Elderly: 50 micrograms
- Depending on response:
  - Gradually increase by 25-50 micrograms every 4 wks to maintenance dose of 100-200 micrograms daily
6. Endocrine system

*child*: **thyroxine** 1 microgram/kg daily for the first 6 months, then adjust according to response

- Treat anaemia and give victim supplements.
- max: 100 micrograms daily

**Prevention**

- Educate patients on the use of iodised salt
- Early detection is important
7. GUIDELINES FOR APPROPRIATE USE OF BLOOD

Refer to the National blood transfusion Guidelines for further details including information on:
- Donor recruitment and selection
- Blood collection and storage procedures and records
- Laboratory testing of donor and recipient blood
- Transfusion reactions
- Clinical aspects of blood transfusion and administration

The following sections have been adapted from the clinical use of blood WHO BTS/99.3 Geneva.

7.1 Key points

- The appropriate use of blood and blood products means the transfusion of safe blood products only to treat conditions leading to significant morbidity or mortality which cannot be prevented or effectively managed by other means.
- Transfusion carries the risk of adverse reactions and transfusion-transmissible infections (e.g. hepatitis, HIV, malaria, etc). NB. Plasma can transmit most of the infections in whole blood and there are few indications for its use.
- Blood donated by family/replacement donors carries a higher risk of transfusion-transmissible infections than blood donated by voluntary non-remunerated donors. NB. Paid blood donors generally have the highest incidence of transfusion-transmissible infections.
- Blood should not be transfused unless it has been:
7. Guidelines for appropriate use of blood

- Obtained from appropriately selected donors
- Screened for transfusion-transmissible infections
- Tested for compatibility between the donor’s red cells and the antibodies in the patient’s plasma in accordance with national requirements. 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

- Blood transfusion can often be avoided
- Appropriate and inappropriate transfusion

7.2 Transfusion criteria

Blood transfusion can be a life-saving intervention but, like all treatments, it may cause acute or delayed complications and carries the risk of transfusion-transmissible infections.

Transfusion may be unnecessary for the following reasons:

- The need for transfusion can often be avoided or minimized by prevention or early diagnosis and treatment of anaemia and its causes.
- There are rarely valid reasons for transfusion given to raise Hb level before planned surgery or to allow earlier discharge from hospital.
- In many cases of acute blood loss, infusion of normal saline or other IV replacement fluids is safer, less expensive and equally effective.
- Good anaesthetic and surgical management can often minimize transfusion requirements.

If blood is given when not needed:
- The patient is exposed to risk for no benefit
7. Guidelines for appropriate use of blood

- An expensive and scarce resource is wasted leading to shortages of blood for patients in real need.

**Do not use blood transfusion to:**
- Expand blood volume, unless there has been blood loss of > 30% of total volume
- Enhance wound healing
- ‘Top up’ Hb for surgery
- Improve the general well-being of the patient

- in patients with ongoing fluid losses, e.g. surgical blood loss
  - IV replacement fluids are 1st line treatment for hypovolaemia as they restore the circulating blood volume and so maintain tissue perfusion and oxygenation.
  - In severe haemorrhage, initial treatment with IV replacement fluids may be life-saving and provide some time to control bleeding and obtain blood for transfusion if it becomes necessary. Crystalloid solutions with a similar concentration of sodium to plasma (balanced salt solutions [BSS]) e.g. sodium.

7.3 Risk of transfusion
In some clinical situations, transfusion may be the only way to save life or rapidly improve a serious condition, but always weigh up the risk of transfusion against risks of not transfusing before prescribing blood/blood products.

**Risks of red cell transfusion**
- Serious haemolytic transfusion reactions
- Transmission of infectious agents, e.g. HIV, hepatitis
7. Guidelines for appropriate use of blood

- Can become contaminated with bacteria and very dangerous if manufactured of stored incorrectly
- Circulatory overload

7.4 Principles of clinical transfusion practice

1. Transfusion is only one part of patient management
2. Prescribe transfusion based on national guidelines and according to individual patient needs
3. Minimize blood loss to reduce need for transfusion
4. In patients with acute loss, give effective resuscitation (IV replacement fluids, oxygen etc) while assessing the need for transfusion
5. Do not use the Hb value (although important) as the only criteria for starting transfusion the decision should be supported by the need to relieve clinical signs and symptoms and prevent morbidity and mortality
6. Be aware of the risks of transfusions, only prescribe transfusion when the benefits are likely to be greater than the risks
7. Clearly record the reason for the transfusion in the patients notes
8. Ensure the transfused patient is closely monitored and that there is immediate response if any adverse reactions occur

7.5 Procedure for handling request

1. The hospital blood bank laboratory to deal only with blood samples that are appropriately labeled on the appropriate sample tubes.
2. The hospital blood bank laboratory not to deal with requests that do not meet the hospital’s criteria

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3. The ABO blood group of neonates younger than 3 months cannot be fully determined.

4. The cause of most of the haemolytic transfusion reaction with fatal consequences is due to clerical errors whereby blood with wrong ABO blood group was administered to patients. Part of the errors (6-20%) is made by selection of blood products from stock and transfer of these products from the hospital blood bank laboratory to the ward. The procedure of transfer of blood and blood components to the ward must be documented in Standard Operating Procedure (SOP). In principle, the blood bank laboratory should issue one unit of blood per patient to the ward.

7.6 Replacement fluids

Key points

- Replacement fluids are used to replace abnormal losses of blood, plasma and other extracellular fluids by increasing the volume of the vascular compartment, mainly in:
  - Treatment of patients with established hypovolaemia, e.g. haemorrhagic shock
  - Maintenance of normovolaemic blood loss in patients with ongoing fluid losses, e.g. surgical blood loss
  - IV replacement fluids are 1st line treatment for hypovolaemia as they restore the circulating blood volume and so maintain tissue perfusion and oxygenation.
  - In severe haemorrhage, initial treatment with IV replacement fluids may be life saving and provide some time to control
bleeding and obtain blood for transfusion if becomes necessary.

Crystalloid solutions with a similar concentration of sodium to plasma (balanced salt solutions [BSS] e.g. sodium chloride 0.9 %, compound sodium lactate solution [Ringer’s lactate], Hartmann’s solution, are effective as replacement fluids. Infuse 3 ml of these for each 1 ml of blood lost. NB. Glucose solutions (e.g. glucose 5% infusion, Darrow’s solution ½ strength in glucose 2.5% infusion) do not contain sodium and are poor replacement fluids do not use unless there is no alternative

- Never use plasma as a replacement fluid
- Never use plain water as an IV replacement fluid – it will cause haemolysis and will probably be fatal
- As well as the IV route, the intraosseus, oral, nasogastric, rectal or subcutaneous routes can be used for administration of replacement fluids. However, except for the intraosseus route, these routes are unsuitable for treating severe hypovolaemia

**Major Products Available: Whole Blood (WB)**

**Description/Contents:**

450-500 mL blood from the donor is collected into an anticoagulant/preservative solution and undergoes no further processing if used as WB.

**Indications:**

- **Severe anaemia:**
  - **Neonates:**
    - Refer to hospital for specialized management
ii. **Children and infants:**
- If Hb = 4g/dl or less (or haematocrit 12%) whatever the clinical condition of the patient
- If Hb = 6g/dl or less (or haematocrit 13-18%) if any of the following life threatening clinical complications are also present:
  - Clinical features of hypoxia and cardiac decomposition: acidosis (usually causes dyspnoea) – impaired consciousness
  - Hyperparasitaemia (>20%) or cerebral malaria
  - Septicaemia
  - Meningitis

iii. **Adults**
- Only consider blood transfusion if anaemia is likely to cause or has already caused clinical signs of hypoxia
- Do not transfuse more than necessary – only give sufficient Hb to relieve hypoxia
- Match the dose to the patient’s size and blood volume
- Hb content of a 450 ml unit of blood may range from 45-75 g
- Patients may be precipitated into cardiac failure by infusion of blood or other fluids.

**If transfusion is necessary:**
- Give one unit (preferably of red cell concentrate) over 2-4 hours
- Give a rapidly acting diuretic, e.g. frusemide 40 mg IM
- Reassess the patient

**If symptoms of severe anaemia persist:**
- Give further 1-2 units
iv. **Pregnancy:**
1. **Duration of pregnancy <36 weeks:**
   - If Hb 5 g/dl or less irrespective of clinical condition
   - If Hb 5-7 g/dl and with any of the following present:
     - Established or incipient cardiac failure or clinical evidence of hypoxia
     - Pneumonia or other serious bacterial infection
     - Malaria
     - Pre-existing heart disease
2. **Duration of pregnancy 36 weeks or more:**
   - If Hb 6 g/dl or less irrespective of clinical condition
   - If Hb 6-8 g/dl and with any of the above conditions are present:
     - Elective caesarean section
   - If there is history of:
     - Antepartum haemorrhage (APH)
     - Postpartum haemorrhage (PPH)
     - Previous caesarean section
   
   *If Hb 8-10 g/dl:*
   - Establish/ confirm blood group and save freshly taken serum for cross matching
   *If Hb <8 g/dl:*
   - Have 2 units of blood cross matched and available

v. **Pre-operatively:**
   - If Hb 7-8 g/dl in a well – compensated and otherwise healthy patient presenting for minor surgery NB. A higher preoperative Hb level will be needed before elective surgery in the following situations:
7. Guidelines for appropriate use of blood

- Inadequate compensation for the anaemia
- Significant co-existing cardio respiratory disease
- Major surgery or significant blood loss expected

b) Acute haemorrhage with shock

Management of acute haemorrhage/hypovolaemia

- Replacement of blood volume with suitable replacement fluids is more important than red cell replacement in the management of previously healthy patients who have lost >30% of their blood volume.
- The need for blood transfusion must be determined by:
  - The amount and speed of blood loss
  - The patient’s critical signs
  - Response to initial IV fluid resuscitation

v. Adults

Fluid resuscitation

1. Infuse sodium chloride 0.9% or compound sodium lactate infusion (Ringer’s lactate) as soon as possible to restore circulating blood volume rapidly and maintain organ perfusion.
   - Give a volume of infusion of at least 3 times the volume of blood lost.

NB. Do not use glucose infusion or other IV infusions with low sodium content unless there is no alternative.

2. Give an initial fluid bolus of 20-30 ml/kg of the above fluids over 60 minutes to any patients with signs of >15% blood loss (class 2 hypovolaemia and above).
7. Guidelines for appropriate use of blood

- If possible, warm the fluid to prevent further patient cooling
- Start rapidly, monitor BP
- Reduce rate according to BP response

3. Assess patient response to guide further fluid infusion or need for blood transfusion.

4. If urgent transfusion likely to save life, do not wait for fully cross matched blood:
   - Use uncross matched group O negative blood or of the same ABO and RhD as the patient.

Reassessment
- Evaluate response to fluid resuscitation:
  - Reassess patient’s clinical condition
  - Detect any change
  - Assess response to resuscitation
- Signs of normovolaemia being re-established:
  - Decreasing heart rate
  - Normalizing capillary refill time
  - Return of peripheral pulses
  - Increase urine output
  - Return of normal BP

Management strategy
This is based on patient’s response to initial resuscitation and fluid administration

1. Rapid improvement
   Some patients respond quickly to initial fluid bolus and remain stable after it is completed - blood loss is usually <20 % of total volume

2. Transient improvement
   Patient’s who have a blood loss of 20-40 % or are still bleeding will improve with the initial bolus, but deteriorate when the fluid is slowed
3. **No improvement**

Failure to respond to adequate volumes of fluids and blood require immediate surgical intervention to control the haemorrhage. In trauma, failure to respond may be due to heart failure caused by myocardial contusion or cardiac tamponade.

### Management strategy in adults

#### Established hypovolaemia of class 2 and above

- **Infuse 20-30 ml/kg of crystalloid**
  - **Rapid improvement**
    - Slow IV fluids to maintenance levels
    - No immediate transfusion: X-match
    - Regular reassessment
    - Detailed examination
    - Definitive treatment
    - Appropriate specialist referral
  - **Transient improvement**
    - Rapid fluid administration
    - Initiate **blood transfusion***
    - Regular reassessment
    - Detailed examination
    - Early surgery
  - **No improvement**
    - Vigorous fluid administration
    - Urgent **blood transfusion***
    - Immediate surgery
7. Guidelines for appropriate use of blood

### Classification of hypovolaemia in adults

<table>
<thead>
<tr>
<th>Class</th>
<th>Mild</th>
<th>Progressing</th>
<th>Severe</th>
<th>End stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood loss (L)</td>
<td>&lt; 0.75</td>
<td>0.75 - 1.5</td>
<td>1.5 - 2</td>
<td>&gt;2</td>
</tr>
<tr>
<td>% of total blood volume</td>
<td>&lt;15</td>
<td>15 - 30</td>
<td>30 - 40</td>
<td>&gt;40</td>
</tr>
<tr>
<td>Pulse rate</td>
<td>N</td>
<td>&gt;100</td>
<td>&gt;120</td>
<td>&gt;140 (1)</td>
</tr>
<tr>
<td>Pulse pressure</td>
<td>N</td>
<td>R</td>
<td>VR</td>
<td>VR/A</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>N</td>
<td>N</td>
<td>R</td>
<td>VR</td>
</tr>
<tr>
<td>Capillary refill</td>
<td>N</td>
<td>P</td>
<td>VP</td>
<td>A</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>N</td>
<td>20 - 30</td>
<td>30 - 40</td>
<td>&gt;45 (2)</td>
</tr>
<tr>
<td>Mental state</td>
<td>Alert</td>
<td>Anxious</td>
<td>Confused</td>
<td>Confused/unconscious</td>
</tr>
<tr>
<td>Urine output (ml/h)</td>
<td>&gt;30</td>
<td>20 - 30</td>
<td>5 - 20</td>
<td>&lt;5</td>
</tr>
</tbody>
</table>

**Notes on table:**

1) but variable in terminal stages of shock
2) or slow sighing respiration

\[
\text{N = normal, R = reduced, VR = very reduced, P = prolonged, VP = very prolonged, A = absent}
\]

**Post-transfusion**

- monitor vital signs:
  - every 15 minutes for the first hour
  - every 30 minutes for the next hour then
  - every hour thereafter for 24 hours

- check Hb level after 72 hours

**B. Children**

The principles of management and resuscitation are the same as for adults.

**Hypovolaemia**

UCG 2010 155
7. Guidelines for appropriate use of blood

- Recognizing this may be more difficult than in adults.
- Vital signs may change little, even when up to 25% of blood volume is lost (class 1 & 2 hypovolaemia).
- Tachycardia is often the first response to hypovolaemia but may also be caused by fear or pain.

**Replacement fluids**
- Initial fluid challenge should represent 25% of blood volume as signs of hypovolaemia may only show after this amount is lost.
- If there are signs of class 2 hypovolaemia or greater, give 20-30 ml/kg of crystalloid fluid over 60 minutes
  - Start rapidly
  - Monitor BP
  - Reduce rate depending on BP response
- Depending on response, repeat up to 3 times if necessary, i.e. up to 60 ml/kg maximum

**Transfusion**
- If no response to initial fluid challenge of a total of 60 ml/kg, give further crystalloid fluids and blood transfusion.
- Initially transfuse 20 ml/kg of whole blood or 10 ml/kg of packed cells (only in severe anaemia.)
### Classification of hypovolaemia in children

<table>
<thead>
<tr>
<th></th>
<th>Class 1 Mild</th>
<th>Class 2 Progressing</th>
<th>Class 3 Severe</th>
<th>Class End stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood volume lost</td>
<td>&lt; 15%</td>
<td>15-25%</td>
<td>25-40%</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>Pulse rate</td>
<td>&lt;150</td>
<td>&gt;150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse pressure</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic BP</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capillary refill</td>
<td>N</td>
<td>P</td>
<td>VP</td>
<td>A</td>
</tr>
<tr>
<td>Respiratory rate/respiration</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental state</td>
<td>N</td>
<td>Irritable</td>
<td>Lethargic</td>
<td>Comatose</td>
</tr>
<tr>
<td>Urine output (ml/kg/h)</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

**Notes on table**

N= normal, P= prolonged, VP= very prolonged, A= absent

**Normal value for paediatric vital signs and blood volume**

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Pulse (rate/min)</th>
<th>Systolic BP (mmHg)</th>
<th>Respiration (rate/min)</th>
<th>Blood Vol (ml/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>120-160</td>
<td>70-90</td>
<td>30-40</td>
<td>85-90</td>
</tr>
<tr>
<td>1-5</td>
<td>100-120</td>
<td>80-90</td>
<td>25-30</td>
<td>80</td>
</tr>
<tr>
<td>6-12</td>
<td>80-100</td>
<td>90-110</td>
<td>20-25</td>
<td>80</td>
</tr>
<tr>
<td>&gt;12</td>
<td>60-100</td>
<td>100-120</td>
<td>15-20</td>
<td>70</td>
</tr>
</tbody>
</table>
c) **Intra-operatively**
   - Where necessary and as required

d) **Sickle-cell anaemia**
   - Blood transfusion is not necessary for a sickle cell patient with steady Hb of 6-8 g/dl or a haemtocrit of 18-20%.
   - Blood transfusion is necessary if Hb <5 g/dl
   - Red cell transfusion may be needed because of cardiac failure or bacterial infection during pregnancy.
   - Red cell transfusion is not needed in a pregnant patient if Hb is >6 g/dl and there are no complications
   - For caesarean section, if there is steady Hb of 8 g/dl, pre-operative blood transfusion is not needed.
   - Whole blood transfusion is needed only to replace acute blood loss.
   - The main purpose of red cell transfusion is to restore Hb to steady level with packed cells only.

e) **Indications for transfusion in neonates**
   - Refer to hospital level if transfusion required
   - Main indications:
     - Severe unconjugated hyperbilirubinaemia
     - haemolytic disease of the new born
     - Severe anaemia (refer to hospital for specialized management)
   - Other indications:
     - Complications of prematurity
     - Sepsis
     - Acute blood loss from any cause
     - Transfusion is needed if blood loss is >8 ml/kg or 10% of blood volume in premares
Transfusion Guidelines for Blood Components

1. Red Cell Transfusion Guidelines:

Major Products Available:
Red Blood Cells (pediatric pack/red cell concentrate)

Description/Contents:
Red Blood Cells (RBCs) are prepared from Whole Blood (WB) by the removal of most of the plasma. RBCs are stored in one of several saline-based anticoagulant/preservative solutions, yielding a haematocrit (Hct) between 55-80%.

Indications:
The major indication for RBC product transfusions is prevention or treatment of symptoms of tissue hypoxia by increasing the oxygen-carrying capacity of blood. The transfusion requirements of each patient should be based on clinical status rather than on predetermined Hct or hemoglobin (Hgb) values.

1. haemorrhagic shock due to:
   • Surgery
   • Trauma
   • Invasive procedure
   • Medical conditions (e.g. Gastro-intestinal hemorrhage)

2. Active bleeding with:
   • Blood loss in excess of 20% of the patients calculated blood volume or
   • Blood loss with 20% decrease in blood pressure and or 20% increase in heart rate

3. Symptomatic anemia with
   • Heamoglobin less than 8 g/dl
   • Angina pectoris or Central Nervous System (CNS) symptoms with heamoglobin less than 10 g/dl
4. Asymptomatic anemia
   • Preoperative hemoglobin less than 8 g/dl AND
   • Anticipated surgical blood loss greater than 500 ml

5. Sickle cell disease:
   When general anesthesia is anticipated, when signs and symptoms of anemia are present, or for exchange transfusion when indicated (e.g. pregnancy, stroke, seizures, priapism, or acute chest syndrome).
   • Anemia due to renal failure/hemodialysis refractory to erythropoietin therapy.

**Red blood cells products should not be transfused for volume expansion only or to enhance wound healing.**

**Dosage/Administration:**

Red Cells require compatibility testing and should be ABO and Rh compatible. One unit of RBCs should increase the hemoglobin of a 70 kg adult by approximately 1 gm/dL in the absence of volume overload or continuing blood loss. Clinical signs and symptoms should be assessed after every unit of red blood cell transfusion so that the need for additional transfusion and the patient's blood volume status can be assessed. Patients with chronic anemia, who are volume expanded, and other patients susceptible to fluid overload should be transfused slowly. The initial transfusion period should be carefully monitored with a slow transfusion rate to allow the early detection of a transfusion reaction. Transfusion should be completed within 4 hours per unit. Alternatively the unit may be divided by the Blood Bank in advance and administered in two or more aliquots.
Alternative Therapy:
Diagnosis and treatment of nutritional anemias (iron, B12, and folate deficiencies) will usually avoid the need for transfusion. Erythropoeitin has been shown to reduce transfusion needs in patients with chronic renal failure and other patients with chronic anemia. Autologous transfusion (pre-operative donation, isovolemic hemodilution, perioperative blood recovery, and post-operative blood salvage) has been shown to reduce red cell requirements in carefully selected patients. DDAVP, aprotinin, and other pharmacologic agents have been shown to reduce blood loss during some surgical procedures.

2: Platelet Transfusion Guidelines:
Platelets

Major Products Available:
Platelets concentrate (Random donor platelets - RDP)
Platelets Pooled

Description/Contents:
RDP are separated from whole blood by differential centrifugation. One unit of RDP contains at least $5.5 \times 10^{10}$ platelets, typically $7.5 \times 10^{10}$ platelets. Pooled RDP are typically prepared from 4-6 units of RDP. Platelets are suspended in donor plasma, unless washed.

Indications:
• Prevention/treatment of non-surgical bleeding due to thrombocytopenia
If possible, prior to transfusion the reason for thrombocytopenia should be established. When thrombocytopenia is caused by marrow failure, the following transfusion triggers are considered appropriate: If platelet count is \(<10,000/\mu L\) and no additional abnormalities exist. If platelet count is between 10,000 and 20,000/\(\mu L\) and coagulation abnormalities exist or there are extensive petechiae or ecchymoses. If the patient is bleeding at sites other than skin and platelet count is \(<40-50,000/\mu L\).

- Patients with accelerated platelet destruction with significant bleeding (such as autoimmune thrombocytopenia or drug-induced thrombocytopenia).
- The endpoint should be cessation of bleeding, since an increment in platelet count is not likely to be achieved. Prophylactic transfusion is not indicated in these disorders.
- Prior to surgical and major invasive procedures when the platelet count is \(<50,000/\mu L\).
- During neurosurgical and ophthalmologic procedures some authorities recommend that the platelet count be maintained between 70,000 and 100,000/\(\mu L\).
- Bleeding with qualitative platelet defect documented by history and/or laboratory tests.
- The cause should be identified and corrected, if possible, prior to surgery. Platelet transfusion is indicated only if the defect cannot be otherwise corrected: for example, a congenital platelet abnormality. Consultation with the blood bank physician is recommended in these situations.
- Diffuse microvascular bleeding after cardiopulmonary bypass or massive transfusion.
7. Guidelines for appropriate use of blood

- Platelet count and coagulation studies should be performed prior to the transfusion to guide subsequent therapy. During surgery on patients with quantitative or qualitative platelet defects, the adequacy of hemostasis in patients should be evaluated by the assessment of microvascular bleeding.

**Platelet transfusion should be avoided in thrombotic thrombocytopenic purpura, heparininduced thrombocytopenia, and post-transfusion purpura, except in cases of life threatening hemorrhage.**

**Issue of platelet concentrates**

1. It is advised to give as much as possible ABO blood groups compatible platelets.
2. Due to the short shelf life of platelets, they should be kept in the laboratory as short as possible, and must be transfused as soon as possible.
3. They must be stored at 20 – 24 degrees under continuous agitation.
4. Because of the risk of bacterial contamination, platelets must be administered via the infusion.
5. The storage of platelets under uncontrolled conditions e.g. at the ward should be avoided.

**Dosage and administration:**
Compatibility testing is not required. Platelet concentrate products should be ABO identical where possible because platelet increments may be higher. If not possible, good clinical results are usually obtained with ABO mismatched platelets. In this case, transfusion of large quantities of ABO incompatible plasma may lead to a positive direct antiglobulin test and, rarely, clinically significant red cell destruction. Rh compatibility is important but
not always possible. Post exposure prophylaxis with anti-Rh immune globulin should be considered following Rh-positive platelet product transfusions to Rh-negative women who may have children in the future. 4-5 pooled RDP. This should raise the platelet count of a typical 70 kg man approximately 30,000-50,000/μL. Platelet count increments after transfusion may be lower than expected in the presence of certain medications, fever, splenomegaly, infection, or alloimmunization to HLA or specific platelet antigens.

Alternative Therapy:
DDAVP (Desmopressin) may improve the platelet functional defect in uremia. It also raises von Willebrand factor levels in mild-moderate von Willebrand’s disease, which may improve platelet function. Pharmacologic agents such as Aprotinin may reduce major surgical bleeding and thereby avoid the dilutional thrombocytopenia characteristic of massive transfusion. Some of these agents may also have a direct effect on improving platelet function.

3. Plasma Transfusion Guidelines: Plasma

Major Products Available:
Fresh Frozen Plasma (FFP)
Plasma Frozen Within 24 hours After Phlebotomy (FP24)
FFP Thawed
Plasma, Cryoprecipitate Reduced
7. Guidelines for appropriate use of blood

Description/Contents:
All plasma products are prepared by separation from whole blood by centrifugation. The volume of plasma varies and appears on the label. Fresh Frozen Plasma contains all soluble clotting factors and contains the plasma from one unit of whole blood, approximately 250 ml, separated and frozen within 8 hours of collection. FFP Thawed should be transfused within 24 hours. Plasma Frozen Within 24 hours After Phlebotomy has somewhat reduced levels of Factor VIII (65-80%). Thawed Plasma is a unit of FFP or FP24 thawed at 30-37 °C and maintained at 1-6 °C for up to 5 days. Levels of Factors V and VIII in Thawed Plasma are reduced and Thawed Plasma should not be used to treat patients with deficiencies of these factors. Plasma, Cryoprecipitate Reduced is prepared by thawing FFP at 4 °C and removing the Cryoprecipitate, which yields plasma that is depleted in Factor VIII, von Willebrand factor (vWF), fibrinogen, Factor XIII, and fibronectin. Other proteins such as albumin, Factors II, V, VII, IX, X, and XI are unaffected.

Indications*:
• Bleeding, preoperative, or massively transfused patients with a deficiency of multiple coagulation factors.
• Patients with bleeding and/or urgent invasive procedures on warfarin therapy. Vitamin K will reverse the warfarin defect in about 12 hours.
• Thrombotic thrombocytopenic purpura and related syndromes.
• Congenital or acquired coagulation factor deficiency when no concentrate is available.
7. Guidelines for appropriate use of blood

- Specific plasma protein deficiencies. Examples include Anti-thrombin III deficiency and C-1 esterase deficiency (hereditary angioedema). Specific treatment protocols for these rare conditions should be referenced.

- Disseminated Intra-vascular coagulation (DIC) such as in disseminated septaeemia following surgery, abruptio placenta and post abortion sepsis.

  * Not all plasma products are suitable for all the above indications. The choice of plasma product should be based on the underlying deficiency and the contents of the available plasma products (see description/content).

Plasma product transfusion for coagulopathies is not indicated unless the Prothrombin Time (PT) or Partial Thrombin Time (aPTT) is >1.5 times the midpoint of the normal values.

**Do not transfuse plasma products for volume expansion, for prophylaxis following cardiopulmonary bypass, or as a nutritional supplement.**

**Dosage and Administration:**

Plasma product transfusions should be ABO compatible. Crossmatching and Rh compatibility are not required for plasma product transfusions. The usual starting dose is 10-15 mL/kg (i.e. 3-4 units for a 70-kg patient). An assessment of the effect of the product on the bleeding problem should be made before continuing therapy.

**Alternative Therapy:**

For volume expansion, saline, other electrolyte solutions, albumin, or synthetic colloids are safer, cheaper and more effective. When appropriate, a specific coagulation factor concentrate should be used for treatment. Treatment with vitamin K can
avoid the need for plasma transfusion in patients with vitamin K deficiency or on warfarin.

4. Cryoprecipitate Transfusion Guidelines:

Major Products Available:
Cryoprecipitated AHF (Cryoprecipitate)
Cryoprecipitated AHF, Pooled

Description/Contents:
The cold insoluble portion of plasma that precipitates when fresh frozen plasma is thawed at 1-6°C. The supernatant (cryo-poor plasma) is removed and the residual volume of cryoprecipitate (approximately 15 ml) is refrozen and stored at -18 °C. Cryoprecipitate provides therapeutic amounts of Factor VIII:C, Factor XIII, von Willebrand factor, and fibrinogen. Each bag of cryoprecipitate contains 80-100 units of Factor VIII:C and 150-200 mg of fibrinogen (Factor I). In addition, significant amounts of Factor XIII (fibrin-stabilizing factor) and von Willebrand factor (vWF), including the high molecular weight multimers of vWF, are also present.

Indications:
1. Fibrinogen levels less than 115 mg/dl
2. Cases of disseminated intravascular coagulation where both fibrinogen and Factor VIII may be depleted.
3. Platelet count greater than 100,000 with evidence of platelet dysfunction and no response to DDAVP
4. Prophylaxis or treatment of significant Factor XIII deficiency.

Historically, patients with von Willebrand’s disease (vWD) and Hemophilia A are treated with Cryoprecipitate.
Cryoprecipitate should not be used in the treatment of Hemophilia B (Factor IX deficiency, Christmas disease).

Cryoprecipitate has also been used in the production of "fibrin glue" with the addition of thrombin to form an insoluble clot for application to surgical margins and other surgical applications. Such use is not Food and Drug Administration FDA-approved, although widespread. The safety of this procedure, including the risk of the thrombin source, has not been established.

**Dosage and Administration:**
For fibrinogen replacement, ten bags of cryoprecipitate will increase the fibrinogen level of a 70-kilogram recipient approximately 70 mg/dl. Cryoprecipitate is administered after pooling. Compatibility testing is not necessary, but the product should be ABO plasma compatible. Rh type is not important.

**Alternative Therapy:**
Factor VIII concentrates that are made with recombinant DNA technology or have been pasteurized are safer and are the treatment of choice for patients with hemophilia A and von Willebrand’s disease. DDAVP (desmopressin) causes the release of Factor VIII and vWF in most patients with mild-moderate Hemophilia A and vWD. Therefore, DDAVP may be used instead of cryoprecipitate or factor concentrates in these patients.

**Autologous blood transfusion**
Autologous blood transfusion is the collection and re-infusion of the patient’s own blood or blood components. Autologous blood transfusion allows you to donate blood for own use. After collection, blood is clearly marked with your name and
7. Guidelines for appropriate use of blood

reservd for your use only. Documentation carefully monitored. Autologous blood donation is possible by the following:

- Those who are **not** anaemic (starting haemoglobin must be at least 11 g/dl, slightly lower than required of a regular blood donor i.e. 12 g/dl)
- Those who have no medical condition that could cause problems during or after the blood donation process
- Those who are having planned surgery that routinely requires a blood transfusion (except in cases where long term storage is desired)
- For planned surgery Autologous blood must be tested for transfusion transmissible infections, even if it is going to be transfused to the same patient.

**Five categories of autologous transfusions recognized:**

1. **Preoperative autologous blood donation, transfusion and storage:** units of blood are drawn from a patient usually starting (in short term case) 3-5 weeks before elective surgical procedure and stored for transfusion at the time of the surgery

2. **Intra-operative haemodilution:** blood is collected at the start of surgery and the fluid volume lost is replaced with appropriate IV solutions, then finally stored blood is re-infused after surgery

3. **Intra-operative blood salvage:** blood is salvage from the surgical area during the operation for re-infusion during or after the surgical procedure

4. **Postoperative blood salvage:** blood is collected after surgical procedure is complete by drainage of the operative area and re-infused

5. **Autologous self stored blood (blood banking):** your own blood is preserved in a frozen state for
use by you in case your need of a blood transfusion arises. The safest blood you can receive is your own! This process eliminates donor-transmitted diseases. If you have a rare blood type or if your blood contains rare components, this process may mean the difference between life and death. Autologous blood is always a perfect match. It will be there when you need it regardless of the general blood shortage.

**Adverse reactions to transfusion**

**Key points**

1. Report all suspected acute transfusion reactions immediately to the hospital blood bank laboratory that handles with the clinician after getting pre-transfusion sample, post-transfusion sample, patients urine and the transfused unit. Attention is made to the blood bank when suspected contamination by bacteria or haemolysis is from the blood bank. Regrouping and testing are done on both patient and transfused samples.

2. Acute reactions may occur in 1-2% of patients. Rapid recognition and management of these may save the patient’s life.

3. Errors and failure to follow correct procedures are the commonest cause of life threatening acute haemolytic reactions.

4. Bacterial contamination of red cells or platelet concentrates is an under-recognized cause of acute haemolytic transfusion reactions.

5. Patients who receive regular transfusions are at particular risk of acute febrile reactions. With experience, these can be recognized so that transfusions are not delayed or stopped unnecessarily.
6. Transfusion-transmitted infections are the most serious delayed complications of transfusions. Since these may occur long after the infusion, the association with them may be missed. Therefore record all transfusions accurately in the patient’s case notes and consider transfusion in the differential diagnosis.

7. Infusion of large volumes of blood and IV fluids may cause haemostatic defects or metabolic disturbances.

**Recommendations:**

1. The blood used for the compatibility testing must be stored for 7 days at 2-8 °C for possible investigation on transfusion reactions.

2. A nurse should observe the patient during the first 5-10 minutes after starting of each unit. At the end of the period, the vital functions must be registered. It should be documented which parameter and at what frequency (pulse, temperature, BP).

3. The clinician handling the patient must be involved in the differential diagnosis of transfusion reactions. Also a quick and clear investigation should be started in the hospital blood bank laboratory.

4. Prior to disconnecting, the unit must be closed to avoid reflux of patient blood into the donor blood.

5. Systematic teaching and training of nursing staff to prevent recognize and treatment of transfusion reactions is indicated.
### Recognition and management of acute transfusion reactions (occurring within 24 hours of transfusion)

#### Category 1: mild reactions

**Signs and symptoms:**
- Localized cutaneous reactions, e.g. urticaria, rash
- Pruritis

**Management:**
- Slow the transfusion
- Give antihistamine, e.g. promethazine hydrochloride 25-50 mg by deep IM or slow IV
  - give <25 mg/min as a diluted solution containing 2.5 mg/ml in water for injections (max: 100mg)
  - child: 1-5 yrs: 5 mg by deep IM
    - 5-10 yrs: 6.25-12.5 mg by deep IM

*If no clinical improvement within 30 minutes or if condition worsens:*
- Treat as category 2

#### Category 2: moderately severe reactions

**Signs and symptoms:**
- Flushing
- Urticaria, pruritis
- Rigors
- Fever
- Restlessness, palpitations
- Tachycardia
- Mild dyspnoea
- Headache

**Management:**
- Stop the transfusion
- Replace the infusion set and keep the IV line open with sodium chloride 0.9% infusion
7. Guidelines for appropriate use of blood

- Notify the medical officer in charge and the blood bank immediately
- Send blood unit with infusion set, freshly collected urine and new blood samples (one clotted and one anticoagulated) from the vein opposite the infusion site together with the appropriate request form to the blood bank for laboratory investigations.
- Give antihistamine IM (see category 1 above)
- Give antipyretic: paracetamol 15 mg/kg (adult: 1g)
- If there are anaphylactic features (e.g. bronchospasm, stridor): give hydrocortisone 4 mg/kg IV and aminophylline 6 mg/kg IV
- Collect urine for the next 24 hours for volume output and evidence of haemolysis and send to the hospital laboratory if there is clinical improvement.
- Restart transfusion slowly with a new blood unit and observe carefully if no clinical improvement within 15 mins of restarting or condition worsens.
- Treat as category 3

**Category 3: life-threatening reactions**

**Signs and symptoms:**
- Rigors
- Fever
- Anxiety, restlessness
- Hypotension (fall of >20% in systolic BP)
- Tachycardia (rise of >20% in heart rate)
- Haemoglobinuria
- Unexplained bleeding (DIC)
- Pain in chest, or near infusion site, or in loin/back, headache
- Respiratory distress, shortness of breath, dyspnoea
Management:
- Stop the transfusion
- Give sodium chloride 0.9% IV infusion 20-30 ml/kg over 5 minutes to maintain systolic BP
- Raise patient’s legs
- Maintain airway and give high flow oxygen by mask
- Give adrenaline (epinephrine) injection 1 mg/ml 0.01 mg/kg slow IM
- If there are anaphylactic features (e.g. bronchospasm, stridor): give hydrocortisone 4 mg/kg IV and aminophylline 6 mg/kg IV.
- Give diuretic: furosemide 1 mg/kg IV
- Notify the medical officer in charge and blood bank immediately
- Send blood unit with infusion set, freshly collected urine and new blood samples (one clotted and one anticoagulated) from the vein opposite infusion site with appropriate request form to blood bank laboratory investigations.
- Check fresh urine specimen for haemoglobinuria
- Start a 24-hour urine collection and fluid balance chart and record all intake and output
- Maintain fluid balance
- Refer for further management where necessary

Notes:
- If an acute transfusion reaction occurs, stop the transfusion immediately and remove the giving set. Check the blood pack labels and patient’s identity. If there is a discrepancy consult the blood bank.
- In an unconscious or anaesthetized patient, hypotension and uncontrolled bleeding may be the only signs of transfusion problem.
- In a conscious patient with a severe haemolytic transfusion reaction, signs/symptoms may
7. Guidelines for appropriate use of blood

appear within minutes of infusing only 5-10 ml of blood
– close observation at the start of infusion of each unit is therefore vital

• For all category 2 & 3 reactions, record the following in the patient’s notes:
  – type of reaction
  – time from start of transfusion that reaction occurred
  – volume, type and pack numbers of blood products transfused
8. NUTRITION

8.0. Policy guidelines on infant and young child feeding, January, 2009

1. All mothers should be counselled and supported to initiate breastfeeding within an hour of delivery and to exclusively breastfeed their infants for the first six months of life unless medically contra-indicated.

2. Parents should be counselled and support to introduce adequate, safe and appropriately fed complimentary foods at six months of age and continue breast feeding for two years.

3. Pregnant women and lactating mother should be appropriately cared for and encouraged to consume adequate nutritious foods.

4. Health service providers should establish HIV status of all pregnant women and lactating mothers.

5. All pregnant women and lactating mother should encourage to confidentially share there HIV status with service providers and key family members in order to get appropriate IYCF services.

6. Exclusive breastfeeding should be recommended for infants of HIV infected women for the first six months irrespective of the infants HIV status, unless replacement is acceptable, feasible, affordable, sustainable and safe (AFASS).

7. Infants borne to mothers with HIV should be tested for HIV infection from six weeks of age, appropriate feeding, counselling given to the mother based on her personal situation.
8. Malnourished children should be provided with appropriate medical care, nutritional rehabilitation and follow-up.

9. Mother of infants who are borne with Low Birth Weight but can suckle should be encouraged to breastfeed and those who cannot, be assisted to express breast milk and feed the baby.

10. Mothers care taker and families should be counselled and supported to practice optimal IYCF in emergencies and other exceptionally difficult/special circumstances.

### 8.1 Protein Energy Malnutrition ([PEM] of Early Childhood)

Malnutrition in childhood.

The term malnutrition is derived from two French words (mal = bad) and (Nutriture = nutrition) and it literally means ‘bad nutrition’, and technically includes under nutrition and over nutrition.

- Malnutrition is a significant contributor/cause of morbidity and mortality among children less than five years of age in sub-Saharan Africa (SSA).
- Malnutrition (PEM), singly or in combination with other disease, is a significant contributor/cause of morbidity and mortality among children less than five years of age in Uganda as well.
- PEM underlies two-fifth (≅ 40%) of childhood deaths in Uganda.
- Thus, protein energy malnutrition (PEM) is a significant public health problem, mainly of the under developed world.
- Current accurate statistics on the magnitude of the problem, both on the global and the local level are scanty:

**Examples:**
- 850 million people are chronically hungry in the world
4-6 million Ugandans suffer from chronic energy deficiency.
20% Ugandans live in abject poverty and suffer from chronic hunger.
About 39%, 22.5% and 4.0% of the under-five year old children are stunted, underweight and wasted respectively in Uganda.

In the under-five year old children, the most prevalent form of malnutrition is protein energy malnutrition (PEM).
Protein energy malnutrition (PEM) describes a broad spectrum of clinical conditions ranging from Marasmus (dry malnutrition) on one extreme end to Kwashiorkor (wet malnutrition) on the other extreme end with intermediate forms, such as Marasmic – Kwashiorkor (mixed malnutrition).
The intermediate forms constitute the majority of cases.

**Forms of PEM:**
- **Primary PEM** – Inadequate diet is the primary cause;
- **Secondary PEM** – disease or other medical condition is the primary cause;
- **diet is secondary.**
- **Acute malnutrition** – Is an indicator of current nutritional status,
  - reflecting recent
  - weight changes or
  - disruption in nutrient intake.
  - **Acute malnutrition is the most appropriate indicator of the current nutritional status and appropriate indicator to use in an emergency**
setting. The children are thinner than the normal ones of same height.
- Chronic malnutrition – Is an indicator of the nutritional status overtime. Chronically malnourished children are shorter (stunted) than their comparable age group.

Aetiology/Causes of PEM:

Causes/contributing Factors to Malnutrition:

- Immediate causes: diet
  disease
- Basic causes: Food Insecurity
  Poor health services
  Poor environmental sanitation
- Underlying causes: Poverty
  Politics
  Policies
  Programs

- **Food Factors:**
  - Food insecurity
  - Balanced diet (6 principles of diet design)
  - Organoleptic characteristics of food (e.g. colour, taste, consistency, flavour)
  - Food preparation
  - Food taboos

- **Non-Food Factors**
  - Infections and infestations
  - Poverty and corruption
  - Poor governance
  - Human rights and the right to food
8. Nutrition

- Poor infrastructure
- Poor marketing and distribution system
- Underdeveloped Agro-Industry
- Inter-sectoral nature of nutrition
- Loan facilities
- Nutrition education/advocacy
- Political economy
- Saving culture

**Some of the factors responsible for malnutrition include:**
- Excessive workload for women; No time to prepare nutritious meals for the children.
- Poverty
- Inadequate food intake
- Presence of disease
- Poor weaning practices
- Food insecurity
- Poor maternal and child rearing practices
- Inadequate water supply.
- Harmful cultural practices/institutions
- Poor environmental sanitation
- Family instability
- Low family incomes
- Low education/or illiteracy
- Lack of nutrition education (IEC component of PHC)
  (IEC = Information, Education, Communication; PHC = Primary Health Care)

**Consequences of PEM**

**Several consequences of PEM in children include:**
- Impaired growth and development
- Impaired mental development.
- Impaired body resistance/immune system.
- Increased risk of adult chronic diseases
8. Nutrition

- Increased risk for the cycle of inter-generational malnutrition
- Contributes a lot to the loss of millions of dollars to the national economy and overall development.

Clinical Features of PEM

- **Marasmus:**
  - Severe wasting (severe weight loss of muscle tissue and subcutaneous fat).
  - Wasting is less than 60% (≤ 3SD) of the expected weight for age (% Harvard Standard)
  - Absence of bilateral pitting oedema of both feet.
  - “Old man’s face” – because of severe wasting of muscles and subcutaneous fat on the face.
  - The ‘excess skin’ hangs/gathers around the buttocks (baggy pants)
  - The ribs are prominent, so are the zygoma bones.
  - Scapular blades and extremities (the limbs)
  - Eyes are sunken (due to loss of orbital fat).
  - Apathetic/or at times irritable in case of medical complications
  - Appetite is fairly good
  - Skin is almost normal
  - Hair demonstrates some changes – Not as dramatic as in Kwashiorkor.
  - Organomegaly is rare (liver, spleen – enlargement)

- **Kwashiorkor**
  - Presence of bilateral pitting oedema (oedema of both feet)
  - Miserable
  - Apathetic
Moon face
Appears adequately nourished due to excess extracellular fluid.
Skin changes (dermatosis) (flaky paint dermatitis)
Hair changes → silky, straight, sparsely distributed, easily, painlessly pluckable.
Severe pallor of the conjunctiva, mucous membranes, palms and soles.
Loss of skin turgor (dehydration) + malnutrition
Organomegaly (Liver, spleen) is common.

- **Marasmic – Kwashiorkor**
  Presents with features of both Marasmus and Kwashiorkor, such as:
  - Oedema of both feet
  - Marked wasting (due to loss of muscles + fat)
  - Apathy/Misery
  - Skin changes (Dermatosis)
  - Hair changes (silky, pluckable)
  - Some degree of organomegaly (Liver, Spleen)
8. Nutrition

Biochemical and Immunological Features

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marasmus</th>
<th>Kwashiorkor</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Total protein</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum Albumin</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum Globulin</td>
<td>↑</td>
<td>↑↑ or Normal</td>
</tr>
<tr>
<td>• Serum Transferrin</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum Immunoglobulins</td>
<td>↑ or ↓</td>
<td>↑↑ or ↓ (IgG, IgM, IgA)</td>
</tr>
<tr>
<td>• Serum complement</td>
<td>↓</td>
<td>↑↑</td>
</tr>
<tr>
<td>• Cortisol</td>
<td>↑</td>
<td>↑↑</td>
</tr>
<tr>
<td>• Insulin</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Glucagon</td>
<td>↑</td>
<td>↑↑</td>
</tr>
<tr>
<td>• Serum Electrolytes</td>
<td>↑ or Normal</td>
<td>↑ or Normal</td>
</tr>
<tr>
<td>• Serum Sodium</td>
<td>↑ or Normal</td>
<td>↑ or Normal</td>
</tr>
<tr>
<td>• Serum Potassium</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum magnesium</td>
<td>↓</td>
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</tr>
<tr>
<td>• Serum Zinc</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum Selenium</td>
<td>↓</td>
<td>↓↓</td>
</tr>
<tr>
<td>• Serum Iron</td>
<td>↑ or ↓</td>
<td>↑ or ↓</td>
</tr>
<tr>
<td>• Serum Copper</td>
<td>↓</td>
<td>↓↓</td>
</tr>
</tbody>
</table>

Differential Diagnosis
- Nephrotic syndrome (Nephritis)
- Liver disease
- Heart disease
- Malabsorption syndrome
- Malignancy (e.g. Gastro intestinal tract cancer,
- Liver Cancer/Hepatocellular carcinoma).
Investigations:
The following investigations are useful in establishing a diagnosis of PEM and differential diagnoses.

- History: - especially Dietary history
- Blood: - Complete Blood count (Full Haemogram) (e.g. Hb, ESR, white blood cells (WBC) (total and differential)
- Red blood cells (RBC), Haematocrit
- Blood sugar, serum electrolytes, serum protein (total and Albumin, globulins), serum complement, transferin immunoglobulins (IgG, IgM, IgA); haemoparasites, Malaria, HIV/AIDS

Urine:
- Urinalysis – Urine sugar, protein, casts (granular, hyaline), electrolytes, amino acids/ or amino acid metabolites, microorganisms, cells (WBC or RBC).

Stool
- Stool microscopy – for ova and cysts, occult blood, parasites.

Chest x-ray
- Look for evidence of Tuberculosis or other chest abnormalities.

The Management of Protein Energy Malnutrition of Early childhood
- Assessment of the Nutritional status:
  - Histories
  - Physical examination
  - Anthropometric measures
  - Biochemical indicators
  - Immunological indicators
  - Clinical features.
8. Nutrition

- **Dietary history:**
  - Obtain a detailed history on food intake of the child, especially the 24-hour dietary recall.
  - History on breast-feeding and weaning/complementary feeding should also be sought.
  - History of both present and past infections/illness and their management.
  - History of immunization against the six common immunizable diseases (Measles, Tuberculosis, Whooping cough/Pertussis, diphtheria, Polio, Tetanus) and now also against influenza and meningitis plus hepatitis B in adults.

- **Clinical Examination**
  - Anthropometry (physical body dimensions)
    - Weight for age (W/A)
    - Height for age (H/A)
    - Weight for Height (W/H)
    - Mid upper arm circumference (MUAC)
    - Quack stick Index (MUAC/Ht)

**SYSTEMS REVIEW (SYSTEMIC EXAMINATION)**
Examination should be systematic; from head to toe.

- **CNS:**
  - evidence of mental retardation

- **EENT:**
  - Symmetry of eyes, ears and relation to nose
  - Evidence of infection (e.g. otitis media, conjunctivitis)
  - Evidence of nutrient deficiency (e.g. bitot spot, angular stomatitis, cheilosis, magenta tongue).
  - Pallor of mucous membranes
  - Mouth ulcers
8. Nutrition

- **R/S:**
  - Evidence of chest infection (e.g. cough, dyspnoea)
  - Increased respiratory rate (RR)

- **CVS:**
  - Increased heart rate (HR); increased pulse rate (PR)

- **P/A:**
  - Bowel movements
  - Abdominal distension – Ascites, organomegaly (e.g. enlarged liver, spleen)
  - Bowel sounds (e.g. Alterations in paralytic ileus/dehydration, obstruction (constipation/worms)

- **Urinary system/Urogenital System (UGS)**
  - Painful micturition/crying on passing urine
  - Blood in urine
  - Pain around public area – evidence of cystitis (bladder infection)
  - Pus in urine (Pyuria)

- **Integumental System:**
  - Skin turgor (malnutrition, dehydration)
  - Skin lesions/dermatosis, flaky paint dermatitis, ulcers

- **Musculoskeletal System**
  - Wasting (loss of muscle tissue and subcutaneous fat)
  - Bilateral pitting oedema of both feet – (may present in grades 0 up to 3)
  - Flabby muscles.

- **General examination**
  - Temperature
  - Cyanosis
  - Jaundice/icterus
8. Nutrition

General Principles of Initial Treatment

Management

a) **Treatment/Prevention of Hypoglycaemia**  
(blood sugar <3mmol/l or <55mg/dl)

- Give 2ml/Kg of 25% glucose/dextrose solution IV
- Prepare by diluting 50% glucose/dextrose solution with an equal volume of saline or Ringer’s Lactate infusion or – give 10% glucose solution – 2ml/Kg by mouth.
- Use common table sugar/sucrose if glucose is not available or 5mls/Kg/hr of Glucose 5% (50g sugar in 1 litre of water).
- Prepare by dissolving 2 teaspoonful of sugar in half a mug (18 teaspoonful =100mls) of clean water.
- Begin feeding quickly upon admission.
- Provide frequent and regular small feeds (3 hourly day and night)
- Treat infections promptly
- If the patient can drink, give a small feed of an intensive therapeutic diet (F75, SENUUS, DISCO 150).

- **Classification of Malnutrition (PEM)**
- **Biochemical Classification**
  - Macro-nutrient malnutrition (PEM in children)
  - Micro-nutrient malnutrition (Hidden Hunger)
- **Public Health Classification**
  - Stunting (height/age - 2SD)
  - Underweight (weight/age - 2SD)
  - Wasting (weight/height - 2SD)
- **Clinical Classification Underweight**
  - Mild
  - Moderate
  - Severe
8. Nutrition

- **Severe Underweight**
  - Kwashiorkor (wet malnutrition)
  - Marasmus (Dry malnutrition)
  - Marasmic –Kwash (Mixed malnutrition)

- **Overweight/obesity**
  - In children
  - Majority cases are adults

b) **Treatment/Prevention of Hypothermia**
  - Measure body temperature twice daily
  - Ensure that the patient is well covered with cloths, hats and blankets.
  - Ensure enough covering/blankets are provided at night.
  - Encourage caretaker/mother to sleep next to her child (body to body contact, direct heat/warmth transfer from mother to child).
  - Keep the ward closed during the night and avoid wind drafts inside.
  - Quickly clean the patient with a warm wet towel and dry immediately. Avoid washing the baby directly in the first few weeks of admission.
  - Provide frequent and regular small feeds (3 hourly day and night).
  - Hypothermia is axillary temperature <35oC and rectal temperature <35.5oC.

c) **Treatment of Dehydration**
  - Dehydration is a clinical condition brought about by the loss of significant qualities of fluids and salts from the body.
  - Common causes of dehydration include:
    - Diarrhoea
    - Excessive sweating as in high fever
- Vomiting
- Respiratory distress
- Management of dehydration is with plans A, B, C.
- This dehydration treatment modality is based on the degree of dehydration.

**Plan A**
- There is no clinical dehydration yet
- It is meant to prevent clinical dehydration
1. **Advise the mother/Caretaker on the 3 rules of home treatment (i.e. extra fluids, continue feeding, appointment to come back for review)**
   Give extra fluids – as much as the child can/will take.

2. **Advise mother to:**
   - Continue/increase breast feeding
   - If the child is exclusively breastfed give oral rehydration solution (ORS) or clean water in addition to milk.
   - If the child is not exclusively breastfed, give one or more of:
     - ORS
     - Soup
     - Rice-water
     - Yoghurt drinks
     - Clean water
   - In addition to the usual fluid intakes give ORS after each loose stool or Episode of vomiting.
     - < 2yrs → give 50 –100ml
     - > 2 yrs → give 100 – 200ml
   - Give the mother 2 packets of ORS to use at home
   - Giving ORS is especially important if the child has been treated with Plan B or Plan C during current visit.
8. Nutrition

- Give small but frequent sips of ORS from a cup.
- If the child vomits, wait for 10 minutes, then give more ORS slowly.
- In a child with high fever or respiratory distress, give plenty of fluids to counter the increased fluid losses in these conditions.
- Continue giving extra fluid as well as ORS until the diarrhoea or other cause of dehydration ceases.

3. **Advise the mother on:**
- Correct breastfeeding and other feeding during sickness and health
- Increasing fluids during illness
- How to maintain her own health
- When to return to the health worker/health facility for review.

**Plan B**
- There is some clinical dehydration
- Give ORS in the following amount during the first 4 hours:

<table>
<thead>
<tr>
<th>Age (Mo)</th>
<th>&lt;4</th>
<th>4-12</th>
<th>13-24</th>
<th>25-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (Kg)</td>
<td>&lt;6</td>
<td>6-9.9</td>
<td>10-11.9</td>
<td>12-19</td>
</tr>
<tr>
<td>ORS (ml)</td>
<td>200-400</td>
<td>400-700</td>
<td>700-900</td>
<td>900-1400</td>
</tr>
</tbody>
</table>

**Notes:**
1. Only use the child’s age when the weight is not known.
2. You can also calculate the approximate amount of ORS to give a child in the first 4 hours as:
   - Weight (KG) x 75ml
     - Show the mother how to give the ORS:
   - Give frequent small sips from a cup.
   - If the child wants more than is shown in the table, give more as required.
8. Nutrition

- If the child vomits, wait 10 minutes, then continue more slowly
  - For infants <6 months who are not breastfed, also give 100-200ml of clean water during the first 4 hours.
  - Reassess the patient frequently (every 30-60 minutes) for the classification of dehydration and the selection of the treatment plan.

8.2: VITAMIN A DEFICIENCY

Lack of vitamin A which is required for proper functioning of the retina & of epithelial cells. More common in children

**Causes**
- Malnutrition
- Severe childhood illness, eg. measles, whooping cough

**Clinical features**
- Night blindness
- Conjunctival dryness - see Xerophthalmia,
- Corneal ulceration (keratomalacia)
- Dry, rough and thickened skin ('toad skin')

**Differential diagnosis**
- Other causes of blindness, eg. glaucoma, trachoma, onchocerciasis, gonococcal ophthalmia, accidents, cataract

**Investigations**
- Diagnosis is based on clinical presentation
- Serum vitamin A

**Management**

- **vitamin A**: give 3 doses (days 1, 2 and 14)
  - < 6 months:  50,000 IU
  - 6-12 months: 100,000 IU
  - over 12 months: 200,000 IU
Note
- Give prophylactic vitamin A to children with measles, malnutrition, chronic respiratory infections, persistent diarrhoea and to lactating mothers
9. CARDIOVASCULAR DISEASES

9.0 DEEP VEIN THROMBOSIS (DVT)

Clot formation within the deep venous system usually of the calf, thigh or pelvic veins. The clot can cause a local problem at site of formation or dislodge leading to thromboembolism in various parts of the body, particularly the lungs.

Causes
- Venous stasis (immobilization, prolonged bed rest, surgery, limb paralysis)
- Heart failure, myocardial infarction
- Blunt trauma
- Venous injury including cannulation
- Increased coagulability states such as those associated with some medicines – oral contraceptive pills, chemotherapy
- Malignant disease of pancreas, lung, stomach, prostate
- Pregnancy and postpartum
- Polycythaemia
- Anaesthesia – general
- Stroke
- Long distance air travel

Clinical features
- 50% of cases may be clinically silent
- Painful swelling of the calf, thigh and groin with a positive Homans’ sign (unreliable for diagnosis)
- Dislodgement of the thrombus may lead to a greater risk of pulmonary embolism characterized by fever, pleuritic chest pain, haemoptysis, dyspnoea.

Differential diagnosis
- Cellulitis
- Myositis
- Contusion
9. Cardiovascular diseases

- Sarcoma of the underlying bone
- Phlebitis
- Karposis sarcoma of the leg

**Investigations**
- Blood: haemogram, clotting/bleeding time, fibrinogen degradation products. Prothrombin time (PT) and International Normalised Ratio (INR).
- In case of pulmonary embolism: ECG, chest X-ray, echo cardiogram.
- Venogram
- Ultrasound (at specialised centres)

**Management**

- **Fibrinolysis** at specialised centers
- **Unfractionated heparin** given as: IV bolus 5000 IU stat then 250 IU units per kg subcutaneously 12 hourly for 5 days adjust dose according to APTT maintain INR between 2 - 3.
- **Low molecular weight heparin** *(enoxaparin)* 1mg/kg daily (LMWH) for 5 days can be used as an alternative
- **plus warfarin** 5mg single dose given in the evening, commencing on day 3.
  - maintenance dose: 2.5-7.5mg single dose daily, adjusted according to the INR 2 -3.
- Check for bleeding and monitor Prothrombin Time (PT) and INR.
- **Starting therapy with warfarin alone increases the risk of thrombus progression and embolisation.**

**Antidotes for anticoagulants**

For heparin:
- **protamine sulphate**: 50mg slow IV (over 10 minutes) will neutralise the action of 5,000 IU of heparin when given within 15 minutes of heparin
9. Cardiovascular diseases

- 1mg protamine neutralises approx 80-100 IU heparin (max dose: 50mg)
- if protamine is given longer than 15 minutes after heparin, less is required as heparin is rapidly excreted

**For warfarin:**
- **phytomenadione** (vitamin K) usually 2-5mg SC, or oral
  - in severe haemorrhage transfusion with fresh frozen plasma (15mls/kg) or fresh whole blood.
  - dose depends on INR and degree of haemorrhage; large doses may reduce response to resumed warfarin therapy for a week or more

**Note:**
- Check for bleeding and monitor INR and PT

**Prevention:**
- Early ambulation
- Prophylaxis with Heparin in any acutely ill medical patient and prolonged admission.

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**9.1. INFECTIVE ENDOCARDITIS**

An infection of the heart valves and lining of the heart chambers by microorganisms which is difficult to diagnose and treat. It is classified into 3 types:

- **Sub-acute endocarditis:** caused by low virulence organisms such as *Streptococcus viridans*
- **Acute endocarditis:** caused by common pyogenic organisms such as *Staphylococcus aureus*
- **Post-operative endocarditis:** following cardiac surgery and prosthetic heart valve placement. The commonest organism involved is *Staphylococcus albus*
9. Cardiovascular diseases

**Clinical features**
- Acute or chronic illness
- Fatigue
- Weight loss
- Low grade fever and chills
- Embolic phenomena affecting various body organs
- Congenitally abnormal or previously damaged heart valve predisposes to this condition
- Heart failure may occur
- The disease may be of short duration if due to acute endocarditis and the patient may be critically ill
- Prominent and changing heart murmurs may occur
- Splenomegaly, hepatomegaly
- Anaemia
- Finger clubbing

**Note:**
- Any unexplained fever in a patient with a heart valve problem should be regarded as endocarditis

**Differential diagnosis**
- Cardiac failure with heart murmurs
- Febrile conditions associated with anaemia

**Investigations**
- Blood cultures: these are usually positive and all efforts should be made to identify the responsible pathogen and obtain sensitivity data before starting treatment
- At least 3 sets of blood cultures 8 mls each should be obtained (each from a separate venepuncture) at least one hour apart.
- Blood: haemogram, ESR
- Urinalysis for microscopic haematuria, protenuria
- Echocardiography
- ECG
9. Cardiovascular diseases

**Initial empirical therapy**  
- **benzylpenicillin** 4 MU IV every 4 hours  
  plus **gentamycin** 1mg/kg IV every 8 hours  
  *child:* **Benzyl Penicillin** 50,000 IU/kg per dose every 6 hours and **Gentamycin** 2.5mg/kg per dose every 8 hours  
  **X gentamycin** is contraindicated in pregnancy

*Once a pathogen has been identified:*  
- Amend treatment accordingly

**Prevention**  
- Prophylactic **Amoxicillin** 2g (50mg/kg for children) plus **gentamycin** 1 hour before plus 500 mgs 8 hourly for 48 hrs after dental extraction and tonsillectomy in individuals with cardiac valve defects.  
- Prompt treatment of skin infections

### 9.2. CONGESTIVE HEART FAILURE

Inadequate cardiac output for the body's needs despite adequate venous return - may be due to failure of both left and right ventricles.

**Causes**  
- Hypertension  
- Valvular heart disease, eg. rheumatic heart disease  
- Anaemia  
- Myocarditis  
- Prolonged rapid heart beat (Arrhythmias)  
- Thyroid disease  
- Cardiomyopathy  
- Myocardial infarction  
- Congenital heart disease

**Clinical features**  
*Infants and young children*  
- Respiratory distress with rapid respiration, cyanosis, subcostal, intercostal and sternal recession.
9. Cardiovascular diseases

- Rapid pulse, gallop rhythm
- Excessive sweating
- Tender hepatomegaly
- Difficulty with feeding
- Cardiomegaly
- Wheezing

*Older children and adults*
- Palpitations, shortness of breath, exercise in tolerance
- Rapid pulse, gallop rhythm
- Raised jugular venous pressure (JVP)
- Dependent oedema
- Enlarged tender liver
- Fatigue, orthopnea, exertional dyspnoea
- Basal crepitations
- Wheezing

**Differential diagnosis**
- Severe anaemia
- Protein Energy Malnutrition (PEM)
- Nephrotic syndrome
- Asthma
- Severe pneumonia

**Investigations**
- Chest X-ray
- Blood: haemogram
- Urea and electrolytes
- Echocardiogram
- ECG

**Management**
- Bed rest with head of bed elevated
- Prop up patient in sitting position
- Reduce salt intake
- **furosemide** 20-40mg IV or oral increasing as required to 80-160mg daily or every 12 hours according to response
  - *child*: 1mg/kg IV or IM repeated prn according to response (max: 4mg/kg daily)

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9. Cardiovascular diseases

- **ACE inhibitors** start with small dose captopril 6.25 mg 8 hourly aiming for a maintainance dose of 50 mg 8 hourly. Child: 1mg/kg daily. (Avoid if systolic BP is less than 90 mmHg.)

**Plus**

- **Spironolactone** for heart failure 25-50mg once a day
  
  *child*: initially 1.5-3mg/kg daily in divided doses

For acute pulmonary oedema:

- **morphine** 5-15mg IM (0.1 mg/kg for children)
- **plus prochlorperazine** 12.5mg IM
- Repeat these every 4-6 hours till there is improvement

- **Beta-blockers** like carvedilol at specialised centers.

  *In urgent situations:*
  
  - **digoxin injection** loading dose 250 micrograms IV 3-4 times in the first 24 hours
  
  Maintenance dose: 250 micrograms daily
  
  *child*: 10 micrograms/kg per dose as above

  *In non-urgent situations:*
  
  - **digoxin** loading dose 0.5-1mg orally daily in 2-3 divided doses for 2-3 days
  
  Maintenance dose: 250 micrograms orally daily
  
  - elderly patients: 125 micrograms daily
  
  *child*: loading dose: 15 micrograms/kg orally 3-4 times daily for 2-4 days
  
  Maintenance dose: 15 micrograms/kg daily for 5 days

**Note**

- Ensure patient has not been taking digoxin in the past 14 days before digitalizing, because of risk of toxicity due to accumulation in the tissues

**Prevention**

- Early diagnosis and treatment of the cause
- Effective control of hypertension
9.3: HYPERTENSION

Persistently high resting blood pressure (>140/90 mm Hg at least two measurements five minutes apart with patient seated).

<table>
<thead>
<tr>
<th>Classification of Blood pressure (BP)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Prehypertension</td>
</tr>
<tr>
<td>Hypertension, stage 1</td>
</tr>
<tr>
<td>Hypertension, stage 2</td>
</tr>
</tbody>
</table>

key: SBP=systolic blood pressure  DBP=diastolic blood pressure

Causes

- In the majority of cases the cause is not known (essential hypertension)
- Secondary hypertension is associated with:
  - Kidney diseases
  - Endocrine diseases
  - Eclampsia
  - Medicines (steroids and decongestants containing caffeine and pseudoephedrine)
  - Others

Clinical features

- The majority of cases are symptomless and are only discovered on routine examination
- May present as a complication affecting:
  - Brain (stroke)
  - Eyes (impairment of vision)
  - Heart (heart failure)
  - Kidney (renal failure)
9. Cardiovascular diseases

General symptoms include:
- Headache
- Palpitations, dizziness
- Shortness of breath

Differential diagnosis
- Pre-eclampsic toxaemia (PET)
- Eclampsia
- Other causes of stroke

Investigations
- Urine analysis
- Blood sugar
- Plasma urea and electrolytes
- Chest X-ray
- ECG

Management: Treat to maintain optimal blood pressure

Mild hypertension (stage 1)
- Do not add extra salt to cooked food
- Increase physical activity / exercise
- Reduce body weight
- Stop smoking
- Decrease alcohol intake

If all the above fail (within 3 months) initiate medicine therapy:
- Give bendrofluazide 2.5mg-5mg each morning
  - avoid in pregnancy and breastfeeding

Moderate and Severe hypertension (stage 2)
- bendrofluazide 2.5-5mg each morning
- plus ACE inhibitor (e.g. Captopril, Lisinopril or enalapril) or CCB (e.g. Nifedipine or amlodipine) or ARB (e.g. Lorsatan or Candesartan) or Beta blockers (e.g. Atenolol or propranolol)
  see table on the next page for dosages.
9. Cardiovascular diseases

Hypertensive emergencies
- Treatment depends on whether there is acute target organ damage e.g. encephalopathy, unstable angina, myocardial infarction, pulmonary oedema or stroke.
- If acute end target organ damage present admit and give parenteral medicines. Give IV furosemide 40-80 mg stat.
- *Plus IV Hydralazine 20mg* slowly over 20 minutes. Check blood pressure regularly at least 3 hourly.
- If without acute target organ damage treat with combination oral antihypertensive therapy as above for severe hypertension.

**Special Considerations.** (Compelling indications)
Patients with hypertension and other comorbidities require special attention and medicine therapy may differ from that above. The table below indicates the suitable medicines for such patients.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Diuretic</th>
<th>Beta blocker</th>
<th>ACE inhibitor</th>
<th>ARB</th>
<th>CCB</th>
<th>Aldosterone antagonist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Post Myocardial infarcion</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Coronary artery disease</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>Chronic kidney disease</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

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9. Cardiovascular diseases

Caution
△ Propranolol, atenolol: do not use in heart failure or asthma
△ Diuretics: do not use in pregnancy or breastfeeding except in case of pulmonary oedema or pre-eclampsia

Note:
◆ Bendrofluazide: potassium supplements are seldom required - only use in susceptible patients
◆ Methyldopa: use in hypertension with renal failure and in pregnancy and breastfeeding

Prevention
• Regular physical exercise
• Reduce salt intake

9.4. SCAEMIC HEART DISEASE (Coronary heart disease)

A condition in which there is insufficient blood flow through the coronary arteries of the heart thus leading to ischaemia and/or infarction

Cause/risk factors
• Deposition of fatty material (cholesterol plaques) inside the coronary arteries
• Enlarged heart following hypertension
• Diabetes mellitus, obesity and hypertension
• Smoking
• Hyperlipidemia
• Family history of heart disease

Clinical features
• Chest pain which may be localised on the left or central part of the chest ranging from mild to severe deep pain
• Tightness in the chest or a sense of oppression worsening on exertion and relieved by rest and lasting only a few minutes
9. Cardiovascular diseases

- There may be associated anxiety, vomiting and sweating
- Signs of sympathetic activation
  - eg. pallor and tachycardia
- Low BP
- Shortness of breath
- Arrhythmias - may cause sudden death

**Differential diagnosis**

- Indigestion
- Peptic ulcers
- Pleurisy
- Pericarditis
- Severe anaemia
- Dissecting aneurysm

**Management HC4**

- Give **aspirin** 150mg single dose (to be chewed)
- **glyceryl trinitrate** 500 micrograms sublingually
  - Repeat after 5 min if no response
- Give **propranolol** 10-40mg daily for as long as is required
  - Ensure close observation of the pulse rate and circulatory status
  - Avoid in patients with shock or hypotension
- **Refer to higher level of care.**

**Prevention**

- Low-fat, low-cholesterol diet
- Stop smoking
- Effective control of hypertension and diabetes mellitus

---

9.5. PERICARDITIS

Inflammation of the heart membrane (pericardium) which may be:

- Acute and self-limiting, sub-acute or chronic
- Fibrinous, serous, haemorrhagic or purulent
9. Cardiovascular diseases

**Causes**
- Viral, eg. Coxsackie A & B, influenza A & B, Varicella
- Bacterial, eg. mycobacterium, staphylococcus, meningococcus, streptococcus, pneumococcus, gonococcus
- Fungal: histoplasmosis
- Mycoplasma
- Uraemia (less common)
- Hypersensitivity such as acute rheumatic fever, myocardial infarction
- Radiation
- Trauma
- Neoplasms

**Clinical features**
- Pericardial inflammation: retrosternal pain radiating to shoulder and much worse on deep breathing, movement, change of position or exercise
- Pericardial rub is a diagnostic sign
- Pericardial effusion: reduced cardiac impulses, muffled heart sounds, acute cardiac compression
- Effects on cardiac function: chronic constrictive pericarditis, acute cardiac compression (cardiac tamponade), dyspnoea, restlessness, rising pulmonary and systemic venous pressure, rapid heart rate, pulsus paradoxus, low BP and low output cardiac failure.

**Differential diagnosis**
- Any cause of central retrosternal chest pain eg. pneumonia, ischaemic heart disease, peptic ulcer

**Investigations**
- ECG
- X-ray: chest
- Echo cardiography
9. Cardiovascular diseases

**Management H**

- According to cause and presenting clinical features
- If there is fluid, perform tapping

**Prevention**

- Early detection and treatment of infections

### 9.6. PULMONARY OEDEMA

Congestion of the lung tissue with fluid

**Cause**

- Cardiogenic: CCF
- Inflammatory diseases, eg. cancer, TB
- Fibrotic changes

**Clinical features**

- Dyspnoea, breathlessness
- Rapid breathing rate
- Cough with frothy blood stained sputum

**Differential diagnosis**

- Pneumonia
- Plural effusion
- Foreign body
- Trauma

**Investigations**

- Chest X-ray
- ECG
- Echocardiography

**Management H**

**Acute**

- Find cause of left ventricular failure & treat accordingly
- Give high concentration oxygen
- *plus furosemide* 40-80mg IM or slow IV
  - repeat prn up to 2 hourly according to response
  - doses >50mg should be given by IV infusion
  - *child*: 0.5-1.5mg/kg daily (max: 20mg daily)
- *plus glyceryl trinitrate* 500mcg sublingually every 4-6 hours
9. Cardiovascular diseases

- Give morphine 5-15mg IM or 2-4mg slow IV
  - child: 0.1mgs/kg slow IV single dose
- plus prochlorperazine 12.5mg by deep IM
  - avoid in children
- Repeat these every 4-6 hours till there is improvement

Caution
- No digitalization if patient has had digoxin within the past 14 days but give maintenance dose

Prevention
- Early diagnosis and treatment of cardiac conditions, respiratory tract infections
- Avoid (narcotic) medicine abuse

9.7: RHEUMATIC HEART DISEASE

A valvular complication of rheumatic fever.

The valves commonly involved are:
- Mitral valves leading to stenosis, incompetence or both
- Aortic valve leading to stenosis and incompetence

Cause
- As for acute rheumatic fever

Clinical features
- Heart failure
- Arrhythmias
- Thromboembolic problems eg. stroke
- Palpitations
- Heart murmurs depending on valves affected and nature of effect caused
- The patient may be asymptomatic and the valvular lesion discovered as an incidental finding
- Increased cardiac demand as in pregnancy and anaemia may lead to congestive cardiac failure as a presentation
Differential diagnosis
- Other causes of cardiac failure

Investigations
- Chest X-ray
- ECG where available
- Echocardiography

Management
- Treat heart failure if present
- **benzathine penicillin** 2.4 MU IM once monthly
  - or **phenoxymethylpenicillin** (Penicillin V)
    - 750mg every day
- **Child:**
  - **benzathine penicillin** <30kg: 0.6 MU once monthly
    - >30kg: 1.2 MU once monthly
      - continue either medicine up to 30 years of age
      - **If allergic to penicillin give**
        - **erythromycin** 250 mg per day
10. SKIN DISEASES

10.0. BOILS (Furunculosis)
Deep-seated infection of the hair follicles

Causes
- Bacterial infection with *Staphylococcus aureus* leading to the collection of pus

Clinical features
- Common in people with poor general health, diabetes or the debilitated
- Presentation usually occurs with one or more acute, tender, painful swellings (furuncles) at site of infection
- Most common on neck, breasts, face, and buttocks
- The swelling becomes fluctuant, may point after 3 days

Differential diagnosis
- Carbuncles
- Acne

Investigations
- Multiple furuncles: pus swab for Gram staining and C&S

Management
- Apply intermittent moist heat to allow lesion to point and drain spontaneously
  - extensive incision may spread the infection
- Cover with clean dressing
  If in the nose or central facial area or if occurring in immunocompromised patients:
- Give 5-7 days systemic antibiotic based on C&S results
  - cotrimoxazole 960mg every 12 hours
  - child: 24mg/kg per dose
  - or erythromycin 250mg every 6 hours
10. Skin diseases

*child*: 7.5mg/kg per dose

or **flucloxacillin** 250-500mg every 6 hours before food  *child*: 12.5-25mg/kg per dose

*If more extensive lesions with collections of pus:*

▶ Give systemic **antibiotic** as above

▶ When lesion is ready, incise, drain and dress

*If recurrent*: check for diabetes mellitus and HIV

**Prevention**

- Personal hygiene with use of antiseptic soap

### 10.1. CARBUNCLES

A cluster of boils with spread of bacterial infection to subcutaneous tissue

**Cause**

- *Staphylococcus aureus*

**Clinical features**

- Common in males over 40 years
- Pain and induration of the affected area
- Usually on the nape of the neck
- May progress to formation of pus and sloughs
- May spread to involve surrounding tissues while the original site appears to dry

**Differential diagnosis**

- Boils
- Lupus vulgaris
- Acne

**Investigations**

➢ Pus swab for Gram staining and culture

**Management**

- As for Boils, p209
- Check for diabetes mellitus and HIV

**Prevention**

- Personal hygiene with use of antiseptic soap
10. Skin diseases

10.2. CELLULITIS and Erysipelas

An acute inflammation of the skin and subcutaneous tissues

**Causes**
- Bacterial infection (often *Streptococcus pyogenes*)
- Predisposing factors:
  - minor trauma
  - infected spot

**Clinical features**
- Pain, tenderness
- Acute localised inflammation and oedema
  - in erysipelas, lesions are more superficial and have a defined raised margin
- Skin becomes tense and shiny in advanced stages
- Fine creases and wrinkles indicate resolution of the condition

**Differential diagnosis**
- Lymphoedema
- Blunt trauma

**Management**
- Elevate the affected limb
- Give an analgesic as required.

**Antibiotic therapy:** (7-10 day course)
- **PPF** 1.5 MU IM daily
  - *child:* 50,000 IU/kg per dose
  - *or benzylpenicillin* 1-2 MU IV or IM every 6 hours
  - *child:* 50,000-100,000 IU/kg per dose

Once clinical improvement occurs:
- Change to **amoxicillin** 500mg every 8 hours
  - *child:* 7.5-15mg/kg per dose

*If patient allergic to penicillin:*
- **erythromycin** 250mg every 6 hours
  - *child:* 7.5mg/kg per dose
10. Skin diseases

10.3. ECZEMA (Dermatitis)
Acute or chronic superficial inflammation of the skin

Cause
- Allergic dermatitis: allergic reaction to food, chemicals or other substances
- Atopic dermatitis: unknown

Clinical features
- Vesicles (acute stage)
- Itchy rash commonly with dry rough scaly skin
- Secondary infection may cause the lesions to ooze and become wet, and cause regional lymph nodes to enlarge and fever to develop

Differential diagnosis
- Seborrhoeic dermatitis

Management
HC3
- Remove the cause if known
- Apply hydrocortisone cream 1% every 12 hours
  If no response:
  - Apply betamethasone cream 0.1% every 12 hours
  - Give a sedative antihistamine to relieve itching
  - Give a systemic antibiotic as for Boils
    - continue for at least 7 days

Prevention
- Avoid contact with allergens

10.4. FUNGAL SKIN INFECTIONS
Superficial infection caused by dermatophytes, fungi which invade dead tissue of the skin and its appendages (stratum corneum, nails and hair), eg. athletes foot, ringworm

Causes
- Tricophyton mentagrophytes or T. rubrum
Clinical features
- In athletes foot, infection usually starts on the 3<sup>rd</sup> and 4<sup>th</sup> interdigital spaces on the under surface of the lateral aspect of the toes.
- Dorsum of the feet is mainly affected by *T. rubrum* causing erythematous and dry scaling of the foot.
- Itching (main symptom).
- Skin cracks and ulceration, bullae formation.
- Blisters may be formed during acute flare-ups.
- Complications may include cellulitis, fungal invasion of toenails (onychomycosis).

Differential diagnosis
- Jiggers.
- Ground itch (hookworm).
- Cellulitis.
- Eczema, contact dermatitis.
- Psoriasis.
- Maceration from tight footwear.

Investigations
- Scales from the active edge of the lesions are scraped off and placed in 10-20% KOH for 30 minutes and examined microscopically for mycelia.
- Culture of specimen on Sabouraud’s agar.

Management
- If lesion wet, eg. in skin folds or toe webs:
  - Apply gentian violet paint 1% twice daily.
- If lesion dry, eg. once wet lesion dry or if dry initially:
  - Apply benzoic acid + salicylic acid 6% + 3% sparingly twice daily
  - Continue for 14 days after lesions healed.
- If poor response:
  - Apply clotrimazole cream 1% every 12 hours
  - Continue for 14 days after the lesions have healed.
10. Skin diseases

If still poor response, extensive lesions, chronic cases and/or if nails infected:

- Add griseofulvin 10mg/kg daily with/after food:
  - hair and skin infections: 2-6 weeks
  - nail infections: 6 months/until the nail appears normal
  - double the dose in severe infections

Note

- Advise patient on the need to persist with the long duration treatments
- Personal foot hygiene is important
  - Griseofulvin
    - Take with fatty food,
    - Do not use for Tinea versicolor (pityriasis)

10.5. HERPES SIMPLEX

A viral infection transmitted by direct contact and characterised by a localised primary lesion, latency and recurrence

Cause

- Herpes simplex virus types 1 and 2

Clinical features

Herpes simplex type 1: primary infection

- May be asymptomatic
- In 10% of cases there may be fever, malaise, gingivostomatitis and vesicular lesions in the oropharynx
- Generalised cutaneous eruptions
- Meningoencephalitis and chronic eczema may be a complication

Herpes simplex type 1: reactivation of primary infection

- Herpes labialis
- Severe in the immunosuppressed

Herpes simplex type 2

- Primary and recurrent infections can be asymptomatic
10. Skin diseases

- Vesicular lesions in the genital area
- Aseptic meningitis or disseminated visceral infection in the newborn may occur as complications

**Differential diagnosis**
- Other causes of genital sores, eg. syphilis
- Other causes of meningoencephalitis

**Investigations**
- No routine investigation necessary
- Good history taking and physical examination are very important in making a diagnosis
- Cytology
- Serological tests
- Virus isolation

**Management**

HC2

All patients:
- Symptomatic treatment: clean lesions with antiseptic solution, eg. **chlorhexidine solution 0.05%** or **hydrogen peroxide solution 6%**

**Prevention**

Provide health education on:
- Personal hygiene
- Avoiding direct contact with infected people
- Use of gloves and condoms as applicable

10.6. HERPES ZOSTER (SHINGLES)

An acute infection involving primarily the dorsal root ganglia and characterised by a vesicular eruption in areas supplied by peripheral sensory nerves in the affected root ganglia

**Cause**

- *Varicella zoster* virus, usually reactivated from the posterior root ganglia by reduced immunity
Clinical features
- Chills, fever
- Malaise
- The above precede characteristic crops of vesicles which are very painful, typically unilateral and involve the side supplied by affected nerve

Differential diagnosis
- Chicken pox
- Herpes simplex

Investigations
- Clinical diagnosis is sufficient

Management
*All ages: symptomatic and supportive treatment:
- clean the lesions with an antiseptic solution,
- eg. chlorhexidine solution 0.05%
  or hydrogen peroxide solution 6%
- apply calamine lotion 2-3 times daily
- analgesics as necessary
- in early stages: apply acyclovir cream 5%
  every 12 hours
- acyclovir 800mg every 5 hours for 7 days can be given, especially if the disease is diagnosed very early or is disseminated

*If the infection involves the eye:
- Refer to an Eye Specialist

Prevention
- Protect high-risk individuals (eg. the immuno-suppressed) from direct contact with the disease
10.7. IMPETIGO

Acute infection of the outer layer of the skin

**Cause**
- *Streptococcus* or *Staphylococcus* infection

**Clinical features**
- Common in children
- Lesions usually on face, head and hands as small brown crusts on an erythematous base
- In some cases large flaccid bullae containing pus and serum are formed commonly in the axilla and groin

**Differential diagnosis**
- Pemphigus

**Investigations**
- Pus swab for Gram stain, C&S

**Management**
- Clean affected area with chlorhexidine solution HC2 0.05% or hydrogen peroxide solution 6%
  - *If infection mild and localised:*
  - Apply gentian violet aqueous paint 1% every 12 hours
  - Keep skin clean by frequent washing and drying and use soap and water to soften and gently remove any superficial crusts
  - *If signs of regional or systemic spread, eg. pyrexia:*
  - Give systemic antibiotic as for Boils
  - Apply potassium permanganate solution HC3 0.01% followed by debridement and removal of crusts

**Prevention**
- Proper hygiene with use of antiseptic soap
- Wash and keep children dry
10.8. PEMPHIGUS
A rare potentially fatal skin disease characterised by intra-epidermal bullae on apparently healthy skin or mucous membranes

Causes:
• Unknown (probably autoimmune)

Clinical features
• Occurs in middle-aged/older persons - rare in children
• Tense or flaccid bullae of varying size
• Lesions may rupture leaving raw painful areas
• Bullae may be generalized or localized - commonly to the face

Differential diagnosis
• Chronic ulcerative facial lesions
• Other bullous dermatoses

Management
▶ Clean affected area with chlorhexidine solution 0.05% or hydrogen peroxide solution 6%
▶ Apply compresses soaked in potassium permanganate solution 0.01% every 4 hours - helps remove skin debris and reduce risk of secondary infection

If there is secondary infection:
▶ Give systemic antibiotic as for Boils
If it persists or if severe:
▶ Refer to a skin specialist

10.9. PSORIASIS
A chronic recurrent skin disease characterised by scaling reddened papules or plaques on the scalp and extensor surfaces of the arms and legs (back of the elbows and front of the knees).
10. Skin diseases

The scales are a result of greatly accelerated epidermal growth resulting in incomplete keratinization and maturation. The reddening is due to increased blood flow in the subepidermal cutis. This is clinically demonstrated.

The lesions in psoriasis tend to appear at sites of trauma (Koebner’s reaction). Bluntly scraping off the superficial scales reveals punctuate bleeding (Auspitz signs).

Cause
- Unknown but the predisposition to development is genetically transmitted
- About 30% of cases have a family history

Clinical features
- Onset is gradual and usually in patients 25-40 years old
- Maculopapular scaly eruptions on plaques are either due to psoriatic skin disease and/or psoriatic arthritis
- Worsening psoriasis may lead to total erythroderma
- An extra-articular feature is pitting or thickening of nail plate with accumulation of debris under the nail plate
- Inflammatory psoriatic arthritis (5-10% of patients) involves the distal interphalangeal joints

Differential diagnosis
- Fungal infection, lichen planus (papules, tend to occur on flexor surfaces)
- Mycosis fungoides
- Seborrhoeic dermatitis
- Medicine-induced eruptions

Investigations
- Blood: serum uric acid, rheumatoid factor and anti-nuclear factor
Management

After removal of the scales and preferably after bathing:

Mild cases:
- Apply salicylic acid ointment 2% twice daily

More severe cases
- Apply coal tar ointment 1% 1-3 times daily
  - then expose affected area to sunlight
  - or apply dithranol ointment 0.1% twice daily

Caution
△ Dithranol: take care to apply only to the lesions; wash hands well after application

10.10. SCABIES

Contagious skin disease associated with severe itch

Cause
- A parasitic mite, Sarcopterus scabiei hominis
- Transmitted by close personal contact

Clinical features
- Intense pruritic eruption of wheals, papules, vesicles and thread like burrows, common in flexural areas, i.e. wrists and inter-digital creases; and axillae, nipples, buttocks and genitalia
- Secondary infection is common and may lead to glomerulonephritis

Differential diagnosis
- Papular urticaria, chicken pox
- Pyoderma
- Drug eruptions
- Atopic dermatitis, seborrhoeic dermatitis
- Onchocerciasis

Investigations
- Identification of mites, their eggs or faeces
10. Skin diseases

Management

HC2

- Wash (scrub) the body well
- Apply benzyl benzoate lotion 25% to the whole body from the scalp to the soles of the feet but taking care to avoid contact with the eyes
  - repeat twice more with an interval of 24 hours between applications and no bathing for 72 hours after the first application
  - for children, dilute the lotion with an equal part of water before application to give a strength of 12.5%
- Give a sedative antihistamine to relieve itching
  - see Skin allergy/Urticaria

If treatment ineffective or unsuitable:

- ivermectin 200 micrograms/kg single dose

Supporting measures:

- Wash patient’s clothing and bedding and use a hot iron to eliminate the eggs or (if this is not possible) leave items outside exposed to the air to prevent reinfestation.

If secondary infection is present:

- Give an antibiotic as in Boils

Prevention

- Personal hygiene (washing clothes and regular bathing)
- Avoid close contact with infected people

10.11. SKIN ALLERGY/URTICARIA

An acute, sub-acute or chronic inflammation of the skin caused by endogenous or exogenous agents. Urticaria is an itchy skin rash.

Causes

- Endogenous: familial, also associated with other allergic diseases
- Exogenous: agents include sunlight, chemicals, certain foods, insect bites
10. Skin diseases

Clinical features
- Inflammation of the skin with vesicles, redness, oedema, oozing or wheals that may/may not be well demarcated
- Contact dermatitis: may be localized to the point of contact or generalised
- Seborrhoeic dermatitis: presents with excessive dandruff, papules and crusting
- Nummular dermatitis: presents with coin-shaped lesions that may be widespread

Differential diagnosis
- Fungal and bacterial infections of the skin
- Helminth infestations

Investigations
- No satisfactory investigations for skin allergy
- Blood: haemogram to demonstrate eosinophilia
- Stool: microscopy to exclude worms

Management (5-day course) HC2
- Establish the cause and treat accordingly
- Apply calamine lotion 15% 1-2 times daily
- Give an analgesic for any pain/discomfort
  - Avoid aspirin
- Give chlorphenamine 4mg every 8 hours
  - child: 2mg per dose
  - or promethazine hydrochloride 25mg at night
    - increase to every 12 hours if necessary
    - child: 1mg/kg daily in 1-2 divided doses

Prevention
- Avoid contact with known allergens
- Treat helminth infections

10.12. TROPICAL ULCER (TU)
A specific acute ulcerative skin disease

Cause
- Trauma followed by presence of fusiform bacilli and spirochetes (Vincent’s type)
• Common in people with malnutrition and poor hygiene

**Clinical features**
• Over 95% occurs in lower third of the leg

*Stage 1:*
• Trauma, painful swelling, blister with blood stained discharge leading to an oval lesion which spreads rapidly

*Stage 2:*
• Necrosis with yellowish/black sloughs which separate to form ulcer with raised and thickened edge. Floor has early bleeding granulations, and foul smelling yellowish discharge

*Stage 3:*
• Symptoms subside or may go into a chronic stage

**Complications include**
• Chronic tropical ulcer
• Cancellous osteoma (exostosis)
• Epithelioma
• Contracture

**Differential diagnosis**
• Buruli ulcer

**Investigations**
- Swab for C&S
- X-ray

**Management**

Acute (all ages)
- Clean the wound with **chlorhexidine solution 0.05%**
  or **hydrogen peroxide solution 6%**
- Excise the necrotic edges
- Elevate and rest the leg
- Perform daily dressing

*If not responding:*
- add **PPF 800,000 IU IM once daily for 7-10 days**
  *child*: 20,000 IU/kg per dose
10. Skin diseases

Alternative in case of allergy to penicillin: (adults only)

- **doxycycline** 100mg every 12 hours for 5 days

Chronic (all ages)
- Give **antibiotics** as per C&S results
- Where there are no facilities for C&S:
  - Give **metronidazole** 200mg every 8 hours for 5 days
  - child: 35-50mg/kg per dose
  - plus **cotrimoxazole** 960mg every 12 hours for 5 days
  - child: 24mg/kg per dose
- Then do a skin graft

**Prevention**
- Ensure personal hygiene
- Ensure good nutrition
- Avoid trauma
11. NEUROLOGICAL/PSYCHIATRIC CONDITIONS

11.0. ALCOHOL DEPENDENCE SYNDROME

A disorder characterised by the need to take large daily amounts of alcohol for adequate functioning.

Causes
- Genetic
- Social and environmental factors including availability
- Stress, peer pressure
- Personality disorders

Clinical features
- Physical: trauma, peptic ulceration, damage to liver and pancreas, hypertension, alcoholic cardiomyopathy, alcohol foetal syndrome, alcohol withdrawal fits, tremors
- Psychological: alcohol intoxication, delirium, dementia, alcoholic hallucinosis
- Social: loss of job, marriage, friends

Differential diagnosis
- Abuse of other psychoactive substances
- Depression

Investigations
- Blood: haemogram
  - shows elevated mean corpuscular volume
- Social investigations

Management
- Treat any presenting physical or psychiatric problem
- Counselling - must be on going
- Psychosocial rehabilitation

Prevention
- Health education on dangers of alcohol abuse
- Reduce accessibility to alcohol
11. Neurological/Psychiatric conditions

11.1. DRUG and SUBSTANCE ABUSE

A state arising from the repeated administration of a drug or other substance of abuse on a periodic or continuous basis leading to physical, social or occupational problems.

Cause

*Social factors:*
- Peer pressure
- Idleness/unemployment
- Social pressures
- Poverty
- Cultural use
- Increased availability

*Psychological factors:*
- Other psychiatric disorders eg. anxiety, depression
- Stress
- Adolescent development changes

Commonly abused drugs

- Alcohol
- Tobacco
- Cannabis (njaga, bhangi, marijuana)
- Khat (mairungi)
- Heroin
- Cocaine
- Petrol fumes
- Organic solvents (eg. thinners)
- Pethidine
- Amphetamines (eg. speed)
- Mandrax® (methaqualone)

Presenting features

- Change in behaviour, eg. excessive irritability
- Change in function, eg. decline in school/work performance
- Loss of interest
- Episodes of intoxication
  - eg. slurred speech, staggering gait
11. Neurological/Psychiatric conditions

- Involvement in illegal activities, eg. rape, theft
- Change in appearance eg. weight loss, red eyes, puffy face, unkempt, untidy
- Financial difficulties, eg. stealing, unpaid debts
- Relationship problems, eg. increased conflicts, communication breakdown

**Management**

HC2

- Psychosocial therapy (counselling)
- Treat presenting symptoms, eg. Delirium.
- If necessary, refer to higher level for detoxification

**Prevention**

- Health education on dangers of drug abuse
- Employment/recreational opportunities
- Encourage social and cultural values
- Attempt to reduce availability of drugs of abuse in the community

11.2. ANXIETY

Anxiety is a normal physiological response which enables a person to take steps to deal with a threat. When anxiety is prolonged or interferes with normal functions of the individual, it constitutes the clinical condition of an anxiety state.

**Causes**

- Mainly psychological

**Types and clinical features**

- **Generalized anxiety:** unrealistic and excessive worry about two or more life events
- **Panic attacks:** sudden onset of intense apprehension or terror usually lasts a few minutes to one hour
- **Phobia:** persistent fear of a known stimulus (object or situation), eg. animals, water, confined spaces
- **Obsessive-compulsive disorder:** repeated disturbing thoughts associated with time-
11. Neurological/Psychiatric conditions

- Post-traumatic stress disorder: where a person who experienced a major threatening life event, later in life begins to experience the same either in dreams or in clear consciousness.

Each of the above clinical types will have one or more of the following peripheral manifestations:

- Palpitations
- Tremors
- Urinary frequency, hesitancy or urgency
- Dizziness
- Diarrhoea

**Differential diagnosis**

- Consider organic conditions, eg. hyperthyroidism, hypoglycaemia, phaeochromocytoma

**Management**

- Psychotherapy (counselling) is of primary importance
- Benzodiazepines, eg diazepam 5mg 1-2 times daily
  - increase if necessary to 15-30mg daily in divided doses
  - *elderly patients*: give half the above dose

**Caution**

- Benzodiazepines, eg. diazepam:
  - are addictive
  - avoid prolonged use, i.e. not more than 7 days
  - give the lowest possible dose for the shortest period
  - avoid alcohol

If poor response:

- Give an antidepressant at night, eg. imipramine or amitriptyline 25-50mg

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11. Neurological/Psychiatric conditions

Note
- Diazepam: is not appropriate for treating depression, phobic or obsessional states or chronic psychoses
- Antidepressants: may be useful in managing panic disorders

Prevention
- Good personality development

11.3. DEPRESSION
A common disorder of both adults and children mainly characterised by low mood and loss of pleasure (dysphoria).

Causes
- Biological, genetic and environmental factors act together to produce the disease.

Clinical features
- Low mood and loss of interest or pleasure are key symptoms; apathy
- Associated lack of energy, body weakness
- Difficulty in concentrating
- Poor sleep
- Poor appetite
- Reduced libido
- Multiple body pains
- Suicidal thoughts – occur in up to 65% of patients
- Children and adolescents usually present with school phobia, truancy, poor academic performance, alcohol and drug abuse

Differential diagnosis
- Thyroid dysfunction (hypothyroidism)
- Adrenal dysfunction (Addison’s disease)
- Parkinson’s disease
- Stroke
- Dementia
11. Neurological/Psychiatric conditions

Investigations
- Obtain thorough social and personal history

Management of depression
- Psychological support may be adequate in mild cases
  
  *In more severe forms:*
  - Give a tricyclic antidepressant, e.g. **imipramine** or **amitriptyline** 75-100mg at bed time. *If required:* slowly increase to a maximum of 150mg daily in divided doses
    - continue treatment for at least 6 months
  - Add supportive cognitive/behavioural psychotherapy
  
  *In severe cases:*
  - Refer to higher level for further management including electroconvulsive therapy (ECT)

Note
- Amitriptyline: may be particularly useful in depression with associated anxiety
- Carefully evaluate risk of suicide

Prevention
- Early diagnosis (postnatal depression)
- Genetic counselling, good antenatal care

11.4. Postnatal depression

This type of depression presents as a condition of persistent low mood following delivery affecting 20% of new mothers. If lasting only 1-2 weeks, it is also known as ‘maternity blues’. May progress to postnatal psychosis.

Causes
- Not well known
  
  *Predisposing factors include:*
  - Previous psychiatric history
  - Recent stressful events
  - Young age
11. Neurological/Psychiatric conditions

- First baby (primigravida) and associated fear of the responsibility for the new baby
- Poor marital relationship
- Poor social support

**Clinical features**
- As for depression above plus
- Starts soon after delivery and may continue for a year or more
- Feelings of sadness with episodes of crying, anxiety, marked irritability, tension, confusion
- Guilty feeling of not loving baby enough
- Loss of positive feeling towards loved ones
- Apathy

**Differential diagnosis**
- Febrile illness as a result of infection, eg. malaria

11.5. DELIRIUM (Acute confusional state)

A condition of impaired brain function resulting from diffuse physiological change.

**Causes**
- Infections, eg. malaria, trypanosomiasis, syphilis, meningitis, rabies, typhoid fever, pneumonia, HIV/AIDS
- Intoxication with or addiction to alcohol or other substances
- Cerebral pathology, eg. head trauma, tumour
- Heart diseases, eg. cardiac failure
- Severe anaemia
- Epilepsy
- Electrolyte imbalance

**Clinical features**
- Acute onset of mental confusion with associated disorientation
- Reduced ability to think coherently, reasoning and problem solving are difficult or impossible
- Illusions and hallucinations are common
11. Neurological/Psychiatric conditions

- especially in visual form

- Symptoms tend to fluctuate
  - patients feel better in the day and worse at night

**Differential diagnosis**
- Dementia
- Schizophrenia

**Investigations**
- Guided by history and physical examination
- Blood: baseline haemogram can be helpful

**Management**
- Identify and treat the cause
- Withhold any unnecessary drugs
- Restore fluids and monitor electrolytes
- Prevent convulsions

*When features of psychosis appear:*
- Give an antipsychotic: **chlorpromazine**
  200mg every 12 hours
  *or* **haloperidol** 5-10mg every 12 hours
  - this is the drug of choice
  *or* **trifluoperazine** 15mg every 12 hours
- Provide reassurance

*For severe agitation and tremulousness of delerium tremens:*
- **diazepam** 5-10mg slow IV every 10-15 minutes
  - until patient calm but not asleep
  - doses required may exceed 100mg daily

**Note**
- Good nursing care is of prime importance and can give good results

**Prevention**
- Early diagnosis and treatment
11.6. DEMENTIA

A chronic organic mental disorder characterised by failing memory.

**Causes**
- Primary degeneration of the brain
- Vascular disorders causing intracranial bleeding
- Infections, eg. syphilis, TB, HIV/AIDS, meningitis
- Metabolic disorders, eg. hypothyroidism
- Brain trauma
- Toxic agents, eg. carbon monoxide, alcohol

**Clinical features**
- Impairment of the short and long term memory
- Impaired judgment, poor abstract thinking
- Language disturbance (aphasia)
- Personality change - may become apathetic or withdrawn, may have associated anxiety or depression because of failing memory.

**Differential diagnosis**
- Normal aging
- Delirium
- Schizophrenia
- Depression

**Investigations**
- Guided by history and clinical picture to establish cause

**Management**

- Where possible, identify and treat the cause
- Avoid quiet, dark, private rooms

*Only if restless and agitated:*
- Give **haloperidol** 1.5-3mg every 12 hours
  - adjust according to response
  - usual daily dose: 1.5-30mg or **thioridazine** 25-400mg daily for 4 weeks
  - give as a single dose at night or in 2 divided doses every 12 hours
- Give adequate psychological care and nutrition
11. Neurological/Psychiatric conditions

11.7. EPILEPSY

A discrete recurrent abnormality in electrical activity of the brain, resulting in behavioural, motor or sensory changes. There may be associated changes in consciousness.

**Causes**
- Idiopathic
- Brain infections
- Brain trauma
- Metabolic disorders, eg. hypoglycaemia
- Congenital malformation, brain tumour

**Clinical features**
- Will depend on the type of epilepsy:

**Grand mal**
- May commence with a warning sensation in the form of sound, light or abdominal pain (aura)
- There may be a sharp cry followed by loss of consciousness and falling
- Tonic contraction of muscles occurs followed by jerking movements (clonic phase)
- There may be urinary incontinence, frothing and tongue biting
- A period of deep sleep follows
- Episodes of mental confusion may follow (post-ictal psychosis)

**Petit mal**
- Mainly a disorder of children
- The attack is characterized by a brief loss of consciousness (5-10 seconds) in which posture is retained but other activities cease
- The child has a vacant stare
- Previous activities are resumed at the end of the attack
- Several attacks may occur in a single day
11. Neurological/Psychiatric conditions

**Complex–partial seizures (Temporal lobe epilepsy)**
- Has varied symptoms
- Signs of autonomic nerve dysfunction, i.e. sweating, flushing and gastric sensation
- Mental confusion with perceptual disorders (illusions, hallucinations), memory loss or distortion, mood variation, abnormal repetitive lip movement, automatism.

**Focal epilepsy**
- Fits begin with motor contraction or sensory change in a particular point of the body such as the thumb.

**Myoclonus epilepsy**
- Abnormal jerking movements occur usually in the limbs but may involve the whole body.

**Status epilepticus**
- Convulsive state in which the seizure lasts >30 minutes or several epileptic seizures occur in succession without recovery of consciousness in between.

**Differential diagnosis**
- Syncope
- Hypoglycaemia
- Migraine
- Hypocalcaemia
- Conversion disorder
- Hyperventilation and panic attacks

**Investigations**
- Electroencephalogram (EEG)
  - useful in petit mal and temporal lobe epilepsy
- X-ray: skull
- Other investigations are guided by suspected cause.
11. Neurological/Psychiatric conditions

Management (depends on type of epilepsy)

Petit-mal
- ethosuximide initially 500mg daily in 2 divided doses
  - increase if necessary by 250mg every 4-7 days
  - up to a usual daily dose of 1-1.5g
  - child >6 yrs: as above
    - <6 yrs: initially 250mg single dose at night
    - increased gradually as required to usual
      - 20mg/kg daily in 2 divided doses

Grand-mal
- phenytoin initially 3-4mg/kg (150-300mg) daily
  - as single dose or 2 divided doses
  - increase gradually prn to usual 200-500mg daily
    - or carbamazepine
      - initially 100-200mg 1-2 times
      - daily increased prn in 100mg increments every 2 weeks
      - to usual 800-1,200mg daily in divided doses
    - or phenobarbitone 60-180mg at night
      - child:
        - phenytoin initially 5mg/kg daily in 2 divided doses
          - usual range: 4-8mg/kg daily, max: 300mg daily
          - or carbamazepine 10-20mg/kg daily
            - in at least 2 divided doses
          - or phenobarbitone 8mg/kg daily

Temporal lobe epilepsy
- carbamazepine - doses as for Grand mal above

Focal epilepsy
- phenytoin - doses as for Grand mal above

Myoclonic epilepsy
Management as for focal epilepsy

Status epilepticus
- diazepam 10mg rectally
  - child <4: 5mg
    - repeat once prn after 5 mins
  - or diazepam 10-20mg slow IV (5mg/min)
    - repeat once prn after 30-60 mins
11. Neurological/Psychiatric conditions

**Note:**
- Diazepam: in serious cases of status epilepticus, doses of 20-40mg, titrated to individual patient response, may be needed
- Treatment should always continue until patient is seizure-free for at least 2 years then gradually taper off the doses

**Prevention**
- Good antenatal care and delivery
- Control causative factors

11.8. MANIA

A disorder of mood control usually in the excited form with associated behavioural problems.

**Causes**
- Biological, genetic, environmental factors acting together

**Clinical features**
- Elevated, expansive or irritable moods are the key symptoms
- Speech is increased with flight of ideas
- Increased self image, restlessness and over-activity are common
- Delusions of grandeur may occur
- Increased libido
- Increased appetite - but weight loss occurs due to over-activity
- Auditory and visual hallucinations may be present

**Differential diagnosis**
- Organic mental states
- Schizophrenia

**Investigations**
- Good social and personal history
11. Neurological/Psychiatric conditions

Management
> Effective psychological care
> **chlorpromazine** initially 100-200mg every 8 hours then adjust according to response
  - daily doses up to 300mg may be given as a single dose at night
  > or **trifluoperazine** initially 5-10mg every 12hrs **HC4**
  > then adjust according to response
  - up to 40mg or more daily may be required in severe or resistant cases
  > or **haloperidol** initially 5-10mg every 12 hrs **HC4**
  > then adjust according to response
  - up to 30-40mg daily may be required in severe or resistant cases

If extrapyramidal side-effects appear:
> Add an anticholinergic: **benzhexol** initially 2mg **HC4** every 12 hours then reduce gradually to once daily and eventually give 2mg only when required.

Prevention
- Genetic counselling
- Good psychosocial support

11.9. MIGRAINE

Periodic severe headache usually unilateral and associated with visual disturbance and vomiting.

Causes
The cause is unknown but thought to be linked to:
- Familial factors
- Craniovascular disorders which can be precipitated by:
  - Stress
  - Anxiety
  - Menstruation
  - flashing lights
  - tyramine-containing foods, eg. red wine, cheese, chocolate
11. Neurological/Psychiatric conditions

Clinical features
- Severe episodic unilateral headache not responding to common pain-killers
- Nausea and vomiting
- May resolve without treatment

Differential diagnosis
- Any cause of headache
- Conversion disorder (hysteria)

Management
- **ergotamine tartrate** initially 2mg sublingually then 1-2mg hourly to a maximum of 6mg in 24 hrs or 10mg in a week
- **plus propranolol** 10-20mg every 8-12 hours prn for as long as there is migraine

Caution
\(\text{\textcopyright Ergotamine: contraindicated in pregnancy and ischaemic heart disease}\)

Prevention
- Avoid precipitating factors

11.10. PARKINSONISM (Parkinson’s disease)

A movement disorder resulting from degeneration and malfunction of the CNS common in old age.

Causes

*Primary Parkinsonism:*
- Cause is unknown

*Secondary Parkinsonism:*
- Infections, eg. sleeping sickness, syphilis
- Poisoning, eg. manganese, carbon monoxide
- Drugs, eg. chlorpromazine, haloperidol
- Hormone disorders, eg. phaeochromocytoma
- Vascular disorders
- Degeneration of basal ganglia
- Intracranial tumour
- Trauma

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Clinical features
- Mainly in males
- Intentional tremor
- Excessive salivation
- Vacant facial expression (mask face)
- Muscle rigidity
- Walking with short quick steps (shuffling gait)
- Urinary incontinence (sometimes occurs)

Differential diagnosis
- Any causes of tremor
- Thyrotoxicosis
- Dementia

Investigations
- Good history and clinical examination

Management (adults) HC4
- benzhexol 2-15mg daily in 1-3 divided doses
  or benzatropine 1-2mg IM or IV - repeat if symptoms reappear

Caution
- Benzhexol, benzatropine: use lower doses in the elderly as they may otherwise cause confusion as a side-effect

Prevention
- Only for secondary type
- Avoid antecedent causes

11.11. POSTNATAL PSYCHOSIS

A condition of marked mental disturbance following delivery. May be regarded as a severe form of postnatal depression.

Causes
- Not well known but hormonal changes may have a role

Predisposing factors:
- First child
11. Neurological/Psychiatric conditions

- Previous major psychiatric history
- Family history of mental illness
- Inadequate psychosocial support during pregnancy
- Infections in early puerperium

**Clinical features**
- Usually starts in the first or second week after delivery
- Three clinical types are usually observed:
  - acute organic states
  - affective disorder (mania and depression)
  - schizophrenia

**Investigations**
- Good history, physical and psychiatric assessment

**Management**
- Treat any identifiable cause/precipitant, eg. fever
- Give psychotherapeutic drugs as for Mania

**Note**
- Puerperal psychoses are no different from other similar psychoses
- Give concurrent psychotherapy and drug therapy
- Gradually adjust doses depending on response

**Prevention**
- Proper antenatal screening, good psychosocial support
- Early detection and treatment

### 11.12. SCHIZOPHRENIA

A chronic disorder with disturbance of:
- Form and content of thought; perception
- Sense of self, relationship to external world
- Mood, behaviour

**Causes**
- Not known but there are associated biological, genetic and environmental factors.

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Clinical features
Any one or more of these may be diagnostic:
- Delusions (abnormal beliefs) - may be multiple, fragmented or bizarre
- Disconnected ideas with speech which is vague and inadequate in content
- Hallucinations (especially auditory forms)
- Mood is usually inappropriate
- Difficulty in forming and sustaining relationships
- Apathy with self-neglect

Differential diagnosis
- Organic mental states, eg. following drug abuse
- Mood disorders

Investigations
- Good social, personal and family history

Management
- As for Mania
  If no response:
- Refer to next level for further management

Note
- Give concurrent psychotherapy and drug therapy
- Gradually adjust doses depending on response

Prevention
- Genetic counselling
- Good psychosocial support
- Early detection and treatment

11.13. SUICIDAL BEHAVIOUR
An attempted conscious act of self-destruction which the individual concerned views as the best solution.
- usually associated with feelings of hopelessness and helplessness and conflicts between survival and stress.
11. Neurological/Psychiatric conditions

**Causes**

*Physical illness, eg.*
- HIV/AIDS
- Head injury
- Malignancies
- Bodily disfigurement

*Psychiatric disorders, eg.*
- Depression, schizophrenia, dementia
- Chronic alcohol abuse
- Personality disorders
- Epilepsy

**Risk of suicide**

*Risk is high if:*
- Patient >45 years old
- Associated alcoholism
- History of suicide attempts
- Evidence of violent behaviour or previous psychiatric admission

*Risk may be low if patient is:*
- <45 years old
- Married
- Employed
- In stable interpersonal relationships
- In good physical health

**Note**

Suicide is relatively rare in children and adolescents. However there is increased risk if there is:
- Disturbed family background, eg. death of parents, divorce
- Use of alcohol other drugs of abuse
- Physical illness
- Psychiatric disorder

**Management**

- Identify cause for suicidal behaviour and treat as an emergency, eg. Depression
11. Neurological/Psychiatric conditions

- Carefully observe patient to minimize risk of self-harm
- Provide adequate psychological care

**Prevention**
- Identify and manage risk factors
- Ensure good psychosocial support
12. EYE CONDITIONS

Notes on use of eye preparations
- Eye drops: apply 1 drop every 2 hours until the condition is controlled then reduce frequency
- Eye ointment: if used alone, apply 3-4 times daily;
  if used with drops, apply at night only
- Continue treatment for 48 hours after healing

12.0. CATARACT

Opacity of the lens inside the eye
- by far the commonest cause of blindness in Uganda

Cause
- Old age
- Trauma
- Genetic
- Severe dehydration in childhood

Clinical features
- Reduced vision
- Pupil is not the normal black colour but is grey, white, brown or reddish in colour
- Condition is not painful unless caused by trauma
- Eye is not red unless condition is caused by trauma

Management (adults and children)  HC2
- Do not give any medicines
- Explain to patient that the condition is very treatable
- Refer to a cataract surgery centre

Prevention
- Give early treatment for childhood diarrhoea and vomiting to prevent severe dehydration
- Wear protective goggles when hammering, sawing, chopping, grinding, etc
- Caution children playing with sticks about risk of eye injuries

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12. Eye conditions

12.1. CONJUNCTIVITIS

Inflammation of the conjunctiva of the eye

**Causes**
- Infection: bacterial or viral
- Trauma: chemicals, foreign bodies
- Smoke
- Allergy

**Clinical features**
- Watery discharge (virus or chemicals)
- Pus discharge (bacteria)
- Cornea is clear and does not stain with fluorescein
- Visual acuity is normal
- Redness (usually both eyes, but may start/be worse in one, usually reddest at outer edge of the eye)
- Swelling
- Itching (may be present)

**Differential diagnosis**
- Corneal ulcer (tends to be in one eye only, redness is greatest near the cornea, pain often great)
- Refer urgently for specialist treatment

**Investigations**
- Good history and examination

**Management (adults & children: 7 day course)**
- Apply tetracycline eye ointment 1%
  - or chloramphenicol eye ointment 1%

*In allergic conjunctivitis:*
- Use hydrocortisone eye drops 0.5%
  - or hydrocortisone eye ointment 1%
  - or betamethasone eye drops 0.1%

*In associated allergy and infection:*
- Use hydrocortisone + polymyxin B eye drops + Oxytetracycline.
12. Eye conditions

*or neomycin + betamethasone eye drops*

**Caution**
△ Do not use steroid preparations unless sure of the diagnosis as they may mask infections

**Prevention**
- Personal hygiene; daily face washing
- Wear protective goggles when using dangerous chemicals, hammering, sawing, chopping, grinding
- Warn children playing with sticks on risk of eye injuries
- Avoid irritants and allergens

### 12.2. FOREIGN BODY (FB) in the EYE

**Causes**
- Solids: dust, insects, metal or wood particles
- Liquids: splashes of irritating fluids

**Clinical features**
- May be severe pain, tears or redness
- FB may be visible

**Differential diagnosis**
- Other injury or trauma

**Management (all patients)**
- Make a thin ‘finger’ of moistened cotton wool, move the eyelid out of the way and gently remove the FB
  
  *If this fails:*

  - Refer to an Eye Specialist

  *For irritating fluids in the eye:*

  - Wash the eye with plenty of clean water or normal saline

  *If the cornea is damaged:*

  - Apply *tetracycline eye ointment 1%*, cover the eye and refer to an Eye Specialist
12.3. KERATITIS

Inflammation of the cornea

**Cause**
- Infection: bacterial, viral or fungal, leading to corneal ulceration
- Trauma: chemical, foreign bodies

**Clinical features**
As for conjunctivitis except that in keratitis:
- The cornea is not clear and will stain with fluorescein in the case of corneal ulcer
- Visual acuity is usually reduced
- Condition is often unilateral
- The eye is painful

**Management (adults and children)**
- Apply tetracycline eye ointment 1%
- Explain the seriousness of the condition to the patient
- Refer to a qualified eye health worker

**Prevention**
- Wear protective goggles when hammering, sawing, chopping, grinding
- Warn children playing with sticks on risk of eye injuries

12.4. OPHTHALMIA OF THE NEWBORN

Purulent discharge from the eyes in babies <1 month

**Causes:**
- Infections: usually from mother’s birth canal or due to poor hygiene of the person caring for the newborn
  - bacterial, eg. *Gonococci*
  - chlamydial
12. Eye conditions

Clinical features
- Reddening of one or both eyes
- Swelling of the eye lids
- Purulent discharge
- Excessive production of tears (lacrimation)
- If not treated early, will result in scar formation or perforation of the cornea, either of which will lead to blindness

Prevention and prophylaxis
- Good antenatal care with screening and treatment of mother for genital or urinary tract infections
- Clean delivery
- Prophylactic treatment of all neonates soon after delivery: wipe the eyes of the newborn with a sterile gauze immediately after birth then apply tetracycline eye ointment 1% single dose to both eyes

Management
- Use any antibiotic eye drops available (see also note below) as often as possible (preferably every half hour)
- benzylpenicillin 50,000 IU/kg IM every 12 hrs for 5-7 days
  For chlamydial infections.
- Apply tetracycline eye ointment every 6 hours for at least 21 days
  or give erythromycin 10mg/kg every 6 hours for 14-21 days
- Carefully clean away any purulent discharge as required

Note
- If antibiotic eye drops are not available: dissolve benzylpenicillin 1 MU in 10mL of sodium chloride injection 0.9%
  - use this solution as eye drops
  - make a fresh solution every day

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12.5. STYE (Hordeolum)
A localized infection of the hair follicle of the eyelids

Cause
- *Staphylococcus aureus*

Clinical features
- Itching in the early stages
- Swelling
- Pain, tenderness
- Pus formation
- May burst spontaneously

Differential diagnosis
- Other infections of the eyelids
- Blepharitis

Management  
Usually the stye will heal spontaneously  
Avoid rubbing the eye as this might spread the infection.
- Apply a warm/hot compress to the eye
- Apply *tetracycline eye ointment* 1% 2-4 times daily
- Remove the eye lash when it is loose

Prevention
- Remove any loose eyelashes
- Good personal hygiene

12.6. TRACHOMA
A chronic infection of the outer eye caused by *Chlamydia trachomatis* (a very small Gram-negative bacterium)

Clinical features
- Only the eyes are involved

*In early stages:*
- Reddening of the eye
- Itching
- Follicles (grain-like growth) on the conjunctiva
12. Eye conditions

In the later stages:
- Scar formation on the eyelids causing the upper eyelid to turn inwards (entropion) and causing the eyelashes to scratch the cornea
- Scarring of the cornea leading to blindness

Differential diagnosis
- Allergic conjunctivitis (chronic)
- Other chronic infections of the eye

Management of trachoma
This may be summarised as SAFE:
S = surgery for entropion (part of treatment)
A = antibiotics (part of treatment)
F = face washing (part of prevention)
E = education and environment (part of prevention)

Antibiotic treatment

Adults and children:
- Apply tetracycline eye ointment 1% twice daily for 4-6 weeks (until the infection/inflammation has gone)
- plus cotrimoxazole 960mg every 12 hours for 14 days
  - child: 24mg/kg per dose
- or erythromycin 500mg every 6 hours for 14 days
  - child: 10-15mg/kg per dose

If there are any complications:
- Refer to specialist

Prevention
- Good personal hygiene, regular face washing
- Clean deliveries
12.7. UVEITIS

An inflammation of the uvea of the eye (i.e. the iris + the ciliary body + the choroid)

Causes
- TB
- HIV
- CMV (cytomegalovirus)
- Toxoplasmosis
- Leprosy
- Autoimmune disease
- Trauma and others

Clinical features
- Dull, deep-seated pain
- Often unilateral (but can be bilateral)
- Ciliary redness (mostly around the cornea)
- Pupil irregular and has a different size from that in the healthy eye
- Reduced vision (sometimes severely reduced)

Management (adults and children) HC2
- Do not give any medicine
- Explain the seriousness of the condition to the patient
- Refer to a qualified eye health worker

Prevention
- Wear protective goggles when hammering, sawing, chopping, grinding, etc
- Warn children playing with sticks about risk of eye injuries

12.8. XEROPHTHALMIA

Dryness of the part of the eye ball exposed to air and light due to Vitamin A deficiency

Clinical features
- Starts with night blindness
- Followed by dryness of the conjunctiva and cornea
• Eventually the cornea melts away, the eye perforates and total blindness occurs

**Differential diagnosis**
• Trachoma
• Corneal injury

**Management**

HC2

▷ See under Vitamin A deficiency

**Prevention**

• Good balanced diet especially for children, women and institutionalised persons, eg. prisoners, long-term hospital in-patients, boarding school students, etc

• **vitamin A** supplements:
  – child <5 yrs presenting with any illness: 100,000 IU
  – any child being vaccinated against measles: 100,000 IU
  – all mothers after delivery: 200,000 IU
  – anyone being vaccinated against polio: 200,000 IU
13. EAR, NOSE & THROAT CONDITIONS

13.1. EAR CONDITIONS

13.1.1. FOREIGN BODY (FB) in the EAR

Causes
- Types of FB commonly involved include insects (e.g., flies, cockroaches, ants) seeds, beads, stones
- Children: usually insert the FB themselves or their peers may do it
- Adults: usually insects, cotton buds
- Occasionally the FB may penetrate adjacent parts and lodge in the ear

Clinical features
- Blockage - FB may be seen
- Noise in the ear
- Hearing loss

If attempts have been made to remove the FB:
- Bleeding/discharge from the ear

Management

Smooth round FBs:
- Syringe the ear with clean lukewarm water
- If it can not been removed by syringing: remove with a blunt hook
  - general anaesthesia will be essential in children and sensitive adults
  - do not use forceps to try to grasp round objects as this will only push them further in the ear

Other FBs:
- If there is an edge to grab: remove with Hartmann (crocodile) forceps
- Insects: kill these by inserting clean cooking oil or water into the ear, then syringe out with warm water
- Impacted seeds: do not use syringing with water as the seed may swell and block the ear
13. Ear, nose & throat conditions

- refer immediately to ENT specialist if you can’t remove with a hook
  ▶ Suction may be useful for certain FBs

### 13.1.2. GLUE EAR (OTITIS MEDIA WITH EFFUSION)

A non-suppurative otitis media

**Cause**
- Blockage of the Eustachian tube by:
  - adenoids
  - infection in the tube
  - thick mucoid fluid
  - tumours of the postnasal space
- Unresolved acute otitis media
- Viral infection of the middle ear
- Allergy

**Clinical features**
- Hearing impairment (the main feature)
  - often fluctuant, eg. in children: ‘this child hears when s/he wants to and sometimes ignores you’
- Presence of non-purulent fluid in middle ear
- Buzzing noise in ears/head
- Retracted or bulging ear drum
- Loss of usual colour of ear drum or dullness

**Management**
- Eliminate known or predisposing causes
  **Adult:**
    - **chlorphenamine** 4mg every 12 hours for 10 days
      *child:* see p115 for dose sizes - divide 4mg tablets if syrup not available
    - **plus xylometazoline nasal drops 0.1%** or ephedrine 2 drops every 8 hours for 2 weeks
      *child:* use **0.05%** drops
    - Exercises: chewing, blowing against closed nose tends to open the tube
13. Ear, nose & throat conditions

If effusion persists beyond 6 weeks in spite of the above:
- Refer to ENT specialist

### 13.1.3. OTITIS EXTERNA

Infection of the external ear canal which may be localised (furunculosis) or generalised (diffuse) which is covered here

**Causes**
- Bacterial, fungal, viral infections

**Clinical features**
- Pain, tenderness on pulling the pinna (external ear)
- Itching
- Swelling
- Pus discharge

**Differential diagnosis**
- Foreign body
- Otitis media (especially with pus discharge)
- Traumatic injury

**Investigations**
- Good history and physical examination are important in making a diagnosis
- If there is a discharge: pus swab for microscopy, C&S
  - if discharge is white or black, it is fungal
  - if discharge is yellow, it is bacterial

**Management**
- Thoroughly clean external ear canal
- Apply antibiotic drops, eg. **chloramphenicol eye drops 0.5%** 2 drops into the ear every 8 hours for 14 days
- Give **analgesics HC2**

*If fungal infection suspected:*
- Apply **clotrimazole, ear drops apply twice**
  - continue until discharge dries up
  - continue for total of 8 weeks.
13. Ear, nose & throat conditions

If severe:
- **flucloxacillin** 250-500mg every 6 hours for 5-7 days  child: 12.5-25mg/kg per dose

### 13.1.4. OTITIS MEDIA (SUPPURATIVE)

An acute or chronic infection of the middle ear occurring mostly in children <2yrs

**Causes**
- Bacterial infection, eg. *Streptococcus pneumoniae, H.influenzae*
  - commonly follows an acute infection of the upper respiratory tract

**Clinical features**
Good history and careful ear examination are very important in making the diagnosis
- Acute onset of pain in the ear, redness
- Fever
- Pus discharge for <14 days
- Bulging of the eardrum
- **Chronic:** pus discharge from one or both ears for >14 days

**Differential diagnosis**
- Foreign body in the ear
- Otitis externa and media with effusion
- Refered ear pain e.g. from toothache

**Investigations**
- Pus swab for microscopy, C&S

**Management (5-day course) HC2**

*Acute infection:*
- **cotrimoxazole** 960mg every 12 hours  child: 24mg/kg per dose
  - or **amoxicillin** 500mg every 8 hours  child: 15mg/kg per dose
- Give analgesics as required
- Review after 5 days
  - if eardrum is still red, repeat the above course
13. Ear, nose & throat conditions

**Chronic infection:**
Systemic antibiotics are **not** recommended
- Dry 3 times daily for several weeks - until it stays dry
- Each time after drying, apply 2-4 drops of **chloramphenicol ear drops 0.5% into the ear**
- Do not allow water to enter the ear

**Prevention**
- Health education, eg. advising patients on recognizing the discharge of otitis media (believed by some to be ‘milk in the ear’)
- Early diagnosis and treatment of acute otitis media and URTI
- Treat infections in adjacent area e.g. tonsillitis

**Note**
- Refer if complications occur eg. meningitis, mastoid abscess (behind the ear), infection in adjacent areas, eg. tonsils, nose
- Infection in adjacent areas e.g. tonsils, nose

### 13.1.5. MASTOIDITIS

Inflammation of the mastoid bone behind the ear

**Causes**
- Usually a complication of suppurative otitis media

**Clinical features**
- Pain or tender swelling felt over the mastoid bone - with or without pus discharge from the ear
- Fever

**Differential diagnosis**
- Inflamed lymph node behind ear

**Investigations**
- Diagnosis mainly by clinical features
- X-ray: useful in chronic mastoiditis
- Blood: haemogram - shows leucocytosis
- Examine ear with auroscope
**Management (with 10-14 day course of antibiotics)**

- **Admit urgently. Give emergency treatment**
- **chloramphenicol** 1g IV or IM every 6-8 hours
  - *child*: 25mg/kg (max: 750mg) per dose
- **or ampicillin** 2g IV every 6 hours
  - *child*: 25-50mg/kg per dose
- Surgical drainage may be necessary to remove pus if an abscess has formed

**Caution**

△ Refer urgently

### 13.1.6. WAX in the EAR

An accumulation of wax in the external ear

**Cause**

- Excessive and/or thick wax production
- Small and/or hairy ear canal

**Clinical features**

- Blocked ears
- Buzzing sound
- Sometimes mild pain

**Management (adults and children)**  
HC2

Wax in the ear is normal and usually comes out naturally from time to time

*If it accumulates to form a wax plug and causes a problem for the patient:*

- Soften the wax by inserting drops of **vegetable oil**
  - or **glycerin** into the ear 3 times a day for a few days - after this the wax may fall out on its own
- Syringe the ear carefully with clean warm water when the wax is soft
- ✗ Advise the patient not to poke **anything** into the ear in an attempt to clean it as this may damage the eardrum
- ✗ Don’t syringe if (a) there is history of discharge(b) If there is pain.
13. Ear, nose & throat conditions

13.2. NASAL CONDITIONS

13.2.1. ADENOID DISEASE

Enlargement/inflammation of nasopharyngeal tonsil - common in children of 3-7 years.

Clinical features
May be due to enlargement of inflammation or both.
- Obstruction of the nose leading to mouth breathing, difficulty eating, snoring, jaw deformities
- Obstruction of the Eustachian tube leading to hearing loss which fluctuates due to fluid in the middle ear ("Glue ear")
- Discharge from the nose
- Cough - recurs frequently
- Physical and other developmental retardation, eg. small size for age

Diagnosis
Usually on history

Investigations
- X-ray: neck soft tissue, lateral view shows narrowing of the post-nasal space

Differential diagnosis
- Other causes of nasal obstruction and discharge, eg.
  - rhinitis, FB, deviated septum, sinusitis
- Dental and jaw diseases or abnormalities

Management
If symptoms are not marked:
- Give conservative treatment with chlorphenamine
  1-2mg daily (depending on age) for 7 days
If symptoms are marked or do not improve on treatment:
- Refer to ENT department for surgery
13.2.2. ATROPHIC RHINITIS

Chronic infection of the nasal mucosa in which various components become thinner (atrophy) due to fibrosis of the terminal blood vessels.

**Cause**
- Unknown but associated with:
  - HIV/AIDS
  - Poor socio-economic status
  - Syphilis
  - Rhinoscleroma (early stages)

**Clinical features**
- Tends to affect both nasal cavities
- Affects females more than males
- Foul stench not noticed by patient who cannot smell
- Crusts and bleeding points in the nose
- Epistaxis when crusts separate
- Sensation of obstruction in the nose
- Nasal airway very wide

**Investigations**
- C&S of smear of nasal material
- X-ray: to exclude sinusitis

**Differential diagnosis**
- Atrophy from other causes

**Management**
- Clean nasal cavities twice daily to remove crusts (most important)
  - syringe the nose or douch it with warm isotonic saline
    or sodium bicarbonate solution 5%
    (dissolve 1 teaspoonful of powder in 100mL cup of warm water)
- Then apply tetracycline eye ointment 1% twice daily
- Give cotrimoxazole 960mg every 12 hours for 14 days
13. Ear, nose & throat conditions

- for rhinoscleroma: give 1.44g (3 x 480mg tabs) every 12 hours for 6 weeks

If atrophic rhinitis not better or is worse after 2 weeks:

▶ Refer to ENT specialists

**Prevention:**

- Treat/eliminate known causes such as syphilis

### 13.2.3. FOREIGN BODY in the NOSE

**Occurs usually in children <5 years**

**Causes**

- Seeds e.g. bean, peas, ground nut
- Paper, foam rubber (eg. mattress foam)
- Beads, stones, metal objects

**Clinical features**

- Usually inserted by the child and therefore mostly found in the right-hand nasal cavity
- Foreign body noticed by child/parent:
  - may be visible or felt
  - sharp object may cause bleeding
- Unilateral foul-smelling discharge from the nose

**Differential diagnosis**

- Infection in the nose, sinuses or adenoids

**Investigations**

- Usually not required
- X-rays may be helpful in case of metallic objects like wires or ball bearings

**Management**

- Sit the child up or wrap in a blanket

**First aid**

- Blow through the mouth while blocking the unaffected side of the nose

**Other methods of removal**

- Paper or foam rubber:
  - Grasp firmly and remove with a fine forceps, eg.
13. Ear, nose & throat conditions

Tilley’s forceps
Other objects:
- Carefully pass a blunt hook behind the object and then gently pull it out

*If the above fails:*
- Refer to an ENT specialist

**Prevention**
- Prevent children placing objects in mouth, nose & ears
- Insects of potential danger should be destroyed, eg. cockroaches, ants, beetles

### 13.2.4. EPISTAXIS

Bleeding from the nostrils - may be arterial or venous

**Causes**

**Local:**
- Nose-picking
- Trauma
- Infections of the nose
- Tumours

**General:**
- Hypertension
- Bleeding disorders
- Pertussis
- Sickle-cell trait/disease
- Renal failure
- Often familial
- Can also be a symptom of serious disease, eg. typhoid, malaria, viral fevers such as Ebola

**Clinical features**
- Bleeding from the nose
  - on examination the site of bleeding may be seen
- Signs and symptoms of shock if bleeding is severe
- Signs and symptoms of predisposing cause
13. Ear, nose & throat conditions

**Differential diagnosis**
- Clinical assessment to exclude any of above causes

**Investigations**
- Blood: full haemogram, platelet count

**Management**

**General management:**
- Sit the patient up (if patient not in shock)
- Instruct patient to pinch the nose between the finger and the thumb for 15 minutes, breath through the mouth and spit out any blood
- Ask patient to blow out any blood clots

*If bleeding continues:*
- Impregnate a gauze strip with *soft paraffin* or *tetracycline eye ointment* and pack into the nose using forceps
- Leave gauze in place for 24-48 hours
- Give broadspectrum antibiotic

*If bleeding still does not stop after this period:*
- Refer to hospital for further management

**Prevention**
- Avoid picking the nose
- Treat/control predisposing conditions

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**13.2.5. NASAL ALLERGY**

An abnormal reaction of the nasal tissues to certain allergens which tends to start in childhood; vasomotor rhinitis starts in the 20s and 30s.

**Causes**

**a) Predisposing**
- Hereditary - family history of similar or allied complaints is common
- Infections may alter tissue permeability
- Psychological and emotional factors in vasomotor rhinitis
b) Precipitating
- Changes in humidity and temperature
- Dust mite
- Certain foods; drugs, eg. aspirin
- Infections
- Alcohol
- Aerosols/fumes

Clinical features
- Often present in school age children
- Sometimes preceded or followed by eczema or asthma. Less common in persons >50 years old
- Paroxysmal sneezing
- Profuse watery nasal discharge
- Nasal obstruction - variable in intensity and may alternate from side to side
- Postnasal drip (mucus dripping to the back of the nose)

Diagnosis
- Careful history is most important.
- Large turbinates on examining the nose

Differential diagnosis
- Nasal infection
- Foreign body
- Adenoids (in children)

Management
- Avoid precipitating factors (most important)
- Antihistamines, eg. chlorphenamine 4mg every 12 hours for up to 21 days then as required thereafter if recurs
- Reassurance
- Surgery may be required for obstruction of the nose
- Do not use vasoconstrictor nasal drops, eg. ephedrine and xylometazoline as (especially with repeated or prolonged use) they cause rebound congestion and alter the nasal environment making structures hardened.
### 13.2.5. SINUSITIS (Acute)

Inflammation of air sinuses of the skull

#### Causes
- Allergy
- Foreign body in the nose
- Dental focal infection
- Viruses, eg. rhinovirus, often as a complication of URTI
- Bacteria, eg. *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Streptococcus pyogenes*

#### Clinical features
- Rare in patients <5 years
- Throbbing headache above the eyes, sinus tenderness
- Discharge from nostrils and into the throat
  - clear when due to viruses
  - yellow (purulent) when due to bacteria
- Nasal blockage (sometimes)

#### Differential diagnosis
- Common cold
- Allergic rhinitis
- Foreign body in the nose
- Nasal polyps
- Adenoids

#### Investigations
- C&S of the discharge
- X-ray of sinuses

#### Management

**General management (all ages)**
- Steam inhalation may help clear blocked nose
- **Give analgesics**
  - *If there is a dental focus of infection:*
  - Extract the tooth
  - Give an **antibiotic**, see gingival infections
13. Ear, nose & throat conditions

If there is a foreign body in the nose:

- Remove it in hospital

Note on use of antibiotics

- **Do not** use antibiotics except in bacterial sinusitis
- Use antibiotics only in those with clear features of sinusitis eg. persistent purulent nasal discharge cough with one or more of:
  - sinus tenderness
  - facial or periorbital swelling
  - persistent fever

*In such cases give:* (7-10 day course)

- **cotrimoxazole** 960mg every 12 hours
  - *child:* 24mg/kg per dose
  - or **amoxicillin** 500mg every 8 hours
  - *child:* 15mg/kg per dose

13.3. THROAT CONDITIONS

13.3.1. FOREIGN BODY (FB) in the AIRWAY

Mostly occurs in children <5 years

**Cause**

- Types of FBs include seeds (especially groundnuts) beans, maize, plastics, rubber, metal wires, ball bearings
- Usually inhaled from the mouth
  - child is chewing, laughing or crying or there is a sudden disturbance, which opens the vocal cords so the object is inhaled

**Clinical features**

- History of inhalation (usually reported as swallowing) or choking
- Stridor (Noisy breathing)
- Cough
- Difficulty in breathing, wheezing
13. Ear, nose & throat conditions

- Hoarseness of voice if FB stuck at the vocal cords
- Symptoms start suddenly, fever is initially absent and some of the symptoms may be transient (may disappear after a short period)
- Upper airway obstruction as shown by:
  - flaring of the nostrils
  - recession of the chest inlet and/or below the ribs
  - rapid chest movements
  - air entry may be reduced (usually on the right side)

Investigations
- Once the history and examination are suggestive, investigations can be omitted to save time
- Chest x-ray may show lung collapse, hyperinflation, mediastinal shift, shift of heart shadow

Management

Child:
- Prop the child up
- Give oxygen
- Penicillin intra muscular urgently
- Antibiotics or steroids
- Refer to an ENT specialist

Adult:
- Dislodge large FB, eg. chunk of meat, from the pharynx by standing behind the patient with both arms around the upper abdomen and giving 6-10 thrusts (Heimlich manoeuvre)
  - such circumstances are very rare
  - If patient pregnant or very obese: perform 6-10 chest thrusts with patient lying on the back

Prevention
- Do not give groundnuts or other small hard food items to children <2 years
- If a child is found with objects in the mouth, leave the child alone to chew and swallow or gently persuade the child to spit out the object
  - do not struggle with/force the child
13. Ear, nose & throat conditions

13.3.2. FOREIGN BODY in the FOOD PASSAGE

Causes
- Types of FBs commonly involved include fish or chicken bones (in the pharynx and oesophagus), cedar tree (Xmas tree) leaves which get stuck in the pharynx or even behind the soft palate in the nasopharynx, coins.
- **Children:** tend to insert objects in their orifices
  - coins are particularly likely to be ingested
- **Adults:** eating fish or chicken while drunk or not paying attention (eg. watching television) or both are risky
  - sharp objects lodge in the tonsils, behind the tongue or in the pharynx and some may get stuck in the oesophagus

Clinical features
- Difficulty and pain in swallowing
  - patient winces as attempts to swallow
- Drooling of saliva
- Patient may point to where foreign body is stuck with a finger (pointing sign)
- FB may be seen, eg. in tonsil, pharynx

Differential diagnosis
- Infection in pharynx
- Trauma by foreign body

Investigations
- X-ray may reveal radio-opaque FB
  - coins may appear on x-rays done for other reasons
- Many FBs are radiolucent
  - look for a gas shadow if in the oesophagus

Management

Initial:
- Allow only clear fluids
- Do not try to dislodge/move the FB with solid food
13. Ear, nose & throat conditions

- this may push it into the wall of the oesophagus causing infection and sometimes death

▶ Give IV infusion if unable to swallow liquids or if oral fluid intake is poor

*If FB is invisible on X-ray or symptoms persist >24 hours from time of ingestion:*
▶ Refer to Regional Centre with ENT facility
*If FB is visible in the pharynx, tonsil, etc:*
▶ Grasp and remove it with long forceps

*If patient tried to push FB with solid food:*
▶ Give broad-spectrum antibiotic cover with amoxicillin 500mg every 8 hours for 5 days

**Prevention**
- *Children*: keep potential FBs out of the way as far as is possible
- Advise on care in eating, i.e. not taking in too large pieces of food, chewing thoroughly before swallowing
  - advise once a FB is stuck to avoid trying to ‘push’ it down with solid food as this may sometimes be fatal

### 13.3.3. PHARYNGITIS (Sore throat)

Inflammation of the throat

**Causes**
- Viral: most cases
- Infection with various bacterial organisms of which Group A haemolytic *Streptococci* is the commonest
- Diphtheria in non-immunized children
- Gonorrhoea (usually from oral sex)
- Viral upper respiratory tract infections
- May also follow ingestion of undiluted spirits
- *Candida albicans* in the immunosuppressed
Clinical features
- Abrupt onset
- Pain on swallowing
- Fever
- Loss of appetite, general malaise
- In children: nausea, vomiting and diarrhoea
- Inflamed tonsils and throat
- Tender neck glands
- Exudates on tonsils

Differential diagnosis
- Tonsillitis
- Epiglottitis
- Laryngitis
- Otitis media, if there is referred pain

Investigations
- Throat examination with torch and tongue depressor
- Throat swab for microscopy, C&S
- Blood: haemogram
- Serological test for haemolytic streptococci (ASOT)

Management

Most cases are viral and do not require antibiotics
- Keep the patient warm
- Give plenty of (warm) oral fluids
- Give analgesics for 3 days
- Review the patient for progress

If streptococcal pharyngitis suspected:
- benzathine penicillin 1.2 MU IM single dose
  - child: <30kg: 30,000 IU/kg
  - or PPF 20,000 IU/kg IM daily for 10 days
  - or phenoxymethylpenicillin 500mg every 6 hours for 10 days  
    - child: 12.5mg/kg per dose

If allergic to penicillin:
- erythromycin 500mg every 6 hours for 10 days
  - child: 12.5mg/kg per dose
13. Ear, nose & throat conditions

**Note**
- If not properly treated, streptococcal pharyngitis may lead to acute rheumatic fever and retropharyngeal or peritonsillar abscess - therefore ensure that the full 10-day courses of antibiotics are completed where applicable
- Cotrimoxazole is **not effective** for the treatment of streptococcal pharyngitis and it should **not** be used
- For candidiasis use **ketoconazole**

### 13.3.4. TONSILLITIS

Inflammation of the tonsils

**Cause**
- Streptococcal infection (most common)
- Viral infection (less common)

**Clinical features**
- Sudden onset, most common in children
- Sore throat
- Fever, shivering
- Headache
- Vomiting
- Enlarged inflamed tonsils and cervical lymph nodes
- Complications include: sinusitis, endocarditis, nephritis, LRTI, peritonsillar abscess (quinsy), otitis media

**Differential diagnosis**
- Pharyngitis
- Submandibular lymphadenitis

**Investigations**
- Throat swab: for C&S

**Management**

*If bacterial:*
- **phenoxymethylpenicillin** 500mg every 6 hours for 10 days  
  *child*: 10-20mg/kg per dose
13. Ear, nose & throat conditions

If viral:
- Treat symptomatically with analgesics and increased oral fluids

13.3.5. PERITONSILLAR ABSCESS (QUINSY)
An abscess between the tonsil capsule and the lateral wall of the pharynx.

**Cause**
- Follows (often mild) tonsillitis attack

**Clinical features**
- Severe throat pain
- Fever
- Headache, malaise
- Rigors may occur
- Inability to open the mouth; salivation and dribbling
- Bad mouth odour
- Thickened muffled (unclear) speech
- Ear pain
- Enlarged cervical lymph nodes
- Tonsil and soft palate reddish and oedematous
- Swelling pushing the uvula to opposite side - may be pointing (bulging collection of pus)

**Differential diagnosis**
- Tumour
- Tonsillitis
- Abscess in the pharynx

**Investigations**
- Carry out C&S on pus if present or after drainage

**Management**
Early stages: Diseases of adolescents and adults
- Conservative management
- Bed rest
- **benzylpenicillin** adults 2MU IV or IM every 6 hours for 48 hours then switch to **amoxicillin** 500mg every 8 hours to complete a total of 7 days
13. Ear, nose & throat conditions

- If unable to take oral fluids: set up an **IV drip**

*When swelling is marked:*

- Surgery (which should be done by a trained person)
  - suction facility will be needed
  - carry out incision & drainage at the most pointing area with the protected tip of No.11 surgical blade

- 6 weeks later: refer for tonsillectomy as this condition might recur

**Prevention**

Prompt and adequate treatment of tonsillitis
14. GENITO-URINARY DISEASES

14.0: ACUTE CYSTITIS

A lower UTI involving infection/inflammation of the bladder which is a common manifestation of uncomplicated UTI especially in young women

**Cause**
- Bacterial infection, eg. *Escherichia coli*

**Clinical features**
- Lower abdominal pain - usually burning in nature
- Tenderness on touch (palpation)
- Urgency on passing urine, frequent passing of small amounts of urine
  - there may be retention of urine in severe infection
- Dysuria
- Pyuria (pus in the urine making it cloudy)

**Investigations**
- Midstream urine: microscopy, protein, WBCs, C&S

**Management**

Uncomplicated infections
- Ensure high fluid intake
- Alkalinise the urine with oral sodium bicarbonate solution 5% (dissolve 5g in 100mL water) twice daily
  - may help to relieve symptoms in mild cases
- **cotrimoxazole** 1.92g (4 tablets of 480mg) single dose
  - child: 48mg/kg single dose
- **or ciprofloxacin 500mg single dose**
  - child: 10-15mg/kg single dose

*If poor response, or recurrent infections:*
- Do not continue to treat ‘blind’
- Refer for investigation of C&S and further management
14. Genito-Urinary diseases

Prevention
- Improved personal/genital hygiene
- Avoid sharing of bathing basins, towels, soap, etc

14.1. ACUTE GLOMERULONEPHRITIS
Acute inflammation of the renal glomeruli

Causes
- Immune reactions (usually 1-5 weeks after a streptococcal skin or throat infection)

Clinical features
- Common in children >3 and adolescents
- Haematuria (passing smoky, red or tea-coloured urine)
- Oedema: puffiness of the face/around the eyes, less commonly generalized body swelling
- Discomfort in the kidney area (abdominal or back pain)
- May be anorexia
- General weakness (malaise)
- High BP, commonly presenting as headaches, visual disturbances, vomiting and occasionally pulmonary oedema with dyspnoea
- Convulsions (in hypertensive crisis)
- Oliguria as renal failure sets in
- Evidence of primary streptococcal infection:
  - usually as acute tonsillitis with cervical adenitis
  - less often as skin sepsis

Differential diagnosis
- Kidney infections, eg. TB, pyelonephritis,
- Kidney tumours
- Heart failure
- Malnutrition
- Allergic reactions
14. Genito-Urinary diseases

**Investigations**
- Urine: protein, microscopy for RBCs and casts, WBCs
- Blood: urea (uraemia) and creatinine levels, ASOT, electrolytes
- Ultrasound: kidneys
- Throat & skin swab (where indicated): for C&S

**Management**
- Monitor urine output, BP, daily weight
- Restrict fluid input (in oliguria)
- Restrict salt and protein in the diet (in oliguria)
- Avoid or use with caution any drugs excreted by the kidney
- Treat any continuing hypertension
- Treat primary streptococcal infection (10-day course):
  - **Phenoxymethylpenicillin** 500mg every 6 hours  
    *child*: 10-20mg/kg per dose
  - or **amoxicillin** 500mg every 8 hours  
    *child*: 15mg/kg per dose
- *If allergic to penicillin:*
  - **erythromycin** 500mg every 6 hours  
    *child*: 15mg/kg per dose

**Note**
- Ciprofloxacin, tetracycline, doxycycline and cotrimoxazole are **unsuitable and should not be used** for treating primary streptococcal infection

**Prevention**
- Treat throat and skin infections promptly and effectively
- Avoid overcrowding
- Adequate ventilation in dwellings
14.2. NEPHROTIC SYNDROME

Disorder of the kidneys, common in children and characterised, irrespective of the cause, by:
- generalised oedema
- severe loss of protein in urine (proteinuria)
- low protein (albumin) levels in the blood serum (hypoalbuminaemia)
- hyperlipidaemia (high blood cholesterol)

Causes
- Idiopathic/unknown (majority of cases)
- Congenital (rare)
- Secondary: due to post-streptococcal acute glomerulonephritis, malaria, allergy, UTI

Investigations
As for Acute glomerulonephritis plus
- Serum protein and cholesterol

Differential diagnosis
- Cardiac failure
- Nutritional disorders causing low blood protein levels, eg. kwashiorkor
- Malabsorption syndrome
- Allergic states causing generalised body swelling
- Chronic glomerulonephritis

Management
- Give a high protein diet (up to 2g/kg daily)
- Restrict salt intake (<2g daily, i.e. <half teaspoon/day)
- Restrict water/fluid intake
  - If severe oedema
  - furosemide 40-80mg each morning to induce diuresis child: 1-2mg/kg per dose (but see notes below)
    - use of furosemide is not routine in children
    - only give if oedema is interfering with breathing or urination
14. Genito-Urinary diseases

- carefully watch out for electrolyte disturbances and hypovolaemic shock
- **prednisolone** 2mg/kg daily (max: 60mg)
  - continue until no further proteinuria (around 6 weeks)
  - gradually reduce the dose after the first 4 weeks eg. reduce by 0.5mg/kg per day each week

*When oedema has subsided and if still hypertensive:*

- Give appropriate treatment - see Hypertension

*If clinical signs of/suspected infection:*

- Give **antibiotic** as in Acute glomerulonephritis
  - *If UTI suspected:* treat as in 14.0 Acute cystitis

*If patient from area of endemic schistosomiasis:*

- **praziquantel** 40mg/kg single dose

*If no improvement after 4 weeks or patient relapses:*

- Refer for further management

14.3. ACUTE PYELONEPHRITIS

Upper urinary tract infection involving one or both kidneys (but not usually involving the glomeruli) which may extend to the bladder

**Cause**

- Bacterial infection, eg. *Escherichia coli* usually following some form of obstruction such as enlarged prostate and urethral stricture, but may occur without an obstruction
- Pregnancy (due to enlarged uterus pressing on the ureters)
- Fibroids pressing on the ureters
Clinical features
- Loin pain, tenderness in one or both kidney areas (renal angle)
- Dysuria, desire to pass urine even when the bladder is empty (strangury), frequent passage of small amounts of cloudy urine
- Fever
- Vomiting
- May be rigors (generalized body tremors)
- In infants: may simply present as fever without other signs
- Diarrhoea and convulsions (common in children)

Differential diagnosis
- Appendicitis
- Infection of the fallopian tubes (salpingitis)
- Infection of the gall bladder (cholecystitis)

Investigations
- Urine: microscopy for pus cells and organisms, C&S of mid-stream urine
  - the specimen should reach the lab within 2 hrs of collection or be refrigerated at 4°C for not more than 24 hours
- Blood: full count, C&S, urea, electrolytes
- IV urography

Management
- Ensure adequate intake of fluid (oral or IV) to irrigate the bladder and dilute bacterial concentrations
- Ensure perianal hygiene
- Ensure regular complete emptying of the bladder and/or double voiding (additional attempt to empty bladder after initial urine flow ceases)
- Give paracetamol for pain and fever
- Give antibiotic: cotrimoxazole 960mg every 12 hrs for 10-14 days
14. Genito-Urinary diseases

- **child:** 24mg/kg per dose
  - or **amoxicillin** 500mg every 8 hrs for 10-14 days
  - **child:** 15mg/kg per dose

  *In severe cases or if no response to above in 48 hrs:*

- **ampicillin** 1-2g IV or IM every 6 hours for 7-14 days
  - **child:** 50mg/kg per dose
- **plus gentamicin** 2.5mg/kg IV or IM every 8 hours for 7 days (reduce dose in renal impairment)

*Following initial response to parenteral therapy:*

- Consider change to **ciprofloxacin** 750mg every 12 hrs for the rest of the course
  - ✗ contraindicated in pregnancy

### 14.4: RENAL COLIC

Acute severe pain in the loin (kidney area) as a result of obstruction of the ureters by a stone

**Cause:**
- Urinary stones

**Clinical features**
- Acute severe, steady and continuous loin pain often radiating to the lower abdomen, testes or labia

**Differential diagnosis**
- Lower UTI
- Acute upper UTI
- Other causes of acute abdominal pain

**Investigations**
- X-ray: for radio-opaque stones
- IVP
- Blood
- Ultrasound
- Urinalysis
### 14. Genito-Urinary diseases

**Management**

- Treat underlying cause
- Ensure oral fluid intake of 3-4L/day after the crisis
- **pethidine** 50-100mg IM single dose

#### 14.5: RENAL FAILURE

Acute or chronic impairment of renal function

**Causes**
- Compromised renal perfusion eg. dehydration, heart failure, shock
- Obstructed urinary flow
- Damage to renal tissue

**Clinical features**
- Oliguria (urine flow <1mL/kg/hr)
- Generalised oedema
- Heart failure, hypertension
- Hyperkalaemia
- Nausea and vomiting
- Lethargy
- Dyspnoea
- Convulsions
- Encephalopathy
- Anorexia

**Differential diagnosis**
- Other renal disorders

**Management (adults and children)**

As dialysis facilities are limited to referral hospitals, the initial management is conservative to support the patient and maintain body biochemistry as near normal as possible until renal function recovers.

**Acute**
- Monitor fluid input and output.
  - daily fluid requirements = 10mL/kg + total of losses through urine, vomitus and diarrhoea
Monitor BP twice daily
Daily weighing
Restrict salt intake (<2g or half teaspoonful daily)
Restrict potassium intake eg. fruit, vegetables, meat, fizzy drinks
Restrict protein intake
Ensure adequate calories in diet
Check urine and electrolytes frequently
Treat any complications (eg. infections, hypertension, convulsions) adjusting drug dosages according to the clinical response where appropriate.

Note:
Do not give any drugs which may make kidney damage worse

If no response to above general measures:
Refer for specialist management including possible peritoneal dialysis as soon as possible and before the patient’s condition becomes critical.

**Chronic**
Permanent impairment of renal function due to progressive damage to the renal tissue
Refer for specialist management

**Prevention**
- Early, effective treatment of throat, skin and urinary tract infections

**USE OF DRUGS IN RENAL FAILURE**
- Be very careful when prescribing any drug and check available prescribing information (eg. in BNF) regarding use in renal failure/impairment
- Many drugs are excreted through the kidneys and accumulate when urinary output is reduced
- Some drugs are presented as sodium or
potassium salts and contribute to accumulation of these electrolytes

- With life-threatening infections (e.g. meningitis), use normal or high doses of antibiotics initially and then reduce doses once the condition has responded

a) **Drugs which are usually safe**
   - doxycycline
   - erythromycin
   - benzylpenicillin (max 6g daily in severe impairment)
   - phenytoin
   - rifampicin

b) **Drugs to use with care in reduced doses**
   - ACE inhibitors (e.g. captopril)
   - amoxicillin
   - chloramphenicol (avoid in severe impairment)
   - ciprofloxacin
   - cotrimoxazole
   - diazepam
   - digoxin
   - insulin
   - isoniazid-containing medicines
   - pethidine (increase dose interval, avoid in severe impairment)
   - phenobarbitone
   - propranolol

c) **Drugs to avoid using**
   - aspirin and other NSAIDS (e.g. ibuprofen, indomethacin)
   - codeine
   - ethambutol
   - gentamicin
   - nalidixic acid
   - nitrofurantoin
   - streptomycin
15. HIV/AIDS and SEXUALLY TRANSMITTED INFECTIONS (STI)

For details on management of HIV infections, refer to:

*HIV Infection: Diagnostic and Treatment Strategies for Health Care Workers, 3rd edition,* STD/AIDS Control Programme MoH 2004

**National Antiretroviral treatment Guidelines for adults, Adolescents and children, July 2008**

For Guidelines on HIV/AIDS Health Worker Safety, for details refer to

- Infection control policies and procedures.

15.0. HIV INFECTION / ACQUIRED IMMUNO DEFICIENCY SYNDROME (AIDS)

**Acquired Immuno-Deficiency Syndrome (AIDS)**

A condition of reduced immunity as a result of infection with Human Immuno-Deficiency Virus (HIV)

**Modes of transmission**

- sexual intercourse with an HIV-infected person
- Transfusion with HIV-infected blood
- Mother-To-Child Transmission during pregnancy, delivery or through breastfeeding
- HIV-contaminated sharp instruments, e.g. Dental and surgical equipment, needles, scalpels, razors, hair shaving equipment (clippers), nail cutters and other sharp objects.
- exposure to HIV-infected materials through an open wound or cut
**Clinical Diagnosis of HIV Infection**

This is based on demonstration of one or more opportunistic infections or key findings:

- **Cardinal findings:** The presence of any one of these is diagnostic of underlying HIV infection:
  - Kaposi’s sarcoma
  - Cryptococcal meningitis
  - Oesophageal candidiasis
  - Herpes zoster in patients <50 years
  - Oral thrush in patients <50 years (if no antibiotics taken in the past month)
  - Pneumocystis carinii pneumonia (Pneumocystis jiroveci)
  - Toxoplasmosis infection
  - Cytomegalovirus retinitis

- **Other findings/risk factors:** presence of any two or more of these is diagnostic of underlying HIV infection:
  - characteristic findings:
    - severe pruritic maculopapular skin rash (prurigo)
  - associated findings:
    - weight loss >10%
    - recurrent fevers for >1 month
    - recurrent diarrhoea for >1 month
    - generalised lymphadenopathy
  - **For children under 5 years of age, HIV infection should be suspected if the child has two or more of the following:**
    - Pneumonia
    - Persistent diarrhoea (diarrhoea lasting more than two weeks)
    - Very low weight-for-age
    - Oral thrush
    - Ear discharge
    - Generalized lymphadenopathy (enlarged
palpable lymph nodes in more than one site)  
− Parotid enlargement  
− Mother is HIV positive  
− Positive HIV Antibody test in a child less than 18 months

Epidemiological risk factors for HIV  
− Present or past high-risk behaviour (multiple sexual partners)  
− Loss of a spouse or partner from HIV disease  
− Having sexually transmitted infections, especially Herpes simplex virus type 2  
− Being an uncircumcised man  
− Being in an HIV-discordant sexual relationship or marriage  
− History of blood transfusion after 1975 to 1986

Differential diagnosis of HIV  
• TB  
• Untreated diabetes mellitus  
• Malnutrition  
• Cancer  
• Other chronic diseases

Investigations  
➢ Blood: HIV serology  
➢ Investigations for specific complicating diseases

Management Health Centre II  
Antiretroviral Therapy (ART) for HIV infection is now available at hospital level, Health Centre IV and some Health centre III Nation-wide. Availability of ARVs has increased because of provision of free ARVs by Ministry of Health and partners. However, the number of eligible patients that has not yet been reached is still big because of the following reasons:
• Stigma and late presentation by HIV positive patients
• Poor health seeking behaviour
• Inadequate HIV testing facilities
• Limited access to HIV treatment centres
• Poverty and ignorance in the community

Even without the use of specific ARV treatment, there are many ways in which good HIV management can help patients:
• By use of Cotrimoxazole prophylaxis
• By treating opportunistic infections as they occur
• By treating symptoms, such as pain, diarrhoea, skin problems, as they develop
• Encouraging the patient & family to help themselves by:
  – eating a balanced diet
  – taking regular exercise
  – keeping active and resting well
  – going for treatment promptly if unwell
  – spending quality time with family and friends
  – obtaining support from a counsellor
  – abstaining from sex, or being faithful to one partner
  – using a condom to help ensure safe sex

Whatever the stage of HIV/AIDS infection, it is very important to counsel the patients/clients about taking an HIV test. This means counselling before, during and after blood testing, bearing in mind that eventually most HIV patients will develop AIDS.

**Prevention of HIV**
• Always follow safe sex practices, eg. use condoms, avoid multiple sexual partners
• Avoid unsafe injections given by unlicensed persons
• Never share used needles, syringes, razors, hair
shavers, nail cutters and other sharp objects.
- Avoid contact with infected body fluids, especially blood
- Follow safe blood transfusion practices
- Follow safe infusion and injection practices, eg. proper sterilisation of reusable surgical items
- Whenever possible avoid (especially unnecessary) use of injectable medicines – use oral, rectal or other non-injectable dose-forms instead where these are appropriate and available
- Ensure effective implementation of all interventions for Prevention of Mother-to-Child Transmission (PMTCT) of HIV infection
- Avoid tattooing, body-piercing and scarifications unless carried out under strictly hygienic conditions in properly controlled premises
- Ensure one sterilised knife per circumcision candidate
- Provide HIV counselling and testing (HCT) for HIV infection

15.1. Psychosocial support for HIV +ve persons

HIV +ve persons benefit greatly from the following support after the first impact of the test result is overcome:
- Provision of emotional support
  - empathise with concerns and fears
  - use good counselling skills
- Helping the person understand the social, medical and psychological implications for him/herself, the unborn child (in the case of a pregnant woman) and any sexual partners
- Connecting the person with support services, including (religious) support groups, orphan care, income-generating activities, home care, and others
Helping the person find strategies to involve his/her partner and extended family in sharing responsibility

Helping the person identify someone from the community to support and care for him/her

Discussing with HIV +ve mothers how to provide for the other children in the family:
- help her identify a person from the extended family or community who will provide support

As appropriate, confirming and supporting information given in HCT on mother-to-child transmission, possibility of ARV treatment, safer sex, infant feeding and FP advice
- help the person absorb and apply information given

If the person shows signs of AIDS or terminal illness, refer her for appropriate management

a) How to provide psychosocial support:
- Conduct peer support groups for persons who tested HIV +ve and for couples affected by HIV/AIDS:
  - led by a social worker and/or HIV +ve person who has come to terms with his/her status
  - held outside the clinic so as not to reveal the HIV status of the participants

Groups are the key to success in psychosocial support

- Ensure good links between health services and psychosocial support services
  - to exchange information for coordinated interventions
  - to make a plan for each family involved
  - the health professional and social worker/Community Health Worker (CHW) should keep active links with each other and with support organizations
b) **Counselling on safer sex and use of condoms**

- Safer sex is any sexual practice which reduces the risk of transmitting HIV and other STIs.
- Advise the person that the best protection comes from:
  - correct and consistent use of condoms during every sexual act
  - choosing sexual activities which do not allow semen, vaginal fluid, or blood to enter the mouth, anus or vagina of the partner or to touch any open wound of the partner.
- Make sure the person knows how to use condoms and where to get them.

*If the person is HIV +ve:*

- Explain to him/her that he/she is infected and can give the infection to his/her partner who must therefore use a condom during every sexual act.
- Explain the extra importance of avoiding infection during pregnancy and breastfeeding.
  - the risk of infecting the baby is higher if the mother is newly HIV +ve.
- *If partner’s HIV status is unknown:*** counsel on the benefits of testing the partner.

*If the person is HIV –ve or status unknown:*

- Explain that he/she is at risk of HIV and in women the importance of remaining –ve during pregnancy and breastfeeding.
  - the risk of infecting the baby is higher if the mother is newly HIV +ve.
- *If partner’s HIV status is unknown:*** counsel on the benefits of testing the partner.
c) **For women: benefits of involving and testing male partners**

Men are still generally the main decision-makers in the family and community. Involving them will:
- have a greater impact on increasing acceptance of condom use and safer sex practices to avoid infection and unwanted pregnancies
- help reduce risk of suspicion and violence
- help increase support to their partners
- motivate men to get tested

**15.2. Mother-to-Child Transmission of HIV**

Approximately a third of the women who are infected with the human immunodeficiency virus (HIV) can pass it to their babies.

**Timing**
- During pregnancy (15-20%)
- During time of labour and delivery (60% - 70%)
- After delivery through breast feeding (15 - 20%)

**Pre-disposing factors**
- High maternal viral load
- Depleted maternal immunity for example very low CD4 cell counts
- Prolonged rupture of membranes
- Intra-patrum haemorrhage and invasive obstetrical procedures
- First twin is at higher risk of infection than second twin
- Premature baby is at higher risk than term baby
- Mixed feeding carries a higher risk than exclusive breastfeeding or use of replacement feeding
Investigation
• Blood: HIV serological test

Management
Access to the recommended package for Prevention Of Mother-to-Child Transmission of HIV (PMTCT);
See also Section 15.2 Pregnancy and HIV Infection.
1. Provide routine counselling and testing for HIV during pregnancy for the woman and her male partner
2. Give preventive counseling for HIV negative women

For the HIV positive women:
1. Provide co-trimoxazole (Trimethoprim 160mg/Sulphamethoxazole 80mg) daily for all positive women.
2. Administer one of the following antiretroviral drugs for PMTCT according to the policy
   a) **Mother:** 200mg oral **Nevirapine** at onset of labour.
   b) **Baby:** 2mg/kg body weight within 72 hours of birth
   c) **Mother:** 300mg oral **Zidovudine** and 150mg oral **Lamivudine** twice a day from 32-36 weeks through labour and for one week after delivery; plus 200 mg oral **Nevirapine** at onset of labour.
   d) **Baby:** Oral **Nevirapine** 2mg/kg body weight within 72 hours of birth plus oral **Zidovudine** 4 mg/kg body weight twice a day for one week.
   e) **Mother:** 300mg oral **Zidovudine** twice a day from about 28 weeks through labour plus 200mg oral **Nevirapine** at onset of labour.
   f) **Baby:** Oral **Nevirapine** 2mg/kg body weight within 72 hours of birth plus oral
15. HIV/AIDS and STI

Zidovudine 4mg/kg body weight twice a day for one week.
g) **Mother:** Zidovudine, Lamivudine and Nevirapine combination or Stavudine, Lamivudine and Nevirapine combination from after 14 weeks of gestation, throughout pregnancy and for life.

h) **Baby:** Oral Zidovudine 4mg/kg body weight twice a day for one week.

3. Apply modified obstetric practices
4. Provide counseling and support for optimal infant feeding

**Prevention**

- Abstinence from sex during pregnancy and while breast feeding
- Correct and consistent use of condoms during pregnancy and while breast feeding
- HIV counseling and testing for the couple to know sero-status
- Access the recommended PMTCT package for HIV infected mothers
15.3: Baseline Clinical Evaluation Checklist for Patients Starting ART

<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History:</strong></td>
</tr>
<tr>
<td>• Level of understanding of HIV/AIDS; the length of time since the diagnosis of HIV infection;</td>
</tr>
<tr>
<td>• Demographics and lifestyle: whether employed &amp; nature of work</td>
</tr>
<tr>
<td>• History of previous ART, prior use of nevirapine during pregnancy;</td>
</tr>
<tr>
<td>• Pregnancy risks: Contraception options and choices, current or planned pregnancy, access to contraceptive services.</td>
</tr>
<tr>
<td>• Sexual risks and disclosure: Willingness to practice safer sex, disclosure of HIV serostatus, use of condoms, HIV counseling and testing of sex partners and children.</td>
</tr>
<tr>
<td>• Symptoms of chronic pain and depression</td>
</tr>
<tr>
<td>• History of opportunistic infections &amp; other significant illnesses e.g. TB &amp; STIs, hospitalizations and surgeries;</td>
</tr>
<tr>
<td>• Current medications (including anti TB drugs, traditional therapies etc.)</td>
</tr>
<tr>
<td><strong>Physical Exam:</strong></td>
</tr>
<tr>
<td>• Weight</td>
</tr>
<tr>
<td>• Nutritional status</td>
</tr>
<tr>
<td>• Functional capacity and level of disability</td>
</tr>
</tbody>
</table>
| • Examination of vital signs, skin, eyes, oropharynx (presence of thrush), lymph nodes, lungs, heart, abdomen, genital tract (STIs), extremities, nervous
### Assessment

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
</table>
| **3** | Baseline Labs to assess immunosupression and disease aggressiveness  
- Confirming HIV serostatus  
- CD4 testing,  
- Viral load if available and affordable  
- Full blood count particularly for patients starting on a ZDV-containing regimen  
- Pregnancy test for women of child bearing potential starting on EFV-containing regimen |
| **4** | Baseline Labs to assess general Health and diagnose any pre-existing HIV complications.  
- A sputum smear for AFB for patients who have coughed for more than 2-3 weeks and a chest X-ray for patients who have unproductive cough or whose AFB smears are negative  
- Urine analysis for proteinuria, etc, particularly for patients starting on TDF containing regimen  
- Syphilis screening  
- Serum chemistries (liver and renal function tests), if available  
  - If ALT is elevated, do Hepatitis B surface antigen test, if available or refer  
- Symptom directed lab tests to diagnose pre-existing illnesses. |
| **5** | Staging of disease using WHO clinical criteria |
| **6** | Counselling and assessment of patients’ readiness to start therapy including assessment for specific education/information/counselling support needs |
**Goals of ART**

The goals of treatment with antiretroviral medicines are to inhibit viral replication while minimizing toxicities and side effects associated with the medicines. The inhibition of virus replication permits restoration of the immune system. Viral eradication from the host genome is not achievable, thus a cure for HIV is not yet possible. By using highly active antiretroviral therapy (HAART), it is possible to promote growth in children and prolong the survival of all HIV infected patients, reduce their morbidity and improve their quality of life. In summary the goals of ART are:

- The suppression of HIV replication, as reflected in plasma HIV concentration, to as low as possible and for as long as possible
- The preservation or enhancement of the immune function (CD4 restoration), thereby preventing or delaying the clinical progression of HIV disease
- Quality of life improvement
- Reduction in HIV related morbidity and mortality
- Promotion of growth and neurological development in children

HAART may be defined as therapy which is potent enough to suppress HIV viraemia to undetectable levels (<50 copies/mL), as measured by the most sensitive assay available, and which is durable in its virologic effect. HAART conventionally includes three or more medicines from at least two classes. However, as long as there is full and durable suppression of viral load, any regimen should be regarded as HAART. On the other hand, known suboptimal regimens, e.g. monotherapy, double nucleoside, or certain triple nucleoside
combinations are not HAART and are contraindicated in HIV disease.

Tools to achieve the goals of therapy
- Maximization of adherence to ART. This may require getting a treatment buddy who will support the patient to adhere to his treatment.
- Disclosure of HIV serostatus reinforces patient adherence to ART.
- Rational sequencing of medicines so as to preserve future treatment options
- Use ARV medicine resistance testing when appropriate and available
- Use of viral load estimates for monitoring if available

**Principles of ART**
Antiretroviral therapy is part of comprehensive HIV care. The guiding principles of good ART include:
- Not to start ART too soon (when CD4 cell count is close to normal) or too late (when the immune system is irreversibly damaged)
- Efficacy of the chosen medicine regimens
- Freedom from serious adverse effects
- Ease of administration including no food restrictions.
- Affordability and availability of medicines and medicine combinations
- Ongoing support of the patient to maintain adherence

**Limitations of ART**
Antiretroviral medicines are not a cure for HIV. However, when properly used by both patients and health care providers they are associated with excellent quality of life. They are relatively expensive; require an adequate infrastructure and knowledgeable health care workers. Training of health care personnel in the use of ARVs is critical.
15. HIV/AIDS and STI

Even when all these are in place, ART has its own limitations in several ways;

- Medicine interactions and medicine resistance may decrease the potency of these medicines
- Patients on ART may develop adverse medicine reactions
- The HIV medicines are still relatively expensive even though their prices have significantly reduced
- Patients have to take at least 95% of their pills in order to respond well (adherence is key to successful therapy)
- The medications have to be taken for life. At present, eradication of HIV in the body is not possible
- Some patients may not respond (benefit) to treatment and continue to progress with their HIV disease in spite of doing everything right.
- Children are dependent on adults for adherence to ART

**Available agents for ART**

At present antiretroviral medicines come in six classes, each of which attacks a different site (NNRTIs, NsRTIs, NtRTIs all work at the same site) or stage of the HIV life cycle thereby interfering with its reproduction.

- **Nucleoside reverse transcriptase inhibitors** (NsRTIs) incorporate themselves into the DNA of the virus, thereby stopping the building process. The resulting DNA is incomplete and cannot create new virus.
- **Nucleotide reverse transcriptase inhibitors** (NtRTIs) e.g. Tenofovir
- **Non-nucleoside reverse transcriptase inhibitors** (NNRTIs) stop HIV production by binding
directly onto the reverse transcriptase enzyme thus preventing the conversion of RNA to DNA.

- **Integrase inhibitors** (e.g., Raltegravir) interfere with the ability of the HIV DNA to insert itself into the host DNA and thereby copy itself.

- **Protease inhibitors (PIs)** work at the last stage of the virus reproduction cycle. They prevent HIV from being successfully assembled and released from the infected CD4 cell. Boosted Protease inhibitors are combinations of low-dose Ritonavir (RTV) with a PI for pharmacoenhancement.

- **Entry inhibitors also called HIV fusion inhibitors** (e.g., enfuvirtide or T-20) prevent the HIV virus particle from infecting the CD4 cell.

- **CCR5 antagonists** (e.g., Maraviroc) block the CCR5 coreceptor molecules that HIV uses to infect new target T cells. Some forms of HIV use a different coreceptor and thus some patients may not benefit from maraviroc.

### Initiation of ART in adults and adolescents

It is recommended to initiate Antiretroviral Therapy in Adults and Adolescents with documented HIV infection and one of the following:

- CD4 cell count of 250 cells/mm$^3$ and below
- CD4 cell count above 250 but below 350 cells/mm$^3$ in those:
  - Who are co-infected with tuberculosis (TB), or WHO Stage III disease
  - Women who are pregnant
- WHO Stage IV disease irrespective of CD4 cell count
- WHO stage I or II with CD4 cell counts $\leq$250/mm$^3$. 

UCG 2010

300
### 15.4. Recommended First and Second Line Regimens in Adults and Adolescents

<table>
<thead>
<tr>
<th>1st Line Regimens</th>
<th>2nd Line Regimens</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preferred</strong> *</td>
<td>ABC/ddI + LPV/r or TDF+3TC* or FTC+ LPV/r</td>
<td>-Relatively inexpensive regimen. -ZDV less toxic than d4T. -ZDV causes anemia -If patient is anemic start with TDF</td>
</tr>
<tr>
<td>TDF+3TC or FTC plus NVP or EFV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternative 1</th>
<th>ZDV+ddI + LPV/r ABC/ddI + LPV/r ZDV+3TC* + LPV/r</th>
<th>-Use of TDF, FTC and EFV has low toxicity, once daily administration, and effective against hepatitis. -When affordable, this combination is the preferred first-line. -Patients who have peripheral neuropathy and anemia may be considered for this first line regimen.</th>
</tr>
</thead>
<tbody>
<tr>
<td>d4T/3TC + NVP or EFV</td>
<td>ABC/ddI + LPV/r or TDF+3TC or FTC + LPV/r</td>
<td>-Generic co-formulated d4T/3TC + NVP is cheap. -d4T, however, is associated with many toxicities -Only d4T 30mg is recommended irrespective of weight.</td>
</tr>
</tbody>
</table>

**KEY: Next page**
**Key:**

- **ZDV**: Zidovidin
- **D4T**: Stavudine
- **3TC**: Lamivudine
- **NVP**: Nevirapine
- **EFV**: Efavirenz
- **ABC**: Abacavir
- **ddI**: Didanosine
- **LPV/r**: Lopinovir/Ritanavir (Aluvia/Kaletra)
- **TDF**: Tenofovir
- **FTC**: Emeicitabine
- **ATV/r**: Atazanavir/Ritonavir

### 15.5. Recommendations for Initiating Antiretroviral Therapy in Children

<table>
<thead>
<tr>
<th>Age</th>
<th>CD4%</th>
<th>CD4 Absolute</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants &lt;12 months</td>
<td>N/A</td>
<td>N/A</td>
<td>Treat if PCR positive</td>
</tr>
<tr>
<td>12 – 35 months</td>
<td>&lt;20</td>
<td>&lt;750</td>
<td>Treat</td>
</tr>
<tr>
<td>36 – 59 months</td>
<td>&lt;20</td>
<td>&lt;350</td>
<td>Treat</td>
</tr>
<tr>
<td>5 years and over</td>
<td>&lt;15</td>
<td>&lt;250</td>
<td>Treat as adult</td>
</tr>
</tbody>
</table>

N/A = Not Applicable. Infants less than 12 months should be started on ART irrespective of their CD4 cell count status.
### 15.6. Recommended First and Second Line Antiretroviral Regimens for Children and Infants

<table>
<thead>
<tr>
<th>1st Line Regimens</th>
<th>2nd Line Regimens</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preferred * d4T/3TC + NVP or EFV</strong></td>
<td>ABC/ddI + LPV/r or TDF+3TC or FTC + LPV/r</td>
<td>-Generic co-formulated d4T/3TC + NVP is cheap. -d4T 30mg is safe and preferred in children aged &lt;5 years. -Change d4T to ZDV for children ≥5 years</td>
</tr>
<tr>
<td><strong>Alternative ZDV/3TC + NVP or EFV</strong></td>
<td>ABC/ddI + LPV/r or TDF+3TC* or FTC+ LPV/r</td>
<td>-Relatively inexpensive regimen. -ZDV less toxic than d4T. -ZDV causes anemia -If child is anaemic start with d4T (&lt;5 yrs) and switch to ZDV as soon as the anemia recovers or switch to TDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Line Regimens</th>
<th>Second Line Regimens for Treatment Failure</th>
<th>Alternative Second Line Regimens for Treatment Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>d4T/3TC + NVP or EFV</td>
<td>ABC+ ddI +LPV/r ZDV/ddI + LPV/r ZDV/ABC + LPV/r ABC/ddI + LPV/R</td>
<td>ABC/ddI + ATV/r ZDV/3TC + ATV/r</td>
</tr>
</tbody>
</table>

**KEY: Next page**
Key:
d4T: Stavudine
3TC: Lamivudine
NVP: Nevirapine
EFV: Efavirenz
ABC: Abacavir
ddI: Didanosine
LPV/r: Lopinovir/Ritonavir (Aluvia/Kaletra)
TDF: Tenofovir
FTC: Etricitabine
ATV/r: Atazanavir/Ritonavir
15.7. Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Nucleoside reverse transcriptase inhibitors (NRTIs)</th>
<th>Zidovudine (ZDV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose</strong></td>
<td><strong>Formulations</strong></td>
</tr>
<tr>
<td>For &gt;6wks – 12yrs 180 - 240 mg/m² twice daily</td>
<td>Syrup: 10 mg/ml</td>
</tr>
<tr>
<td>&gt;12yrs 300mg twice daily</td>
<td>Capsules: 100 mg and 250 mg (May be opened and dispersed in water or on to a small amount of food and immediately ingested)</td>
</tr>
<tr>
<td>Intravenous: 1.5 mg/kg infused over 30 minutes, every 6 hours until oral dosing is possible.</td>
<td>Tablet: 300 mg</td>
</tr>
<tr>
<td>For children with suspected nervous system involvement dose of 240mg/m2 per dose given twice daily may be more beneficial.</td>
<td></td>
</tr>
</tbody>
</table>

UCG 2010
### Antiretroviral dosage regimens for Children and Infants

#### Stavudine (d4T)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30kg 1mg/kg bd</td>
<td>Oral solution: 1 mg/ml (requires refrigeration after reconstitution)</td>
<td>Well tolerated.</td>
</tr>
<tr>
<td>&gt;30kg 30mg bd</td>
<td>Capsules: 15 mg, 20 mg, 30 mg, 40 mg (Can be opened and mixed with small amount of food or water (stable in solution for 24 hours if kept refrigerated)</td>
<td>Do not use stavudine with zidovudine (ZDV) due to an antagonistic effect</td>
</tr>
<tr>
<td>&gt;60kg 40mg bd</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Lamivudine (3TC)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 wks – 12 yrs;</td>
<td>Syrup; 10mg/ml available</td>
<td>Well tolerated.</td>
</tr>
<tr>
<td>4mg/kg twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;12yrs 150mg</td>
<td>Tablet; 150 mg</td>
<td>No food restrictions</td>
</tr>
<tr>
<td>twice daily</td>
<td></td>
<td>Also active against hepatitis B</td>
</tr>
</tbody>
</table>
### Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3 months: 50mg/m²/dose twice daily</td>
<td>Oral solution from paediatric powder/10 mg/ml (Should be kept refrigerated)</td>
<td>ddI is degraded rapidly unless given as an enteric formulation or combined with buffering agents or antacids</td>
</tr>
<tr>
<td>3 months to &lt;13 years: 90–120 mg/m²/dose twice daily</td>
<td>Chewable tablets: 25 mg, 50 mg, 100 mg, 150 mg, 200 mg (not be swallowed whole but can be crushed or dispersed in water or clear juice)</td>
<td>In children this effect may be less marked and ddI may not have to be administered on an empty stomach</td>
</tr>
<tr>
<td>Maximum dose, ≥13 years or &gt;60 kg: 200 mg/dose twice daily or 400mg once daily</td>
<td>Enteric-coated beadlets in capsules: 125 mg, 200 mg, 250 mg, 400 mg (designed for once daily dosing preferred but still not widely available)</td>
<td></td>
</tr>
</tbody>
</table>
### Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir (ABC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6months – 16yrs 8mg/kg twice daily</td>
<td>Oral solution: 20 mg/ml</td>
<td>Parents must be warned about potential ABC hypersensitivity reaction</td>
</tr>
<tr>
<td>&gt;30kg: 300mg twice daily</td>
<td>Tablet: 300 mg</td>
<td>ABC should be stopped permanently if hypersensitivity reaction occurs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No food restrictions</td>
</tr>
</tbody>
</table>

**Non-nucleoside reverse transcriptase inhibitors (NNRTIs)**

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efavirenz (EFV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syrup: 30 mg/ml (Note: syrup has lower bioavailability and ratio of 1.3 syrup to solid formulation is suggested to achieve an equivalent dose)</td>
<td>Syrup: 19.5 mg/kg/day</td>
<td>Insufficient data on dosing for children &lt;3 years old</td>
</tr>
<tr>
<td>Capsules: 50 mg, 100 mg, 200 mg</td>
<td>Capsule / tablet: 15mg/kg/day</td>
<td>Can be given with food but if taken with food, especially high-fat meals, absorption is increased by an average of 50%</td>
</tr>
<tr>
<td>Tablets: 600 mg</td>
<td>Weight greater than 40 kg, 600 mg once daily</td>
<td>Best given at bedtime in order to reduce CNS side-effects,</td>
</tr>
<tr>
<td></td>
<td>Wt Kg Dose (mg)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-25 300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25-32 400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;32 600 capsules, once a day at night</td>
<td></td>
</tr>
</tbody>
</table>
### Non-nucleoside reverse transcriptase inhibitors (NNRTIs)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efavirenz (EFV)</strong></td>
<td></td>
<td>especially during first two weeks</td>
</tr>
<tr>
<td>Nevirapine (NVP)</td>
<td>Oral suspension: 10 mg/ml</td>
<td>Parents must be warned about a potential severe, life-threatening rash during the 14-day lead-in period. The once-daily induction dose is used to reduce the frequency of rash. Should be permanently discontinued and not restarted in children who develop severe rash</td>
</tr>
<tr>
<td>160–200 mg/m² to maximum dose of 200 mg taken twice daily</td>
<td>Tablet: 200 mg</td>
<td>Medicine interactions: avoid nevirapine if rifampicin is co-administered</td>
</tr>
<tr>
<td>&lt;8yrs</td>
<td>For MTCT prevention: 2 mg/kg/dose within 72 hours of birth once only. If the maternal dose of nevirapine was given less than 2 hours before delivery, then administer 2 mg/kg/dose to the infant immediately after birth and repeat within 24–72 hours of first dose. If the infant weight is not available, administer 0.6 ml oral suspension.</td>
<td>Can be given without regard to food</td>
</tr>
<tr>
<td>4mg/kg once daily for 14 days then 7mg/kg twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;8yrs</td>
<td>4mg/kg once daily for 14 days then 4mg/kg twice daily</td>
<td></td>
</tr>
</tbody>
</table>
### Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2yrs: 2.9ml/m² twice daily with food.</td>
<td>Oral solution: 80 mg/ml lopinavir plus 20 mg/ml ritonavir</td>
<td>Should be taken with food</td>
</tr>
<tr>
<td></td>
<td>Capsules: 133.3 mg lopinavir plus 33.3 mg ritonavir (Should not be crushed or opened; must be swallowed whole)</td>
<td>Preferably, oral solution and capsules should be refrigerated; however, can be stored at room temperature up to 25°C for two months; at &gt;25°C medicine degrades more rapidly</td>
</tr>
<tr>
<td></td>
<td>Tablets: 100 mg lopinavir + 25 mg ritonavir (Should be taken with food)</td>
<td>There are many medicine-to-medicine interactions because RTV inhibits cytochrome</td>
</tr>
</tbody>
</table>
### Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>310mg/m2 once daily (od)</td>
<td>ATV Oral powder 50mg/1.5g dispersible powder</td>
<td>Should be taken with meals</td>
</tr>
<tr>
<td>Wt 15kg - &lt; 20kg 8.5 mg/kg ATV and 4mg/kg RTV od</td>
<td>ATV Capsules 100, 150, 200 and 300mg capsules</td>
<td>Approved for children over 6 years but has been used in 3mths – 6yr olds</td>
</tr>
<tr>
<td>Wt &gt; 20kg 7mg/kg and RTV 4mg/kg od Maximum dose 300mg RTV and 100mg RTV once daily</td>
<td>Must be taken with 100mg capsule/liquid of ritonavir</td>
<td>Store in cool dry place protect from light (15-25°C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No combination pill available (ATV+Rtv)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Currently recommend for 2nd line therapy (Discuss with experts prior to use)</td>
</tr>
</tbody>
</table>
### Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th><strong>Dose</strong></th>
<th><strong>Formulations</strong></th>
<th><strong>Comments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mg/150 mg/200 mg as 1 tablet twice daily</td>
<td>Tablet: d4T (30 mg) plus 3TC (150 mg) plus NVP (200 mg); or d4T (40 mg) plus 3TC (150 mg) plus NVP (200 mg)</td>
<td>Contains a fixed dose of NVP, therefore cannot be used for induction as nevirapine dose escalation required (see NVP dosing recommendations)</td>
</tr>
<tr>
<td>Maximum dose: one 30-mg d4T-based tablet twice daily</td>
<td>Tablet: 6 mg stavudine/30 mg lamivudine/50 mg nevirapine (baby)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tablet: 12 mg stavudine/60 mg lamivudine/100 mg nevirapine (junior)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suspension: stavudine 10 mg / 5 ml + lamivudine 40 mg + nevirapine 70 mg</td>
<td></td>
</tr>
</tbody>
</table>
### Zidovudine (AZT) plus Lamivudine (3TC) (Combivir)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine - 180-240mg/m2/dose twice daily</td>
<td>Oral solution: not available</td>
<td>Tablet: ZDV (300 mg) plus 3TC (150 mg)</td>
</tr>
<tr>
<td>Lamivudine - 4mg/kg/dose twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum dose: 1 tablet/dose twice daily</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Stavudine (d4T) plus Lamivudine (3TC)

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stavudine - 1mg/kg/dose twice daily</td>
<td>Oral solution: stavudine 10 mg + lamivudine 40 mg/5 ml</td>
<td>Tablets: d4T (30 mg) plus 3TC (150 mg) or d4T (40 mg) plus 3TC (150 mg)</td>
</tr>
<tr>
<td>Lamivudine - 4mg/kg/dose twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum dose: 1 tablet/dose twice daily</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Antiretroviral dosage regimens for Children and Infants

<table>
<thead>
<tr>
<th>Dose</th>
<th>Formulations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine - 180-240mg/m2/dose twice daily</td>
<td>Oral solution: not available</td>
<td>Parents must be warned about potential ABC hypersensitivity reaction</td>
</tr>
<tr>
<td>Lamivudine - 4mg/kg/dose twice daily</td>
<td>Tablet: ZDV (300 mg) plus 3TC (150 mg) plus ABC (300 mg)</td>
<td>ABC should be stopped permanently if hypersensitivity reaction occurs Pharmacokinetic data: Available only for adults and adolescents</td>
</tr>
<tr>
<td>Abacavir - 8mg/kg/dose twice daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum dose: 1 tablet/dose twice daily</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

People co-infected with tuberculosis and HIV infections

Co-management of TB and HIV is complicated by drug interactions between rifampicin and both the NNRTI and PI classes, IRIS, pill burden, overlapping toxicities, and adherence issues. Active TB may be present when ART needs to be initiated or develop during treatment. For patients with active TB in whom HIV infection is diagnosed and ART is required the first priority is to initiate standard anti-TB treatment.
### Antiretroviral Therapy for Individuals with Tuberculosis Co-Infection

<table>
<thead>
<tr>
<th>Situation</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Pulmonary TB and CD4 count <250/mm³ or extra pulmonary TB or WHO stage IV | **Start TB therapy and when tolerated (usually within 2 to 6 weeks) ADD one of these regimens:**  
- ZDV/3TC/EFV or TDF/3TC/EFV – not to be used in first trimester of pregnancy or in women of childbearing potential without assured contraception  
- ZDV+3TC+TDF - can be used in persons co-infected with HIV/HBV. No interaction with rifampicin.  
- ZDV/3TC/NVP, TDF/3TC/NVP - used only if in rifampicin-free continuous phase |
| Pulmonary TB and CD4 250-350/mm³ | **Start TB therapy for 2 months THEN start one of these regimens:**  
- ZDV/3TC/EFV or NVP  
- TDF/3TC/EFV or NVP  
- ZDV+3TC+ABC or ZDV+3TC+TDF – can be used in women who are pregnant and those with high CD4 >250 |
| Pulmonary TB and CD4 >350/mm³ | **Defer ART. Treat TB first. Monitor clinically and also do CD4 counts. Re-evaluate patient at eight weeks and the end of TB treatment** |
15.8. SEXUALLY TRANSMITTED INFECTIONS
A collection of disorders, several of which are better regarded as syndromes for more effective management using a syndromic approach.

Prevention of STIs
General preventive measures include:
- Give health education about STIs (very important)
- Provide specific education on the need for early reporting and compliance with treatment
- Ensure notification and treatment of sexual partners
- Counsel patient on risk reduction, e.g., practice of safe sex by using condoms, remaining faithful to one sexual partner, personal hygiene
- Provide condoms
- If necessary and possible, schedule return visits

15.9. URETHRAL DISCHARGE SYNDROME (MALE)

Causes
A number of diseases, usually spread by sexual intercourse, produce similar manifestations in the male and may be difficult to distinguish clinically:
- Gonorrhoea: caused by the bacterium Neisseria gonorrhoea
- Trichomoniasis: caused by the protozoan Trichomonas vaginalis
- Non-gonococcal urethritis: caused by virus-like bacteria Mycoplasma and Chlamydia trachomatis

Clinical features
- Patients complain of mucus or pus appearing at the tip of the penis or staining of underwear
- Burning pain on passing urine (dysuria)
- Examination may show a scanty or profuse discharge
Investigations
- Pus swab: Gram stain, C&S
- Blood: screening tests for syphilis
- Examine patient carefully to confirm discharge
- Retract prepuce to exclude presence of ulcer

Treatment (patients and partners)

**HC2**
- **ciprofloxacin** 500mg single dose
  - *plus* **doxycycline** 100mg every 12 hours for 7 days
  - *If partner is pregnant:*
    - Give **erythomycin** 500mg every 6 hours for 7 days
      - *plus* **cotrimoxazole** 2.4g (5 tabs) every 12 hours for 3 days
  - *If discharge or dysuria persists and partners treated:*
    - Exclude presence of ulcers under prepuce
    - Repeat **doxycycline** 100mg every 12 hours for 7 days
    - Also give **metronidazole** 2g single dose
  - *If discharge or dysuria persists and partners not treated:*
    - Start the initial treatment all over again
  - *If discharge still persists:*
    - Refer for specialist management
15.10. ABNORMAL VAGINAL DISCHARGE SYNDROME

Often the first evidence of genital infection, although absence of abnormal vaginal discharge does not mean absence of infection.

Causes

- Can be a variety and often mixture of organisms
- Bacterial vaginosis

Clinical features

- In all cases: abnormal increase of vaginal discharge
  - normal discharge is small in quantity and white to colourless
- Gonorrhoea produces a thin mucoid slightly yellow pus discharge with no smell
- Trichomoniasis causes a greenish-yellow discharge with small bubbles and a fishy smell and itching of the vulva
- Candida albicans causes a very itchy, thick white discharge like sour milk
- Mycoplasma, chlamydia may cause a non-itchy, thin, colourless discharge

Differential diagnosis

- Cancer of the cervix especially in older women with many children (multiparous)
  - causes a blood-stained smelly discharge

Investigations

- Speculum examination especially in older multiparous women
- Pus swab: microscopy, Gram stain, C&S
- Blood: syphilis tests (RPR/VDRL)

Treatment

- If there is lower abdominal tenderness:
  - Treat as in Lower abdominal pain syndrome
- If there is no lower abdominal tenderness but there is itching, erythema or excoriations:

HC2
15. HIV/AIDS and STI

- Insert one **nystatin pessary 100,000 IU** into the vagina at night for 14 days
  - or insert one **clotrimazole pessary 500mg** single dose at night for 1 night
- **plus metronidazole 2g single dose**
  
  *If discharge or dysuria persists:*
- **Give doxycycline 100mg every 12 hours for 7 days**
- **plus ciprofloxacin 500mg stat**
  
  *If discharge or dysuria still persists and partners not treated:*
- Repeat **doxycycline and ciprofloxacin**
  
  *If discharge or dysuria still persists and partners treated:*
- Refer for specialist management
  
  c) If there is **no lower abdominal tenderness and no itching, erythema or excoriations:**
- **ciprofloxacin 500mg stat**
- **plus doxycycline 100mg every 12 hours for 7 days**
- **plus metronidazole 2g single dose**
  
  *If discharge or dysuria persists and partners not treated:*
- Repeat the above 3-medicine treatment
  
  *If discharge or dysuria persists and partners treated or if discharge still persists after the repeat course above:*
- Refer for further management

**In pregnancy:**
- Give **erythromycin 500mg every 6 hours for 7 days**
- **plus cotrimoxazole 2.4g (5 tabs) every 12 hours for 3 days**
  
  ✗ Do **not** give cotrimoxazole in the 1st trimester or after 36 weeks
  
  ✗ Do **not** give ciprofloxacin, chloramphenicol, doxycycline or tetracycline
15. HIV/AIDS and STI

△ Postpone giving metronidazole until after 1st trimester

*Child:* (7-day course)
- **cotrimoxazole** 24mg/kg every 12 hours
  - or **erythromycin** 12.5mg/kg every 6 hours
- plus **metronidazole** 12.5mg/kg every 8 hours

### 15.11. LOWER ABDOMINAL PAIN SYNDROME (FEMALE) / PELVIC INFLAMMATORY DISEASE (PID) SYNDROME

**Causes**
- Infection of the uterus, tubes and ovaries by *N. gonorrhoea, Chlamydia* and anaerobes.

**Differential diagnosis**
- Ectopic pregnancy
- Puerperal sepsis
- Ovulation pain

**Investigations**
- Take history, check if period overdue
- If possible examine the patient bimanually
  - for pregnancy, bleeding, recent delivery or abortion
- Check for severe pain, vomiting or rebound tenderness

**Treatment**

*HC2*

*If any of the above signs and symptoms are found:*
- Refer quickly for further management

*If none of the above signs and symptoms are found:*
- Give **ciprofloxacin** 500mg every 12 hours for 3 days
- plus **doxycycline** 100mg every 12 hours for 10 days
- plus **metronidazole** 400mg every 12 hours for 10 days
If there is an Intra Uterine Contraceptive Device (IUCD):
- Remove it 2-4 days after commencing treatment
If no improvement within 7 days:
- Refer for specialist management

15.12. GENITAL ULCER DISEASE (GUD) SYNDROME

Causes
A number of conditions may produce genital sores in men and women.
- **Syphilis**: caused by *Treponema pallidum* bacteria
- **Genital herpes**: caused by *Herpes simplex* virus
- **Granuloma inguinale**: caused by *Donovania granulomatis*
- **Chancroid**: caused by *Haemophilus ducreyi*

Clinical features
- **Primary syphilis**: the ulcer is at first painless and may be on the fold between the large and small lips of the vulva (labia majora and labia minora) or on the labia themselves or on the penis
- **Secondary syphilis**: multiple, painless ulcers on the penis or vulva
- **Herpes**: small, multiple, usually painful blisters, vesicles or ulcers
- **Granuloma inguinale**: an irregular ulcer which increases in size and may cover a large area
- **Chancroid**: multiple, large, irregular ulcers with enlarged painful suppurating lymph nodes

Differential diagnosis
- Cancer of the penis in elderly men
- Cancer of the vulva in women >50 yrs

Investigations
- Swab: for microscopy
- Blood: for VDRL/TPR
Treatment

a) If blisters or vesicles are present:
   - **aciclovir** 200mg every 5 hours for 5 days
   - Perform RPR test
   - If positive, give **benzathine penicillin** 2.4 MU IM single dose (half into each buttock)
   △ Use alternative regime below in penicillin-allergic patients
   - Advise on genital hygiene
   - *If blisters or vesicles persist:*
     - Repeat **aciclovir** as above
   
b) If blisters or vesicles are absent:
   - **ciprofloxacin** 500mg every 12 hours for 3 days
   - *plus benzathine penicillin* 2.4 MU IM single dose (half into each buttock)
   △ Use alternative regime below in pregnant or penicillin-allergic patients
   - *If ulcer persists for >10 days and partners were treated:*
     - **erythromycin** 500mg every 6 hours for 7 days
   - *If ulcer persists for >10 days and partners were not treated:*
     - Repeat the above course of **ciprofloxacin** and **benzathine penicillin**
     - *If the ulcer still persists:*
       - Refer for specialist management
   
   Alternative regime if patient is pregnant or allergic to penicillin:
   - **erythromycin** 500mg every 6 hours for 14 days
   
Note:
- Genital ulcers may appear together with enlarged and fluctuating inguinal lymph nodes (buboes) which should be aspirated through normal skin and never incised
15.13. INGUINAL SWELLING (Bubo)

Found in many sexually transmitted conditions affecting the female and male genitals.

**Causes**
- Lymphogranuloma venereum (LGV)
- Granuloma inguinale (GI)
- Chancroid

**Clinical features**
- Excessively swollen inguinal glands
- Pain, tenderness
- Swellings may become fluctuant if pus forms

**Prevention**
- Other causes of swollen inguinal lymph nodes, e.g. leg ulcer

**Management**
- Aspirate using wide-bored needle through healthy skin - do not incise
- **doxycycline** 100mg every 12 hours for 10 days
- **plus ciprofloxacin** 500mg every 12 hours for 3 days

15.14. WARTS

**Cause**
- Viral infection

**Clinical features**
- Usually light coloured umbilicated papules with irregular rough surface found on the face and genital areas

**Differential diagnosis**
- Rashes
- Eruptive skin lesions

**Management**
- Apply **podophyllum resin paint 15%** 1-3 times weekly
- apply precisely on the lesion avoiding normal skin
- wash off with water 2-4 hours after each application
- Treat underlying infection & advise on personal hygiene

If no improvement after 3 applications:
- Refer for surgery

Warning
△ Podophyllum resin paint (podophyllin paint):
- protect normal skin with Vaseline® before application

Prevention
- Give health education about STI
- Provide specific education on the need for early reporting and compliance with treatment.
- Ensure notification and treatment of sexual partners.
- Counsel patient on risk reduction, eg. Practice of safe sex by using condoms, remaining faithful to one sexual partner, personal hygiene.
- Provide condoms.
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16.0. Antenatal Care (ANC)

The main objectives of antenatal care are:
- Prevention and treatment of any complications
- Emergency preparedness
- Birth planning
- Satisfying any unmet nutritional, social, emotional and physical needs of the pregnant woman
- Provision of patient education, including successful care and nutrition of the newborn
- Identification of high-risk pregnancy
- Encouragement of (male) partner involvement in antenatal care

Goal-Oriented Antenatal Care Protocol

- Goals for ANC vary depending on the timing of the visit/duration of pregnancy
- In normal (uncomplicated) pregnancies, aim for 4 routine visits as follows:

<table>
<thead>
<tr>
<th>Antenatal Visit</th>
<th>Week of Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>10-20</td>
</tr>
<tr>
<td>2nd</td>
<td>20-28</td>
</tr>
<tr>
<td>3rd</td>
<td>28-36</td>
</tr>
<tr>
<td>4th</td>
<td>&gt;36</td>
</tr>
</tbody>
</table>

- If a woman comes for first ANC later than the 1st trimester, combine and attend to the preceding goals
- At all visits: address identified problems, check BP, and measure the symphysio-fundal height (SFH) and Fetal Heart activity
- Encourage the woman to bring her partner or a family member to at least one visit
16. Obstetric and Gynaecological conditions

16.0.1 First antenatal visit (between weeks 10-20)

Goals
- Risk assessment
- Health education
- Plan for delivery

History taking
- Record name, age, marital status, occupation, education, ethnic origin, residence
- Enquire if patient has any problems and obtain details
- Medical history:
  - include family history of HIV, diabetes, hypertension, TB, hereditary diseases, multiple pregnancy
- Surgical history
- Obstetric and gynaecological history:
  - record for each pregnancy: date, place, maturity, labour, delivery, weight, sex and fate of the infant, and any puerperal morbidity
- Current pregnancy:
  - record history of current pregnancy: date of (first day of) last menstrual period (LMP), date of conception
  - confirm period of gestation/present maturity (= no of weeks from LMP)
  - calculate estimated delivery date (EDD) by adding 7 days to the LMP and 9 months to the month of LMP. e.g. LMP = 1/1/02, EDD = 8/10/02
  - Where the months total is >12, subtract 12 from this, e.g. LMP = 5/5/02, add 9 months = 5+9 = 14, subtract 12 months = 14-12 = 2, therefore EDD = 12/2/03
  - OR subtract 3 from the month if the addition would be greater than 12, e.g. LMP = 5/5/02,
16. Obstetric and Gynaecological conditions

substract 3 from the month and add 1 year to the current year =5-3 = 12/02/03

- any problems encountered, for example, bleeding
- Contraceptive use
- Check for STIs
- Social history:
  - smoking, (alcohol) drinking, drug use habits

Examination

- General physical examination, BP, weight, breasts
- Obstetric examination: symphysio-fundal height (SFH), lie, presentation, foetal heart sounds, presence of multiple gestation
- Vaginal (vulval) examination (only carry out if indicated; use a speculum) as follows:
  - in early pregnancy: to confirm and date the pregnancy and detect any anatomical abnormalities
  - in late pregnancy: to assess pelvic adequacy
  - in labour: to confirm diagnosis and monitor
  - other times: to evaluate symptoms/complaints
- Abdominal examination: to look for Caesarian scar, rule out multiple pregnancy

Laboratory investigations

- Blood: for ABO, rhesus grouping, RPR (syphilis), Hb, RCT
- Urine: for albumin, glucose
- Other tests - as appropriate for the individual patient to assess maternal well-being, e.g. ultrasound, amniotic fluid, foetal heart/movements.

Management of common complaints

(see table in section 16.1)
16. Obstetric and Gynaecological conditions

**Health promotion**
- Address any problems
- Involve husband in ANC
- Draw up delivery plan
- Discuss future family planning (FP)
- Discuss symptoms of miscarriage, pregnancy-induced hypertension (PIH)
- Educate & counsel on PMTCT of HIV and Malaria prevention and use of ITN
- Educate on danger signs
- Proper nutrition:
  - eat more and greater variety of foods, have an extra meal each day
  - advise against any taboos regarding nutritionally important foods
- Adequate hygiene
- Breastfeeding and breast care.
- Discuss Sexual activity during pregnancy, dual protection for FP/HIV
- Avoidance of smoking and alcohol
## 16. Obstetric and Gynaecological conditions

### 16.1. Management of Common Complaints in Pregnancy

<table>
<thead>
<tr>
<th>Complaint</th>
<th>Action</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low back ache</td>
<td>Exclude UTI and local lesion. If none, reassure</td>
<td>Avoid unnecessary medication</td>
</tr>
<tr>
<td>Morning sickness (nausea &amp; vomiting)</td>
<td>Reassure up to 3 months. If severe + dehydration, admit for</td>
<td>Avoid anti-emetics</td>
</tr>
<tr>
<td>Indigestion (flatulence &amp; constipation)</td>
<td>High roughage diet, increase fluids. If severe, treat as on p101</td>
<td>Avoid strong laxatives &amp; enemas</td>
</tr>
<tr>
<td>Excessive salivation (ptyalism)</td>
<td>Reassure</td>
<td>Avoid anticholinergic drugs</td>
</tr>
<tr>
<td>Food craving (pica)</td>
<td>Ensure balanced diet. Eat according to</td>
<td>Discourage harmful materials, e.g. soil</td>
</tr>
<tr>
<td>Generalised pruritus</td>
<td>Reassure. If severe, treat as on p222</td>
<td>Avoid steroids</td>
</tr>
<tr>
<td>Vulval pruritus</td>
<td>Treat as for abnormal vaginal discharge,</td>
<td>Avoid douching with antiseptics</td>
</tr>
<tr>
<td>Cramps</td>
<td>Give calcium lactate 600mg 8 hourly for 5 days</td>
<td>Avoid giving NSAIDS</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Reassure, bed rest</td>
<td>Avoid drugs</td>
</tr>
</tbody>
</table>
Second antenatal visit (between weeks 20-28)

Goals

Address problems
- Take action if abnormal lab results
- Ensure Tetanus Toxoid (TT) vaccination
- Exclude multiple pregnancy
- Assess for signs of PIH
- Check foetal growth
- Exclude anaemia
- Assess the degree of the patient’s risk (normal or high)

History taking
- Interval history of symptoms and/or problems, e.g. vaginal bleeding (antenpartum haemorrhage [APH])
- Date of first foetal movements and drainage of liquor.

Examination
- As for 1st antenatal visit plus
- Weight: amount and pattern of weight change

Laboratory investigations
- As for 1st antenatal visit

Health promotion
- As for 1st antenatal visit plus
- Advise/discuss with patients how to recognize and promptly report any problems so that prompt treatment may be given e.g. vaginal bleeding (APH), draining of liquor, blurred vision and labour pains
- Discuss lab results and the need to treat the partner as necessary
- Discuss voluntary counselling & testing (VCT) in relation to HIV, IPT and ITN as found relevant.
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**Third antenatal visit (between weeks 28-36)**

**Goals**
- Check foetal growth
- Exclude anaemia
- Assess for signs of PIH
- Review delivery plan

**History taking, laboratory investigations**
- As for 2nd antenatal visit

**Examination**
- As for 2nd antenatal visit *plus*
- Pallor - check palms and conjunctiva (for anaemia)

**Health promotion**
- As for 2nd antenatal visit *plus*
- Discuss labour/early rupture of membranes (PROM)
- Review delivery plan

**Fourth antenatal visit (after week 36)**

**Goals**
- As for 3rd antenatal visit *plus*
- Exclude abnormal presentation/lie

**History taking, examination, laboratory investigations, health promotion**
- As for 3rd antenatal visit *plus*
- Lab test: serology for syphilis

16.2. PREGNANCY AND HIV INFECTION

For general information on HIV, including clinical diagnosis, management and psychosocial support

16.3. Additional care for HIV +ve women

Ensure the following additional care is provided during pregnancy, labour, delivery and postpartum period to all HIV +ve women:
- Find out what she has told her partner, labour companion and family support and respect her choice and desired confidentiality.
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- Use universal precautions as for all HIV patients
  - Training employees in handling and disposal of potentially infectious materials
  - Providing guidelines for prevention and control of infections within their facilities
  - Providing the necessary equipment and supplies for prevention and control of infections, such as, educational materials, disposable gloves, disposable syringes and needles and sharp bins
  - Monitoring mechanism to ensure implementation of the prevention measures
- Revise the birth plan
  - advise her to deliver in a health facility
  - advise her to go there as soon as labour starts or membranes rupture.
- Counsel on ARV treatment as appropriate
- Discuss infant feeding choice
- Modify preventive treatment as appropriate using ARVs if available
- Be sensitive to special concerns and fears
  - give psychosocial support
- Advise on the importance of good nutrition
  - talk to family members to encourage the woman to eat enough and help them avoid hard physical work
- Advise her that she is more liable to infections and to seek medical help as soon as possible for:
  - Fever
  - persistent diarrhea
  - respiratory infections, e.g. cough & cold
  - burning urination
  - vaginal itching or foul-smelling discharge
  - severe weight loss
  - skin infections
  - foul-smelling lochia
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During postpartum period:
- Advise on the infectiousness of lochia and blood-stained sanitary pads and how to dispose off these safely according to local facilities
- If not breastfeeding exclusively, advise her to use a family planning method immediately
- Breast care: If not breastfeeding, advise as follows:
  - breasts may be uncomfortable for a while
  - avoid stimulating the breasts
  - support breasts with firm well-fitting bra or cloth
  - express just enough milk to make breasts comfortable
  - advise to seek care if breasts become painful, swollen, red, if she feels ill or has fever

16.4. Counseling on Infant Feeding Choice

Note:
Special training is needed to counsel an HIV positive mother about this issue and to support the chosen method. Such mothers should be referred to a suitably trained counselor. However, if one is not available, or the woman will not seek such help, counsel her as follows:

a) Explain the risks of HIV transmission by breastfeeding & other risks by not breastfeeding
- 25% (5/20) of babies born to HIV positive mothers will be infected during pregnancy and delivery without ARV treatment
- Another 15% (3/20) may be infected by breastfeeding
- If baby breastfed exclusively the risk may be reduced by good technique keeping the breasts healthy
  - mastitis & cracked nipples raise HIV infection risk
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- The risk of not breastfeeding may be much higher because alternative feeding has its own risks:
  - **diarrhoea:** from use of unclean water, utensils or stale milk
  - **malnutrition:** from insufficient quantity, milk too dilute, or from recurrent diarrhoea
- Mixed feeding may also increase risk of HIV transmission and diarrhoea

**b) If a woman has unknown or HIV negative status:**
- Counsel on importance of exclusive breastfeeding and encourage this
- Counsel on need to know HIV status and where to go for VCT
- Explain risks of HIV transmission:
  - even in areas where many women have HIV, up to 70% of babies may be born HIV negative.

**c) If a woman knows & accepts that she is HIV positive.**
- Tell her about options for feeding, advantages & risks:
  - exclusive breastfeeding, then + complementary feeding after 6 months old
  - exclusive breastfeeding stopping at 3-6 months old if replacement feeding possible after this
    *If replacement feeding introduced early:*
    - mother must stop breastfeeding
  - replacement feeding with home-prepared formula or commercial formula and then family foods (provided this is acceptable, feasible, safe and sustainable/affordable)
- In some situations other possibilities are:
  - expressing and heat-treating her breast milk
  - wet nursing by an HIV negative woman
- Help her to assess choices, decide on the best option and then support her choice
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If she chooses breastfeeding: give her special advice (see e) below)

If she chooses replacement feeding: ensure she understands it includes enriched complementary feeding for up to 2 years. If this cannot be ensured, an alternative is exclusive breastfeeding, stopping early when replacement feeding becomes feasible.

- All babies on replacement feeding need regular follow up and all their mothers need support to ensure correct use of this method.

**d) If mother chooses replacement feeding:**
- Ask her which kind of replacement feeding she chose.
- For the first few feeds after delivery, prepare the formula for her then teach the mother how to do this and how to cup feed the baby:
  - wash hands with soap & water
  - boil the water for milk preparation for 5-10 minutes
  - clean cup carefully with soap & water and if possible boil or pour hot boiled water in it
  - decide how much milk and water is needed from the instructions
  - measure these amounts and mix well together
  - allow the liquid to cool down
  - teach mother how to feed baby by cup (8 times daily in the 1st month) and to be flexible and respond to baby’s demands

  *if baby does not finish the feed within 1 hour of preparation* give it to an older child or add to cooking. **Do not** use for the next feed!
  - wash utensils with soapy and water soon after feeding
  - make a new feed each time
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- Give her written instructions on safe preparation of formula feeds
- Explain replacement feeding risks & how to avoid them
- Ensure regular follow-up visits for growth monitoring
- Ensure necessary support for safe replacement feeding
- Advise mother to return if:
  - baby feeding <6 times/day or taking smaller amounts
  - diarrhea
  - other danger signs

**e) If mother HIV positive and chooses breastfeeding:**

- Give special counseling
- Support her in her choice
- Advise mother to breastfeed *exclusively* (i.e. not to give any other drinks or food) for the first 3-6 months
  - breast milk is enough and best for young infants
  - once the mother decides to stop breastfeeding, this should be stopped abruptly and completely and suitable replacement foods started
- Ensure good attachment and suckling to prevent mastitis and nipple damage
- Advise her to return immediately if:
  - any breast problems
  - any baby feeding problems
- Ensure a visit in 1st week to assess the above
- Arrange for further counseling to prepare for possible early stopping of breastfeeding
- Encourage correct condom use to prevent new HIV infection
- Give psychosocial support
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16.5. ANAEMIA IN PREGNANCY

This is the most frequent and a major complication of pregnancy. Its presence in pregnancy is associated with many complications such as premature labour, poor intrauterine foetal growth, weak uterine contractions in labour foetal hypoxia, postpartum haemorrhage, poor lactation and postpartum sepsis, which can lead to death of either the baby/mother.

Clinical features
Mother may give history of:
- Gradual onset of exhaustion or weakness
- Swelling of the legs
- Dyspnoea, dizziness and palpitations
On examination:
- Pallor of the conjunctiva, tongue, palm, vagina, etc. of varying degree, depending on the severity of anaemia
- Glossitis and stomatitis
- Oedema of the legs
- Evidence of heart failure such as engorged neck veins, dyspnoea, hepatomegally, ascites, gallop rhythm and oedema

Investigations
- Blood:
  - Hb (<10.5 g/dL is considered abnormal)
  - Peripheral smear to determine the type of anaemia and presence of malaria parasites
  - Sickling test to exclude sickle-cell disease
- Stool: ova and cysts of hookworm infestation

Management
Depends on degree of anaemia, duration of pregnancy (i.e. time available before delivery) & associated complications:
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*If severe anaemia (Hb \( \leq 7 \text{g/dL} \)):*
- Refer patient to a well-equipped facility for further management

*If Hb > 7g/dL:*
- Give **ferrous sulphate** 200mg 3 times daily
  - the combination tablets with folic acid may be used
- plus **folic acid** 5mg daily

*If mother still anaemic at 36 weeks of gestation or at time of delivery:*
- refer to a well-equipped facility for further management
- Emphasise a realistic balanced diet rich in proteins, iron and vitamins, e.g. red meat, liver, dark green vegetables
- Treat malaria presumptively with SP and follow up
- De-worm the patient with **mebendazole** 500mg single dose in 2nd and 3rd trimesters and follow up
- Treat cause as found from investigations
- Monitor the response to treatment by Hb estimation every 2 weeks. *If given Imferon®, Hb should rise by 0.7-1.0g/dL/week*
- Advise child spacing with an interval of at least 2 years

*If patient has sickle-cell disease:*
- Refer to higher level for ANC and delivery

### 16.6. MALARIA IN PREGNANCY

Malaria complicates about 80% of all pregnancies in Uganda which are associated with abortion, poor foetal mental development, premature labour, intrauterine growth retardation and foetal death, maternal severe anaemia due to haemolysis, and death

Complications are more common in mothers of low gravidity (primi- & secundigravidae), HIV positivity, adolescent age, sickle-cell disease, and those from areas of low endemicity, for example, Kisoro, Kabale, etcetera
Prevention and control of malaria in pregnancy for more information on malaria prevention and control methods:

- Use of insecticide-treated mosquito nets is probably the most cost-effective malaria preventive measure currently known. It reduces mosquito-human contact by barricading, repelling or killing mosquitoes. These nets should be used even before the woman conceives, then throughout pregnancy, and thereafter with her newborn.

- Give all pregnant women intermittent presumptive treatment (IPT) with SP. If there is a history of allergic reaction to sulpha drugs, don’t give SP but emphasize use of the other available infection control options especially the ITNs.

- Give expectant mothers ferrous sulphate plus folic acid and mebendazole to complement SP in preventing maternal anaemia found in >60% of all those attending ANC.

  - delay folic acid for 1 week after administration of SP to avoid antagonism between the two drugs.

Record keeping:

- Keep proper records.

- Provisions are included on the antenatal card for ‘IPT’ provision, ‘net use’.

- For overt malaria cases, make a record in the ‘Complaints’ column.

- Also record the information in the antenatal treatment book, summarise in the monthly return forms, and record in the delivery book when mothers come to deliver.
Malaria in pregnancy:
**Education messages to mothers and the community**
- Malaria is transmitted by anopheles mosquitoes
- Pregnant women & children are at particular risk of malaria
- If untreated, malaria can cause severe anaemia and death in pregnant women
- Malaria can lead to anaemia, miscarriage, stillbirth, mentally-retarded children or low birth weight children less able to survive compared to normal children
- It is better and cheaper to prevent than to treat malaria
  - the individual, family and the community can control malaria by taking appropriate actions
- Sleeping under an insecticide-treated mosquito net is the best way of preventing malaria
- Simple uncomplicated malaria can be easily treated if recognised early, but it is very important to complete the course of treatment in order to achieve a cure
- Severe complicated malaria needs special management, therefore refer cases immediately to higher levels

### 16.7. POSTPARTUM CARE
- Counsel patient on contraception
- Provide appropriate method if required
- Advise mother to abstain from sexual activity for at least 6 weeks after birth
- Check if mother and baby are sleeping under insecticide-treated bed-net, encourage this if necessary:
  - baby should *always* sleep under a net, day or night
- Advise mother on when to seek care as follows:
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Routine postpartum visits:
1st visit: within 1st week (ideally within 2-3 days)
2nd visit: within 4-6 weeks

Follow-up visits:

<table>
<thead>
<tr>
<th>Nature of problem</th>
<th>Return after</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever, lower UTI</td>
<td>2 days</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>1 week</td>
</tr>
<tr>
<td>Hypertension, anaemia, bleeding, vaginal infection, HIV/AIDS signs, depression</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>

Advise mother on danger signs as follows:

<table>
<thead>
<tr>
<th>Type of danger sign</th>
<th>Action to take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal bleeding (&gt;2 pads soaked in 30 mins after delivery or bleeding increases instead of decreases after delivery), convulsions, fast or difficult breathing, fever and too weak to get out of bed, severe abdominal pain</td>
<td>Go to health facility immediately</td>
</tr>
<tr>
<td>Fever, abdominal pain, feels ill, breasts red, tender, swollen, sore nipple, urine dribbling or pain on urination, perineal pain or draining pus, foul-smelling lochia</td>
<td>Go to health facility as soon as possible</td>
</tr>
</tbody>
</table>

- Discuss with mother how to prepare for any postpartum emergency:
  - advise her to have someone near for at least 24 hours after delivery to respond to any change in condition
  - discuss emergency issues with her and partner/family: where to go if danger signs appear, how to get there, costs involved, family/community support
  - advise her to seek help from the community if needed
  - advise her to bring any home-based maternal
16. Obstetric and Gynaecological conditions

- Discuss with mother **newborn hygiene** and **other baby care:**
  - let baby sleep on the back or side
  - keep baby away from smoke and smokers
  - keep baby (especially if small) away from anyone who is ill
  - do not share supplies (for example, clothing, feeding utensils) with other babies

- **Advise mother to return with the baby** as follows:

<table>
<thead>
<tr>
<th>Routine visits</th>
<th>Return at</th>
</tr>
</thead>
<tbody>
<tr>
<td>- postnatal visit</td>
<td>Age 3-7 days</td>
</tr>
<tr>
<td>- immunization visit (note: BCG and Polio 0 are given at birth)</td>
<td>Age 6 weeks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Follow-up visits</th>
<th>Return in</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of problem found on examination:</strong></td>
<td></td>
</tr>
<tr>
<td>- Feeding problem</td>
<td>2 days</td>
</tr>
<tr>
<td>- Red umbilicus</td>
<td></td>
</tr>
<tr>
<td>- Skin infection</td>
<td></td>
</tr>
<tr>
<td>- Eye infection</td>
<td></td>
</tr>
<tr>
<td>- Thrush</td>
<td></td>
</tr>
<tr>
<td>- Mother has: - breast engorgement</td>
<td></td>
</tr>
<tr>
<td>- mastitis</td>
<td></td>
</tr>
<tr>
<td>LBW and: - first week of life</td>
<td>2 days</td>
</tr>
<tr>
<td>- not yet gaining weight</td>
<td></td>
</tr>
<tr>
<td>LBW and: - &gt;1 week old</td>
<td>7 days</td>
</tr>
<tr>
<td>- gaining weight</td>
<td></td>
</tr>
<tr>
<td>Mother is HIV Positive</td>
<td>14 days</td>
</tr>
<tr>
<td>Mother is RPR Positive</td>
<td></td>
</tr>
<tr>
<td>Orphan baby</td>
<td></td>
</tr>
<tr>
<td>INH prophylaxis against TB</td>
<td></td>
</tr>
</tbody>
</table>
16. Obstetric and Gynaecological conditions

- Advise mother to seek health care for the baby as follows:

<table>
<thead>
<tr>
<th>Signs</th>
<th>Action to take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult breathing</td>
<td>Seek health care immediately, day or night</td>
</tr>
<tr>
<td>Convulsions</td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td></td>
</tr>
<tr>
<td>Baby becomes cold</td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td></td>
</tr>
<tr>
<td>Diarrhoea</td>
<td></td>
</tr>
<tr>
<td>Very small, just born</td>
<td></td>
</tr>
<tr>
<td>Becomes more ill after being seen by birth attendant</td>
<td></td>
</tr>
<tr>
<td>Feeding problems</td>
<td>Return to health facility as soon as possible</td>
</tr>
<tr>
<td>Feeds &lt;5 times in 24 hours</td>
<td></td>
</tr>
<tr>
<td>Pus from eyes or cord or skin pustules</td>
<td></td>
</tr>
<tr>
<td>Yellow skin and eyes</td>
<td></td>
</tr>
<tr>
<td>Swollen limb or joint</td>
<td></td>
</tr>
</tbody>
</table>

16.8. Care of mother and baby immediately after delivery

Provide the following care for the first hour after complete delivery of the placenta:

- Constant attention:
  - *never* leave the mother and baby alone
  - record any findings, treatment and procedures in the Postpartum Record

- Monitor every 15 minutes:
  - *Mother*:
    - rapid assessment for danger signs
    - feel uterus if hard and round
  - *Baby*:
    - breathing, warmth

*If any complication in pregnancy or delivery:*
  - temperature, BP, pulse
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**Care of mother:**
- Encourage mother to pass urine, eat and drink
- Ask the companion to stay with her
- Assess amount of vaginal bleeding
  
  *If pad soaked in <5 minutes or constant trickle of blood:*
  - Manage as on
  *If uterus is soft:*
  - Manage as on
  *If bleeding is from perineal tear:*
  - Suture if trained or refer for further management

**Care of baby:**
- Apply an eye antimicrobial, e.g. *tetracycline eye ointment*
  - leave in place and do not wash it away
- Wipe off blood or meconium with wet cloth
  - do not remove vernix or bathe the baby
- Keep baby warm with skin to skin contact
  
  *If feet are cold or mother and baby are separated:*
  - Ensure room is warm
  - Cover baby (and mother) with blanket
  - Reassess after 1 hour
  
  *If breathing difficulty:*
  - Examine the baby according to first newborn examination requirements, classify the condition and treat accordingly
  
  *If baby is stillborn/dead:*
  - Give supportive care
  - Respect local customs
  - Advise mother on breast care
  - Counsel on appropriate family planning
  - Advise on postpartum care & hygiene
  - Provide death certificate & complete required reporting formalities
  - Check identity & give wrapped body to family for disposal/burial according to local customs
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**Breastfeeding:**
- Encourage mother to start this when baby seems ready
- Offer mother help to position/attach the baby if ready

*If unable to start breastfeeding:*
- Plan for alternative feeding method
- **Do not** give artificial feeds before baby has initiated natural breastfeeding
- **Do not** give (sugar) water or local feeds to the baby

16.9. Care of newborn from first hour after delivery

Provide the following care up to the time of discharge:

<table>
<thead>
<tr>
<th>Type of care/monitoring</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep baby with mother</td>
<td><em>If baby in cot, ensure baby is dressed or wrapped/covered with blanket, head covered</em></td>
</tr>
<tr>
<td>- in bed or within easy reach</td>
<td></td>
</tr>
<tr>
<td>Ensure room is warm (&lt;25°C) and has no draughts</td>
<td><strong>Do not</strong> put baby in direct sun or on any cold surface</td>
</tr>
<tr>
<td>Advise/teach mother how to:</td>
<td><em>If mother unable to take care of baby, provide required care</em></td>
</tr>
<tr>
<td>- keep the baby warm</td>
<td>Wash hands before and after handling baby</td>
</tr>
<tr>
<td>- give cord care</td>
<td>Do not bath baby &lt;6 hours old</td>
</tr>
<tr>
<td>- ensure hygiene</td>
<td></td>
</tr>
<tr>
<td>Support exclusive breastfeeding on demand, day &amp; night, whenever baby wants</td>
<td><em>If breastfeeding difficult:</em></td>
</tr>
<tr>
<td>Ask mother &amp; companion to:</td>
<td></td>
</tr>
<tr>
<td>- watch the baby</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Type of care/monitoring</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>- report breastfeeding or breathing problems, cold feet, bleeding from cord</td>
<td>- reassess in 1 hour; <em>if no improvement</em>, measure temp. &amp; manage accordingly</td>
</tr>
<tr>
<td><strong>Check every baby</strong> at 4 and 8 hours then daily for:</td>
<td><em>If breathing problem</em>: assess &amp; manage accordingly</td>
</tr>
<tr>
<td>- warm feet</td>
<td><em>If cord tie loose/cord bleeding</em>: retie cord.</td>
</tr>
<tr>
<td>- feeding</td>
<td><em>If bleeding persists</em>, refer urgently</td>
</tr>
<tr>
<td>- breathing problems</td>
<td></td>
</tr>
</tbody>
</table>

| Check any baby with **warning signs** at 2, 4, 8 and 12 hours: | **Refer urgently** if: |
| - listen for grunting | - breathing problem worsens or persists for >8 hours |
| - look for chest indrawing | - temperature <36.5°C persists or decreases |
| - count breaths/minute | - not able to feed at 8 hours |
| - measure temperature | |
| - observe breastfeeding | |

| **Give prescribed treatments** according to dosage schedule | *If referring the baby*, write treatments given, when & why |
| **Assess breastfeeding in every baby before planning discharge** | **Do not** discharge baby <12 hours old |

| **Examine baby** before discharge | **Do not** plan early discharge if: |
| Advise mother: | - baby small (LBW or preterm) |
| - when to seek care | - not feeding well |
| - when to return if danger signs | |
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### 16.10. Extra care of small babies/twins in the first days of life

Provide the following care for small babies:
- preterm up to 1 month early
- LBW <2,500g

**Note:** Refer very small babies for specialized attention:
- very preterm >1 month early
- LBW <1,500g

<table>
<thead>
<tr>
<th>Type of care/monitoring</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure the room is warm</td>
<td>Provide extra blanket for mother and baby if needed</td>
</tr>
<tr>
<td>Teach mother how to keep baby warm</td>
<td></td>
</tr>
<tr>
<td>Teach mother how to ensure hygiene for baby</td>
<td>Do not bath the baby - clean prn with swabs or cloth</td>
</tr>
<tr>
<td>Give special support for breastfeeding</td>
<td><em>If not breastfeeding well:</em> teach mother alternative feeding methods</td>
</tr>
<tr>
<td>- assess daily</td>
<td></td>
</tr>
<tr>
<td><strong>Assess</strong> small baby daily:</td>
<td><em>If breathing or breastfeeding problem or hypothermia:</em> examine &amp; manage accordingly <em>If maternal concern:</em> examine and manage the baby accordingly <em>If breastfeeding problem persists &gt;3 days or weight loss &gt;10% of birth weight and no other problems:</em> refer for breastfeeding counseling &amp; management</td>
</tr>
<tr>
<td>- measure temperature</td>
<td></td>
</tr>
<tr>
<td>- feeding progress, weight</td>
<td></td>
</tr>
<tr>
<td>- breathing</td>
<td></td>
</tr>
<tr>
<td>Keep mother &amp; baby (or twins) longer before discharge - plan the discharge when:</td>
<td><em>If mother &amp; baby not able to stay:</em> ensure daily (home) visits or send to hospital</td>
</tr>
<tr>
<td>- breastfeeding well</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Type of care/monitoring</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight gain on 3 consecutive days</td>
<td></td>
</tr>
<tr>
<td>body temp normal for 3 consecutive days</td>
<td></td>
</tr>
<tr>
<td>mother confident in caring for baby</td>
<td></td>
</tr>
</tbody>
</table>

16.11. Pre-discharge newborn examination

Use the following procedures to examine all newborn babies before discharge or if baby seen >12 hrs of age as an out patient for routine, follow-up or sick newborn visit

- **Ask the mother:**
  - how old is the baby?
  - how is the baby feeding? How is breastfeeding going?
  - any feeding problems?
  - how many times has baby breastfed in last 24 hours?
  - is baby satisfied with feeds?
  - have you fed baby any other food or drinks?
  - has baby breastfed in previous hour?
  - how do your breasts feel?
  - do you have any other concerns?

  **If first visit:**
  - where was the baby born?
  - who delivered the baby?

- **Check infant record for risk factors:**
  - what was birth weight? LBW? Preterm?
  - Twin?
  - any problem at birth?
  - abnormal or danger signs on previous examination?
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- **Look, listen, feel:**
  - observe a breastfeeding: is the baby able to attach?
  - Suckling effectively?
  - Well positioned?
  - look for ulcers & white patches in the mouth (thrush)

*If breast or nipple pain/discomfort: assess breasts*
- weigh if birth weight not known or to assess weight gain on a follow-up visit for a small baby or after an illness
- check to see if the feet are cold

- **Classify and manage as follows:**

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify</th>
<th>Manage by / Advise on</th>
</tr>
</thead>
<tbody>
<tr>
<td>feeding well weight &gt;2,500g no abnormal signs no special treatment needs</td>
<td>WELL BABY</td>
<td>continue exclusive breastfeeding on demand ensure warmth, cord care, hygiene, other baby care routine visit at age 3-7 days next immunization at 6 weeks when to return if danger signs record on home-based record</td>
</tr>
<tr>
<td>receiving other foods/drinks or given pacifier breastfeeding &lt;8 times/24hrs not well attached/ not suckling well thrush poor weight gain</td>
<td>FEEDING PROBLEM</td>
<td>stop other food/drinks feed more frequently, day &amp; night. Reassure mother she has enough milk ensure correct positioning/attachment <em>If thrush: teach how to treat at home</em> follow up visit in 2 days, recheck weight <em>If no improvement: refer for breastfeeding counseling</em></td>
</tr>
</tbody>
</table>
### 16. Obstetric and Gynaecological conditions

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify</th>
<th>Manage by / Advise on</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Preterm</td>
<td>SMALL BABY</td>
<td>▶ Give special support to breastfeeding small baby/twins</td>
</tr>
<tr>
<td>• LBW 1,500-2,500g</td>
<td></td>
<td>▶ Teach other feeding methods</td>
</tr>
<tr>
<td>• Twin</td>
<td></td>
<td>▶ Teach mother how to care for a small baby</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Follow-up every 2 days &amp; assess breastfeeding till feeding and growing well</td>
</tr>
<tr>
<td>• Mother very ill/receiving special treatments</td>
<td>MOTHER UNABLE TO TAKE CARE OF BABY</td>
<td>▶ Consider other feeding methods till mother can breastfeed</td>
</tr>
<tr>
<td>• Mother transferred</td>
<td></td>
<td>▶ Ensure warmth using other methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Cord care &amp; hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Monitor daily</td>
</tr>
</tbody>
</table>

#### 16.12. Assessment for special treatment needs, local infection and jaundice

Assess every baby as follows:

- **Check records, ask mother if special treatments/test given:**
  - Mother tested RPR positive
  - Mother started TB treatment <2 months ago
  - Mother HIV positive.

- **Look, listen, feel:**
  - Eyes: Swollen & draining pus?
  - Umbilicus: Red & draining pus?
  - Skin: Many or severe pustules? Swelling, hardness or large bullae?
  - Palms and soles: Yellow? Blisters?
  - Movements: Less than normal? Limbs moving symmetrically?
  - Presenting part (head or buttocks): swelling, bruising?
  - Malformation?
### Classify and manage as follows:

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify</th>
<th>Manage by / Advise on</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blisters on palms and fingers</td>
<td>CONGENITAL SYPHILIS</td>
<td>▶ Refer newborn urgently to hospital</td>
</tr>
<tr>
<td>• Mother tested RPR Positive.</td>
<td>RISK OF CONGENITAL SYPHILIS</td>
<td>▶ Give baby single dose benzathine penicillin 50,000 IU/kg</td>
</tr>
<tr>
<td>• Mother started TB treatment &lt;2 months before delivery</td>
<td>RISK OF TB</td>
<td>▶ Give baby prophylaxis with isoniazid 5mg/kg daily for 6 months ▶ Vaccinate with BCG only after treatment completed ▶ Follow up every 2 weeks</td>
</tr>
<tr>
<td>• Mother known HIV +ve</td>
<td>RISK OF HIV</td>
<td>▶ Counsel on infant feeding ▶ Special counseling if mother breastfeeding ▶ Follow up every 2 weeks</td>
</tr>
<tr>
<td>• Eyes swollen, draining pus</td>
<td>GONOCOCCAL EYE INFECTION</td>
<td>▶ Give single application of tetracycline eye ointment ▶ Teach mother how to treat eye infection at home ▶ Assess &amp; treat mother &amp; partner for possible gonorrhoea ▶ Follow up in 2 days ▶ If no improvement: refer urgently to hospital</td>
</tr>
<tr>
<td>• Umbilical redness extending to skin or draining pus</td>
<td>SERIOUS UMBILICAL INFECTION</td>
<td>▶ Give ampicillin 50mg/kg IM* every 12 hours plus gentamicin 5mg/kg every 24 hrs (4mg/kg if preterm) for 7 days ▶ Reassess after 2 days ▶ If not improved, refer</td>
</tr>
<tr>
<td>• Red umbilicus</td>
<td>LOCAL UMBILICAL INFECTION</td>
<td>▶ Teach mother to treat at home ▶ Follow up in 2 days ▶ If not improved, refer</td>
</tr>
</tbody>
</table>
### 16. Obstetric and Gynaecological conditions

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify</th>
<th>Manage by / Advise on</th>
</tr>
</thead>
</table>
| • Many/severe skin pustules/bullae | SEVERE SKIN INFECTION | ▶ Give ampicillin 50mg/kg IM* every 12 hours plus gentamicin 5mg/kg every 24 hrs (4mg/kg if preterm) for 7 days  
▶ Reassess after 2 days  
▶ If not improved, refer |
| • Skin swelling, redness, hardness |                   |                                                                 |
| • <5 pustules                | LOCAL SKIN INFECTION | ▶ Teach mother to how to treat infection at home                  |
| • Yellow palms & soles       | SEVERE JAUNDICE    | ▶ Refer urgently  
▶ Encourage breastfeeding  
   - if b/f problem, give expressed milk by cup |

* give IM doses into thigh muscle
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16.13. Newborn hygiene

a) Eye care
At birth:
- Wipe each eye with a separate clean cloth, cotton wool or corner of the towel used to dry the baby
- Apply tetracycline eye ointment 1% within 1 hour
  - do not wash this away
- Explain to mother to seek care if eyes drain pus and not to apply anything into the eyes

b) Cord prophylaxis
- Wash hands before and after cord care
- Put nothing on the stump
  - keep stump loosely covered with clean clothes
  - fold nappy below the stump
  - if stump soiled, wash with clean water and soap, dry completely with clean cloth

If umbilicus red or draining pus or blood:
- Examine the baby and manage accordingly
  - do not bandage the stump or abdomen
  - do not apply anything to the stump
  - avoid touching the stump unnecessarily

c) General baby care hygiene
- Use cloth on baby’s bottom to collect stool
  - dispose as for sanitary towels/pads and wash hands
- Wash the baby:
  At birth: only remove blood or meconium
  - do not remove vernix
  - do not bath baby if cold or < 6 hours old
  Later and at home:
  - Wash the face, neck and under arms daily
  - Wash the buttocks when soiled & dry completely
  - Bath when necessary using warm water:
    - ensure room is warm with no draughts
    - dry completely, then dress and cover the baby
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Note: small babies need even more careful attention:
- Wash hands before and after baby care
- Keep baby warm during washing/bathing and dry very carefully

16.14. NEWBORN RESUSCITATION

Start resuscitation within one minute of birth if baby is not breathing or is gasping for breath. Observe universal hygiene precautions to prevent infection

➤ Keep the baby warm
   - clamp and cut the cord if necessary
   - transfer the baby to a dry clean warm surface
   - tell the mother that the baby is having difficulty starting to breathe and that you will help the baby

➤ Open the airway
   - position the head so that it is slightly extended
   - suction first the mouth then the nose

➤ If still not breathing, VENTILATE:
   - form a seal with mask covering chin, mouth and nose
   - squeeze bag 2-3 times
   - observe chest
   If not rising:
   - reposition head, check mask seal, squeeze bag harder

➤ Stop and look for breathing after 1 minute
If breathing >30/minute and no severe chest in-drawing:
   - stop ventilating
   - put baby skin-to-skin on mother’s chest.
   - observe every 15 minutes for breathing and warmth
   - DO NOT LEAVE THE BABY ALONE
If breathing <30/minute or severe chest drawing:
- continue ventilating
- arrange for immediate referral
- give oxygen if available
  If no gasping or breathing at all after 20 minutes of ventilation:
  - stop ventilation

### 16.15. ANTENATAL & POSTNATAL MEDICATION

In general, try to avoid drug use during pregnancy, delivery and breastfeeding. Always carefully weigh the desired benefits of any drug against possible harm to the mother and baby

- Ensure adequate nutrition and consumption of foods with iron (meat, fish, beans and many vegetables) and folate (green vegetables, fruits, liver and yeast)
- Check for and treat any anaemia
- Check on tetanus toxoid (TT) immunization status and vaccinate if required

**At second visit:**
- De-worm with mebendazole 500mg single dose

**Throughout pregnancy:**
- **ferrous sulphate + folic acid** 200mg + 400mg once daily - to prevent iron and folate deficiency
- **multivitamins:** one tablet 3 times daily
- **Intermittent presumptive treatment of malaria (IPT):** SP single dose (3 tabs) in 2nd and 3rd trimesters
  - give first dose between weeks 16-24
  - give second dose between weeks 28-36
  - in HIV positive patients give IPT on three occasions between weeks 16-36 with at least 4 weeks between doses
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After delivery:
- **vitamin A** (retinol) 200,000 units single dose  
  - ideally day 2 after delivery or at any time during the first 2 months after delivery
- **Iron/folic supplementation**: ensure mother has 3 months supply of **ferrous sulphate + folic acid** and give counseling on compliance
- **Syphilis**: check RPR status in records  
  - if no RPR in pregnancy then do RPR test  
  - if positive: treat woman and partner with **benzathine penicillin** and  
  - treat the newborn with **benzathine penicillin** 50,000 IU/kg single dose

**16.16. HIGH RISK PREGNANCY (HRP)**

This is a pregnancy with a higher risk of an adverse outcome for the mother or baby, e.g. abortion, intrauterine death, still birth, prematurity, other morbidity or mortality. However, any pregnancy involves a level of risk

**High risk criteria: history or current**
- extremes of reproductive age: <18 and >35
- primigravida: especially if too young, short or old
- high parity: 5+ or short birth interval
- large infants: 4kg and over
- prematurity: LBW <2.5kg
- obstructed and difficult labours
- poor obstetric history, e.g. SBs, NNDs, abortions, C/S
- history of reproductive tract surgery, e.g. VVF repair (ruptured uterus)
- genetic or familial diseases
- medical conditions: diabetes, cardiac, renal, hypertension, rhesus, those with disabilities, those with obstetrical risks, e.g. multiple pregnancy, malpresentations, etc
- APH, PPH, DVT, IUGR
- PROM, post dates, CPD
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Management
- Refer the patient to HC4 for further HRP management

Principles of management
- Identification of high risk cases
- Prophylaxis and antenatal counseling
  - will prevent some HRPs
- Early start of antenatal care
- Close medical supervision during pregnancy
- Special investigations to evaluate foetal development and maternal well-being
- Timely intervention for therapy and delivery

16.17. VAGINAL BLEEDING IN EARLY PREGNANCY
This is always abnormal and patients may need to be admitted or referred. The commonest cause of bleeding in the first six months (<26 weeks gestation) is abortion, ectopic pregnancy and sometimes abnormal periods.

Abortion (miscarriage)
Loss of products of conception before 28 weeks of pregnancy

Cause
- Not known in the majority of patients
- May be intentional (induced abortion)
- May be spontaneous (often as a result of fever)

Clinical features
- Depend on the cause and stage of the abortion

Threatened abortion
Little vaginal bleeding and may be no lower abdominal pain. Pregnancy may still continue. Uterus is of size expected by dates and cervix is closed.
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**Inevitable abortion**
Process irreversible, contractions (pain similar to labour pains) and bleeding, cervix may proceed to open.

**Complete abortion**
All uterine contents have been passed out, little bleeding, cervix closed. Uterus empty and reduced in size

**Incomplete abortion**
Uterine contents not completely passed out, bleeding sometimes with clots from the vagina (may be severe), severe lower abdominal cramps, cervix open and products of conception may be felt in the cervical canal.

**Septic abortion**
Incomplete abortion with infection (often criminal): fever, offensive vaginal discharge, lower abdominal pain and tenderness on palpating the abdomen.

**Missed abortion**
Foetus died, contents of the uterus not expelled, may be dark blood drops (spotting) from the vagina, uterus smaller than expected by dates.

**Molar abortion**
Abnormal placenta, no foetus, vaginal bleeding and passing of red material like ripe coffee berries/white (translucent) grape like material, uterus much bigger than expected, mother feels no foetal movements even after five months.

**Habitual abortion**
More than two consecutive, spontaneous abortions - usually associated with incompetent cervix

**Differential diagnosis**
- Pregnancy outside the uterus (ectopic pregnancy)
- Other causes of bleeding from the vagina, eg. cancer
- Other causes of lower abdominal pain
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**Investigations**
- Urine: pregnancy test
- Ultrasound
- Blood: complete count

**Management**

**Complete abortion**
- Bed rest
  - If patient in shock:
  - Resuscitate with **IV fluids**
    - If anaemic:
  - Refer to HC4 for replacement of blood loss
  - Treat anaemia

**Threatened abortion**
- Bed rest
- Abstain from sex for at least 14 days
- Observation
  - For pain:
    - **paracetamol** 1g every 6-8 hours prn for 5 days

**Incomplete abortion**
- **methylergometrine** 200-400 micrograms IM or IV stat
  - If signs of infection:
    - **amoxicillin** 500mg every 6 hours for 7 days
    - **plus metronidazole** 400mg every 8 hours for 7 days
  - Refer for manual vacuum aspiration evacuation of uterus

**Septic abortion**
- Give 7-day course of **antibiotics** as in incomplete abortion (above)
- Evacuate the uterus

**Missed abortion**
- Refer to hospital

**Molar abortion**
- Resuscitate and give **methylergometrine** as in incomplete abortion (above)
- Refer to hospital for further management
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16.18. PREMATURE RUPTURE OF MEMBRANES (PROM)

PROM is rupture of membranes before start of labour and can occur either when foetus is immature (preterm or <37 weeks) or mature (term).

Confirming the diagnosis

The typical odour of amniotic fluid is diagnostic. *If membrane rupture not recent or leakage is gradual*, confirming the diagnosis may be difficult:

- Place a vaginal pad over the vulva and examine visually and by smell after 1 hour.
- Use a high-level disinfected speculum for vaginal examination:
  - fluid may be seen coming from the cervix or forming a pool in the posterior fornix
  - ask patient to cough; this may cause a gush of fluid

**Do not** do digital vaginal examination - it does not help diagnosis and may cause infection.

- If available, do tests:
  - nitrazine test (may get false positive due to blood & some vaginal infections)
  - ferning test (false negative common)

Management

a) *If there is vaginal bleeding with abdominal pain* (intermittent or constant):

- Suspect and treat as abruptio placentae

b) *If there are signs of infection* (fever, foul-smelling vaginal discharge):

- Give antibiotics as for amnionitis

c) *If there are no signs of infection and pregnancy <37 weeks* (foetal lungs more likely to be immature):

- Give 7-day course of antibiotics to reduce maternal and neonatal infective morbidity and to delay delivery.
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- **erythromycin** 250mg every 8 hours
- **plus amoxicillin** 500mg every 8 hours
- Consider referral for special care of the newborn
- Give **corticosteroids** to the mother to improve foetal lung maturity: **dexamethasone** 6mg IM every 6 hours for a total of 4 doses
- **Do not** use in presence of infection
- Deliver at 37 weeks

**d)** If there are **palpable contractions** and **blood-stained mucus**: suspect preterm labour

**e)** If there are **no signs of infection** and **pregnancy 37 weeks**:

- if the membranes have been ruptured for >18 hours:

- Give prophylactic **antibiotics** as above until delivery to help reduce neonatal group B streptococcus infection:
  - **ampicillin** 2g IV every 6 hours
  - or **benzylpenicillin** 2MU IV every 6 hours
  - if there are no signs of infection after delivery, stop the antibiotics
  - if the membranes have been ruptured for <18 hours:

- Assess the cervix
  - **6** if the cervix is favourable (soft, thin, partly dilated):
  - Refer to HC4 or above (with facilities for emergency obstetric management) for induction with **oxytocin**

### 16.19. AMNIONITIS

Infection of amniotic membranes/fluid before delivery

**Clinical features**
- **History of vaginal draining of liquor**
- **Labour for >48 hours**
- **Fever**
- **Foul-smelling vaginal discharge**
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Management

- Give a combination of antibiotics until delivery:
  - ampicillin 2g IV every 6 hours
  - plus gentamicin 5mg/kg IV every 24 hours

If the woman delivers vaginally:

- Stop antibiotics postpartum

If the woman has a Caesarean section:

- Continue the above antibiotics and add metronidazole 500mg IV every 8 hours
  - continue until 48 hours after fever has gone

- Assess the cervix and manage as in 16.8(e) above If metritis is suspected (fever, foul-smelling discharge):

- Give amoxicillin 500mg every 8 hours for 7 days
  If patient allergic to penicillins: give erythromycin in the same dose

If newborn sepsis is suspected:

- Arrange for a blood culture
- Give antibiotics as for Septicaemia

16.20. MASTITIS

Infection of the breast usually in a breastfeeding mother

Causes

- Usually Staphylococcus aureus entering from the baby’s mouth through a cracked nipple into an engorged breast

Clinical features

- Pain in the breast which is swollen, often shiny and tender with enlarged veins
- Fever
- May proceed to become an abscess (see below)

Differential diagnosis

- Breast engorgement

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**Investigations**
- Breast milk: for C&S

**Management**
- Stop breastfeeding on the affected breast
- Apply hot compresses to relieve pain in affected breast
- Express milk to avoid breast engorgement
- Continue breastfeeding on the normal breast
- Treat the baby, if thought to be the source of infection

*If the infected breast improves:*
- Restart breastfeeding on it

*If there is pain:*
- Give aspirin 600mg every 8 hours prn
- *plus* gentamicin or erythromycin

**Prevention**
- Manage breast engorgement if not breastfeeding or lost baby - suppress lactation, do not express milk, wear a tight bra

### 16.21. BREAST ABSCESS

Bacterial infection of the breast with collection of pus

**Cause**
- *Staphylococcus aureus* most common

**Clinical features**
- Breast is hot, swollen, painful and very tender
- Skin is red and shiny
- Firm lump - felt initially but may later fluctuate

**Investigations**
- Pus: for C&S

**Differential diagnosis**
- Breast cancer
- Other breast lumps
16. Obstetric and Gynaecological conditions

Management  \( \text{HC4} \)
- Incision and drainage under general anaesthesia
- Dress the wound
- Give gentamicin 5-7mg/kg IV in divided doses daily for 5 days (contraindicated in pregnancy) or erythromycin 500mg every 6 hours for 5 days
- Give an analgesic to treat pain
- Breastfeeding: handle as in 15.12 Mastitis

### 16.22. DYSMENORRHOEA

Painful menstruation

**Causes**
- Not known

**Clinical features**
- Severe lower abdominal pain just before the period which could continue during the period

**Differential diagnosis**
- Endometriosis
- Other causes of lower abdominal pain

**Management  \( \text{HC2} \)**
- Give analgesics
- Review the patient after 5 days
- If no response or if recurrent, refer for specialist management

### 16.23. HYPEREMESIS GRAVIDARUM

Excessive vomiting during pregnancy

**Cause**
- Not known but may be common in multiple and molar pregnancy

**Clinical features**
- May occur from the 4\(^{th}\) week of pregnancy and could continue beyond the 12\(^{th}\) week
- Patient may develop complications of excessive vomiting such as vomiting blood, dehydration
16. Obstetric and Gynaecological conditions

Investigations
- Blood: complete count, slide for MPs
- Urinalysis: to exclude UTI
- Ultrasound scan: to detect molar or multiple pregnancies

Differential diagnosis
- Intestinal obstruction
- Other causes of vomiting
- Molar pregnancy

Management
- Treat any dehydration
- Chlorpromazine 25mg every 6 hours prn
  or Metoclopramide 10mg every 6 hours prn
  or Prochlorperazine 10mg every 8 hours prn
  If vomiting severe:
  - Chlorpromazine 25mg deep IM every 6 hrs prn
  - Prochlorperazine 12.5mg deep IM followed by 10mg oral dose after 6 hours
  - Metoclopramide 10mg IV/IM every 6 hrs prn
- Vitamin B complex 1 tab every 8 hrs for 7 days
  For sedation:
  - Promethazine 25mg IM or orally every 8 hrs prn
  If vomiting does not respond to the above treatment:
  - Refer to hospital for further management

16.24. ECTOPIC PREGNANCY

Pregnancy outside the uterus, usually in the uterine tubes - could result in an emergency

Cause
- Partial blockage of the tube due to a previous infection
- Excessively long tubes

Clinical features
- Menstruation ceases as in normal pregnancy
16. Obstetric and Gynaecological conditions

- Lower abdominal pain, often acute and followed by slight bleeding from the vagina
- If the tube ruptures, the patient may suddenly become anaemic and go into shock
- Abdomen may be very tender on palpation and could stop moving with normal breathing
- Tenderness of moving cervix during vaginal examination
- There may be signs of free fluid in the abdomen

Differential diagnosis

- Other causes of acute abdominal pain and vaginal bleeding, eg. twisted ovarian cyst
- Appendicitis
- Abortion
- PID

Investigations

- Usually diagnosed clinically
  - if the tube ruptures, there may be little time for investigations, but ultrasound could be useful (if patient not in shock)
- Pregnancy test (to exclude other causes)

Management

- Set up IV drip and run very slowly
- Refer for definitive treatment, i.e. laparotomy and salpingectomy

16.25. PELVIC INFLAMMATORY DISEASE (PID)

Infection (usually ascending from the vagina) occurring in the uterus, ovary or uterine tubes

Causes

- Gonococcus (*Neisseria gonorrhoea*)
- *Chlamydia trachomatis*
- Mycoplasma
- Gram-negative bacilli, eg. *Escherichia coli*
Clinical features
- Pain in lower abdomen
- Vaginal discharge - could be smelly and mixed with pus
- Tenderness on palpating the lower abdomen
- Swellings may be felt if there is pus in the tubes or pelvic abscess
- Vaginal examination will produce tenderness when the cervix is moved

Investigations
- Speculum examination
- Pus swab: for C&S
- Ultrasound (if available)

Differential diagnosis
- Cancer of the cervix
- Bladder infection
- Ectopic pregnancy

Management
- **HC4**
  - ciprofloxacin 500mg every 12 hours for 3 days
  - plus doxycycline 100mg every 12 hours for 10 days
  - plus metronidazole 500mg every 12 hours for 10 days

Caution
- △ Avoid alcohol: increases nausea caused by metronidazole
- △ Remove any IUCD 2-4 days after commencing treatment
- △ Avoid sex during menstrual period and for 6 weeks after an abortion

**16.26. PUERPERAL SEPSIS**
Infection of the female internal genital tract, within 6 weeks of childbirth or abortion
16. Obstetric and Gynaecological conditions

Causes
- Ascending infection from contamination during delivery or abortion
- Bacteria include: Staphylococcus aureus, and Gram-negative bacteria from the gut, eg. Escherichia coli, Bacteroides, Streptococcus pyogenes

Clinical features
- Persistent fever >38°C
- Pain in the lower abdomen
- Persistent bloody/pus discharge (lochia) from genital tract which may have an unpleasant smell
- Tenderness on palpating the uterus

Differential diagnosis
- Other causes of fever after childbirth, e.g. malaria, UTI, DVT

Investigations
- Thorough systemic examination
  - to exclude other causes of fever
- Abdominal examination for tenderness and uterine size
- Vaginal examination - to rule out retained products
- Blood: complete count, C&S, malaria parasites
- Lochia: C&S
- Urine: for protein, sugar, microscopy, C&S

Management

Parenteral antibiotic therapy:
- ampicillin 500mg IV or IM every 6 hours
- plus gentamicin 5-7mg/kg IV or IM daily in 2 divided doses (every 12 hours)

If fever persists for >48 hours:
- Add metronidazole 500mg IV every 8 hours for at least 3 doses

After clinical improvement:
- Switch to metronidazole 400mg orally every 8 hours
16. Obstetric and Gynaecological conditions

- **plus amoxicillin** 500mg every 8 hours
- Continue antibiotics until cured (usually 7-10 days)

**Supportive/additional therapy:**
- Give **IV fluids**
- Give **analgesics**
- If anaemic, transfuse with blood
- Look for retained products and evacuate uterus if necessary

**Caution**
- Metronidazole: avoid strictly use of alcohol during treatment

### 16.27. ANTEPARTUM HAEMORRHAGE (APH)

Vaginal bleeding occurring after the 28 weeks of pregnancy up to 2nd stage of labour

**Causes**
- Local causes from genital tract
- **Placenta praevia:** all or part of the placenta is found in the lower segment of the uterus
- **Abruptio placentae:** premature separation of a normally placed placenta

**Clinical features (see table below)**

**Differential diagnosis**
- Ruptured uterus especially in a patient with previous Caesarean section
- Local causes, e.g. cervical cancer

**Investigations**
- Take a good history and do a careful examination
- Ultrasound: to find the site of the placenta
- Blood:
  - grouping, cross-matching
  - haemoglobin, fibrinogen levels
  - clotting time
Clinical features

<table>
<thead>
<tr>
<th>Placenta praevia</th>
<th>Abrupto placentae</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Painless</td>
<td>• Severe pain</td>
</tr>
<tr>
<td>• Foetal movements usually present</td>
<td>• Loss of foetal movements common</td>
</tr>
<tr>
<td>• Open bleeding from the vagina</td>
<td>• Open bleeding may be absent, only serous fluid in some cases (bleeding is behind the placenta)</td>
</tr>
<tr>
<td>• Shock and anaemia, if bleeding is heavy</td>
<td>• Shock and anaemia, even when no open bleeding</td>
</tr>
<tr>
<td>• Uterus soft and not tender</td>
<td>• Uterus hard and tender</td>
</tr>
<tr>
<td>• High presenting part (head) or malpresentation (the part in the lower uterus not head)</td>
<td>• Foetal parts difficult to feel because of hard uterus</td>
</tr>
<tr>
<td>• Foetal heart usually heard</td>
<td>• Foetal heart often absent</td>
</tr>
</tbody>
</table>

Management

- Set up IV infusion
- Refer for further management

16.28. POSTPARTUM HAEMORRHAGE (PPH)

Severe bleeding from the vagina following delivery:
- Primary PPH occurs in the first 24 hours
- Secondary PPH occurs between 24 hours and six weeks

Causes

- Failure of uterus to contract, or damage to/rupture of the perineum, vagina or uterus
  - tends to cause bleeding in the first 24 hours
- Precipitated labour
- Infection in the uterus
- Retained placenta
Clinical features
- Bleeding from the genital tract which is often >500mL
- The uterus may be still large, soft and not contracted especially in primary PPH
- In secondary PPH, there may be signs of infection, e.g. fever, abdominal tenderness
- Check for signs of shock if bleeding severe or of any amount which causes worsening of the patient’s condition

Investigations
- If time (e.g. in secondary PPH) - blood: for Hb, clotting, grouping

Management
- Establish and treat the cause of the bleeding - look for local causes if bleeding continues
- Check uterus to see if contracted
- Check if placenta has been expelled - if yes, expel any clots in the birth canal
- Ensure bladder is emptied
- If bleeding not severe, rub uterus to stimulate contractions
- Start IV infusion
- Refer to HC4 level
- Restore blood volume
- Give methylergometrine 200-400 micrograms slow IV or IM - single dose
  or oxytocin 5 IU/ergometrine 500 micrograms IM

If the placenta is retained:
- Carry out manual removal of the placenta under general anaesthesia, especially if bleeding is present
  - if this is not possible, refer for further management

If there is infection:
- Give antibiotics as in Puerperal sepsis
16. Obstetric and Gynaecological conditions

Prevention
- Identify mothers at risk and manage accordingly
- Ensure active management of 3rd stage of labour and delivery by skilled staff
- Give 5 days prophylactic antibiotics in prolonged or obstructed labour or in presence of other risk factors, e.g. rupture of membranes, birth before arrival at HC, retained placenta, instrument delivery:
  - amoxicillin 500mg every 8 hours or
  - erythromycin 500mg every 6 hours
  - plus metronidazole 400mg every 8 hours

16.29. RETAINED PLACENTA

Failure of delivery of placenta within 30 minutes of delivery of the baby

Causes
- Poor management of 3rd stage of labour
- Failure of the uterus to contract
- Failure of the placenta to separate, e.g. if it is stuck in uterine muscle
- Closing of the cervix before the placenta is expelled

Clinical features
- The umbilical cord protrudes from the vagina
- Bleeding may be present (in partial separation)
- The uterus may be poorly contracted and high in the abdomen
- If the placenta is retained >24 hours: may be signs of infection, e.g. fever, unpleasant bloody discharge

Differential diagnosis
- Retained second twin

Investigations
- Blood: Hb, grouping and cross-matching

Management
- Set up IV infusion
16. Obstetric and Gynaecological conditions

- amoxicillin 500mg every 8 hours or
  erythromycin 500mg every 6 hours
- plus metronidazole 400mg every 8 hours

  If bleeding present:
  - Give methylergometrine 200-400 micrograms
    slow IV or IM - single dose
  - or oxytocin 5 IU/ergometrine 500 micrograms IM
  - Try controlled contraction

  If this fails:
  - Refer to HC4 for further management

16.30. RUPTURED UTERUS

Partial or complete tearing of the uterus, common in:
- multiparous women (i.e. have had >1 live babies)
- women with previous C/S

Causes/predisposing factors
- Assisted deliveries/obstetric procedures
- Neglected, obstructed labour
- Tearing of a poorly-healed uterine scar during labour
- Damage to uterus due to a blow, eg. kick or accident
- Oxytocic herbs

Clinical features
- Labour pains have stopped
- Continuous abdominal pain
- Vaginal bleeding
- Anxiety, anaemia and shock
- Abdomen is irregular in shape
- Foetal parts easily felt under the skin if the foetus is
  outside uterus and foetal heart is not heard

Differential diagnosis
- Abruptio placentae
- Placenta praevia
- Other causes of acute abdomen in late pregnancy
- Ruptured spleen
- Bowel obstruction
16. Obstetric and Gynaecological conditions

**Investigations**
- Blood: Hb, grouping and cross-matching

**Management**
- Set up IV infusion
- *amoxicillin* 500mg every 8 hours *or* *erythromycin* 500mg every 6 hours
- *plus* *metronidazole* 400mg every 8 hours
- Give *oxygen*
- Refer to hospital immediately

**Caution**
- Do not attempt fundal pressure

### 16.31. ECLAMPSIA

Occurrence of fits after 20 weeks of pregnancy in a mother with no previous fits

**Clinical features**
- Patient may or may not have had previous clinical features of severe pre-eclampsia
- Patient develops headache, blurring of vision and sees aura (flickering lights before her eyes)
- Fits like an epileptic
- BP raised >140/90
- Oedema of legs and sometimes face and body
- Unconsciousness if condition not treated

**Investigations**
- Blood for:
  - Hb
  - malaria parasites
  - urea, electrolytes
  - clotting time
  - fibrinogen levels

**Differential diagnosis**
- Other causes of fits, e.g. cerebral malaria, meningitis, epilepsy, poisoning
Management
Aims at stopping convulsions and then delivering the baby

First Aid
- Protect the airway by placing the patient on her left side
- Prevent patient from hurting herself, e.g. stop her from biting the tongue by using a padded spatula or airway
- Refer as soon as possible

Anticonvulsants
- Start anticonvulsants with a loading dose of magnesium sulphate injection 50%:
  - dilute 4g (8mL) to 20mL total volume with water for injection
  - give as slow IV bolus over 10-15 minutes
- Check respiration rate and patellar reflexes
  If there are further convulsions:
  - Repeat the dose of magnesium sulphate as above

Note: magnesium sulphate is the first-line recommended anticonvulsant in management of this condition. However if the drug is not available, use diazepam 10mg slow IV over 2 minutes as an alternative

If these are satisfactory:
- Refer to HC4 for further management
- Continue loading dose with magnesium sulphate HC4
  - use 10g (20mL of 50% solution)
  - mix with 1mL of lignocaine injection 2%
  - give 10.5mL of this mixture IM into each buttock
- Monitor BP, pulse and respiration half hourly Pass indwelling Foley’s catheter for continuous bladder drainage
Monitor fluid balance

- Patient passed 100mL urine or more over last 4 hours
- Respiratory rate is >16 per minute
- Patellar reflexes are present

Give maintenance dose of magnesium sulphate 5g (10mL of 50% solution) deep IM every 4 hours

Continue until 24 hours after convulsions have stopped

If BP is >110mm diastolic or >170mm systolic:

- Refer to HC4 for further management
- Give hydralazine 10mg IV bolus
  - According to response, repeat hydralazine dose every 15 minutes until diastolic BP down to 100mm
  - Alternative if hydralazine not available: nifedipine 20mg sublingually every 12 hours for 1-2 doses until delivery
- Monitor BP every 15 minutes until stable
- Deliver the baby within 6-12 hours by the quickest method once BP is controlled

Note

Antidote for magnesium sulphate: if there is respiratory distress (rate <16 breaths per minute), give calcium gluconate 1-2g slow IV & repeat prn until rate increases

16.32. SEVERE PRE-ECLAMPSIA

A hypertensive condition of pregnancy which may result in maternal fits

Clinical features
- Headache
- Epigastric pain, vomiting
- Blurring of vision
16. Obstetric and Gynaecological conditions

- Oedema (swelling of legs and other parts of the body)
- Diastolic BP 110
- Urine protein ++
- May be oliguria
- Excessive weight gain

**Differential diagnosis**

- Other causes of oedema and hypertension, eg. renal disease

**Investigations**

- Urine: for protein
- Blood for:
  - urea, uric acid and electrolytes
  - clotting time
  - fibrinogen levels

**Management**

| High BP in pregnancy should be managed at HC4 level or higher |

*If diastolic BP >95mm:*

- Refer the patient

*If patient has severe pre-eclampsia:*

- Set up IV drip
- Give loading dose of magnesium sulphate
- Refer as soon as possible to HC4 for further management (as for Eclampsia)

**16.33. OBSTRUCTED LABOUR**

Failure of labour to progress despite good uterine contractions

**Causes**

- Any failure of descent of the baby down the birth canal
- Large baby
- Small or deformed pelvis
- Malpresentation - the presenting part of the foetus is not the head, eg. breech presentation, arm
16. Obstetric and Gynaecological conditions

- Malposition - an abnormal position of the foetal head when this is the presenting part, eg. occipito-posterior

Clinical features

- Contractions are strong but no evidence of descent of the presenting part
- Malposition or malpresentation may be felt on abdominal examination
- In late stages, the pains may stop when the uterus is ruptured, or in a first delivery they will just stop spontaneously

Management

**HC2**
- Set up an **IV drip**
- Start 5-day course of antibiotics: **amoxicillin** 500mg every 8 hours or **erythromycin** 500mg every 6 hours
- **plus metronidazole** 400mg every 8 hours
- Refer urgently to HC4 for further management

Prevention

- Careful monitoring of labour using a partogram
17. MUSCULOSKELETAL and JOINT DISEASES

Note: Treatment of all of these conditions should start at HC4 level or higher where there is a qualified medical officer. Lower levels should carry out clinical diagnosis only then refer urgently for management

- Diseases of the musculoskeletal system present mainly with pain and stiffness.
- Rheumatic diseases cause physical impairment and disability (30%) in the community.
- Most Rheumatic disease require symptomatic treatment of pain.

Cause of joint Disease
- Infections
- Inflammatory disorder
- Degeneration disorders

17.0. PYOGENIC ARTHRITIS (Septic arthritis)
An inflammatory lesion affecting a joint - mainly affects children

Causes
Usually haematogenous spread from a primary focus following bacteremia e.g. septic skin lesions, Sinustic, throat infections, Abrasions, wounds, pressure sores and Osteomyelitis
- Staphylococcus aureus
- Gram -ve bacilli, eg. Salmonella spp
- Streptococcus spp

Clinical features
- Fever - neonates may not show this but refuse to feed
- Jaundice (eg. yellow eyes)
- Dehydration
- General malaise
- Swelling of joint
17. Musculoskeletal and Joint diseases

- Severe pain
- Reduced or abolished movement, temporary loss of limb function (pseudoparalysis)
- Localised heat and tenderness

Differential diagnosis
- Inflammatory joint disease (instead of other causes)
  - Intra articular hemorrhage e.g. hemophilia and other bleeding disorders.
- Trauma
- Sickle-cell arthritis
- Other causes of joint swelling
- Osteomyelitis of neighboring bone

Investigations
- X-ray: affected joint and similar opposite joint (for comparison)
- Blood: haemogram, C&S, ESR (usually elevated)
- Joint fluid: aspirate for C&S - if fail to get pus by aspiration, use arthrotomy (in theatre)
- Joint fluid-Gram stain

Management

- Admit the patient
- Immobilise the affected limb leaving the joint free
- Aspirate/drain the joint
  - repeat daily prn until no further pus obtained
- Give an analgesic for 3 days

Initial empirical antibiotic therapy:
- gentamicin 2.5mg/kg IV every 8 hours
  - When acute phase is over/clinical improvement occurs:
- Change to flucloxacillin 500mg every 6 hours before food to complete the course
  - child up to 2yrs: 125mg/dose
  - 2-10 yrs: 250mg/dose
- Continue for at least 3 weeks after inflammation gone
17. Musculoskeletal and Joint diseases

* Modify antibiotic therapy as necessary according to the results of C&S of the joint aspirate
  - alternative antibiotic in adults for pathogens other than *S.aureus*: **ciprofloxacin** 500mg every 12 hours for at least 3 weeks – continue until patient improves.

  * Child (for sedation):
  - Give **diazepam** 2.5-5mg rectally
    - repeat prn after 30 minutes

* Salmonella arthritis
  - **chloramphenicol** 500mg every 6 hours for 14 days
    - *child*: 12.5mg/kg per dose
  - Other management as above

**Notes**
In some cases, especially adults with infection due to *S.Aureus*, repeated aspiration or surgical washout of the joint may be necessary in addition to appropriate antimicrobial therapy.

**17.1. RHEUMATOID ARTHRITIS**
A disease of joints affecting mainly women
- attacks tend to be bilateral

Most common form of chronic inflammatory joint disease.
Typically, symmetrical involvement and causes joint destruction

**Causes**
- Unknown origin, probably autoimmune

**Clinical features**
- Articular Manifestations
- Extra articular manifestations
  - Rheumatoid nodules (20%) at extensor surface like forearm below joint
  - Anorexia
17. Musculoskeletal and Joint diseases

- Weight loss
- Muscle wasting
- Ocular and cardiac effects
- Neurological effects may also occur
- Typically attacks hand joints, especially metacarpophalangeal
- Pain in affected joints
- Moderate increase in local heat
- Swelling with some joint effusion
- Mainly synovial membrane thickening
- In chronic cases, joint deformities may occur

**Differential diagnosis**
- Osteoarthritis
- Gouty arthritis (in males)
- Reactive arthritis
- Management

**Goals of treatment**
- Relief of symptoms
- Preservation of joint function
- Suppresion of active and progression of disease (prevent of structure damage and deformity)
- Maintenance of patient’s normal lifestyle

**General treatment**
- Physical rest
- Anti inflammatory medicines
- Physical Therapy

NSAIDS: provide symptomatic relief but don’t modify the disease
Simple analgesics: for simple pain relief.
Corticosteroids: have very potent anti inflammatory activity.
Medicines that suppress the disease process: (2nd line, disease modifying) but require special management.
- Antimalarials – chloroquine
- Sulphasalazine
17. Musculoskeletal and Joint diseases

- Methotrexate
- d-penicillamine
- gold (parenteral)

Indications for disease modifying medicines
- persistent symptoms and signs of inflammatory arthritis
- evidence of progressive radiological damage
- Troublesome extra articular manifestations

Investigations
- X-ray: of affected joint/s
- Blood: haemogram, ESR, rheumatoid factor, antinuclear factor

Management

**aspirin** 1.2g after food every 8 hours until symptoms are relieved, combined with
**omepranol** when patient experience serious gastrointestinal intestinal discomfort.
**indomethacin** 50mg as above
**diclofenac** 50mg as above

Contraindicated in patients with peptic ulcer
- refer for specialist management

If patient does not respond:
- refer for specialist management

17.2. GOUT ARTHRITIS

An inflammation disorder involving a joint(s) due to deposition of uric acid crystals.

Predominant in males

Causes:
- Altered urate metabolism with deposition of urate salts in the joint and other tissues in advanced cases

Clinical features

**Acute gout**
- Affected joint is hot, red and swollen
- Attacks mostly the big toe at the metatarsophalangeal joint (podagra),

UCG 2010
17. Musculoskeletal and Joint diseases

- Occasionally may start in other joints
- Sudden severe pain (often at night)
- Lumps under the skin (tophi) in soft tissues, eg. the ear
- Differential diagnosis: pseudo gout

**Chronic gout**
- Repetitive acute attacks are followed by progressive cartilage and bone erosion.
- Deposition of tophi in soft tissue e.g. ear cartilage, bursae and tendon sheaths.

**Differential diagnosis**
- Joint infection
- Rheumatoid arthritis
- Injury

**Investigations**
- Joint aspirate uric acid crystals viewed by a polarizing microscope
- X-ray: of the joint/s
- Blood: serum uric acid (elevated)

**Management**

**Acute attacks:**
- Non steroidal anti inflammatory medicines (NSAIDS)
  - Indomethacin 50 mg (elevated)
  - Diclofenac
- Colchicine 500 micrograms
- Avoid aspirin
- Avoid diuretics
- Don’t treat with allopurinol or uricosuric medicines
- Rest the joint
- Control the diet
- **Indomethacin** 50mg every 4-6 hours for 24-48 hours then 25-50mg every 8 hours for the duration of the attack
  - or **Diclofenac** 25-50mg every 8 hours after food
  - or **Colchicine** 1mg initially then 500 micrograms
17. Musculoskeletal and Joint diseases

17.3: OSTEOARTHRITIS

A joint disease usually affecting obese adults >40 years.

- Commonest form of joint disease
- Characterized by the degeneration of articular cartilage and simultaneous proliferation of new

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every 2-3 hours until relief is obtained or vomiting and diarrhoea occurs or until total dose of 6mg is reached
- do not repeat course within 3 days

**Chronic gout:**

- **allopurinol** initially 100mg daily after food then increase by 100mg weekly according to plasma or urinary uric acid levels to daily maintenance dose of 100-900mg depending on the severity of the condition.
  - average dose: 300mg daily
  - give daily doses totalling >300mg in divided doses

**Note:**

- **Allopurinol:** do not use for treating acute attacks of gout or for treating asymptomatic hyperuricaemia and do not start the medicine within 1 month of an acute attack
- Use prophylactic **colchicine** 500 micrograms every 12 hours 2-3 days before starting allopurinol and continue for at least 1 month after the hyperuricaemia has been corrected (usually about 3 months therapy is required).
- **If an acute attack starts during treatment of chronic gout,** treat this in its own right while continuing the therapy for the chronic condition.

**Prevention**

- alcohol
- Avoid eating red meat - especially if roasted
- Avoid drinking Weight reduction

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bone, cartilage and connective tissue
  • Pathological changes in osteoarthrosis are irreversible

**Causes**
  • Previous injury
  • Previous joint inflammatory
  • Over weight

**Clinical features**
  • May involve any joint - commonest in the hip, spine and knees
  • Restriction of movement, pain on moving the joint but tends to be absent at rest, limp in case of lower limbs
  • Swelling, deformity
  • No accumulation of joint fluid

**Differential diagnosis**
  • Gout; gouty arthritis
  • Rheumatoid arthritis

**Investigations**
  ➢ Normal blood count and ESR
  ➢ X-ray: of the joint/s

**Management**

**Goals of treatment:**
  • Patient education
  • Pain relief
  • Optimazation of function
  • Minimize progression

**General measure**
  • Weight reduction
  • Encourage activity and regular exercise
  • Use of appropriate foot wear and walking aids

**Drug treatment**
  • Adequate doses of simple analgesics e.g. paracetamol 1 g 6 hrly
  • Topical preparation (NSAIDS)
17. Musculoskeletal and Joint diseases

- NSAIDS: only in acute exacerbation or severe pain (review their continued use)
- Intra articular corticosteroid injections (specialist).
  - **indomethacin** 25-50mg every 8 hours
    - continue until pain is relieved
  - If a lower limb is involved, provide a walking aid for the patient – this should be held on the opposite side to the affected limb
  - Range of motion exercises
    *If no response (i.e. if cannot walk >100m without pain):*
  - Refer for specialist management

**Note**
- Other non-steroidal anti-inflammatory medicines (NSAIDS) may be used instead of indomethacin
  - see management of somatic pain

**Caution**
- △ Indomethacin: contraindicated in peptic ulcer
- △ Indomethacin gives more serious side effects compared to *diclofenac* and *ibuprofen*

### 17.4: OSTEOMYELITIS

Infection of bone by pus-forming bacteria, mainly affecting older children and adults.

**Causes**
- Any type of bacterium but most commonly *S.aureus* following infection elsewhere in the body

**Clinical features**
- Onset is usually sudden
- Fever - usually high but may be absent especially in neonates
- Pain (usually severe)
- Tenderness and increased ‘heat’ at the site of
17. Musculoskeletal and Joint diseases

- Infection, swelling of the surrounding tissues
- May also be swelling of the neighboring joint
- Reduced or complete loss of use of the affected limb
- The patient is usually a child of 4 yrs or above with reduced immunity, but adults may also be affected
- History of injury may be given and may be misleading especially if there is no fever

**Differential diagnosis**

- Infection of joints
- Injury (trauma) to a limb, fracture (children)
- Bone cancer – osteosarcoma (around the knee)
- Pyomyositis (bacterial infection of muscle)
- Cellulitis
- Sickle-cell disease (thrombotic crisis)

**Investigations**

- X-ray shows:
  - nothing abnormal in first 1-2 weeks
  - loss of bone density (rarefaction) at about 2 weeks
  - may show a thin ‘white’ line on the surface of the infected part of the bone (periosteal reaction)
  - later, may show a piece of dead bone (sequestrum)
- Blood:
  - C&S: type of bacterium may be detected
  - cell count: shows increase in neutrophils (neutrophilia)

**Management**

If skin abscess has formed:

- Incision and drainage of pus in theatre followed by C&S

Usually requires at least 4-6 weeks of mostly parenteral therapy

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17. Musculoskeletal and Joint diseases

**Acute osteomyelitis**
- Admit the patient - this is an **emergency condition**
- Immobilise and elevate the leg, leaving the affected area visible for constant monitoring
- Drill the infected bone in order to drain pus from the abscess and reduce intraosseous pressure
  - with the knee, use arthrotomy
- Give **antibiotics** as for Septic arthritis
  - monitor response using temperature, when this falls switch to oral antibiotics
  - continue prn for up to 3 months
- Give analgesics

*Child (for sedation):*
- Give **diazepam** 2.5-5mg rectally
  - repeat prn after 30 minutes

**Note**
In children, cellulitis may be a complication or differential diagnosis which is often missed. If diagnosed, it should be treated in the same way as acute osteomyelitis.

**17.5. PYOMYOSITIS**

Inflammation of muscle which may lead to pus formation and deep-seated muscle abscess.

**Causes**
- Bacterial infection (commonly *Staphylococcus aureus*)
- Trauma

**Clinical features**
- Most commonly localised in one muscle - usually large striated muscle
- History of trauma
- Fever
- Painful swelling of the involved muscle
- Affected area is hot, swollen, and tender
- Fluctuation when pus forms
17. Musculoskeletal and Joint diseases

**Differential diagnosis**
- Cellulitis
- Boils
- Osteomyelitis
- Peritonitis (in pyomyositis of abdominal muscles)
- Consider HIV infection

**Investigations**
- Blood: full count, C&S
- Pus: C&S

**Management**
- Elevate and immobilise affected limb (where relevant)
- Check frequently for pus formation
- **cloxacillin** 2g IV or IM every 6 hours for 5-10 days
  - child: 12.5-25mg/kg per dose
- As soon as pus localises:
  - Carry out surgical incision and drainage of the abscess
  - leave the wound open
- Once clinical improvement occurs:
  - Change to **flucloxacillin** 500mg every 6 hours before food to complete the course
    - child up to 2yrs: 125mg per dose
    - child 2-10 yrs: 250mg per dose
  - Alternative antibiotic:
    - Only to be used if above medicines not available:
      - **chloramphenicol** 500mg every 6 hours for 5-10 days
        - child: 12.5mg/kg per dose

17.6: TUBERCULOSIS of the SPINE

(Pott’s disease) – commonest form of skeletal TB which often causes complete destruction of the intervertebral disc with partial destruction of two adjacent vertebrae which is most marked
anteriorly. The destruction may involve a single or multiple spinal segments of dorsal spine (75%), cervical spine (<10%) or (rarely) lumbar spine.

**Causes**
- A chronic infection caused by *Mycobacteria*

**Clinical features**
- Commonest in young adults
- Back stiffness due to muscle spasms
- Anterior collapse of affected vertebrae leads to visible deformity (angular kyphosis or gibbus)
- Localised tenderness, localised abscess
- Weakness of legs
- Visceral dysfunction
- *In thoracic spinal TB*: pus formation produces a paravertebral abscess
- *In lumbar spinal TB*: pus tracks along the iliopsoas muscles and points in the groin
- *In thoracic or thoraco-lumbar spinal TB*: spinal cord involvement results in (Pott’s) paraplegia
- Signs of spinal cord compression (Pott’s paraplegia) or nerve root lesion

**Differential diagnosis**
- Staphylococcal spondylitis
- Brucellosis
- Metastatic lesion

**Investigations/ Diagnosis**
- Adequate history & careful examination
- X-ray spine shows:
  - disc space narrowing
  - paravertebral shadow
  - single/multiple vertebral involvement
  - destruction lesions of 2 or more vertebrae without new bone formation
  - destruction of vertebral end-plates
  - expanding inflammatory mass
• Blood:
  - WBC (within normal limits),
  - lymphocyte:monocyte ratio is approx 5:1
  - ESR = 25mm/hr (Westergreen method)
• Skin tuberculin test (not specific)
• Tissue biopsy:
  - ZN staining of aspirate
  - for needle aspirate guided by fluoroscopy, open biopsy and guinea pig inoculations, refer to Regional Referral Hospital

**Management**

- Rest the spine
- Fit a spinal corset or plaster jacket for pain relief
  
  *All patients* (see 3.12 Tuberculosis for explanation of medicine regimes)

- **2 SHRZ / 7 HR**
  
  *Alternative regime:*

- **2 EHRZ / 7 HR**

  *If patient has progressive paraplegia despite adequate conservative treatment:*

- Refer for specialist surgery to regional or national referral hospital.
18. MISCELLANEOUS CONDITIONS

18.0: ANAPHYLACTIC SHOCK

Acute hypersensitivity reaction

**Cause**
- Allergy to pollens, some drugs (eg. penicillins, vaccines, aspirin) or certain foods (eg. eggs, fish, cow’s milk, nuts, some food additives)
- Reaction to insect bites, eg. wasps and bees

**Clinical features**
- Sudden collapse
- Hypotension
- Excessive sweating
- Thin pulse

**Differential diagnosis**
- Other causes of shock, eg. bleeding, severe dehydration

**Management**
- Determine and remove the cause
- Keep patient warm
- Secure the airway
- Restore the BP: lay the patient flat and raise the feet

- **adrenaline (epinephrine) injection 1 in 1000 (1mg/mL)** 0.5-1mg IM
  - repeat initially (several times if necessary) every 10 minutes according to BP, pulse rate and respiratory function until improvement occurs
  - *child*: see dose table below

- Administer 100% oxygen
  - this is of prime importance

- Give an antihistamine as useful adjunctive treatment, eg. promethazine hydrochloride
  - 25-50mg by deep IM or slow IV (give <25mg/min as a diluted solution of 2.5mg/mL in water for injections, max: 100mg)
18. Miscellaneous conditions

**Child**
- 1-5 yrs: 5mg by deep IM
- 5-10 yrs: 6.25-12.5mg by deep IM
- repeat dose every 8 hours for 24-48 hours to prevent relapse

*To prepare the diluted solution:* dilute each 1mL of promethazine hydrochloride injection 25mg/mL with 9mL of water for injections

*In severely affected patients:*
- **Hydrocortisone** 200mg IM or slow IV stat
  - child <1 yr: 25mg; 1-5 yrs: 50mg; 6-12 yrs: 100mg
  - helps to prevent further deterioration
- Repeat **adrenaline** and **hydrocortisone** every 2-6 hours prn depending on the patient’s progress
- **Sodium chloride 0.9% infusion** 20mL/kg by IV infusion over 60 mins
  - start rapidly then adjust rate according to BP

### Table: Child adrenaline doses for IM injection

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Vol of adrenaline 1 in 1000 (mL)</th>
<th>Normal</th>
<th>Underweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.2</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>3-4</td>
<td>0.3</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.4</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>6-12</td>
<td>0.5</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>&gt;12</td>
<td>0.5-1</td>
<td>0.5-1</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- Adrenaline: IM is the route of choice
  - absorption is rapid and more reliable than SC
### 18. DEHYDRATION

A condition brought about by the loss of significant quantities of fluids and salts from the body.

**Cause**
- Diarrhoea
- Vomiting
- Excessive sweating as in high fever
- Respiratory distress

### 18.1. Management in children **HC2**

Management with Plan A, B or C is based on an assessment of the degree of dehydration according to key clinical signs - see table below. Refer to *Management of Childhood Illness* MoH 2000 for further details.

**Clinical features of dehydration in children**

<table>
<thead>
<tr>
<th>Signs</th>
<th>None/Mild</th>
<th>Some</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>General condition</td>
<td>Well, Alert</td>
<td>Restless, irritable</td>
<td>Lethargic or unconscious or very drowsy</td>
</tr>
<tr>
<td>Eyes</td>
<td>Not sunken</td>
<td>Sunken</td>
<td>Sunken</td>
</tr>
<tr>
<td>Fontanelle</td>
<td>Not sunken</td>
<td>Sunken</td>
<td>Sunken</td>
</tr>
<tr>
<td>Ability to drink</td>
<td>Drinks normally</td>
<td>Drinks eagerly, thirsty</td>
<td>Drinks poorly or not able to drink</td>
</tr>
<tr>
<td>Skin pinch</td>
<td>Goes back quickly</td>
<td>Goes back slowly</td>
<td>Goes back very slowly</td>
</tr>
</tbody>
</table>

**Plan A (No dehydration and for prevention):**

- Counsel the mother on the 3 rules of Home Treatment
  - extra fluids, continue feeding, when to return
18. Miscellaneous conditions

- Give extra fluids - as much as the child will take

Advise the mother to:

- Continue/increase breastfeeding:
  - if child exclusively breastfed, give ORS or clean water in addition to milk
  - if child not exclusively breastfed, give one or more of: ORS, soup, rice-water, yoghurt drinks, clean water

- In addition to the usual fluid intake, give ORS after each loose stool or episode of vomiting:
  - <2yrs: 50-100mL; 2yrs and over: 100-200mL
  - give the mother 2 packets to use at home
  - giving ORS is especially important if the child has been treated with Plan B or Plan C during current visit
  - give frequent small sips from a cup
  - if child vomits, wait 10 minutes, then give more slowly

- In a child with high fever or respiratory distress, give plenty of fluids to counter the increased fluid losses in these conditions

- Continue giving extra fluid as well as ORS until the diarrhoea or other cause of dehydration stops

Counsel the mother on:

- Correct breastfeeding and other feeding during sickness and health
- Increasing fluids during illness
- How to maintain her own health
- When to return to the health worker

**Plan B (Some dehydration):**

- Give ORS in the following approximate amounts during the first 4 hours:

<table>
<thead>
<tr>
<th>Age (mths)</th>
<th>&lt; 4</th>
<th>4-12</th>
<th>13-24</th>
<th>25-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>&lt; 6</td>
<td>6-9.9</td>
<td>10-11.9</td>
<td>12-19</td>
</tr>
<tr>
<td>ORS (mL)</td>
<td>200-400</td>
<td>400-700</td>
<td>700-900</td>
<td>900-1400</td>
</tr>
</tbody>
</table>

- Only use child’s age when you don’t know the weight
You can also calculate the approx. amount of ORS to give a child in the first 4 hours as weight (kg) x 75mL
- Show the mother how to give the ORS
  - give frequent small sips from a cup
  - if the child wants more than is shown in the table, give more as required
  - if the child vomits, wait 10 minutes, then continue more slowly
- For infants <6 months who are not breastfed, also give 100-200mL of clean water during this first 4 hours
- Reassess patient frequently (every 30-60 minutes) for classification of dehydration and selection of Treatment Plan

After 4 hours:
- Reassess the patient
- Reclassify the degree of dehydration
- Select the appropriate Treatment Plan A, B or C
- Begin feeding the child in the clinic

If the mother must leave before completing the child’s treatment:
- Show her how to prepare ORS at home and how much ORS to give to finish the 4-hour treatment
- Give her enough packets to complete this and 2 more to complete Plan A at home
- Counsel the mother on the 3 rules of home treatment
  - extra fluids, continue feeding, when to return

Plan C (Severe dehydration):
  a) If you are able to give IV fluids:
- Set up an IV fluids line immediately
  - if the child can drink, give ORS while the drip is set up
- Give 100ml/kg of compound sodium lactate infusion (Hartmann’s solution or Ringer’s
18. Miscellaneous conditions

Lactate solution) or half-strength [HS] Darrow’s solution in glucose 2.5% or sodium chloride infusion 0.9%

- divide the IV fluid as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30mL/kg in:</th>
<th>Then give 70mL/kg in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (&lt;12 months)</td>
<td>1 hour*</td>
<td>5 hours*</td>
</tr>
<tr>
<td>Children (12 mths-5yrs)</td>
<td>30 minutes*</td>
<td>2½ hours*</td>
</tr>
</tbody>
</table>

* Repeat once if radial pulse still very weak/undetectable

- Reassess patient frequently (every 30-60 minutes) for classification of dehydration and selection of Treatment Plan

If the patient is not improving:
- Give the IV drip more rapidly
  As soon as the patient can drink - usually after 3-4 hours in infants or 1-2 hours in children:
  - Also give ORS 5mL/kg/hour.
  - Continue to reassess the patient frequently, classify the degree of dehydration and select appropriate Plan A, B or C to continue treatment

b) If you are unable to give IV fluids but IV treatment is available nearby (i.e. within 30 minutes):
- Refer urgently for IV treatment
If the child can drink:
- Provide the mother with ORS and show her how to give frequent sips during the trip to the referral facility
c) If you are unable to give IV fluids and this therapy is not available nearby (i.e. not within 30 minutes ORS) but you can use a nasogastric tube (NGT) or the child can drink:

- Start rehydration with ORS by NGT or by mouth:
  - give 20mL/kg/hour for 6 hours (total = 120mL/kg)

- Reassess the child every 1-2 hours:
  - if there is repeated vomiting or increasing abdominal distension, give the more slowly
  - if hydration status is not improving within 3 hours, refer the child urgently for IV therapy

- After 6 hours, reassess the child
- Classify the degree of dehydration
- Select appropriate Plan A, B or C to continue treatment

Note:

- If possible, observe the child for at least 6 hours after rehydration to ensure that the mother can correctly use ORS to maintain hydration
18. Miscellaneous conditions

### 18.1.2. Management in Older Children & Adults

**Clinical features of dehydration older children and adults**

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Degree of dehydration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
</tr>
<tr>
<td>General appearance</td>
<td></td>
</tr>
<tr>
<td>Thirsty, alert</td>
<td>Thirsty, alert</td>
</tr>
<tr>
<td>Pulse</td>
<td>Normal</td>
</tr>
<tr>
<td>Respiration</td>
<td>Normal</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>Normal</td>
</tr>
<tr>
<td>Skin pinch</td>
<td>Returns rapidly</td>
</tr>
<tr>
<td>Eyes</td>
<td>Normal</td>
</tr>
</tbody>
</table>

#### Clinical feature

<table>
<thead>
<tr>
<th>Degree of dehydration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
</tr>
<tr>
<td>Tears</td>
</tr>
<tr>
<td>Mucous membranes</td>
</tr>
<tr>
<td>Urine output</td>
</tr>
</tbody>
</table>

- at least 2 of these signs must be present
Rehydrate the patient as follows—next page:

<table>
<thead>
<tr>
<th>Degree of dehydration</th>
<th>Rehydration fluid</th>
<th>Route</th>
<th>Volume to give in first 4h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>ORS (2)</td>
<td>Oral</td>
<td>25mL/kg</td>
</tr>
<tr>
<td>Moderate</td>
<td>ORS</td>
<td>Oral</td>
<td>50mL/kg (3)</td>
</tr>
<tr>
<td>Severe</td>
<td>SLC inf (4)</td>
<td>IV</td>
<td>50mL/kg (5)</td>
</tr>
</tbody>
</table>

**Notes on table**
1. Volumes shown are guidelines only— if necessary volumes can be increased or the initial high rate of administration maintained until clinical improvement occurs.
2. As well as ORS, other fluids such as soup, fruit juice and clean water may be given.
3. Initially adults can usually take up to 750mL ORS/hour.
4. If sodium lactate compound IV infusion (Ringer-Lactate) is not available:
   - use half-strength [HS] Darrow’s solution in glucose 2.5%
   - or sodium chloride infusion 0.9%
   - however, both of these are less effective
5. In severe dehydration, give IV fluids as rapidly as possible at first until radial pulse can be felt then slow down the rate of administration. Volumes which may be given over the first 24 hours (60kg adult) are as follows:

<table>
<thead>
<tr>
<th>Time period</th>
<th>Volume of IV fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>First hour</td>
<td>1L</td>
</tr>
<tr>
<td>Next 3 hours</td>
<td>2L</td>
</tr>
<tr>
<td>Next 20 hours</td>
<td>3L</td>
</tr>
</tbody>
</table>

After 4 hours, evaluate rehydration in terms of clinical signs (and not in terms of volumes of fluid given).
As soon as signs of dehydration have gone (but not before) start fluid maintenance therapy with as much alternating ORS and water (to avoid hypernatraemia) as the patient wants.

Continue this for as long as the cause of the original dehydration persists.

**Note:**
Continued nutrition is important – there is no physiological reason to discontinue food during treatment for dehydration.

### 18.2. FEBRILE CONVULSIONS

A disorder mainly affecting children between 6 months and 6 years characterised by generalized tonic-clonic seizures in a febrile illness.

**Cause**
- Malaria fever
- Respiratory tract infections
- Urinary tract infections
- Other febrile conditions

**Clinical features**
- Elevated temperatures (>38°C)
- Convulsion is usually brief (<15 minutes) but may recur if temperature remains high
- No CNS infection or neurological abnormality in the period between convulsions

**Differential diagnosis**
- Epilepsy
- Meningitis
- Encephalitis
- Brain lesions
- Trauma
- Hypoglycaemia
- Hypocalcaemia
18. Miscellaneous conditions

**Investigations**
- Blood: slide for malaria parasites; haemogram
- LP and CSF examination
- Full blood count
- Random blood glucose
- Urinalysis, culture and sensitivity
- Chest xray

**Management**

- Treat the cause
- Lie prone
- Use tepid sponging to help lower the temperature
- Give an antipyretic:
  - **paracetamol** 10mg/kg every 8 hours prn
- Give **diazepam** 500 micrograms/kg rectally
  - maximum dose: 10mg
  - repeat prn after 10 minutes
  - if diazepam rectal dose-form is not available
  use diazepam injection solution and give the
  same dose rectally using the syringe after
  removing the needle

---

18.3. HYPOGLYCAEMIA

A clinical condition due to reduced levels of blood sugar (glucose).

**Causes**
- Overdose of insulin or anti-diabetic drugs
- Excessive alcohol intake
- Starvation
- Operations to reduce the size of the stomach (gastrectomy)
- Tumours of the pancreas (insulinomas)
- Certain drugs, eg. quinine
- Hormone deficiencies (cortisol, growth hormone)

**Clinical features**
- Profuse sweating
- Nervousness
18. Miscellaneous conditions

- Fainting
- Palpitations
- Poor sight
- Weakness
- Hunger
- Abdominal pain
- Vomiting
- Convulsions
- Loss of consciousness

**Differential diagnosis**
- Other causes of loss of consciousness

**Investigations**
- Blood sugar
- Specific investigations
  - to exclude other causes of hypoglycemia

**Management**
- Oral *glucose* or *sugar* (before coma sets in)
  10-20g in 200mL water (2-4 teaspoons) is usually taken initially and repeated after 15 minutes if necessary
  or if patient is unconscious, *glucose 50%* 20-50mL IV, followed by 10 % dextrose solution by drip at 5-10 mg /kg/min until patient regains consciousness, then encourage oral sugary drinks.

- Where possible, treat the cause of the hypoglycemia.

**Prevention**
- Educate patients at risk of hypoglycaemia e.g. Diabetics, patients who have had a gastrectomy, on recognition of symptoms of hypoglycemia.
- Advise patients at risk to have regular meals and always to have glucose or sugar with them for emergency treatment of hypoglycaemia.

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18. Miscellaneous conditions

18.4. PAIN

‘Pain is what the patient says hurts’

This is the most common symptom of disease. The nature, location and cause of pain differ in each case. Pain requires a holistic approach as it can be affected by spiritual, psychological, social and cultural factors which may need to be addressed after physical pain is controlled.

Important categories of physical pain are:

- **Nociceptive pain**: the pain pathways are intact
  - these pains respond to the analgesic ladder
- **Neuropathic pain**: there is damage to nerves or the pathways
  - these pains respond only partially to the analgesic ladder and need adjuvants of amitryptiline or phenytoin (see below)

**Causes**

- Acute: postoperative, acute infection or trauma
- Chronic pain:
  - constant and usually increasing: cancer
  - recurrent sickle-cell crisis, arthritis, HIV/AIDS
  - drug side-effect or toxicity eg peripheral neuropathy due to isoniazid (anti-TB drug) or D4T ( stavudine, antiretroviral drug)

**Clinical features**

- Those of the underlying disease

Further therapeutic clues to the nature and management of pain may be elicited by:

- Duration
- Severity – can assess using the Numerical Rating Scale, where the patient grades his/her pain on a scale of 0= no pain to 5= worst pain ever experienced
- Site and radiation
- Nature (eg. stabbing, throbbing, crushing,
18. Miscellaneous conditions

- Periodicity (constant or intermittent)
- Relieving or aggravating factors
- Accompanying symptoms
- Remember there may be more than one pain-ask the patient and get a detailed history as above for each pain
- A targetted physical examination

Management

Reasons for poor management of pain

Pain, especially if chronic, is often poorly managed for a number of reasons including:

- Waiting for the patient to complain about pain rather than asking the patient about it
- Failure to obtain details of pain from attending nurses and relatives who often know the patient better than the clinician
- Prescribing the right drug in the wrong dose or with the wrong frequency or duration
- Failure to prescribe an appropriate adjuvant drug, eg. antidepressant or anticonvulsant in neuropathic pain
- Failure to make adequate use of strong opioids (eg. morphine) where indicated, because of misplaced fear of causing addiction, respiratory depression or death
- Failure to use other forms of therapy where appropriate, eg. radiotherapy, steroids, cytotoxic chemotherapy, antibiotics, muscle relaxants, etc
- Failure to regularly review the patient’s condition and the drug regime prescribed
- Lack of the right medicines

The aim of pain management is to:

- Diagnose and treat the disease causing the pain
- Achieve total pain relief with minimal side-effects and therefore enable the patient to live as normal a life as possible
18. Miscellaneous conditions

**Non-drug treatment** may include:
- Lifestyle adjustment
- Patient counselling
- Massage with aromatherapy oils – may be useful for neuropathic pain and muscular pain
- Reflexology
- Application of heat or cold packs
- Relaxation
- Distraction e.g. listening to radio
- Non-pharmacological treatment of underlying cause e.g. surgery or radiotherapy of cancer

**Important management points**
- Health professionals specially trained in palliative care should supervise management of chronic pain in advanced or incurable conditions (e.g. cancer, AIDS)
- Morphine is usually the drug of choice for severe pain
- See also *Pain and Symptom Control in the Cancer and/or AIDS patient in Uganda and other African Countries*, 4th edition, HOSPICE AFRICA UGANDA, 2006
- In continuous pain, analgesics should be given:
  - by the clock (i.e. according to a regular dose schedule)
  - by the patient (i.e. self-administered)
  - by the mouth (i.e. as oral dose forms)

### 18.4.1. Nociceptive or Somatic pain

Pain arising from any organ of the body with intact nerves:
- the commonest type of pain (may occur in any patient)

Medicines required depend on intensity of pain and are selected in steps according to the WHO analgesic ladder
18. Miscellaneous conditions

**Step 1: Non-opioids**
- **paracetamol** 1g every 4-6 hours (max: 4g daily)
  - **aspirin** 600mg every 4-6 hrs
    - do not give aspirin in 3rd trimester of pregnancy
  - **NSAIDs** (give doses after food)
    - eg. **ibuprofen** 1.2–1.8g daily in 3-4 divided doses
      - max: 2.4g daily
    - **indomethacin** 50-200mg daily in divided doses
    - **diclofenac** 75-150mg daily in 2-3 divided doses

**Child:**
- **paracetamol** 10 – 15 mg/kg every 4-6 hours
  - **ibuprofen** 20 mg/kg every 4-6 hours (give after food)
    - max 500 mg per day in children < 30 kg.
    - not recommended for children under 1 year old

**Note on antipyretic effect**
The above doses of aspirin, paracetamol and ibuprofen may also be used for antipyretic therapy

**Step 2: Weak opioids**
- **codeine phosphate** 30-60mg every 4 hours
  - **child** 1–12 yrs: 3mg/kg daily in divided doses
  - **dihydrocodeine** 30mg every 4-6 hours
  - **child** >4 yrs: 0.5-1mg/kg every 4-6 hours
  - +/- **Step 1 drug**
Step 3: Strong opioids

| ALWAYS GIVE STRONG OPIOIDS WITH A LAXATIVE UNLESS SEVERE DIARRHOEA IS PRESENT |

Notes

- Morphine 10mg parenteral is equivalent to 30mg by mouth (i.e. multiply parenteral dose by 3 to get oral equivalent).
- Morphine 5mg by mouth is equivalent to 1.6mg parenteral (i.e. divide oral dose by 3 to get the parenteral equivalent).
- Regular injections are not indicated in chronic pain.
- Chronic pain is more manageable when controlled using small doses of oral morphine titrated to control pain without causing drowsiness. It is due to accumulation of metabolites which are also active analgesics.
- Respiratory depression has not been recorded when morphine is given orally and titrated against pain and drowsiness - however it has occurred due to regular parenteral dosing.

**morphine** (as oral solution 1mg/ml): initially 2.5-5mg orally (see also note below) every 4 hours

- then titrate the dose according to response
- continued drowsiness indicates too much and the dose should be titrated down slowly
- oral morphine solution is absorbed from the buccal mucosa and can be dripped into the mouth in adults and children
  - or morphine (as slow-release tablets, eg morphine SR).
- start with 10mg orally or rectally every 12 hours
- adjust the dose (but not the frequency) to
achieve satisfactory pain control

- if the patient is changing from oral liquid to slow-release tablet preparation, add the total taken in 24 hours to control pain and divide this by 2 to get the nearest equivalent dose as morphine SR (10mg and 30mg available in Uganda)

> Leave patient with a few extra doses of oral morphine to take for breakthrough pain and calculate needs at next visit. (Breakthrough pain is a temporary exacerbation of pain after pain has been controlled on a regular dose of oral morphine.

> The breakthrough dose is equivalent to the 4 hourly dose of oral liquid morphine being taken. If the patient needs regular breakthrough doses, then add the number of breakthrough doses given in a day to the total daily dose, then divide by six to get the new 4 hourly dose. For example, a patient on 5mg oral morphine every 4 hours (=30mg in 24 hours) requiring 3 breakthrough doses in a day (=3 x 5mg, total 15mg) would need a new total of 45mg of oral morphine in a day = 45/6 or 7.5mg every 4 hours).

> +/- Step 1 drug

Notes

Dose titration:
- When titrating the dose upwards because pain is not controlled, increase by 50-75% of the previous dose

Pethidine:
- Avoid this in treating chronic pain because:
  - it accumulates with severe side-effects on the gut
  - it does not work well by mouth except in large doses with resultant severe side-effects
18. Miscellaneous conditions

- Use for analgesia in labour: 50-150 mg orally every 4 hours prn or 50-100mg SC repeated prn after 1-3 hours
  - max: 400mg/24 hrs
  - Child >6 mths: 0.5-2mg/kg/dose
  - only use as one off-dose for acute severe pain if morphine not available

Respiratory depression:
- This side-effect of opioids does not occur when oral small doses are used initially, and gradually titrated according to response
- If mistakenly given in large doses by injection, respiratory depression can be reversed by naloxone

Nausea and vomiting:
- Rarely occurs in Africans, commoner in Caucasians
- Occurs only in the first five days (it is self-limiting)
- Control with an oral antiemetic (for 5 days only), eg.
  - haloperidol 1mg every 12 hours
  - metoclopramide 10mg every 12 hours
- Vomiting later on is usually due to another cause in the illness

Use of morphine in dyspnoea and severe diarrhoea:
- Use in small oral doses to relieve dyspnoea in respiratory diseases such as lung cancer, pleural effusion, COAD, heart failure and pneumonia
  - it increases relaxation and oxygenation
  - start with 2.5mg orally every 4 hours or add 2.5mg every 4 hours to present analgesic dose
- Use similar small doses for severe diarrhoea in HIV/AIDS patients
18. Miscellaneous conditions

Cautions on use of opioids
• Contraindicated in respiratory depression and head injury
• Use with care in the following conditions
  – advanced liver disease (but can be used in hepatocellular carcinoma [HCC] when titrated as above)
  – acute asthma
  – acute abdomen (can use while awaiting diagnostic tests - never leave the patient in pain)
  – hypothyroidism
  – renal failure (reduce starting dose and/or reduce dose frequency)
  – elderly or severely wasted patient (reduce starting dose and/or reduce dose frequency)
• Use with extreme care (i.e. start with small doses and use small incremental increases) in:
  – hypovolaemic shock: start with 10mg IV (as absorption is slow due to hypovolaemia)
  – recurrent or concurrent intake of alcohol or other CNS depressants

18.4.2. Neuropathic pain
Occurs as a result of damage to nerve tissue. There are two clinical kinds of pain:
• Stabbing-type pain in a nerve distribution with minimal pain in between (eg. trigeminal neuralgia) but can occur with any nerve
  – responds to phenytoin
• Paraesthesia, dysaesthesiae or burning-type pain eg. post-herpetic neuralgia
  – responds well to small doses of amitriptyline
• Both elements may be combined

a) Trigeminal neuralgia or stabbing-type pain
Acute phase:
  ▶ phenytoin 200-400mg daily in 1-2 divided doses
18. Miscellaneous conditions

- *drug of choice* because has minimal side-effects and does not need monitoring
- may need up to 600mg daily
- avoid if patient is on antiretroviral therapy due to interactions (Nevirapine and Protease inhibitors)
  
  or *carbamazepine* initially 100mg 1–2 times daily
- increase gradually according to response
- causes white cell depression
- needs monitoring
- more expensive than phenytoin
- usual dose: 200mg 3–4 times daily (up to 1.6g daily may be needed)
- avoid if patient is on antiretroviral therapy due to interactions (Nevirapine and Protease inhibitors)

- ± *amitriptyline* 12.5-25mg at night or every 12 hours depending on response

b) Post-herpetic neuralgia

Acute phase:

- *amitriptyline* 12.5-25mg at night or every 12 hours depending on response
  
  *If stabbing element to pain:*
  
  - add *phenytoin* (doses as above)

18.4.3. Back or bone pain

- Pain in the lumbar region of the spine
  - is a symptom not a disease entity
- Bone pain anywhere

Causes

- Disc degeneration (often has a neuropathic element because of pressure on sciatic or other nerve)
- Osteoporosis (if collapse of vertebrae or fracture)
- Infection, eg. TB, brucellosis
- Metastatic disease, eg. breast or prostate cancer
18. Miscellaneous conditions

- Cervical cancer
- Strain
- Congenital abnormalities
- Spondylolisthesis (forward shift of one vertebra upon another, due to defect of the joints which normally bind them together)
- Renal disease
- Pelvic infection
- Retroperitoneal infection

Clinical features
- Depend on the cause
- In infections: pain is throbbing and constant
- Sciatica - if sciatic nerve roots involved

Differential diagnosis
- See distant causes above

Investigations
- As far as possible try to establish the cause and type of pain (nociceptive or neuropathic)
- X-ray: spine and pelvis
  - if available, is affordable and will aid management

Management
- analgesics (see management of somatic pain)
  - give a Step 1 drug for 7 days or as long as required according to patient
  - NSAIDs are the Step 1 drug of choice in bone pain
  - may have to add a Step 2 or 3 drug especially in metastatic disease

For acute back pain:
- Rest the back on a firm but not hard surface

For neuropathic element:
- Manage as for neuropathic pain above
18. Miscellaneous conditions

18.5. FLUID & ELECTROLYTE IMBALANCE

A condition where losses of bodily fluids from whatever cause has led to significant disturbance in the normal fluid and electrolyte levels needed to maintain physiological functions.

**Water and electrolyte exchange**

- Fluid consumption is 2-2.5L in 24 hours (1.5L by mouth and 0.5-1L in solid food)
- Daily fluid loss is through:
  - urine (800-1,500mL)
  - stool (250mL)
  - insensible loss through skin and lungs (600mL) which is affected by hyperventilation, fever and high environmental temperatures
- Daily sodium intake is 100-200mmol
- Daily potassium intake is 50-100mmol
- There will be a deficiency of salts if:
  - there are increased losses, eg. excess sweating, urinary losses or GIT losses through diarrhoea and vomiting
  - there is reduced intake, eg. post-operative patients

**Disorders of fluid and electrolytes**

Disorders may occur in the fluid volume, concentration (sodium composition) and distribution of fluid and other electrolytes and PH. The main disorders likely to cause such problems are:

- Diarrhoea - prolonged
- Vomiting - prolonged
- Burns - excessive
- Haemorrhage - severe
- Intestinal obstruction
- Peritonitis
- Diabetes
- Nasogastric drainage
- Paralytic ileus
18. Miscellaneous conditions

- Fistula drainage (especially if high output)
- Third spacing eg. Peritonium
- Major organ failure (eg. renal, hepatic, cardiac)

Caution

△ Over-infusion of IV fluids may also cause fluid and electrolyte imbalance

*Mild to moderate fluid loss* will lead to varying degrees of dehydration

*Severe fluid loss* will lead to shock

**IV fluid and electrolyte therapy**

This has three main objectives:

- To replace lost body fluids and continuing losses.
- To correct electrolyte and acid-base disturbances
- To maintain daily fluid requirements

![always use an IV drip in patients who are seriously ill (except patients in congestive heart failure – for these use only an indwelling needle) and may need IV drugs or surgery. If the fluid is not needed urgently, run it slowly to keep the IV line open.]

- Administer daily fluid and electrolyte requirements to any patient not able to feed
- The basic 24-hour requirement for a 60kg adult is 3L and for children is 150mL/kg
- One third of these daily fluids (1L in an adult) should be (isotonic) *sodium chloride 0.9% infusion*
- The other two thirds (2L in an adult) should be: *glucose 5% infusion or half-strength Darrow’s solution in glucose 2.5% infusion or compound sodium lactate infusion (Ringer-Lactate solution)*
- As well as the daily requirements replace increased fluid lost due to the particular condition according to the assessed degree of dehydration.
18. Miscellaneous conditions

Caution
△ Closely monitor all IV drips to ensure that the rate is adjusted as required and that the drip is not allowed to run dry as this will introduce air bubbles into the circulation with the potentially fatal risk of air embolus.
△ If the drip has been neglected and allowed to run dry, remove it and set up a new drip at another site.
△ Check the drip site daily for any signs of infection, change drip site every 2-3 days or when the drip goes into tissues (extravasation).

Clinical features of severe dehydration
- Inelastic skin (loss of skin turgor)
- Low urinary output
- Rapid, thready pulse
- Low BP
- Reduced level of consciousness

Clinical features of hypovolaemia
- Tachycardia (rapid pulse, often thready, small volume)
- Low BP
- Postural change (eg. supine to sitting/standing – change in heart rate and BP)

In diarrhoea and vomiting with severe dehydration, paralytic ileus, etc:
- Replace fluid losses with isotonic solutions containing potassium, eg. compound sodium lactate infusion (Ringer-Lactate solution) or half-strength Darrow’s solution in 2.5% glucose infusion (see also Dehydration)

If there is blood loss and the patient is not in shock:
- Use sodium chloride 0.9% infusion for blood volume replacement giving 0.5-1L in the 1st hour and not more than 2-3L in 4 hours
18. Miscellaneous conditions

**If there is blood loss >1L:**
- Give 1-2 units of blood to replace volume and concentration

**In severe burns:**
- See p[Error! Bookmark not defined.] for calculation of IV fluid requirements and details of rehydration regimes

**In patients undergoing aspiration of fluid in the non-functioning compartments:**
e.g. in ascites, pleural effusion and chronically distended urinary bladder
  - intravascular fluid redistribution will lead to a fall in BP
  - Give isotonic solutions to correct this:
    - eg. **sodium chloride 0.9% infusion**
    - or **compound sodium lactate infusion** *(Ringer-Lactate solution)*

**In patients with shock:**
- Give **compound sodium lactate infusion** *(Ringer-Lactate solution)* or **sodium chloride 0.9% infusion** 20mL/kg IV over 60 mins for initial volume resuscitation
  - start rapidly, closely monitor BP
  - reduce the rate according to BP response

**In patients with severe shock and significant haemorrhage:**
- Give a blood transfusion

**In Intestinal obstruction:**
- patient may be dehydrated due to vomiting; if dehydration is severe, replace fluid losses with isotonic solutions containing potassium, eg. compound sodium lactate infusion *(Ringer-Lactate solution)* or half-strength Darrow’s solution in 2.5% glucose infusion
- aspirate upper gastrointestinal fluids using a nasogastric tube and large syringe
18. Miscellaneous conditions

- consult a surgeon
- give pain relief parenterally
- avoid metoclopramide as it would worsen colic, instead use haloperidol 1 – 2 mg nocte sc.

18.6. ANAESTHESIA GUIDELINES

Anaesthesia main objectives during surgery are:
- To relieve pain
- To support physiological functions
- To provide good conditions for the operation

GENERAL CONSIDERATIONS

The facilities for administering anaesthesia must be:
- Available and in a state of readiness at all times
- Appropriate in quality and quantity
- Compatible with safety

Staffing requirement for anaesthesia
- Anaesthesia provider
- An assistant for the anaesthesia provider
- Adequate assistance in positioning the patient
- Adequate technical assistance to ensure proper functioning and servicing of all equipment

Before anaesthesia

Read the notes/ medical records of the patient
Assess the patient very carefully
The drugs, equipment, instruments and materials to be used must be known
Prepare properly:
- The workplace
- The patient

During anaesthesia

Anaesthesia is administered (induction and maintenance)
The patient must be monitored meticulously:
- To ensure his/her wellbeing
18. Miscellaneous conditions

- To detect dangerous signs as soon as they arise and appropriately treat them
- Expertise in resuscitation is obligatory
- If in trouble ask for help

**After anaesthesia**

The patient
- Recovers from effects of anaesthesia
- Has stable vital signs
- Is returned to the ward in the fully conscious state, no worse, or if at all possible, even better than before operation.

**ALWAYS PAY ATTENTION TO DETAIL.**

The anaesthetist, surgeon and theatre staff are on the same team.

**Know your limits. Seek help Consult or refer to a higher level of care**

**Types of Anaesthesia**

Anaesthesia may be produced in a number of ways:

a) **General anaesthesia**

Basic elements: loss of consciousness, analgesia, prevention of undesirable reflexes and muscle relaxation

b) **Regional or Local anaesthesia**

Sensation of pain is blocked without loss of consciousness.

The conduction of stimulus from a painful site to the brain can be interrupted at one of the many points:

- Surface Anaesthesia
- Infiltration Anaesthesia
- Intravenous regional anaesthesia
- Nerve block/Plexus block
- Epidural Anaesthesia
- Spinal Anaesthesia

**Preparation in the operating theatre**

Should be in a constant state of preparedness for anaesthesia

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18. Miscellaneous conditions

The following should be available, checked and ready:

- Oxygen source
- Operating table that is adjustable and with its accessories
- Anaesthesia machine with accessories
- Self inflating bag for inflating the lungs with O₂
- Appropriate range of face masks
- Suction machine with appropriate range of suction catheters
- Appropriate range of oropharyngeal airways, endotracheal tubes and other airways e.g. Laryngeal mask airway
- Laryngoscope with suitable range of blades
- Magill’s forceps
- Intravenous infusion equipment, appropriate range of cannulae and fluids (solutions)
- Equipment for regional anaesthesia
- Adequate lighting
- Safe disposal of items contaminated with body fluids, sharps and waste glass
- Refrigeration for storage of fluids, drugs and blood
- Anaesthetic drugs: general and local anaesthetic agents
- Muscle relaxants
- Appropriate range of sizes of syringes
- Monitors: stethoscope, sphygmomanometer, pulseoximeter
- Appropriate protection of staff against biological contaminants. this includes: gowns, gloves, masks and eye shields
- Drugs necessary for management of conditions which may complicate or co-exist with anaesthesia must be at hand
Preoperative Management
Aim is to make the patient as fit as possible in the given circumstance before surgery.

Assessment of the patient
- Identify the patient and establish rapport
- A standard history is obtained and an examination done
- Emphasis is on the cardio-respiratory systems
- Investigations appropriately interpreted e.g., Hb

Establish health status/condition of the patient
Classify physical status of the patient according to A.S.A. (ASA classification 1-5+ or - E).
Make a plan for anaesthesia based on the information obtained.

Preparation of the patient
- Explain the procedure to the patient and ensure understanding
- Ensure informed consent form is signed
- Weight of every patient should be taken
- Check site and side of the operation
- Check period of fasting
- Remove
  - Ornaments /prosthesis that may injure the patient
  - Make ups that may interfere with monitoring
- Rest of preparation according to condition of the patient and nature of the operation (Condition of deficits / imbalances should be corrected, control chronic conditions)

Ability of the patient to withstand the stresses and adverse effects of anaesthesia and the surgical procedure will depend on how well prepared he is.
The commonly used drugs in anaesthetic practice

GENERAL ANAESTHETIC AGENTS

1. **Intravenous agents**: thiopentone, ketamine, propofol

**Thiopentone**
- Solution concentration: 2.5% or 25 mg/ml
- Route: intravenous
- Dose: 3 to 5mg/kg body wt.
- Indication: induction of anaesthesia, anticonvulsant
- Contraindication: airway obstruction, shock, hypersensitivity to barbiturates, severe heart disease
- Side effects: drowsiness, depression of cardio respiratory system (in clinical doses)
- Complication: hypotension, apnoe (dose dependent), tissue necrosis in case of extravasation of the solution

**Ketamine**
- Solution concentration: 50mg/ml, 10mg/ml
- Route: intravenous, intramuscular
- Dose: I.V. 1-2mg/kg body wt
  - I.M. 5-7mg/kg body wt
- Indication: induction of anaesthesia, maintenance of anaesthesia (infusion), Analgesia
- Contraindication: hypertension, epilepsy, raised intracranial pressure e.g. head injury
- Side effects: emergency delirium, hallucinations, increased salivation, increased muscle tone
- Prevent salivation by atropine premedication, treat emergency delirium by giving diazepam
18. Miscellaneous conditions

**Propofol**
- Solution (emulsion): 1% or 10mg/ml
- Route: intravenous
- Dose: 1-2.5mg/kg body wt titrated at a rate of 4mls/sec.
- Indications: induction of anaesthesia, maintenance of anaesthesia
- Contraindication: hypersensitivity, hypotension, obstetrics, paediatrics
- Side effects: pain at site of injection

2. Inhalational anaesthetic agents

**Halothane**
A volatile liquid at room temperature
- Indication: induction of anaesthesia (in children, patients with airway obstruction)
- Maintenance of anaesthesia
- Precaution: -always use at least 30% oxygen with halothane,
  - It is safe to avoid use of adrenalin to prevent high incidence of arrhythmias
- Adverse effects which may occur include:
  - Atony of the gravid uterus
  - Postoperative shivering
  - Severe cardiopulmonary depression

**Ether**
A highly volatile and inflammable liquid
- Indication: maintenance of anaesthesia
- Side effects: nausea and vomiting, increases salivation, irritates the airway
- Precaution: -Avoid sparks e.g. diathermy, in the ether risk zone
  - Give atropine to prevent salivation

**MUSCLE RELAXANTS**
Used to provide muscle relaxation to facilitate a procedure
Precaution before using a muscle relaxant:
18. Miscellaneous conditions

- Have means of supporting the **airway** and **respiration**
- used in a patient who is unconscious e.g. general anaesthesia, or sedated

**Short acting muscle relaxant**

**Suxamethonium:**
- Solution concentration: 50 mg/ml
- Action: fast onset and short duration
- Route: intravenous or intramuscular
- Dose: 1-2mg/kg body weight
- Indication: muscle relaxation for short procedure e.g. tracheal intubation, reduction of fracture
- Contraindications: airway obstruction, hyperkalaemia conditions e.g. tetanus, burns >3days old.

**Long acting muscle relaxants**

**Pancuronium:**
- Solution concentration: 2mg/ml
- Action: slow onset and long duration (45 min.)
- Route: intravenous
- Dose: 4-6 mg initially thereafter 2mg or 0.08-0.1mg/kg
- Indication: muscle relaxants for long procedure e.g. laparotomy

**Atracurium:**
- Solution concentration: 10mg/ml
- Action: duration=20 - 40 min.
- Route: intravenous
- Dose: 0.3- 0.6 mg/kg
- Indication: muscle relaxation for operation of intermediate duration
LOCAL ANAESTHETIC AGENTS

Lignocaine:
Solution concentrations of lignocaine commonly used:
- Topical- larynx pharynx 20-40mg/ml or 100mg/ml
- Infiltration 2.5- 5mg/ml ± with adrenaline 1:2.000.000
- Nerve block 10- 20mg/ml ± adrenaline 1:2.000.000
- Spinal 50mg/ml hyperbaric solution

Action: fast onset
- Plain lignocaine 40 – 60 min
- Lignocaine with adrenaline 60 – 90 min

Dose: lignocaine with adrenaline 6-7mg/kg body weight
- Plain lignocaine 3mg/kg body weight

It is important to calculate the volume of lignocaine that could be used safely

**Note:** lignocaine toxicity-

- Signs and symptoms
  - CNS stimulation followed by depression
    - Stimulation – restlessness, tremor, convulsions
    - Depression – semi consciousness, coma
- Treatment
  - Give sufficient/ titrate IV diazepam to control convulsions
  - Thiopentone may be used e.g. 50mg
  - Oxygen is given
  - Support airway, breathing and circulation as indicated
  - Admit the patient to ward to continue treatment and observation as needed.

Bupivacaine:
Solution concentration 5mg/ml

Action: slow onset but long duration 4-6 hours or longer
Dose: 2mg/kg body weight
Indication: all regional anaesthesia except intravenous regional anaesthesia. Use hyperbaric bupivacaine solution for spinal anaesthesia.

Other drugs: Analgesics, Naloxone, Noestigmine, Atropine, Diazepam

Drugs for managing the following condition: Anaphylaxis, Cardiac arrhythmias, Pulmonary oedema, Hypotension, Hypertension, Bronchospasm, Respiratory depression, Hypoglycaemia, Hyperglycaemia, Adrenal dysfunction, Raised intracranial pressure, uterine atony, Coagulopathies: (Refer to the relevant sections)

SELECTION OF TYPE OF ANAESTHESIA FOR THE PATIENT
Consider
• Patient factors: medical state, time of last meal, mental state, wish of patient if applicable
• Surgical factors: nature of surgery, site of operation, estimated duration of surgery, position in which the surgery is to be performed
• Anaesthetic factors: availability of drugs, experience and competence of the anaesthetic provider

TECHNIQUES OF GENERAL ANAESTHESIA
Requirements for all:
• Take and record baseline vital signs
• Establish intravenous line and commence infusions

1. General anaesthesia with spontaneous respiration
Induce anaesthesia by:
• Intravenous route (adults)
18. Miscellaneous conditions

Or
- Inhalation route (children, patient with difficult airway)

**Maintenance**
- Secure a clear airway using an oropharyngeal airway
- The mask is placed on the face
- Titrate concentration of inhalation against response of the patient
- Monitor, record every 5 min. or more frequently, BP, Pulse, Respiration, Colour, oxmetry

**Indication:**
- This technique may be used for operations on limbs, perinium, superficial wall of chest and abdomen
- Suitable for operations lasting less than 30 min

2. **General anaesthesia with controlled ventilation**

**Induce** anaesthesia:
- Intravenous/ inhalation (see above)
- Tracheal intubation
  - when spontaneously breathing (for children) or
  - under relaxation by suxamethonium and laryngoscopy
  - confirm correct tube placement by presence of breath sounds on both chest sides
  - connect the breathing / delivery system to the endotracheal tube

**Maintenance**
- Titrate concentration of inhalation agent against response of the patient
- A selected long acting muscle relaxant is given
- Intermittent positive pressure ventilation is done
- Monitor vital signs (as above)
18. Miscellaneous conditions

- At the end of the operation when the patient shows signs of respiratory effort, Neostigmine is given to reverse the effects of the long acting muscle relaxant.

**Indication:**
All operations that require a protected airway and controlled ventilation e.g. intraabdominal, intrathoracic and intracranial operations.

3. Rapid sequence induction of general anaesthesia

Also called crash induction.
For patients with "full stomach" and at risk of regurgitation e.g. emergency surgery, distended abdomen.

**Crash induction steps**
- Establish an intravenous line and commence infusions
- Preoxygenation for > 3 min.
- Induce with selected intravenous anaesthetic agent
- Assistant applies cricoid pressure
- IV suxamethonium is given
- Laryngoscopy is done
- Trachea is intubated and correct tube placement confirmed
- The cuff of the endotracheal tube is inflated then cricoid pressure released
- The position of the tube is fixed by strapping and an airway is inserted.

Then connect to breathing circuit/system to maintain anaesthesia.
TECHNIQUES FOR REGIONAL ANAESTHESIA

Detailed knowledge of anatomy, technique, and possible complications is important for correct injection placement.

Preoperative assessment and preparation of the patient should be done.

Patient refusal and local sepsis are the only absolute contraindications.

Select the appropriate technique for operation.

Precautions:
- Discuss the procedure with the patient
- Identify the injection site using appropriate landmarks
- Observe aseptic conditions
- Use small bore needle which cause less pain during injection
- Select concentration and volume of drug according to the technique
- Aspirate before injection to avoid accidental intravascular injection
- Inject slowly and allow 5-10 min. for onset of drug action
- Confirm desired block effect before surgery commences
- The patient must be monitored throughout the procedure

Note:
Supplemental agents should be available for analgesia or anaesthesia if technique is inadequate.
Resuscitative equipment, drugs and oxygen must be at hand before administration of any anaesthetic.
18. Miscellaneous conditions

Management of the surgical patient with special condition

1. Internal haemorrhage
   - As may occur in ruptured spleen, ruptured tubal pregnancy
   - An emergency condition with unstable vital signs
   - Invasive surgical intervention in whatever state the patient is in is life saving
   - Do not delay operation in attempt to stabilize the patient as this may not be achieved
   - Prompt resuscitative operation is required which includes:
     1. Establish an IV line and infuse fluids rapidly
     2. Rapid sequence induction of general anaesthesia
        - Use drugs with no or minimal cardiac depression
     3. Laparotomy to achieve surgical haemostasis

2. Intestinal obstruction

Preoperative fluid therapy
   - Fluid deficit, the electrolyte abnormalities and acid-base disturbances must be corrected
   - Replace ongoing fluid losses e.g. vomit, fistula, NG-tube drainage
   - Give maintenance fluid
   - Duration, depending on urgency of surgery, may be as long as 6 hours to achieve cellular hydration
   - Monitoring outcome
     The following signs will show the effectiveness of the therapy
     - Pulse rate a gradual decline
     - BP may rise
     - Urine output good if it is 0.5 to 1ml /kg/hr
18. Miscellaneous conditions

- CVP arise of 2-3 cmH₂O with rehydration
- CNS patient more rational
- Mouth less dry
- Skin turgor increased
- The fluid to use: balanced solution e.g. Ringers Lactate. Physiological saline may be used.

Operative fluid therapy
- Blood loss, fluid aspirated from the gut and other fluid losses must be replaced
- Maintenance fluid be given 5ml/kg/hr

Postoperative fluid therapy
- Replace all fluid losses
- Maintenance fluid
- Monitor for adequate rehydration

3. Co-existing medical conditions

Principle:
The medical condition must be stabilized as much as possible before surgery

Preoperative management
- Establish whether condition is stable or unstable
- If unstable then control or correct the condition

Operative and postoperative management
- Anaesthesia technique based on condition and nature of surgery
- Maintain the stable condition

4. Hypertension

Diastolic of 90 mmHg is acceptable
If poorly controlled patient may have
- Vasoconstriction and hypovolaemia
- Exaggerated vasoactive response to stress leading to hypotension or hypertension
- Hypertensive complications under anaesthesia
18. Miscellaneous conditions

Management
- Control hypertension preoperatively
- Take antihypertensive drugs on schedule even on the day of operation
- General anaesthesia technique is preferred
- Ensure adequate-depth of anaesthesia and analgesia
  - oxygenation
  - ventilation
  - circulatory volume replacement

5. Anaemia
Condition of reduced $O_2$ carrying capacity, patient prone to hypoxia
Heart failure may occur
Hypotension or hypoxia can cause cardiac arrest
This should be corrected to acceptable level depending on urgency of surgery
Regional anaesthesia is the preferred method
If general anaesthesia is used avoid myocardial depressant e.g. Thiopentone
  - use small doses of drugs
  - use high oxygen concentration
  - intubate and ventilate except for very short procedures
  - replace blood very carefully
  - extubate patient when fully awake
  - give $O_2$ in the postoperative period

For the sickle cell anaemia the above also apply as well as avoiding use of tourniquet

6. Asthma
Avoid drugs and other factors likely to trigger bronchospasms e.g. Thiopentone
Regional anaesthesia is the preferred method
If general anaesthesia selects drugs accordingly, maintain adequate depth of anaesthesia
7. Diabetes mellitus
Achieve control using standard treatment preoperatively
If diabetic ketoacidosis - delay surgery even in emergency for 8-12 hours
- correct and control all associated disturbances
Hyperglycaemia under general anaesthesia is safer than hypoglycaemia.
Patient should be operated early in the morning where possible.
Regional anaesthesia is the method of choice where applicable

a) Minor surgery
Stop usual antidiabetic dose on the morning of surgery
Start infusion of 5% dextrose infusion rate of 2ml/min in theatre
Monitor blood sugar
Usual medication is resumed as soon as the patient is able to take orally

b) Major surgery
Control on sliding scale of insulin
Infusion of 5% dextrose started on the morning of surgery
Or
Glucose insulin potassium infusion
Monitor blood sugar ≤200mg/
19. POISONING
The entry into the body of toxic substances in amounts which cause dysfunction of body systems.

Causes
- Microorganisms (food poisoning)
- Fluids and gases (organic), eg. agricultural chemicals, petrol, paraffin, carbon monoxide
- Metal poisoning (inorganic), eg. lead, mercury, copper
- Alcohol and medicines (in excessive amounts)

For Food Poisoning, see management of food poisoning.
For Alcohol poisoning, see management of alcohol poisoning.

Introduction
If possible, refer/admit all patients showing signs of poisoning to hospital. Send a note of what is known and what treatment has been given.

Also refer/admit patients who have taken slow-acting poisons even if they appear well. These include:
- Aspirin
- Iron
- Paracetamol
- Tricyclic antidepressants, eg. amitriptyline, imipramine
- Paraquat
- Modified-release products

Even though it may not be possible to identify the poison and the amount taken, it is usually not important as:
- Only a few poisons have specific antidotes
- Few patients need active removal of the poison

Most patients must be treated symptomatically.
However, knowledge of the poison will help you anticipate the likely effects on the patient.

19.0: General measures

a) Respiration
Often impaired in unconscious patients
- Ensure the airway is cleared and maintained
  - insert an airway if available
- Position patient semi-prone to minimise risk of inhalation of vomit
- Assist ventilation if necessary

b) Blood Pressure
Hypotension is common in severe poisoning with CNS depressants. A systolic BP <70mmHg may cause irreversible brain or renal damage
- Carry the patient head down on the stretcher and nurse in this position in the ambulance
- Give oxygen to correct hypoxia
- Set up an IV infusion
Fluid depletion without hypotension is common after prolonged coma and after aspirin poisoning due to vomiting, sweating and hyperpnoea.
Hypertension is less common but may be associated with sympathomimetic poisoning, eg. amphetamines, cocaine.

c) Heart
Cardiac conduction defects and arrhythmias may occur in acute poisoning, especially with tricyclic antidepressants but these often respond to correction of any hypoxia or acidosis.

d) Body temperature
Hypothermia: may develop in patients with prolonged unconsciousness, especially after overdose of barbiturates or phenothiazines, eg. chlorpromazine, trifluoperazine.
19. Poisoning

- it may be missed unless temperature is monitored
- treat by covering the patient with a blanket

e) Convulsions

Do not treat single brief convulsions

If convulsions are prolonged or recur frequently:

- **diazepam** 10mg rectally repeated if necessary
  - child: 400 micrograms (0.4mg)/kg per dose
  - or **diazepam** 10mg slow IV repeated if necessary
  - (max: 30mg)
  - child: 200 micrograms (0.2mg)/kg
  - do not give IM
  - if IV route is not possible remove the needle of the syringe and give the dose rectally

19.1. REMOVAL AND ELIMINATION OF THE POISON

a) Removal from the stomach

- Balance the dangers of attempting to empty the stomach with the likely toxicity of any swallowed poison as determined by the type of poison and amount swallowed.
- **Gastric lavage:**
  - only useful if done within 2 hours of poisoning (except with salicylates when it may be of use within 4 hours)
  - seldom practicable or necessary before the patient reaches hospital
  - do not attempt in drowsy or comatose patients because of the risk of inhaling stomach contents (unless there is a good cough reflex or the airway can be protected with a cuffed endotracheal tube)
  - do not attempt with corrosive or petroleum products
- **Use of emetics:**
  - of limited value, not very effective and may
complicate diagnosis (especially with iron poisoning).
Only consider using:
- in fully conscious patients
- if poison is not corrosive or a petroleum product
- if poison is not absorbed by activated charcoal
- if gastric lavage is inadvisable or impossible

▸ ipecacuanha syrup 0.14% 30mL followed by 200mL water
  ⇒ child 6-18mths: 10mL older child: 15mL
  - repeat once prn after 20 minutes
  - vomiting usually occurs within 15-45 minutes of the first dose.

b) Prevention of absorption of the poison
- Oral activated charcoal can bind many poisons in the stomach and so reduce their absorption.
- It is more effective the sooner it is given but may still work up to 2 hours after poisoning (longer with modified-release products and anticholinergics).
- It is safe and especially useful for poisons toxic in small amounts, eg. antidepressants
- If patient unable to swallow the charcoal/water mixture (slurry), give by gastric lavage tube
  ▸ Give activated charcoal 50g
    ⇒ child: 25g (50g if severe)
    - the dose-form of this medicine currently available in Uganda is 250mg tablets. Grind these into a fine powder before mixing with 100-200mL of water
    (50g = 200 tablets of 250mg)

C) Active elimination of the poison
- Repeated doses of activated charcoal increase elimination of some medicines after they have been absorbed, eg. aspirin, carbamazepine, phenobarbitone, quinine, theophylline
19. Poisoning

- Give **activated charcoal** 50g repeated every 4 hours
- Treat any vomiting as this may reduce the effectiveness of the charcoal
  
  *In case of intolerance:*
- Reduce dose and increase frequency, eg. 25g every 2 hours or 10g every hour

19.2. ACUTE ORGANOPHOSPHATE POISONING

Organophosphates are ingredients of some pesticides and insecticides intended for agricultural and household use.

Poisoning occurs by ingestion, inhalation or absorption through the skin

**Causes**
- May be accidental, eg. rat poison
- Intended poisoning, ie. suicidal or homicidal
- Occupational hazard, eg. agricultural workers

**Clinical features**
- Patient may smell of the chemicals
- Constricted pupils
- Cold sweat, anxiety, restlessness
- Abdominal pain, diarrhoea and vomiting
- Twitching, convulsions
- Bradycardia
- Excessive salivation, difficulty in breathing

**Differential diagnosis**
- Other causes of poisoning
- Other causes of convulsions
- Acute infection

**Management**  
HC4
- Remove contaminated clothing
- Wash contaminated skin with lots of cold water
- Establish and maintain the airway
  - artificial respiration with air or **oxygen** may be required during the first 24 hours after poisoning
19. Poisoning

- Perform gastric lavage if the poison was ingested
- **atropine** 2mg IM or IV (according to the severity of the poisoning) *child*: 20 micrograms/kg per dose
  - repeat dose every 20-30 minutes until signs of atropinization occur (pupil dilatation, hot dry skin, dry mouth, fast pulse)

*In moderate to severe poisoning only and if not responding to atropine:*

- Add **pralidoxime mesylate** 30mg/kg IM
  - follow by 1-2 more doses at 4-6 hour intervals depending on the severity of the poisoning and response to treatment

*In very severe poisoning:*

  - the initial dose may be doubled
  - usual maximum dose: 12g/24 hours
  - the dose can also be given by slow IV (over a 5 minute period) by diluting 1g in 10-15mL of water for injection or by IV infusion (up to 500mg/hour may be required)

- Give **IV fluids** prn for dehydration, hypovolaemia and shock

**Note:**
- **pralidoxime**: only effective if given within 24 hours of poisoning

**Prevention**
- Label agricultural and domestic pesticides properly
- Store such products away from children
- Wear protective clothing when using the products
19.3. PARAFFIN & PETROLEUM PRODUCTS POISONING

Includes paraffin, petrol, paint thinners, organic solvents

**Cause**
- Accidental or intentional ingestion

**Clinical features**
- Patient may smell of paraffin/other petroleum product
- Burning sensation in mouth and throat
- Patient looks pale (transient cyanosis)
- Vomiting, diarrhoea
- Cough, dyspnoea

**Differential diagnosis**
- Other causes of poisoning
- Acute infections

**Management**

HC2

Treatment is supportive and symptomatic
- the main danger is damage to lung tissue
  - Avoid gastric lavage or use of an emetic, as this may lead to inhalation of the gastric contents causing pneumonitis
  - Give plenty of oral fluids (preferably milk)
  - **activated charcoal** may be used:
    - 50g repeated prn every 4 hours *or*
    - 25g repeated prn every 2 hours
  - Refer if complications occur, eg. pulmonary oedema, pneumonia

**Prevention**
- Store paraffin, etc. safely (eg. in a locked cupboard)
19.4. ASPRINE POISONING

Clinical features
- Hyperventilation
- Tinnitus, deafness
- Vasodilation
- Sweating
- Coma (if very severe poisoning)
- Complex acid-base disturbances

Management HC4
- Gastric lavage - worthwhile up to 4 hours after poisoning as stomach emptying is delayed
- Activated charcoal 50g repeated as needed every 4 hours or 25g repeated prn every 2 hours - to delay absorption of any remaining salicylate
- Fluid and electrolyte monitoring and management - to correct acidosis, hyperpyrexia, hypokalaemia and dehydration
- Look out for and treat hypoglycaemia: glucose 50% as IV bolus adult: 20mL child: 1mL/kg
- Anticipate and treat convulsions

19.5. PARACETAMOL POISONING

Clinical features
- As little as 10-15g (20-30 tablets of 500mg) may cause severe hepatic and renal damage
- Nausea and vomiting (usually settle within 24 hours)

Management
- If poisoning took place <2 hours before:
  - Empty the stomach to remove any remaining medicine using gastric lavage or an emetic
  - Despite few significant early symptoms, transfer patients to hospital urgently - maximal liver damage occurs 3-4 days after poisoning
If poisoning took place <12 hours before:
- Also give methionine 2.5g
  - repeat 3 times at 4 hourly intervals

### 19.6. IRON POISONING

**Clinical features**
- Commonest in children
- Nausea, vomiting, abdominal pain, diarrhoea
- Haematemesis
- Rectal bleeding
- Later: hypotension, coma, hepatic necrosis

**Management**
- **deferoxamine** 15mg/kg/hour by continuous IV infusion in sodium chloride 0.9% or dextrose 5% infusion
  - max dose: 80mg/kg/24hrs
  - dissolve initially in water for injections
  - then dilute with infusion fluid

### 19.7. CARBON MONOXIDE POISONING

Usually due to inhalation in confined spaces of smoke, car exhaust or fumes caused by incomplete combustion of fuel gases, eg. use of charcoal stoves in unventilated rooms.

**Clinical features**
- All due to hypoxia
- Headache, nausea, vomiting
- Weakness, collapse, coma, death

**Management**
- Remove person to fresh air
- Clear the airway
- Give oxygen 100% as soon as possible
- Give artificial respiration as required
  - continue until adequate spontaneous breathing starts
- Admit to hospital
19. Poisoning

- due to possibility of delayed complications

In severe poisoning:

- Anticipate cerebral oedema and treat with mannitol 20% 1g/kg by rapid IV infusion

### 19.8. BARBITURATE POISONING

**Management**

- Monitor vital signs
- Gastric lavage
- *Ipecacuanha* can be given to induce vomiting
- *Activated charcoal* may be used to adsorb the poison

### 19.9. NARCOTIC ANALGESIC POISONING

**Clinical features**

- Respiratory depression
- Pinpoint pupils
- Coma

**Management**

- *Naloxone* 0.8-2mg IV
  - *Child*: 10 micrograms/kg IV

*If respiratory function does not improve:*

- *Adult*: repeat dose every 5 minutes to a maximum of 10mg total dose
- *Child*: give one subsequent dose of 100 micrograms/kg

*If respiratory function still does not improve:*

- question the diagnosis

**Note**

- Use IM or SC route if IV not possible
  - onset of action will be slower
- *Naloxone*: doses used in acute poisoning may not be suitable for treating opioid-induced respiratory depression and sedation in palliative care and in chronic opioid use

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19.10. WARFARIN POISONING

Warfarin is an ingredient of some rat poisons.

Management
▶ Empty the stomach
▶ Give activated charcoal
   - absorbs any remaining poison
If there is major bleeding:
▶ phytomenadione (Vitamin K₁) 5mg IV
   - give very slowly

19.11. METHYL ALCOHOL (METHANOL) POISONING

Methanol is used as an industrial solvent and is an ingredient of methylated spirits.

Clinical features
- Similar to alcohol intoxication/poisoning but milder
- Symptoms do not usually appear until 12-24 hours after ingestion and may include headache, dizziness, nausea, vomiting, vasomotor disturbances, CNS depression and respiratory failure.
- Toxic metabolites may cause severe acidosis and retinal/optic nerve damage

Management
▶ Gastric aspiration and lavage
   - only of use if done within 2 hours of ingestion
▶ Correct metabolic acidosis with oral sodium bicarbonate solution 5%
   - leave the solution in the stomach
In severe cases:
▶ Give sodium bicarbonate 8.4% 50mL by slow IV
   - monitor plasma pH
▶ Give 30-35mL of alcohol 40% (eg. waragi, whisky, brandy) in 100mL of water every 3 hours until the acidosis has been corrected
   - delays oxidation of methanol to toxic metabolites
Keep the patient warm
Protect the eyes from strong light
Refer to hospital for further management

19. Poisoning

19.12. ALCOHOL (ETHANOL) POISONING
Alcohol poisoning may be acute or chronic.

a) Acute alcohol poisoning
Symptoms of alcoholic poisoning following ingestion of large amount of alcohol over a short period.

Cause
- Deliberate consumption of excessive alcohol in a short period of time
- Accidental ingestion (may occur in children)

Clinical features
- Smell of alcohol on the breath
- Excessive sweating
- Dilated pupils
- In later stages stupor and coma develop
As coma deepens the following appear:
- Thready pulse and falling BP
- Fall in body temperature
- Noisy breathing

Differential diagnosis
Other causes of coma:
- Malaria and other intracranial infections
- Diabetes mellitus
- Head injury
- Stroke (cerebrovascular accidents)
- Low blood sugar (hypoglycaemia) due to other causes
- Poisoning by other medicines, eg. narcotics
- Mental illness
Investigations
- Blood: alcohol content, glucose level
- Urine: for glucose and protein
- Lumbar puncture

Management
- Maintain a clear airway
- Take measures to reduce the special hazard of aspiration of stomach contents
- Check blood glucose level
- If indicated, treat hypoglycaemia:
  - glucose 50% 20-50mL IV bolus  child: 1mL/kg
- Assess clinical and biochemical response over the next 15 minutes and repeat glucose 50% IV prn
- Monitor hourly blood glucose levels
- Repeat glucose 50% IV prn until the patient wakes up
- If IV glucose is not available:
  - Give glucose 50% or sugar solution 50% rectally or by NGT

Once patient wakes up:
- Continue with oral glucose or sugar solution as required, until the patient can eat a meal

b) Chronic alcohol poisoning

Cause
- Heavy habitual drinking combined with poor nutrition

Clinical features
Features of malnutrition
- Weight loss
- Dry scaly skin
- Brittle discolored hair
- Pale mucous membranes

Cerebral damage
- Memory loss
- Hallucinations
- Tremors
19. Poisoning

Liver disease
- Poor appetite
- Fluid in the abdomen (ascites) as a result of cirrhosis
- Change in behaviour
  - see Alcohol Dependence Syndrome

Management
For delirium:
- **diazepam** 10-30mg rectally every 12 hours prn
- Anticipate and treat hypoglycaemia
- Refer to hospital for further management including:
  - bed rest
  - proper diet
  - treatment of thiamine deficiency
  - psychiatric assistance and counselling on alcohol, withdrawal, abstinence and lifestyle adjustment

19.13. OTHER CHEMICAL/MEDICINE POISONING

Management

For ingested poisons:
- Induce vomiting by giving ipecacuanha syrup
- Carry out nasogastric suction and gastric lavage
- Give activated charcoal
- Provide symptomatic treatment as necessary, eg. for pain, dehydration
- Refer patient to HC4 for further management if the condition deteriorates

Note
- **Ipecacuanha** may cause respiratory depression
  - do not use therefore in paraffin poisoning or in unconscious patients

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19.14. FOOD POISONING

Illness caused by consumption of food or water contaminated by certain pathogenic microorganisms
- usually affects large numbers of people, after ingestion of communal food in homes, hospitals, hotels and parties.

Causes
- Can be infective or toxic
- Infective: by bacteria, eg. *Salmonella typhimurium, Campylobacter jejuni, Bacillus cereus*
- Toxic: by toxins from *Staphylococcus aureus, and Clostridium botulinum*

Clinical features
- Nausea, vomiting
- Intermittent abdominal pain (colic) with associated diarrhoea.
- *Botulism*: paralysis of skeletal, ocular, pharyngeal and respiratory muscles
- Fever (especially if poisoning is the infective type)
- May be self-limiting
  - features disappear without specific treatment

Differential diagnosis
- Cholera
- Dysentery
- Other causes of stomach and intestinal infections

Investigations
- Good history and examination is important for diagnosis
- Stool: examination for C&S

Management:  
- Establish the cause and treat accordingly
- Give **oral or IV fluids** for rehydration as required

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19. Poisoning

- For pain, give **paracetamol** 1g every 4-6 hours
  - max daily dose: 4g
  - child: 10mg/kg per dose

  *If the poisoning is bacterial in origin and diarrhoea persists or is severe (ie. >5 stools/day, bloody and/or fever):*

- Give an **antibiotic** for 3-7 days, depending on response:
  - **cotrimoxazole** 960mg every 12 hours
    - child: 24mg/kg per dose
  - or **erythromycin** 500mg every 6 hours
    - child: 10mg/kg per dose

- or **ciprofloxacin** 500mg every 12 hours
  - ✗ contraindicated in pregnancy
    - child: 10mg/kg per dose

- Follow up patients and manage accordingly

**Prevention**
- Heat cooked foods thoroughly before eating and avoid eating cold left-over cooked foods
- Ensure adequate personal and domestic hygiene
20. ZOONOTIC DISEASES

1. Anthrax
Anthrax is an acute infectious disease caused by the bacterium *Bacillus anthracis*. Anthrax most commonly occurs in wild and domestic animals such as cattle, sheep, goats, camels, antelopes, and other herbivores, but it can also occur in humans when they are exposed to infected animals or tissue from infected animals. The incubation period is usually 1-3 days.

Transmission
Anthrax infection can occur in three forms:
- cutaneous (skin),
- inhalation, and
- gastrointestinal,

*B. anthracis* spores can live in the soil for many years, and humans can become infected with anthrax by handling products from infected animals or by inhaling anthrax spores from contaminated animal products. Anthrax can also be spread by eating undercooked meat from infected animals.

Diagnosis
Anthrax is diagnosed by isolating *Bacillus anthracis* from the blood, skin lesions, or respiratory secretions or by measuring specific antibodies in the blood of persons with suspected anthrax.

Signs and symptoms of anthrax
Symptoms of disease vary depending on how the disease was contracted, but symptoms usually occur within 7 days.

Cutaneous; Most (about 95%) anthrax infections occur when the bacteria enter a cut or abrasion on the skin, when the handling contaminated animal products (e.g. wool, hides, leather or hair products (especially gnat hair) from an infected animal.
Skin infection begins as a raised itchy bump that resembles an insect bite but within 1-2 days develops into a vesicle and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death.

**Inhalation:** Initial symptoms may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is usually fatal

**Intestinal:** The intestinal disease form of anthrax may follow the consumption of contaminated meat and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Intestinal anthrax results in death in 25% to 60% of cases

**Preventive Vaccination**

Vaccination using Human anthrax vaccine for the following groups is recommended:

- Persons who work directly with the organism in the laboratory
- Persons who bundle potentially infected animal products in high-incidence areas,

**Note:** Pregnant women should be vaccinated only if absolutely necessary

**Protocol for anthrax vaccination**

The immunization consists of three subcutaneous injections given 2 weeks apart followed by three additional subcutaneous injections given at 6, 12, and 18 months. Annual booster injections of the vaccine are recommended thereafter.

**Treatment**
Health workers / doctors can prescribe effective antibiotics such as **Ciprofloxacin** which is the medicine of choice; alternatives are **tetracycline** and **penicillin**. To be effective, treatment should be initiated early. If left untreated, the disease can be fatal.

**Public Health Measures to be instituted to prevent and control Anthrax infection**

The following public measures are **key** for quick prevention and control of anthrax infection:

- Health education and information
- Proper disposal by buying of carcasses; burning is the alternative but not recommended as this could spread spores when carcasses bursts,
- No skinning of dead animals as this allows spore formation, which can stay in soil for years and decades.
- No eating of dead carcasses.
- Restrict movement of animals and animal byproducts from infected to non-infected areas.
- Hides and skins from infected animals should be destroyed (bury, burn),
- Mass vaccination of animals is recommended in endemic areas using Animal Anthrax vaccine.

2. **Avian influenza Type A H5N1**

**Infection control and prevention of nosocomial spread of influenza A (H5N1)**

- Use high-efficiency masks in addition to droplet and contact precautions. In addition, get negative pressure room - if available
- Isolate the patient to a single room
- Beds should be placed more than 1 metre apart and preferably be separated by a physical barrier (e.g. curtain, partition). Reinforce standard precautions with droplet and contact precautions.
• Appropriate personal protective equipment (APPE) in all those entering patients' rooms
  − consists of mask (high efficiency mask if available or surgical mask),
  − gown, face shield or goggles, and gloves,
• Limit the number of Health Care Workers (HCWs) who have direct contact with the patient(s);
  − These HCWs should not look after other patients.
  − Number of other hospital employees (e.g. cleaners, laboratory personnel) with access to the environment of these patients should also be limited,
  − Designated HCWs should all be properly trained in infection control precautions.
• Limit the number of visitors and provide them with appropriate APPE and instruct them in its use
• Ask HCWs with direct patient contact to monitor their own temperature twice daily and report to hospital authorities any febrile event
• A HCW who has a fever (>38 °C) and who has had direct patient contact should be treated immediately

Case management
• Take respiratory and blood specimens for laboratory testing for influenza and other infections as clinically indicated
• Treat with a neuraminidase inhibitor such as oseltamivir phosphate (Tamiflu®)
• If clinically indicated, hospitalize patients under appropriate infection control precautions as described in previous sections.
• If a case assessed as not requiring hospitalization, educate the patient and his or her family on personal hygiene and infection control measures (e.g. hand-washing, use of a
• As resources permit, follow up non-hospitalized patients by home visits or telephone contact.
• Provide supportive care.
• Administer oxygen if required.
• As nebulizers and high-air-flow oxygen masks have been potentially implicated in the nosocomial spread of severe acute respiratory syndrome (SARS), use these measures only if clinically justified and apply them under strict infection control, including airborne transmission precautions.
• Take respiratory and blood specimens serially to check for possible bacterial infection. Consider intravenous antibiotic therapy to control secondary bacterial infections as required.
• Avoid administration of salicylates (such as aspirin) in children under 18 years of age because of the risk of Reye syndrome,
  – Use paracetamol or ibuprofen, either orally or by suppository, for management of fever as clinically indicated.
• Immunomodulators such as corticosteroids should be used only in the context of clinical trials.
• The immune response of humans with influenza A (H5N1) infection requires further study.

**Therapeutic use**
• Treatment of influenza in patients one year and above who have been symptomatic for no more than two days
• Duration of treatment is 5 days
• Dose:
20. Zoonotic diseases

- Adults and adolescents (13 years or more): 75 mg twice daily
- Children (> 1 year): <15 kg body weight; 30 mg twice daily
  15 - 23 kg body weight: 45 mg twice daily
  23 - 40 kg body weight: 60 mg twice daily
  > 40 kg body weight: 75 mg twice daily

Prophylactic use

- Indicated for chemoprophylaxis in persons 13 years and above
  - Close contact: 75 mg once daily for at least 7 days
  - Community contacts: 75 mg once daily up to 6 weeks
  - (Protection last only during the period of chemoprophylaxis)

Treatment

- Oseltamivir phosphate (Tamiflu) is effective against all subtypes of influenza viruses A (including H5N1)
- Indicated for both therapeutic and prophylactic use

Discharge policy

- Infection control preemptions for adult patients should remain in place for 7 days after resolution of fever.
- Children younger than 12 years can shed virus for 21 days after onset of illness. Therefore, infection control measures for children should ideally remain in place for this period.
- Children should not attend school during this period.
21. ORAL AND DENTAL CONDITIONS

21.0. ACUTE PERIAPICAL ABSCESS OR DENTAL ABSCESS

Infection with pus formation at the root of a tooth as a sequel to pulpitis caused by dental caries or trauma

**Causes**
- Mixed bacterial flora but mainly *Staphylococcus spp*

**Clinical features**
- Severe pain that disturbs sleep
- Facial swelling may be localized or extending to adjacent tissues
- Abscesses of the mandibular incisors or molars may discharge extra orally
- Affected tooth is mobile and tender to percussion
- Fever and headache may be present

**Differential diagnosis**
- Gingivitis
- Swelling due to trauma
- Pain due to sinusitis, Temporomandibular joint pain dysfunction syndrome or erupting wisdom teeth
- Dentine sensitivity due to thermal, tactile or osmotic stimulus

**Management**

In the absence of systemic signs and symptoms, antimicrobial therapy is usually not indicated
- Drainage and relief of the tooth out of occlusion
- Consider extraction of the infected tooth
- Endodontic therapy (root canal treatment) of the affected tooth
If systemic signs and symptoms are present, prescribe a 3-day course of:

- phenoxymethylpenicillin 500mg every 6 hours  
  child: 10-20mg/kg per dose
- or amoxicillin 250mg every 8 hours  
  child: 25mg/kg per dose
- or PPF 1MU IM daily  child: 50,000 IU/kg per dose

Analgesic

Prevention

- Prevention and early management of dental caries
- Dietary advice: Advise the patient to avoid sugary foods and soft drinks and have adequate fresh fruit and vegetables in their diet.
- Oral hygiene instructions: The patient should regularly brush their teeth after meals.

21.1. DENTAL CARIES

Sugar-dependent infectious disease resulting in cavities or holes in the teeth.

Cause

- Poor oral hygiene results in accumulation of bacteria in a plaque on the tooth surface. Acid is produced as a by-product of the metabolism of dietary carbohydrate by the plaque bacteria causing demineralization of the tooth surface. The weakened tooth structure disintegrates resulting in a cavity in the tooth.

Clinical features

- Localized toothache
- Cavitations in the teeth
- Tooth sensitivity to hot and cold stimuli
- Susceptible sites are those areas where plaque accumulation can occur unhindered e.g. pits and fissures of the posterior teeth, interproximal surfaces and teeth in malocclusion.
20. Zoonotic diseases

**Differential diagnosis**
- Dental abscess
- Referred pain from ENT infections, commonly sinusitis

**Management**
- Give an analgesic
- Refer to a dental specialist for fillings or extraction

**Prevention**
- Dietary advice: Advise the patient to avoid sugary foods and soft drinks and have adequate fresh fruit and vegetables in their diet.
- Reduction in the availability of a microbial substrate by regular brushing, preferably after every meal.
- Tooth strengthening and protection of teeth through use of fluoride rinses and application of sealants to susceptible sites.

a) **NURSING CARIES**

*Definition:* Anterior caries in the pre-school child

**Cause**
Frequent and prolonged consumption of fluid containing fermentable carbohydrates from a bottle, feeder cup or on-demand nightly breast feeding after 15 months of age.

**Clinical features**
- Lower incisors are rarely affected as they are protected during suckling by the tongue and directly cleansed by secretions from sublingual and submandibular salivary glands.
- Rapid progression of decay commencing labially and quickly encircling the teeth.
- Teeth are affected in order of eruption
Management
- Build-up of the teeth should be done using composites to restore shape and function.
- Disc affected teeth interproximally to create self-cleansing areas.
- Dietary advice: eradicate frequent on-demand liquids at night.
- Regular fluoride applications

b) RAMPANT CARIES
Definition: Rapid carious attack involving several including those surfaces that are usually caries-free (e.g. the smooth surface of a tooth).

Cause
- Frequent ingestion of sugary foods and drinks in individuals with reduced saliva flow.
- Prolonged frequent intake of sugar-based syrup medications
- Un-treated nursing caries
- Radiation Caries: Radiation for head and neck cancer may result in fibrosis of salivary glands and subsequent reduction in saliva flow. Patients often resort sucking sweets to alleviate their dry mouth, which further exacerbates the problem.

Management
- Removal of aetiological factors.
- Education, fluoride treatment, tooth restoration, endodontic therapy, extractions.

21.2. GINGIVITIS
a): ACUTE NECROTIZING ULCERATIVE GINGIVITIS (ANUG)
Also known as Vincent’s gingivitis or Vincent’s gingivostomatitis and should not be confused with Vincent’s angina. Inadequately treated ANUG will lapse into a less symptomatic form known as chronic ulcerative gingivitis
20. Zoonotic diseases

**Cause**
Fusospirochaetal complex together with gram negative anaerobic organisms

**Clinical Features**
- Swelling and erythema of the gingival margins which bleed easily when touched, causing difficulty drinking and eating.
- Painful papillary yellowish-white ulcers.
- Patient complains of metallic taste and the sensation of their teeth being wedged apart.
- Fever, malaise and regional lymphadenitis may be present.
- Is associated with poor oral hygiene, but stress and smoking act as co-factors.
- ANUG and severe and periodontitis is often associated with uncontrolled Diabetes Mellitus and debilitated patients with poor hygiene.
- ANUG may be a presenting sign of HIV infection in an otherwise apparently healthy individual.
- Rarely, in patients who are malnourished, ANUG presents with extensive destruction of the face and jaws in the severe form of Cancrum Oris or noma.

**Differential diagnosis**
- Dental abscess
- Swelling due to trauma
- Acute stomatitis
- Oral thrush
- Chemical oral ulcers

**b): CHRONIC GINGIVITIS**
Inflammatory infiltrate in response to the accumulation of undisturbed dental plaque next to the gingival margin.
20. Zoonotic diseases

**Causes**
- Mixed anaerobic and aerobic oral flora, e.g. *Streptococcus viridans*, facultative streptococci; fusiform bacteria, spirochaetes (these result in acute necrotising ulcerative gingivitis [ANUG or Vincent’s infection]); viruses, fungi
- Chemicals
- Poor oral hygiene with increase in plaque accumulation

**Clinical features**
- Swelling and erythema of the gingival margins which bleed on brushing
- Plaque and calculus (tartar) deposits adjacent to the gingival margins

**Management**

*In the absence of systemic signs and symptoms, antimicrobial therapy is not usually indicated.*
- Refer to a dentist for scaling, root planing and polishing to remove plaque and calculus deposits.
- Mouthwash consisting of warm **salt solution**
  - dissolve a 5mL spoonful of salt in 200mL warm water
  - or **hydrogen peroxide solution 6%**
    - add 15mL to a cup (200mL) of warm water
  - or **chlorhexidine solution 0.2%**
    - Repeat mouthwash 3 times daily
- Give an **analgesic** as required

*If systemic signs and symptoms present:*
- Give a 5-day course of antibiotic:
  - **Metronidazole** 400mg every 12 hours (metronidazole is contraindicated in pregnancy)
    - *child:* 10-12.5mg/kg (max: 250mg) per dose
  - **phenoxymethylpenicillin** 500mg every 6 hours
    - *child:* 10-20mg/kg per dose
  - or **PPF** 1MU IM daily
    - *child:* 50,000 IU/kg per dose

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(or erythromycin 250mg every 6 hours
child: 7.5mg/kg per dose

> Refer to a dentist for scaling root planing and polishing to remove plaque and calculus deposits.

**Prevention**

- Give instructions on oral hygiene:
  - regularly cleaning of teeth to remove plaque (atleast twice daily and preferably after every meal)
  - avoid sugary foods and soft drinks
  - regular visits to the dentist for checkups and calculus removal

Good nutrition with increased intake of vitamin C

**21.3. PERIODONTAL ABCESS**

Localized collection of pus within a periodontal pocket.

**Causes:**

- Introduction of virulent organisms into an existing pocket.
- Impaction of a foreign body e.g. a fishbone into healthy periodontal membrane

**Diagnosis:**

Needs to differentiate it from a dental abscess:

**Dental Abscess**

**Periodontal Abscess**

Associated tooth is non-vital

Associated tooth is vital

Tooth is tender to vertical percussion

Tooth is tender to lateral movements

**Management:**

- Incision and drainage under a local anaesthetic
- Debridement of the pocket with a scaler
- **Metronidazole** 400mg 8 hourly and
  **Amoxicillin** 500mg 6 hourly for 5 days
21.4. PERIODONTITIS

a): CHRONIC PERIODONTITIS

Progression of the combination of infection and inflammation of gingivitis into the deep tissues of the periodontal membrane.

Cause

Mixed microbial flora commonly B. gingivalis, B. forsythus, B. intermedius, Wolinella sp, and Fusobacter sp.

Clinical Features

- Bleeding of gums on probing and brushing
- Presence of periodontal pockets due to apical migration of the junctional epithelium beyond the enamel-cemental junction of the tooth.
- Presence of sub-gingival calculus with increased tooth mobility

b): JUVENILE PERIODONTITIS

This condition occurs in the presence of good plaque control and may be related to an immune defect.

Cause

Actinobacillus (Haemophilus) actinomycetemcomitans is the main pathogen together with Capnocytophaga sp, Eikenella corrodens and Bacteroides intermedius organisms

Clinical Features

- Progressive periodontal destruction classically in the permanent incisor and first molar regions in the presence of good oral hygiene
- The gingival around affected tooth may appear entirely normal but deep pockets are detected on probing
- Early tooth loss
Management
- Oral rinses with mouthwash consisting of **chlorhexidine solution 0.2%** 3 times daily
- Give instructions on oral hygiene
- Refer to a dentist for scaling, root planning and polishing to remove plaque and calculus deposits.

### 21.5. PERICORONITIS

Inflammation of the operculum covering an erupting tooth and occurs more commonly in association with the mandibular wisdom teeth.

**Cause**
- Usually associated with partially erupted and/or impacted third molars
- Associated trauma from a tooth in the opposing arch is usually present.

**Diagnosis**
- Pain, trismus, swelling and halitosis
- The operculum is swollen, red and often ulcerated
- Fever and regional lymphadenitis may be present

**Management**
- Operculectomy done under local anaesthesia
- Extraction of the third molar associated with the condition
- Grinding or extraction of the opposing tooth
- Application of caustic agents (trichloracetic acid and glycerine)
- Antibiotics
21.6. PULPITIS
Inflammation of the pulp of a tooth.

Cause
- Commonly presents as a complication of dental caries.
- Thermal, chemical or traumatic insult to the pulp.

Clinical Features
- Pulsatile pain that lasts for several hours and worsens at night
- Thermal sensitivity
- Tooth is very tender to percussion

Differential Diagnosis
- Referred pain of ENT origin e.g. Sinusitis
- Pain due to sinusitis, Temporomandibular joint pain dysfunction syndrome or erupting mandibular wisdom teeth
- Dentine sensitivity due to thermal, tactile or osmotic stimulus

Treatment
- Give an analgesic for pain relief
- Refer to dentist for pulpotomy, endodontic (root canal) treatment or extraction.

Prevention
- Prevention and early management of dental caries
- Dietary advice: Advise the patient to avoid sugary foods and soft drinks and have adequate fresh fruit and vegetables in their diet.
- Oral hygiene instructions: The patient should regularly brush their teeth after meals.
20. Zoonotic diseases

21.7. **STOMATITIS**

Inflammation of the lining of the mouth.

**Causes**
- Nutritional deficiency, e.g. vitamin A
- Infections:
  - Spirochaetes
  - Bacilli
  - Candida
  - Measles virus
  - Herpes simplex virus

**Clinical features**
- Inflammation of the tongue and lining of mouth - tongue is red, raw and painful
- Ulcers on the gum, palate, lips
- Thrush (in babies and HIV/debilitated patients)
- Swelling and bleeding of gums

**Differential diagnosis**
- Allergic reactions
- Lead poisoning
- Lichen planus
- Pemphigus
- Erythema multiforme

**Investigations**
- Swab the mouth for microscopy and culture and sensitivity of bacteria and fungi, though normal oral flora may give false positives
- Blood: for Rapid Plasma Reagin (RPR) test, HIV serology

**Management**

**HC2**
- Wash mouth with **salt solution**
  - dissolve 5mL spoonful of salt in a cup of warm water
  - **hydrogen peroxide solution 6%**
  - add 15mL to a cup (200mL) of warm water
- Repeat this mouthwash 3 times daily
- Continue treatment until healing takes place
Denture Stomatitis
Redness of the palate under a denture with petechial and whitish areas

Causes
• 90% cases due to Candida albicans, 9% other candida species and 1% Klebsiella
• Poor denture hygiene
• Night-time wear of dentures
• Trauma
• Increased intake of sugary foods

Differential Diagnosis
Acrylic allergy

Management
• Remove dentures at night
• Improve denture hygiene by soaking in hypochlorite cleanser and brushing fitting surface
• Replace ill-fitting dentures
• Reduce sugar intake
• Antifungal treatment: Nystatin suspension 100,000 units/ml 6 hourly, or Amphotericin suspension 100mg/ml 6 hourly

21.8. TRAUMA
Injury to the oral or dental tissues as a result of trauma.

TRAUMATIC LESIONS I
a) Fibroepithelial Polyp
Over-vigorous response to low grade recurrent trauma resulting in fibrous hyperplasia.
Diagnosis:
Well localized sessile or pedunculated lump usually located on the palate or lateral surface of the tongue.

Management:
excision biopsy and histological confirmation

b) Mucocoele
Saliva extravasation into the tissues from damage to minor salivary gland ducts. They are commonly seen in the lower labial and ventral lingual mucosa.

Diagnosis:
History of trauma and characteristic appearance

Management:
Surgical removal (recurrence may occur if there is regular trauma)

c) Ranula
A mucocoele that occurs from the sublingual gland.
Diagnosis: Blue transparent sublingual swelling
Management: Excision of the sublingual gland

TRAUMATIC LESIONS II
These simple lesions are often confused for more severe conditions like lichen planus, oral candidiasis, Pemphigus, Erythema multiforme.

a) Burns
Most common after ingestion of hot foods and are particularly seen on the palate or tongue. Chemical burns are usually due to analgesics positioned next to a painful tooth or chemicals used in restorative dentistry.

Diagnosis:
Characteristic sites related to eating, restored or painful tooth.
Management:
Reassurance that healing will occur without scarring. Topical anaesthetic may help.

b) Sharp teeth and restorations
Trauma from sharp teeth or restorations is often worsened in patients with physical or intellectual disability.

Diagnosis:
Lesion is site specific and is related to a sharp edge

Management:
Smooth the edge and/or apply a restorative material to the tooth.

c) Local Anaesthetic
Ulceration due to biting the area of anaesthetised mucosa.

Diagnosis:
Ulcer confined to the area of anaesthetised mucosa

Management:
Reassurance. May require antibiotic therapy if the area becomes secondarily infected.

TRAUMATIC LESIONS III
Trauma due to physical injury e.g. a fall, sports, road traffic accident etc

Management
• Give tetanus booster if needed.
• Check for facial fractures &/or lacerations.
• If evidence of head Injury (amnesia, loss of consciousness, neurological signs) transfer patient to hospital immediately.
(See head injuries and trauma)
Intra-oral look for soft-tissue lacerations, dento-alveolar fractures and damage to teeth.
Check for whereabouts of tooth fragments which are commonly embedded in the lip.
Examine traumatized teeth for mobility
Check occlusion especially if any teeth have been displaced.
Take radiographs of affected teeth to check for root fracture.
Avulsed permanent teeth should be re-planted immediately. Prognosis is good with immediate treatment therefore refer the patient to a dentist as soon as possible.
Suture soft tissue lacerations in 3/0 resorbable suture
Refer to an oral surgeon for reduction and immobilization of mobile teeth and alveolar fragments.
Wash mouth with warm salt solution (dissolve a 5ml spoonful of salt in 200ml of warm water) or hydrogen peroxide solution 6% (add 15ml to a cup 200ml of warm water). Repeat mouth wash 3 times daily.
For elimination of pain, give an analgesic.
Give prophylactic antibiotics if indicated.
Refer to a dentist for orthodontics, endodontic (root canal) treatment or protection of pulp.

Prevention
- Early orthodontic treatment in children with large overjets that are susceptible to trauma
- Provision of a mouth guard for sports made of vacuum formed thermoplastic vinyl.
- Be alert for evidence of child abuse.
21.9. FLUOROSIS
Fluorosis/Mottling.

**Cause**
Occurs due to long term excess of fluoride. Endemic in areas of high fluoride water content occurring naturally in the water.

**Clinical Features**
Varies from white opacities to severe pitting and discoloration due to incorporation of the excess fluoride in the enamel structure.

**Treatment**
Tooth colored (composite) fillings, veneers

**Prevention**
Monitoring of fluoride levels in drinking water
Use of fluoride-free toothpastes in endemic areas

21.10. FALSE TEETH OR “EBINYO”
Traditional beliefs in many Ugandan communities attribute diarrhea, fever and vomiting in children to the developing dentition, with the belief that if the offending teeth or “ebinyo” are not removed, the child will die.

**Facts on Ebinyo**
The practice of extraction of *ebinyo* or false teeth is based on the belief that the rubbing of herbs on the gum (in the region of the canine) or the removal of the primary and/or permanent canine tooth buds will lead to the relief of childhood fevers and diarrhea.

The prevalence reported of this practice in Uganda and neighboring countries is varied. The procedure is done as early as one month and up to three years of age. Most studies report a peak age of four to eighteen months.
20. Zoonotic diseases

Whereas infant illnesses may be attributed to the teething period, they are in fact as a result of the poor health conditions in which these children are reared.

The term “ebinyo” encompasses both the child’s ailment as well as the treatment offered by the traditional healer.

Consequences of Traditional Treatment of Ebinyo:

• Even when the procedure is aimed at removal of the primary canine, damage to the surrounding tissues is an ever-present possibility.

• The incisions in the mouth or the herbs can lead to oral sepsis, bacteraemia, anaemia and death.

• If initial cause of diarrhoea, fever and vomiting is not addressed, dehydration and death can occur.

• Depending on the extent of damage, malocclusion can result because the permanent canine may be missing, impacted or malformed.

Prevention

• Oral health education.

• Appropriate treatment of childhood illnesses.

• Provision of proper nutrition to children.

21.11. MALOCCLUSION

Malocclusion has been described as any deviation from the normal relation of the teeth in the same arch to each other and to the teeth in the opposite arch. Although the aetiology is multifactorial, malocclusion may occur as a result of discrepancies in either the craniofacial skeleton or dentition or both. The need for treatment is determined by the severity of malocclusion. The main indications for orthodontic treatment are aesthetics and function.
Reasons for treatment:
Crossbites (as associated occlusal interferences may predispose to Temporomandibular Pain Dysfunction Syndrome)
Deep traumatic overbite with palatal impingement of the mandibular incisors
Large overjets (increased risk of trauma)
Severe crowding (as this reduces periodontal support of the teeth)
While severe malocclusion can have a psychologically debilitating effect, it is often influenced by social and cultural factors.

Treatment
Removable appliance orthodontic therapy for mild cases in the mixed dentition by a dentist.
Fixed appliance orthodontic therapy for moderate to severe case in adolescents and adults by an orthodontist.
Severe orthodontic cases with discrepancies in the craniofacial skeleton may require orthognathic surgery by an oral and maxillofacial surgeon.

21.12. HIV/AIDS ASSOCIATED ORAL LESIONS
a): Oral Candidiasis
   This is caused primarily by Candida albicans.
   Intractable oral and oesophageal candidiasis can present as pseudomembranous, hyperplastic or erythematous. Angular cheilitis is also common.

Treatment
Nystatin tablets 100,000 units. Dissolve in mouth 4 times daily for 7-14 days after meals.
b): Herpes Infections
Both simplex and zoster infections can affect the face and oral cavity. The clinical presentation of herpes zoster includes multiple small vesicles (2-3mm) that ulcerate and coalesce to form larger ulcers on the oral mucosa commonly on the vermillion border, gingiva, dorsal tongue, and hard palate. Facial or oral lesions of herpes zoster may arise in the areas supplied by the branches of the trigeminal nerve. They always present as a unilateral lesion and never cross the midline.

Diagnosis:
Pre-eruption pain followed by the development of painful vesicles on the skin or oral mucosa that rupture to give rise to ulcers or encrusting skin wounds in the distribution outlined above. Post herpetic neuralgia may continue for years.

Treatment
Acyclovir 200-400mg 5 times daily for 7-10 days.
Symptomatic management: analgesics, topical anaesthetic (e.g. lidocaine)

c): Acute Necrotizing Ulcerative Gingivitis
- see section on gingivitis

d): Kaposi's Sarcoma
A malignancy of vascular endothelium which until the advent of AIDS was seen only occasionally in Jews and immune suppressed patients. It presents as a painless purplish swelling on the skin. In the mouth, the palate is the most frequent site.

Management:
Biopsy to confirm histology then refer for chemotherapy.
e): Persistent Submandibular and/or Cervical Lymphadenopathy
Otherwise inexplicable lymphadenopathy larger than 1cm in diameter and persisting for more than three months. May be prodromal or a manifestation of AIDS

f): Hairy leukoplakia
Clinically hairy leukoplakia may present as an adherent white, corrugated plaque, usually found bilaterally on the borders of the tongue.

Treatment
Podophyllin rosin 25%, apply to lesion once weekly if necessary

21.13. Burkitt's lymphoma
OFTEN PRESENTS AS A TOOTH ACHE IN THE MAXILLA
Teeth are mobile
Extractions do not relieve the swelling
Associated with poor social economic status

Burkitt lymphoma (or "Burkitt's tumor", or "Malignant lymphoma, Burkitt's type") is a cancer of the lymphatic system (in particular, B lymphocytes). It is named after Denis Parsons Burkitt, a surgeon who first described the disease in 1956 while working in equatorial Africa.

Classification
Currently Burkitt's lymphoma can be divided into three main clinical variants: the endemic, the sporadic and the immunodeficiency-associated variants

The endemic variant occurs in equatorial Africa. It is the most common malignancy of children in this area. Children affected with the disease often also had chronic malaria which is believed to have
reduced resistance to Epstein-Barr virus (EBV) allowing it to take hold. The disease characteristically involves the jaw or other facial bone, distal ileum, cecum, ovaries, kidney or the breast.

- The **sporadic type** of Burkitt lymphoma (also known as “non-African”) is another form of non-Hodgkin lymphoma found outside of Africa. The tumor cells have a similar appearance to the cancer cells of classical African or endemic Burkitt lymphoma. Again it is believed that impaired immunity provides an opening for development of the Epstein-Barr virus. Non-Hodgkins, which includes Burkitt’s, accounts for 30-50% of childhood lymphoma. Jaw is less commonly involved, comparing with the endemic variant. Ileo-cecal region is the common site of involvement.

- **Immunodeficiency-associated** Burkitt lymphoma is usually associated with HIV infection or occurs in the setting of post-transplant patients who are taking immunosuppressive drugs. Actually, Burkitt lymphoma can be the initial manifestation of AIDS.

**Treatment**

Effect of chemotherapy, as with all cancers, depends on the time of diagnosis. With faster growing cancers, such as this one, the cancer actually responds faster than with slower growing cancers. This rapid response to chemotherapy can be hazardous to patient as a phenomenon called "tumor lysis syndrome" could occur. Close monitoring of patient and adequate hydration is essential during the process.
Chemotherapy
- cyclophosphamide
- doxorubicin
- vincristine
- methotrexate
- cytarabine
- ifosfamide
- etoposide
- rituximab

Other treatments are:
- immunotherapy
- bone marrow transplants
- surgery to remove the tumor
- radiotherapy.

Epidemiology
Of all cancers involving the same class of blood cell, 2% of cases are Burkitt's lymphoma.
22. HEPATIC AND BILIARY DISEASES

22.0. ACUTE CHOLECYSTITIS

Inflammation of the gall bladder - a surgical emergency

**Chronic cholecystitis**

Acute cholecystitis can become chronic
- requires surgical treatment in hospital

**Causes**

- Obstruction of gall bladder duct by gall stones (calculi)
- May occur after major trauma, burns or surgery
- Occurs in HIV infected persons as acalculous cholecystitis

**Clinical features**

- Sudden onset of pain and tenderness in the right upper quadrant of the abdomen
  - pain worsens on deep breathing
- Nausea and vomiting
- Jaundice (sometimes)
- Low grade fever (38°-39°C) with chills

The severity of acute cholecystitis is classified into three grades.

**Grade I (mild acute cholecystitis)** is defined as acute cholecystitis in a patient with no organ dysfunction and limited disease in the gallbladder, making cholecystectomy a low-risk procedure.

**Grade II (moderate acute cholecystitis)** is associated with no organ dysfunction but there is extensive disease in the gallbladder, resulting in difficulty in safely performing a cholecystectomy. Grade II disease is usually characterized by an elevated white blood cell count; a palpable, tender mass in the right upper abdominal quadrant; disease duration of more than 72 h; and imaging
22. Heptic and Biliary diseases

studies indicating significant inflammatory changes in the gallbladder.

**Grade III (severe acute cholecystitis)** is defined as acute cholecystitis with organ dysfunction.

**Differential diagnosis**
- Acute alcoholic hepatitis
- Intestinal obstruction

**Investigations**
- X-ray, abdominal ultrasound
- Blood: haemogram, liver tests, pancreatitis enzymes and renal function tests.

**Management**
- Nil by mouth
- Relieve pain
- Rehydrate with **IV fluids** and **electrolytes**
- Broad spectrum antibiotic: eg. **ampicillin** 1-2g IV or IM every 6 hours for up to 7 days
  - **Child**: 25-50mg/kg per dose
  - When possible switch to oral **amoxicillin** 500mg-1000mg every 8 hours to complete the course
  - **Child**: 15mg/kg (max: 500mg) per dose
- **plus gentamicin** 5-7mg/kg IV daily in divided doses
  - **Child**: 2.5mg/kg IV every 8 hours
  - **contraindicated in pregnancy**
- Refer to hospital within 2-3 days for surgery (cholecystectomy)

**22.1. CIRRHOSIS**

Liver disease causing irreversible damage. clinically it can be classified as compensated or decompensated. Decompensated cirrhosis is defined by the presence of ascites, variceal bleeding, encephalopathy, or jaundice, which are complications that result from the main
consequences of cirrhosis: portal hypertension and liver insufficiency.

**Causes**
- Infections, eg Viral Hepatitis B and D, Hepatitis C.
- Intoxication with Alcohol, drugs or toxins, eg methotrexate, Isoniazide, methyl dopa.
- Infiltrative disorders, eg. Non alcoholic fatty liver disease, Wilson’s disease, haemochromatosis.
- Immunological; Chronic autoimmune hepatitis.
- Idiopathic
- Congestion with bile eg. primary biliary cirrhosis (PBC)
- Congestion with blood e.g. chronic cardiac failure, Budd chiari syndrome.

**Clinical features**
- Fatigue, weight loss, features of malnutrition
- Jaundice, features of encephalopathy
- Swelling of abdomen (ascites) +/- oedema
- Enlarged spleen

**Differential diagnosis**
- Diffuse hepatic parenchymal disease
- Metastatic or multifocal cancer in the liver
- Renal disease
- Hepatic vein obstruction
- Any cause of enlarged spleen
- Heart failure
- Chronic inflammation of the pancreas

**Investigations**
- Blood: Hb, film, WBC, platelets, prothrombin time (INR) serology (hepatitis B, C, and D), HIV serology
- Stool and urine
- Abdominal ultrasound
- Liver: liver function tests, Alpha feto protein and biopsy
- Endoscopy

HC4

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1. Ascites

Ascites: pathological accumulation of fluid in the peritoneal cavity.

Uncomplicated ascites: Ascites that is not infected and not associated with Hepatorenal syndrome—reduced urinary output (<500ml in 24hrs in adults), abnormal renal function test and ascites not improving on treatment

Grade 1 Ascites (mild). Ascites is only detectable by ultrasound examination

Grade 2 Ascites (moderate). Ascites causing moderate symmetrical distension of the abdomen

Grade 3 Ascites (severe). Ascites causing marked distension abdominal distension
Clinical diagnosis:
fluid thrill (fluid wave), shifting dullness, peritoneal
tap (paracentesis) and analysis of fluid.

Other investigations:
Abdominal ultrasound scan, endoscopy, Liver
function tests, Complete blood count, Renal
function tests, serum Sodium & serum Potassium

Management

- Diet;
  1. Restrict dietary salt to a no add salt diet or
     low salt diet.
  2. Avoid protein malnutrition (associated with
     higher mortality) so allow liberal plant proteins
     and occasional animal proteins (titrate to
     symptoms & signs of hepatic encephalopathy).
  3. Water restrict if has oedema and hyponatremia.
  4. Abstain from alcohol.
  5. Avoid NSAIDS and Herbs.
- Daily monitoring; daily weight, BP, Pulse, stool
  for melaena, encephalopathy
- Diuretics; Spironolactone is the main stay of
diuretic therapy. Use spironolactone (50-100
mg/day in the morning) to reach goal of weight
loss: 300-500 g/day. If needed, doses to be
increased every 7 days up to maximum of 400
mg/day of spironolactone. Furosemide can be
added at a starting dose of 20-40 mg/day and
subsequently increased to 160 mg/day if needed
(monitor for hypotension and best used if pedal
oedema is present). For maintenance it best
titrate to the lowest diuretic dose. Most patients
do well with spironolactone 50mg/day if the have
no ascites.
Drainage
Indicated for severe ascites (grade 3). Paracentesis is always followed by spironolactone.
How much should you tap?
- Small volume: less than 5 litres in 3-4 hours,
- Large volume: 5 to 10 litres with infusion of a plasma expander (e.g., 8 g albumin per liter of ascites removed). Monitor for hypotension.

Don’t keep the patient
Refer if patient has or develops complicated ascites.
More than 50% of patients with complicated ascites die within two years.

Spontaneous bacterial peritonitis (SBP)
Medical emergency occurring in up to 20% of patients with ascites admitted to hospital and should be suspected when ascites increases in severity, particularly in the presence of fever, abdominal pain, abdominal tenderness and worsening encephalopathy. It is also a cause of renal failure, bleeding varices and death. The diagnosis is confirmed by an ascitic tap and cell counts. A neutrophil count of >250/μL in ascitic fluid confirms the diagnosis. Treat with IV antibiotics for 5-10 days. Empirical therapy includes use of IV ciprofloxacin or IV ceftriaxone or IV augmentin. May add metronidazole to the above. Avoid gentamycin and NSAIDs. Give albumin infusion 1g/kg to prevent hepatorenal syndrome. Refer as soon as possible.

2. Hepatic encephalopathy (HE)
Hepatic encephalopathy is a syndrome of neuropsychiatric symptoms and signs, including coma.
Grade 0 subclinical HE - construction apraxia
Grade I confusion, flap tremor
Grade II drowsy
Grade III stuporous
Grade IV coma
Management involves addressing possible pathophysiological mechanisms related to brain, gut, and liver

**Brain**
Treatment involves recognition and correction of precipitating factors including renal impairment, gastrointestinal bleeding, infections and electrolyte disturbances. Encephalopathy may be aggravated by surgery, parenteral nutrition, excessive diuretics, sedatives and opioid analgesics. Intracranial hypertension and sepsis are the main cause of death.

**Gut - Empty the gut**
Give oral lactulose 15-30mL every 8 hours until the condition resolves (aim at 2-3 soft stools/day). Lactulose can be administered through a nasogastric tube (grade 1 and 2) or as an enema in patients with acute HE (grade 3 and 4).
- Give an antibiotic with a local action on the gut, oral metronidazole 400-800mg every 8 hours for 5 days, or oral paromomycin 1000 mg every 6 hours for 5 days.
- Refer to a specialist

**3. Bleeding varices**
- Resuscitate with IV fluids
  - blood transfusion may be required in severe anaemia
- Refer to hospital for further management
22. Hepatic & biliary diseases

22.2. VIRAL HEPATITIS

A condition characterised by inflammation of the liver due to hepatitis viruses may be acute (hepatitis A,B,C,D, E and yellow fever or chronic (hepatitis B and D, C). May be symptomatic or asymptomatic.

Clinical features
- Abdominal discomfort, nausea, diarrhoea
- Malaise
- Enlarged liver and tenderness, pain over the liver area
- Jaundice
- Fever
- Anorexia
- Joint pain
- Urticaria

Differential diagnosis
Includes:
- Other causes of hepatitis e.g. drugs, herbs, tumours, and autoimmune diseases
- Gastroenteritis
- Relapsing fever
- Pancreatitis
- Malaria
- Leptospirosis, Haemorrhagic fevers e.g. Marburg and ebola

Investigations
- Blood:
  - Haemogram
  - slide for malaria parasites
  - liver tests
  - serum for viral antigens and antibodies; Hepatitis B, Hepatitis C and HIV serology.

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Management of Acute Viral Hepatitis

- Admit (only if patient condition is poor)
- Ensure effective infection control measures, e.g. institute barrier nursing, personal hygiene
  - **patient isolation is not necessary unless there is high suspicion of viral haemorrhagic fevers**
- Diet: high in carbohydrates and vitamins allow vegetable proteins,
  - Avoid drugs generally, but especially sedatives and hepatotoxic drugs
Refer if patient has features of liver failure or decompensated liver disease.

**Chronic Hepatitis**

**Chronic Hepatitis B Infection**

Diagnosis
- Hepatitis B surface antigen Positive at 0 and 6 months,
- Hepatitis B core antibody (Negative IgM and Positive IgG).

**Laboratory tests**

HIV serology, liver tests, alpha fetoprotein, abdominal ultrasound, Hepatitis B panel; Hepatitis B surface antigen, e-antigen status, Hepatitis B core antibody (IgM & IgG)

**Prevention**

Vaccination of all individuals at risk e.g. health workers, Hepatitis B positive parents and all those coming from high endemic areas

Refer to the vaccination section
22. Hepatic & biliary diseases

Refer to a regional hospital or higher for the attention of specialist

**Hepatitis B, HIV coinfection**

**Diagnosis**
- Hepatitis B surface antigen positive and HIV serology reactive

Refer to a regional hospital or higher for the attention of specialist

**Chronic Hepatitis C infection**
- Anti hepatitis C antibody positive at 0 and 6 months

Refer to a regional hospital or higher for confirmatory investigations and treatment.

**Drug induced liver injury**
- Diagnosis of exclusion
- Any patient who has evidence of liver enzyme elevation that cannot be attributed to infections, autoimmune disease or malignancy
- Patient exposed to a drug or herbal medication known to cause liver cell injury
- Patients may present with skin or mucosal drug reactions

**Common drugs**: phentoin, carbamazipine, anti tuberculosis drugs, septrin, diclofenac, paracetamol, antiretroviral drug and others.

**Management**
Stop all drugs or herbs
Do not give the drug again (do not rechallenge!)
Refer to a regional hospital or higher for attention of the specialist
Hepatocellular carcinoma

Presents with right upper quadrant pain, hepatomegaly +/- splenomegaly, fever, weight loss, jaundice, ascites, and lymphadenopathy. Risk factors include Hepatitis B, aflatoxin and cirrhosis

Differential diagnosis
- Liver metastasis
- Liver abscess
- Hydatid cyst
- Hematological disease

Investigations
- Abdominal ultrasound (sonogram)
- Alpha fetoprotein
- Liver tests
- Liver biopsy

Refer to a regional hospital or higher.
23. CHILDHOOD ILLNESS

This chapter is adapted from Management of Childhood Illness, MoH 2000 which should be consulted for more detailed information and management flow charts.

The following guidelines use a syndromic approach to the management of common childhood conditions (Integrated Management of Childhood Illness - IMCI) and should be followed page by page. The general approach used involves 5 main steps:

- Assess the child
- Classify the illness
- Identify and provide the required treatment
- Counsel the mother
- Provide follow-up support

23.1. Sick Child (Age 2 months to 5 years)

1. Assess, classify and treat

- Ask the mother what the child’s problems are
- Check if this is an initial or follow-up visit for this problem
  - if follow-up visit:
  - if initial visit: continue as below
- **Check for general danger signs** where the child:
  - is unable to drink or breastfeed
  - is vomiting everything
  - has had convulsions
  - is lethargic or unconscious
- If any of these danger signs is present:
  - Give the child **urgent** attention
  - Complete the assessment
  - Give required pre-referral treatment immediately to avoid delay
  - Treat any current convulsion with **diazepam**
  - Refer urgently as required
Ask about main symptoms:
  a) cough or difficult breathing
  b) diarrhea
  c) fever
  d) ear problem

Then check for malnutrition and anaemia and other problems

a) If child has cough or difficult breathing:
- Ask for how long child has had this
- Ensure the child is calm then:
- Count the number of breaths/minute
- Look for chest indrawing and look/listen for stridor
- Classify and treat as in the table opposite
### 23. Childhood illnesses

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| • Any general danger sign (p490)                                   |                                   | ▶ Give 1st dose of **cotrimoxazole**  
▶ Give vitamin A  
▶ Refer urgently                                                   |
| • Chest indrawing or stridor in calm child                         | SEVERE PNEUMONIA or VERY SEVERE DISEASE |                                                                                               |
| Fast breathing:  
  2-12mths: 50 bpm  
  12mths-5yrs: 40 bpm                                                | PNEUMONIA                        | ▶ Give **cotrimoxazole** for 5 days  
▶ Give vitamin A  
▶ Soothe throat/relieve cough  
▶ Advise mother when to return immediately  
▶ Follow up in 2 days                                               |
| None of above signs                                                | NO PNEUMONIA, COUGH or COLD      | ▶ If cough >30 days:  
  - refer for assessment  
▶ Soothe throat/relieve cough  
▶ Advise mother when to return immediately  
▶ If not improving:  
  - follow up in 5 days                                             |

*If referral is not possible, manage as on*
23. Childhood illnesses

b) If child has diarrhoea:

- Ask for how long child has had this
- Using appropriate local terms, ask if there is blood in the stool
- Look at the child’s general condition, is the child:
  - lethargic or unconcious?
  - restless and irritable?
- Look for sunken eyes
- Offer the child fluid, is the child:
  - unable to drink or drinks poorly?
  - thirsty, drinks eagerly?
- Pinch the skin of the abdomen, does it go back:
  - very slowly? (>2 seconds)
  - slowly?
- Classify and treat as in the table opposite and over

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any 2 of these signs:</td>
<td></td>
<td>▶ If child has no other severe classification:</td>
</tr>
<tr>
<td>• Lethargic or unconcious</td>
<td>SEVERE DEHYDRATION</td>
<td>• give Plan C</td>
</tr>
<tr>
<td>• Sunken eyes</td>
<td></td>
<td>▶ If child also has another severe classification:</td>
</tr>
<tr>
<td>• Unable to drink or drinks poorly</td>
<td></td>
<td>• Refer urgently with mother giving frequent sips of ORS on the way</td>
</tr>
<tr>
<td>• Skin pinch returns very slowly (&gt;2 seconds)</td>
<td></td>
<td>• Advise mother to continue b/feeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ If child ≤2yrs and there is cholera in your area:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• give 1st dose of cotrimoxazole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Give Plan B</td>
</tr>
<tr>
<td></td>
<td>SOME DEHYDRATION</td>
<td>▶ If child also has another severe classification: manage as above</td>
</tr>
</tbody>
</table>

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## 23. Childhood illnesses

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Thirsty, drinks eagerly</td>
<td></td>
<td>▶ Advise mother when to return immediately</td>
</tr>
<tr>
<td>• Skin pinch returns slowly</td>
<td></td>
<td>▶ If not improving: follow up in 5 days</td>
</tr>
<tr>
<td>• Not enough signs to classify as some or severe dehydration</td>
<td>NO DEHYDRATION</td>
<td>▶ Give Plan A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Advise mother when to return immediately</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ If not improving: follow up in 5 days</td>
</tr>
<tr>
<td><strong>and if diarrhoea of 14 days:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Dehydration present</td>
<td>SEVERE PERSISTENT DIARRHOEA</td>
<td>▶ Give vitamin A Treat dehydration before referral (unless child has another severe classification) Refer</td>
</tr>
<tr>
<td>• No dehydration</td>
<td>PERSISTENT DIARRHOEA</td>
<td>▶ Advise mother on feeding child with this condition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Give vitamin A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Follow up in 5 days</td>
</tr>
<tr>
<td><strong>and if blood present in the stool:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Blood in stool</td>
<td>DYSENTERY</td>
<td>▶ Give cotrimoxazole for Shigella for 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Follow up in 2 days</td>
</tr>
</tbody>
</table>

The current recommendation for treatment of diarrhoea is ORT with low osmolarity oral rehydration salts (ORS) and zinc salts (Zn sulphate, Zn gluconate or Zn acetate).

Give zinc (10 - 20 mg) daily for 10 days.
Give 20 mg per day for children above 6 months of age and 10mg per day for children below 6 months of age.
23. Childhood illnesses

c) If child has fever:
by history or feels hot or temperature 37.5°C
(see note 1 in table over)
- Ask for how long child has had this:
  - if >7 days, ask if fever been present every day
- Ask if the child has had measles in the last 3
  months
- Look/feel for stiff neck
- Look for signs of measles:
  - generalised rash
  - one of these: cough, runny nose, red eyes
If child has measles now or had measles in last 3
months:
- Look for mouth ulcers – are they deep or
  extensive?
- Look for pus draining from the eyes
- Look for clouding of the cornea
- Classify and treat as in the table over

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| Any general danger sign or     | VERY SEVERE FEBRILE DISEASE  | ▶ Give 1st dose of quinine for severe malaria  
   Stiff neck                                                   |                                                                                   |
| Fever - by history or          | MALARIA                      | ▶ Give 1st line malaria treatment. - oral CQ + SP  
   - feels hot or                                                      |                                                                                   |
|   - temperature 37.5°C         |                              | ▶ Give one dose of paracetamol  
                                                                 10mg/kg for high fever (38.5°C)                                                  |
|                                |                              | ▶ Advise mother when to return immediately  
                                                                 |                                                                                   |
|                                |                              | ▶ If fever persists:  
                                                                 - follow up in 2 days                                                          |
|                                |                              | ▶ If fever every day for >7 days: refer for assessment                             |

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23. Childhood illnesses

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>If measles now or in last 3 months, classify as:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| • Any general danger sign or | SEVERE COMPLICATED MEASLES | ▶ Give vit A  
▶ Give 1st dose of cotrimoxazole  
▶ If clouding of cornea or pus draining from eye: apply Tetracycline Eye Ointment  
▶ Refer |
| • Clouding of cornea or | | |
| • Deep or extensive mouth ulcers | MEASLES + EYE OR MOUTH COMPLICATIONS | ▶ Give vitamin A  
▶ If pus draining from eye: apply Tetracycline Eye Ointment  
▶ If mouth ulcers: apply Gentian Violet paint  
▶ Follow up in 2 days |
| • Pus draining from eye or | MEASLES | ▶ Give vitamin A |
| • Mouth ulcers | | |
| • Measles now or in last 3 months | | |

Notes:
1. Body temperatures are based on axillary measurement  
   - Rectal readings are approximately 0.5°C higher
2. **TEO** = tetracycline eye ointment
3. Other measles complications (ie. pneumonia, stridor, diarrhoea, ear infection & malnutrition) are classified in other tables

**d) If child has an ear problem:**
- Ask if there is ear pain
- Ask if there is discharge:  
  - If yes, ask for how long has there been a discharge?
- Look for pus draining from the ear
- Feel for tender swelling behind the ear
## 23. Childhood illnesses

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tender swelling behind the ear</td>
<td>MASTOIDITIS</td>
<td>▶ Give 1st dose of <strong>cotrimoxazole</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Give 1st dose of <strong>paracetamol</strong> for pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Refer urgently</td>
</tr>
<tr>
<td>Ear pain or Pus seen draining from the ear and discharge reported for</td>
<td>ACUTE EAR</td>
<td>▶ Give <strong>cotrimoxazole</strong> for 5 days</td>
</tr>
<tr>
<td>&lt;14 days</td>
<td>INFECTION</td>
<td>▶ Give <strong>paracetamol</strong> for pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Dry ear by wicking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Follow up in 5 days</td>
</tr>
<tr>
<td>Pus seen draining from the ear and discharge reported for 14 days</td>
<td>CHRONIC EAR</td>
<td>▶ Dry ear by wicking</td>
</tr>
<tr>
<td></td>
<td>INFECTION</td>
<td>▶ Follow up in 5 days</td>
</tr>
<tr>
<td>No ear pain, No discharge seen</td>
<td>NO EAR</td>
<td>No additional treatment needed</td>
</tr>
<tr>
<td></td>
<td>INFECTION</td>
<td></td>
</tr>
</tbody>
</table>

### e) Check for malnutrition and anaemia

- Look for severe wasting, palmar pallor (severe or some?), oedema of both feet; is the child a sickler?
- Determine weight for age (WFA)
## 23. Childhood illnesses

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Visible severe wasting or</td>
<td>SEVERE MALNUTRITION or SEVERE</td>
<td>▶ Give <strong>vitamin A</strong></td>
</tr>
<tr>
<td>• Severe palmar pallor or</td>
<td>ANAEMIA or VERY LOW WFA</td>
<td>▶ Refer urgently</td>
</tr>
<tr>
<td>• Oedema of both feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Some palmar pallor or</td>
<td></td>
<td>▶ Assess child’s feeding &amp; counsel mother</td>
</tr>
<tr>
<td>• Very low WFA (see notes over)</td>
<td></td>
<td>- <em>if feeding problem</em>: follow up in 5 days</td>
</tr>
<tr>
<td>• Not very low WFA and</td>
<td></td>
<td>▶ Give <strong>mebendazole</strong></td>
</tr>
<tr>
<td>• No other signs of malnutrition</td>
<td></td>
<td>▶ If pallor: give <strong>iron</strong> if child not a sickler - If child a sickler: give folic acid - give 1st line oral antimalarial treatment - Advise mother when to return immediately - <em>If pallor</em>: follow up in 14 days - <em>If very low WFA</em>: follow up in 30 days</td>
</tr>
</tbody>
</table>

### Notes on table

**Mebendazole**: (only give the medicine if child 1 year and no dose given in last 6 months)

**WFA**: Use the graph on to determine weight for age status
23. Childhood illnesses

f) Check immunization

g) Check vitamin A supplementation

If child 6 months: ask if child had vitamin A in past 6 months, if not, give vitamin A

h) Check deworming

If child 1 year: ask if child had mebendazole in past 6 months, if has not had: give mebendazole

i) Assess other problems

- Ensure child with any danger sign is referred as soon as possible after giving:
  - the initial dose of the appropriate antibiotic
  - any other urgent treatments

Note: referral may not be necessary if rehydration of a dehydrated child using Plan C has resolved danger signs

j) Assess feeding (if anaemia, very low weight or child <2 years old)

- Ask about the child’s usual feeding and feeding during the current illness
- Compare the answers given with the Feeding Recommendations for the child’s age

Ask:
- Do you breastfeed the child? If yes,
  - how many times during the day?
  - how many times at night?
- Do you give the child any other food or fluids? If yes,
  - what food or fluids?
  - how many times daily?
  - what do you use to feed the child?
  - what foods are available in the home?

If very low weight for age:
- how large are servings?
- does the child receive his/her own serving?
23. Childhood illnesses

- who feeds the child and how?
- During this illness, has the child’s feeding changed?
- if yes, how?

2. Give the following treatments in clinic only

For each:
- Explain to the mother why the medicine is needed
- Calculate the correct dose for the child’s weight or age
- Use a sterile needle and syringe for injections
- Accurately measure and administer the dose
- If referral is not possible:
  - follow the instructions given

a) Procaine penicillin (once daily IM for 5 days)
   
   2mths-<5yrs: 50,000 IU/kg
   
   - Used as 3rd line treatment of acute ear infection, very severe disease and pneumonia
   - ie. when the 2nd line medicine amoxicillin is not available or child cannot swallow oral medication

b) Chloramphenicol (every 12 hours IM)
   
   2mths-<5yrs: 40mg/kg
   
   - Used for children being referred urgently who cannot take an oral antibiotic
   - Give first dose then refer urgently

   If referral not possible:
   - Repeat dose every 12 hours for 5 days
   - Then change to an appropriate oral antibiotic to complete 10 days treatment

c) Quinine
- Used for severe malaria

d) Diazepam
- Rectal diazepam is used to treat convulsions
23. Childhood illnesses

e) Prevention of low blood sugar

If the child is able to breastfeed:
- Ask mother to breastfeed the child

If the child is unable to breastfeed but can swallow:
  ▶ Give 30-50mL of expressed breastmilk or a breastmilk substitute, eg. fresh cow’s milk, before the child leaves the clinic
  - If neither of these is available, give 50mL sugar water

To make sugar water:
  - Dissolve 5g sugar (1 level teaspoon) in 50mL of clean water or
  - If no measure is available:
    - Dissolve 20g sugar (4 level tsp) in a mug (200mL)
      - of clean water and give 50mL (a quarter) of this

If child unable to swallow:
  ▶ Give 50mL of milk or sugar water by nasogastric tube

3. Teach mother how to give oral medicines at home

- Determine the correct medicine and dose for the child’s weight or age

For each medicine:
- Explain the reason for giving the medicine
- Show how to measure a dose
  - Watch the mother practice this
- Ask the mother to give the first dose to her child

Explain carefully how to give the medicine
- Include dose, frequency and duration
- Stress the need to complete the full course of treatment even if the child gets better
- Collect, measure/count, pack and label it separately
- Check the mother’s understanding before she leaves
23. Childhood illnesses

### Oral medicines used in IMCI

**Amoxicillin** (every 8 hours for 5 days)
- **2-12mths (4-10kg):** 125mg
- **12mths-5yrs (10-19kg):** 250mg
- Used as 2nd line medicine in:
  - pneumonia
  - acute ear infection
  - very severe disease (initial pre-referral dose)

**Antimalarials**

**Cotrimoxazole** (every 12 hours for 5 days)
- **2-12mths (4-10kg):** 240mg
- **12mths-5yrs (10-19kg):** 360mg
- Used as 1st line medicine in:
  - pneumonia
  - dysentery
  - cholera
  - acute ear infection
  - very severe disease (initial pre-referral dose)

**Erythromycin** (every 6 hours for 3 days)
- **2-4mths (4-<6kg):** 62.5mg
- **4-12mths (6-<10kg):** 125mg
- **12mths-5yrs (10-19kg):** 250mg
- Used as 2nd line medicine in cholera

**Folic acid** (single daily dose for 14 days)
- **<5yrs:** 2.5mg

**Iron** (daily in 2 divided doses)
- supply for 14 days initially
  - **2-<4mths (4-<6kg):** 30mg elemental iron
  - **4mths- 3yrs (6-<14kg):** 60mg elemental iron
  - **3yrs-<5yrs (14-<19kg):** 90mg elemental iron
- Used in iron-deficiency anaemia
  - give to non-sicklers
  - *if child is a sickler*, give folic acid (see below)
23. Childhood illnesses

- Continue iron for 3 months after Hb is normal
- ferrous sulphate tablets 200mg = 60mg elem. iron
- ferrous sulphate oral solution paediatric 60mg/5mL = 12mg elemental iron/5mL

**Mebendazole** (single dose, repeat every 6 months)
- <2yrs: 250mg
- 2yrs: 500mg

**Nalidixic acid** (every 6 hours for 5 days)
- 2-4mths (4-<6kg): 62.5mg
- 4-12mths (6-<10kg): 125mg
- 12mths-5yrs (10-19kg): 250mg
- Used as 2nd line medicine in dysentery

**Oral rehydration salts (ORS)**

**Paracetamol** (every 6 hours for 24 hours, ie. 4 doses)
- 2mths-<3yrs (4-<14kg): 125mg
- 3-<5yrs (14-<19kg): 250mg
- Used for fever 38.5°C or (ear) pain

**Vitamin A**
- Up to 6mths: 50,000 IU
- 6-12mths: 100,000 IU
- 12mths-5yrs: 200,000 IU
- In measles, persistent diarrhoea, severe malnutrition, give 3 doses:
  - 1st dose in clinic
  - 2nd dose given by mother at home the next day
  - 3rd dose at clinic 4 weeks later
- In pneumonia: give 1 dose in the clinic
- For supplementation of children 6 mths: give single dose in clinic every 6 months
- Record doses on the <5 card
- Do not give a dose of vitamin A within 4 weeks of any previous dose the child may have been given
23. Childhood illnesses

4. Teach mother how to treat local infections at home

- Explain what the treatment is & why it is needed
- Describe the treatment steps as detailed below
- Watch the mother do the first treatment in the clinic (except cough/sore throat remedy)
- Explain how often to do the treatment and for how long
- Provide the required medication for home treatment
- Check she understands completely before leaving

a) Eye infection

- Clean both eyes 3 times daily:
  - wash hands
  - ask child to close eyes
  - use clean cloth with clean water to gently remove pus
  - use a different part of the cloth for each eye
  - clean each eye from nose-side to ear-side to avoid passing the infection from one eye to the other
- Apply tetracycline eye ointment to each eye 3 times daily after cleaning the eyes
  - ask the child to look up
  - squirt a small amount (5mm length) on the inside of the lower eyelid
  - wash hands again
- Continue application until the redness has gone
  ❌ Do not put anything else into the eye

b) Ear infection

- Dry the ear at least 3 times daily
  - roll clean absorbent cloth or soft gauze into a wick
  - place this in the ear and remove when wet
  - replace wick with a clean one
  - repeat this process until the ear is dry
23. Childhood illnesses

**c) Mouth ulcers**
- Treat these twice daily
  - wash hands
  - wash child’s mouth with clean soft cloth moistened with salt water and wrapped around the finger
  - paint the mouth with **gentian violet aqueous paint 0.5%** (if necessary dilute 1% with an equal volume of water & provide this for the mother to use at home)
  - wash hands again

**d) Sore throat or cough**
- Use a safe remedy to soothe the throat and relieve cough:
  - breastmilk (for exclusively breastfed infant)
  - warm (lemon) tea with honey
  - **simple linctus**
- Do not use remedies containing codeine or antihistamines (eg. chlorphenamine, promethazine)

**5. Follow-up care**
- Care for the child who returns for follow-up using all of the sections/steps below which match the child’s previous classification

*If the child has any new problem:*
- Assess, classify and treat the new problems using the tables 1a) to 1e) above

*If any more follow-up visits are needed:*
- advise the mother when to return with the child

Also advise the mother when to return immediately
23. Childhood illnesses

a) Pneumonia

After 2 days:
- Check for general danger signs
- Assess for cough and difficult breathing
- Ask:
  - is the child breathing more slowly?
  - is there less fever
  - is the child feeding/eating better?

If chest indrawing or any general danger sign:
- Give a dose of 2nd line antibiotic amoxicillin or IM chloramphenicol if unable to swallow
- Refer urgently

If breathing rate, fever and eating are unchanged:
- Change to 2nd line antibiotic amoxicillin
- Advise mother to return in 2 days or
- Refer (eg. if child had measles in past 3 months)

If breathing slower, fever less or eating better:
- Complete the 5 day course of cotrimoxazole

b) Persistent diarrhoea

After 5 days:
- Ask:
  - has the diarrhoea stopped?
  - how many loose stools does the child have per day?

If diarrhoea not stopped (3 or more loose stools/day):
- Do a full reassessment
- Give any treatment needed
- Refer

If diarrhoea stopped (<3 loose stools/day):
- Tell mother to follow usual feeding recommendations for the child’s age
23. Childhood illnesses

<table>
<thead>
<tr>
<th>c) Dysentery</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 2 days, assess for diarrhoea</td>
</tr>
<tr>
<td>- Ask:</td>
</tr>
<tr>
<td>- are there fewer stools?</td>
</tr>
<tr>
<td>- is there less blood in the stool?</td>
</tr>
<tr>
<td>- is there less fever?</td>
</tr>
<tr>
<td>- is there less abdominal pain?</td>
</tr>
<tr>
<td>- is the child eating/feeding better?</td>
</tr>
<tr>
<td>If the child is dehydrated:</td>
</tr>
<tr>
<td>▶ Treat dehydration</td>
</tr>
<tr>
<td>If above signs and symptoms same or worse:</td>
</tr>
<tr>
<td>▶ Change to 2nd line oral antibiotic recommended for Shigella: <strong>nalidixic acid</strong> or <strong>ciprofloxacin</strong> 20mg/kg single dose</td>
</tr>
<tr>
<td>- advise mother to return with the child in 2 days</td>
</tr>
<tr>
<td>Exceptions - if the child:</td>
</tr>
<tr>
<td>- is &lt;12 months old</td>
</tr>
<tr>
<td>- was dehydrated on the 1st visit</td>
</tr>
<tr>
<td>- has measles in last 3 months</td>
</tr>
<tr>
<td>▶ Refer to hospital</td>
</tr>
<tr>
<td>If above signs and symptoms improved:</td>
</tr>
<tr>
<td>▶ Continue giving the 1st line antibiotic <strong>cotrimoxazole</strong> until the 5-day course is completed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d) Malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td>If fever persists &gt;2 days or returns within 14 days:</td>
</tr>
<tr>
<td>▶ Do a full reassessment of the child and assess for other causes of fever</td>
</tr>
<tr>
<td>If child has any <strong>general danger sign</strong> or a <strong>stiff neck</strong>:</td>
</tr>
<tr>
<td>▶ Treat as VERY SEVERE FEBRILE DISEASE</td>
</tr>
<tr>
<td>If child has any <strong>cause of fever other than malaria</strong>:</td>
</tr>
<tr>
<td>▶ Treat the cause</td>
</tr>
<tr>
<td>If malaria is the only apparent cause of the fever:</td>
</tr>
</tbody>
</table>
23. Childhood illnesses

- If possible, do a blood test for malaria parasites
- Treat with 2nd line oral antimalarial quinine
  - advise mother to return with the child in 2 days
  if fever present for 7 days: refer for reassessment

### e) Measles with eye or mouth complications

After 2 days:
- Look for red eyes and pus discharge
- Look at mouth ulcers
- Smell the mouth

**Management of eye infection**

*If pus discharge is persisting:*
- Ask mother to describe how she has been treating the infection.
  *If treatment was correct: refer*
  *If treatment not correct: teach mother the correct way and ask her to return with the child in 2 days*

*If discharge gone but redness remains:*
- Continue the treatment

*If no discharge or redness: stop the treatment*

**Management of mouth ulcers**

*If mouth ulcers worse or bad smell from the mouth:*
- Refer

*If mouth ulcers the same or better:*
- Continue using **gentian violet aqueous paint 0.5%** for a total of 5 days

### f) Ear infection

After 5 days:
- Reassess for ear problem
- Measure child’s temperature

*If there is tender swelling behind the ear or high fever (38.5°C): refer urgently*

**Acute ear infection**
If pain or discharge persists:
- Treat with 5 more days of the same antibiotic *(cotrimoxazole or amoxicillin)*
- Advise mother to continue drying the ear by wicking
- Follow-up in 5 days

**Chronic ear infection** (discharge for 14 days)
- Check mother is wicking the ear correctly
- Encourage her to continue

*If no ear pain or discharge:*
- Praise the mother for her careful treatment of the child
- Ensure that the 5-day course of antibiotic is completed

### g) Feeding problem

After 5 days:
- Reassess feeding
- Ask about any feeding problems found on the 1st visit
- Counsel the mother on any new or continuing problems
  - *if you advise the mother to make significant changes in feeding, ask her to bring the child back again after 30 days*
- *If the child is very low weight for age: ask mother to return 30 days after the 1st visit to measure the child’s weight gain*

### h) Pallor

After 14 days:
*If the child is not a sickler: give iron*
*If child is a sickler: give folic acid*

- Advise mother to return in 14 days for more treatment
- Continue giving iron or folic acid every 14 days for 2 months
If child still has palmar pallor after 2 months:
▶ Refer for assessment

**i) Very low weight for age (WFA)**

After 30 days:
- Weigh the child and determine WFA status using the graph on
- Reassess feeding

*If child is no longer very low WFA*:
- Praise the mother and encourage her to continue

*If child is still very low WFA*:
- Counsel the mother about any feeding problem found
- Ask her to return again in 30 days
- Continue to see the child monthly until feeding well and gaining weight regularly or no longer very low WFA

*Exception: if you do not think that feeding will improve, or if the child has lost weight:*
▶ Refer the child for further management

**6. Counselling of the mother (use Mothers Card)**

**a) Feeding recommendations**
- These recommendations are for sick and healthy children

*Age <6 months*
- **Breastfeed** on demand, day and night
  - at least 8 times/24 hours
- Do **not** give other food or fluids

*Only if the child appears hungry after breastfeeding or is not gaining weight adequately:*
- Give **complementary foods** 1-2 times daily after breastfeeding (foods listed below in Age 6-<12 months section)
23. Childhood illnesses

**Age 6-<12 months**
- **Breastfeed** on demand, day and night
- Give adequate servings of **complementary foods**:
  - hick porridge made with maize, cassava, millet or soya flour or any mix of these. Add sugar and oil and mix with milk or pounded groundnuts
  - mixtures of mashed foods, eg. matooke, potatoes, cassave, posho (maize or millet), rice
  - Mix these with fish or beans or pounded groundnuts
  - Add green vegetables
- Give a **nutritious snack**, e.g. egg, banana, bread:
  - 3 times/day if breastfed or 5 times/day if not

**Age 12-<24 months**
- Breastfeed on demand, day and night
- Give adequate servings of **complementary foods** as above except that you may also add meat to mashed foods
- Give a **nutritious snack** or family food 5 times daily whether breastfeeding or not

**Age 2 years and over**
- Give **family foods** at 3 meals per day to provide a good daily diet which should:
  - be adequate in quantity
  - include an energy-rich food (eg. thick cereal + oil)
  - include protein (eg. meat, fish, eggs, pulses)
  - include fruits and vegetables
- Also add **nutritious snacks** between meals

**Child with persistent diarrhoea**

*If still breastfeeding:*
- Give more frequent and longer feeds day and night
If taking other milk:
- Replace with increased breastfeeding or
- Replace with fermented milk products, eg. yoghurt or
- Replace half the milk with nutritious mashed foods

If taking other foods:
- Follow feeding recommendations above for child’s age

b) Feeding problems
- After counselling the mother as detailed below, follow-up any feeding problem in 5 days

If the child is not being fed as above:
- Counsel the mother accordingly

If mother reports breastfeeding problems:
- Assess breastfeeding
- As required, show mother correct positioning and attachment

If child <6 months old and taking other milk or foods:
- Build the mother’s confidence that she can provide all the breast milk needed
- Suggest giving more frequent, longer feeds day and night and gradually reducing other milk or foods
- If mother is away from the child due to work, etc: suggest she expresses breastmilk to leave for the baby

If other milk needs to be continued, counsel mother to:
- breastfeed as much as possible, including at night
- make sure that any other milk used is:
  - an appropriate breastmilk substitute, eg. cow’s milk,
  - correctly and hygienically prepared
  - given in adequate amounts
  - finish any prepared milk within 1 hour
If the child is being given diluted milk or thin porridge:
- Remind mother that thick foods rich in energy and nutrients are needed by infants and young children
- Advise her not to dilute the milk
- Advise her to make thicker porridge

If the mother is using a bottle to feed the child:
- Recommend using a cup instead of a bottle
- Show the mother how to feed the child with a cup

If the child is not being fed actively:
- Counsel the mother to:
  - sit with the child and encourage eating
  - give the child an adequate serving in a separate bowl

If the mother is not giving foods rich in vitamin A:
- Encourage her to provide these regularly, eg. eggs, green leafy vegetables, carrots, liver, mangoes, yellow sweet potatoes & other dark orange fruit & vegetables

If the child is 6 months and appropriate complementary foods have not been introduced:
- Gradually introduce thick porridge mixed with available protein (eg. milk) and add sugar and fat
- Gradually introduce mashed foods mixed with relish
  - add green leafy vegetables and fat to this
- Give nutritious snacks 3-5 times daily as in feeding recommendations above

If child eats solid food with insufficient nutrient density or variety:
- Give a variety of mashed food mixtures made with local staples and mixed with animal or plant protein relish
  - add green leafy vegetables and fat to this
23. Childhood illnesses

- Give nutritious snacks 3-5 times daily as in feeding recommendations above

**c) Increased fluids during illness**

**For any sick child**
- Breastfeed more often and for longer at each feed

**If not exclusively breastfed:**
- Increase fluid intake, eg. give soup, rice water, yoghurt drinks or clean water

**For a child with diarrhoea**
- Giving extra fluid can be lifesaving
- Give fluid according to Plan A or B depending on the state of dehydration of the child

**d) When to return**

**Follow up visits:** advise mother to return as follows:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Return in</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pneumonia</td>
<td>2 days</td>
</tr>
<tr>
<td>• Dysentery</td>
<td></td>
</tr>
<tr>
<td>• Malaria (if fever persists)</td>
<td></td>
</tr>
<tr>
<td>• Measles + eye/mouth complications</td>
<td></td>
</tr>
<tr>
<td>• Persistent diarrhoea</td>
<td></td>
</tr>
<tr>
<td>• Acute or chronic ear infection</td>
<td></td>
</tr>
<tr>
<td>• Feeding problem</td>
<td>5 days</td>
</tr>
<tr>
<td>• Any other condition (if not improving)</td>
<td></td>
</tr>
<tr>
<td>• Pallor</td>
<td>14 days</td>
</tr>
<tr>
<td>• Very low weight for age</td>
<td>30 days</td>
</tr>
</tbody>
</table>

**Next well-child visit**

- Advise mother when to return for next immunization according to national immunization schedule
23. Childhood illnesses

**When to return immediately**
- Advise mother to return *immediately* if the child has any of these warning signs:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Warning signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any sick child</td>
<td>Not able to drink or breastfeed</td>
</tr>
<tr>
<td></td>
<td>Becomes more sick</td>
</tr>
<tr>
<td></td>
<td>Develops fever</td>
</tr>
<tr>
<td>No pneumonia, cough or cold</td>
<td>Fast breathing</td>
</tr>
<tr>
<td></td>
<td>Difficult breathing</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Blood in stool</td>
</tr>
<tr>
<td></td>
<td>Poor drinking or breastfeeding</td>
</tr>
</tbody>
</table>

**e) Mother’s health**

*If she is sick:*
- Provide care for her or refer for further management

*If she has a breast problem (eg. engorgement, sore nipples, infection):*
- Provide care for her or refer for further management

**For all mothers:**
- Give advice to eat well to maintain strength and health
- Check immunization status and give TT if needed
- Make sure each mother has access to:
  - family planning services
  - counselling on prevention of STIs, HIV/AIDS
  - antenatal care (if pregnant)
23. Childhood illnesses

23.2. Sick young infant (Age 1 week -<2 months)

Assess, classify and treat
- Ask the mother what the child’s problems are
- Check if this is an initial or follow-up visit for this problem
  - if follow-up visit:
  - if initial visit: continue as below

1. Check for possible bacterial infection
   a) Ask
      - Has the infant had any convulsions?
   b) Look, listen, feel
      - Count the number of breaths per minute
        - repeat the count if this is elevated
      - Look for severe chest indrawing and nasal flaring
      - Look and listen for grunting
      - Look and feel for a bulging fontanelle
      - Look for pus draining from the ear
      - Look at the umbilicus. Is it red or draining pus?
        Does the redness extend to the skin?
      - Measure the body temperature
        (or feel for fever or low body temperature)
      - Look for skin pustules
        - if present, are they many or severe?
      - See if the young infant is lethargic or unconscious
      - Observe the young infant’s movements
        - are they less than normal?
### c) Classify and treat possible bacterial infection as in the table over:

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| Any of the following:  
- Convulsions  
- Fast breathing (>60 breaths/minute)  
- Severe chest indrawing  
- Nasal flaring  
- Grunting  
- Bulging fontanelle  
- Pus discharge from ear  
- Umbilical redness extending to skin  
- Fever (>37.5°C or feels hot)  
- Low body temp (<35.5°C or feels cold)  
- Many or severe skin pustules  
- Lethargic or unconscious  
- Less than normal movements | POSSIBLE SERIOUS BACTERIAL INFECTION (PSBI) | ▶ Give 1st dose of IM antibiotics  
▶ Treat to prevent low blood sugar  
▶ Advise mother how to keep infant warm on the way to hospital  
▶ Refer urgently - if referral is not possible, treat as on |
| Any of the following:  
- Umbilicus red or discharging pus  
- Skin pustules | LOCAL BACTERIAL INFECTION | ▶ Give appropriate oral antibiotic  
▶ Teach mother to treat local infection at home  
▶ Advise mother on home care for the young infant  
▶ Follow up in 2 days |
Notes on table
* Body temperatures are based on axillary measurement
  - rectal readings are approximately 0.5°C higher

2. Check for diarrhoea/dehydration

If diarrhoea is present

a) Ask
- For how long it has been present
- If there is any blood in the stool

b) Look and feel
- Check the general appearance of the young infant
  Is the infant:
  - lethargic or unconscious?
  - restless and irritable
- Check the eyes. Are they sunken?
- Pinch the skin of the abdomen.
  Does it go back:
  - very slowly? (takes >2 seconds)
  - slowly?
23. Childhood illnesses

c) Classify and treat the dehydration and diarrhoea as in the table over

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>For dehydration:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 of these signs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lethargic or unconscious</td>
<td>SEVERE DEHYDRATION</td>
<td>- If infant doesn’t have PSBI: give Plan C</td>
</tr>
<tr>
<td>- Sunken eyes</td>
<td></td>
<td>- If infant also has PSBI:</td>
</tr>
<tr>
<td>- Abdominal skin pinch returns very slowly (&gt; 2 seconds)</td>
<td></td>
<td>- Refer urgently with mother giving frequent sips of ORS on the way</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Advise mother to continue breastfeeding</td>
</tr>
<tr>
<td>2 of these signs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Restless, irritable</td>
<td>SOME DEHYDRATION</td>
<td>- Give Plan B</td>
</tr>
<tr>
<td>- Sunken eyes</td>
<td></td>
<td>- Advise mother when to return immediately</td>
</tr>
<tr>
<td>- Skin pinch returns slowly (up to 2 seconds)</td>
<td></td>
<td>- Follow up in 2 days if not improving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- If child also has PSBI: manage as above</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough signs to classify as some or severe dehydration</td>
<td>NO DEHYDRATION</td>
<td>- Give Plan A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Advise mother when to return immediately</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Follow up in 2 days if not improving</td>
</tr>
<tr>
<td>and if diarrhoea of 14 days:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refer, but if the young infant is dehydrated: treat this before referral (unless PSBI also present - see above)</td>
</tr>
<tr>
<td>and if blood present in the stool:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Refer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Give 1st dose of cotrimoxazole</td>
</tr>
</tbody>
</table>

UCG 2010 519
3. Check for feeding problem or low weight

a) Ask
- Is there any difficulty feeding?
- Is the infant breastfed?
  - if yes, how many times in a 24-hour period?
- Does the infant usually receive any other foods or drinks, including water?
  - if yes, how often?
- What do you use to feed the infant?

b) Determine weight for age
- Weigh the child and using the chart on p528 determine if the child is low weight for its age in months

c) Classify and treat feeding problems

Only if infant has any difficulty feeding or is breastfed <8 times/24 hours or is taking any other foods/drinks or is low WFA and has no indications for urgent hospital referral:

d) Look, listen, feel

Assess breastfeeding:
- Has the infant breastfed in the previous hour?
  - if no, ask the mother to put the infant to the breast
  - if yes, ask the mother if she can wait and tell you when the infant is willing to feed again
- Observe breastfeeding for a few minutes
- Is the infant able to attach properly to the breast?
  For good attachment, the following should be present:
  - chin touching breast
  - mouth wide open
  - lower lip turned outwards
  - more areola visible above than below the mouth
- Is the infant able to suckle effectively? This means slow, deep sucks with occasional pauses - clear a blocked nose if it interferes with
23. Childhood illnesses

- Look for ulcers or white patches in the mouth (thrush)

<table>
<thead>
<tr>
<th>Signs</th>
<th>Classify as</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| Any of these signs:  
  - Unable to feed  
  - No attachment at all  
  - Not sucking at all | UNABLE TO FEED  
  - POSSIBLE SERIOUS BACTERIAL INFECTION (PSBI) |  ▶ Prevent low blood sugar  
  ▶ Give 1st dose of IM antibiotics  
  ▶ Advise mother how to keep infant warm on way to hospital  
  ▶ Refer urgently |
| Any of these signs:  
  - Not well attached  
  - Not sucking effectively  
  - <8 BF in 24 hours  
  - Receives other food or drinks  
  - Low weight for age (WFA) according to IMCI chart  
  - Thrush | FEEDING PROBLEM or LOW WEIGHT |  ▶ Advise mother to breastfeed (BF) on demand day and night  
  ▶ If not well attached or not sucking effectively: teach correct positioning and attachment  
  ▶ If feeding <8 times/24 hrs: advise mother to increase BF frequency  
  ▶ If receiving other food or drinks: counsel mother to increase BF, reduce other foods & drinks, use a cup  
  ▶ If not BF at all:  
    - refer for BF counselling & possible relactation  
    - advise on correctly preparing breastmilk substitutes, eg. cow's milk & on using a cup  
  ▶ If thrush: teach mother to treat at home |
| As above | FEEDING PROBLEM or LOW WEIGHT |  ▶ Advise mother on home care for the baby  
  ▶ Follow-up any feeding problem or thrush in 2 days  
  ▶ Follow-up low weight for age in 14 days |
| Not low WFA & no other signs of inadequate feeding | NO FEEDING PROBLEM |  ▶ Advise mother on home care for young infant  
  ▶ Praise mother for feeding the infant well |
23. Childhood illnesses

4. Check young infant’s immunization status with the national immunization schedule

5. Assess other problems

  eg. presenting problems, eye problems, rashes, birth injuries, etc

6. Assess mother’s own health needs

  - Check for current health problems
  - Check whether family planning help is required
  - Check on tetanus immunization status

7. Teach mother to treat local infections at home

  - Explain how the treatment is given
  - Watch her as she does the first treatment in the clinic
  - Advise her to return if the infection gets worse

a) Skin pustules or umbilical infection

  ▶ Wash hands before and after treatment
  ▶ Gently wash off pus and crusts with soap and water
  ▶ Dry the area
  ▶ Apply gentian violet aqueous paint 1%
  ▶ Do this twice daily

b) Thrush

  ▶ Wash hands
  ▶ Gently wash mouth with clean soft cloth, wetted with salt water and wrapped around the finger
  ▶ Apply gentian violet aqueous paint 0.5%
  ▶ Wash hands
  ▶ Do this twice daily
8. **Teach correct positioning and attachment for BF**

- Show mother how to hold the infant:
  - with the infant's head and body straight
  - facing her breast with infant's nose opposite the nipple
  - with infant's body close to hers
  - supporting the infant's whole body, not just the neck and shoulders
- Show her how to help the infant attach, she should:
  - touch her infant’s lips with her nipple
  - wait until her infant’s mouth opens wide
  - move her infant quickly onto her breast aiming the infant’s lower lip well below the nipple
- Look for signs of good attachment and effective suckling - if either is not good, try again

9. **Advise mother on home care for the young infant**

- **Food & fluids**: breastfeed frequently on demand (as often and for as long as the infant wants) day and night, during sickness and health
- **When to return:**
  - for a follow-up visit:
    - Local bacterial infection
    - Any feeding problem
    - Thrush
    - Low weight for age

<table>
<thead>
<tr>
<th>Condition</th>
<th>Return in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local bacterial infection</td>
<td>2 days</td>
</tr>
<tr>
<td>Any feeding problem</td>
<td></td>
</tr>
<tr>
<td>Thrush</td>
<td></td>
</tr>
<tr>
<td>Low weight for age</td>
<td>14 days</td>
</tr>
</tbody>
</table>
23. Childhood illnesses

- **immediately**: advise mother to return with her child immediately if any of these signs are present:
  - Breastfeeding or drinking poorly
  - Becomes more ill
  - Develops fever
  - Fast or difficult breathing
  - Blood in stool
- **Warmth**: ensure the young infant is always warm
  - in cool weather, cover the infant’s head and feet and dress the infant with extra clothing

### 10. Provide follow-up care for the young infant

**a) Local bacterial infection**

After 2 days:
- Check the umbilicus and any skin pustules

*If pus discharge or redness is the same or worse:*
  - Refer

*If pus discharge or redness has improved:*
  - Tell mother to:
    - keep giving antibiotic until 5-day course is completed
    - continue treating the local infection at home

**b) Feeding problem**

After 2 days:
- Reassess feeding
- Ask about any feeding problems found on 1st visit
- Counsel mother about any new or continuing problems
  - *If this requires the mother to make major changes*, ask her to return with the child again after 2 days

*If the infant is low weight for age:*
- Ask the mother to return 14 days after the 1st visit to measure the child’s weight gain
**Exception:** if you think that feeding will not improve or if the child has **lost** weight: Refer

c) Low weight for age (WFA)

After 14 days:
- Weigh the young infant and using the WFA chart to determine if the child is still low weight for age
- Reassess feeding

If the infant is no longer low weight for age:
- Praise the mother and encourage her to continue

If the infant is still low weight for age, but is feeding well:
- Praise the mother and encourage her to continue
- Ask her to return to have the child weighed again within 1 month or when she comes for immunization

If the infant is still low weight for age and still has a feeding problem:
- Counsel the mother about the feeding problem
- Ask her to return to have the child weighed again after 14 days or when she comes for immunization (if this is earlier)
- Continue to see the child every 2 weeks until the child is feeding well & gaining weight regularly or is no longer low WFA

**Exception:** if you do not think that feeding will improve or if the young infant has **lost** weight – refer to hospital

d) Thrush

After 2 days:
- Check for ulcers or white patches in the mouth (thrush)
- Reassess feeding

If thrush is worse or if there are problems with attachment or suckling:
Refer

If thrush is the **same or better** & infant is **feeding well**:

- Continue applying **gentian violet aqueous paint 0.5%** to complete a total of 5 days treatment

### Summary of IMCI medicines used for young infants

**Amoxicillin** (every 8 hours for 5 days)
- Birth-<1mth (<3kg): 31.25mg (=1.25mL syrup)
- 1mth-<2mths (3-<4kg): 62.5mg (=2.5mL syrup)
  - Used as 2nd line medicine in local bacterial infection
  - If not available, use procaine penicillin injection
  - amoxicillin syrup contains 125mg/5mL

**Benzylpenicillin** (initial single pre-referral dose)
- Birth-<2mths (<4kg): 50,000 IU/kg IM
  - Used together with chloramphenicol (below) as initial (pre-referral) treatment of PSBI

*If referral is not possible:* give every 6 hours for at least 5 days (with chloramphenicol)

**Chloramphenicol** (initial single pre-referral dose)
- Birth-<2mths (<4kg): 40mg/kg IM
  - Used together with benzylpenicillin (above) as initial (pre-referral) treatment of PSBI
  - *If referral is not possible:* give every 6 hours for at least 5 days (with benzylpenicillin)
  - *If infant <1 week:* reduce dose by half to 20mg/kg

**Cotrimoxazole** (every 12 hours for 5 days)
- Birth-<1mth (<3kg): 60mg
- 1mth-<2mths (3-<4kg): 120mg
23. Childhood illnesses

- Used as 1st line medicine in local bacterial infection and dysentery
- Avoid in infants <1 month who are premature or jaundiced

**Nalidixic acid** (every 6 hours for 5 days)

*Birth-*<2mths (<4kg): 62.5mg

Used as 2nd line medicine in dysentery

**Procaine penicillin** (once daily IM dose)

*Birth-*<2mths (<4kg): 50,000 IU/kg

- Used as 3rd line medicine in local bacterial infection where either:
  - cotrimoxazole and amoxicillin are not available
  - cotrimoxazole is available but may not be used (see above) and amoxicillin is also not available
  - patient unable to swallow oral medication
23. Childhood illnesses

Weight for Age Chart

Area between bottom 2 curves is low weight for age
Area below bottom curve is very low weight for age

This curve represents normal weight for age

kilograms

months

UCG 2010  528
23.3. VACCINATION SCHEDULE for CHILDREN
Adapted from UNEPI/MoH Immunization Schedule 2002

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccinations to be given</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>BCG: 0.05 mL intradermally for children &lt;11 months, children &gt;11mths: 0.1 mL</td>
</tr>
<tr>
<td></td>
<td>Polio 0: 2 drops orally</td>
</tr>
<tr>
<td>6 wks</td>
<td>DPT-HepB + Hib 1: 0.5mL IM</td>
</tr>
<tr>
<td></td>
<td>Polio 1: 2 drops orally</td>
</tr>
<tr>
<td>10 wks</td>
<td>DPT-HepB + Hib 2: 0.5mL IM</td>
</tr>
<tr>
<td></td>
<td>Polio 2: 2 drops orally</td>
</tr>
<tr>
<td>14 wks</td>
<td>DPT-HepB + Hib 3: 0.5 mL IM</td>
</tr>
<tr>
<td></td>
<td>Polio 3: 2 drops orally</td>
</tr>
<tr>
<td>9 mths</td>
<td>Measles: 0.5 mL SC</td>
</tr>
<tr>
<td>12 mths</td>
<td>Measles: 0.5 mL SC</td>
</tr>
</tbody>
</table>

**Sites of vaccine administration**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended site</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>Right upper arm</td>
</tr>
<tr>
<td>DPT-HepB + Hib</td>
<td>Outer upper aspect of left thigh</td>
</tr>
<tr>
<td>Polio (OPV)</td>
<td>Mouth</td>
</tr>
<tr>
<td>Measles</td>
<td>Left upper arm</td>
</tr>
</tbody>
</table>

**Notes**

a) Aim to complete this schedule within the 1st year of life
b) **Age for vaccinations:** give each vaccine at the recommended age, or if this is not possible, at first contact with the child after this age
c) **BCG vaccination:** give this as early as possible in life, preferably at birth. Complications are uncommon
23. Childhood illnesses

Do not give BCG vaccine to any child with clinical signs and symptoms of HIV/AIDS

*Diluent:* only use the diluent provided for BCG vaccine to reconstitute this vaccine

d) **Polio 0 vaccination (= ‘zero dose’):** this is a primer dose of oral polio vaccine (OPV) which should be given ideally at birth but otherwise in the first 2 weeks of life

e) **DPT-HepB + Hib vaccine:** this is a new combination of DPT vaccine + hepatitis B vaccine (HepB) + haemophilus influenzae type b (Hib) vaccine

f) **DPT-HepB + Hib/Polio:** the minimum dosage interval between each of the three occasions when these vaccines are being given is 4 weeks - ideally given at 6 weeks, 10 weeks and 14 weeks

g) **Measles vaccination:** normally give this at 9 months of age or first contact after this age but also give to any unimmunised child of 6-9 months old who has been exposed to measles patients

- children of 6-9 months vaccinated in this way must have the vaccination repeated at 9 months of age

- *Diluent:* only use the diluent provided for measles vaccine to reconstitute this vaccine

h) **Vaccination of sick children:** admit and treat any child who is severely ill and vaccinate at the time of discharge

i) **Administration and storage of vaccines:**

- never use any vaccine after its expiry date, or when the vaccine vial monitor (VVM) has changed to discard point, or if there has been contamination or loss of the vial labels

- only open one vial or ampoule of a vaccine at a time and when there is a child to vaccinate
23. Childhood illnesses

- remember to discard reconstituted vials of BCG, measles and DPT-HepB + Hib after 6 hours
- in a static unit, if there is a balance of doses left in a vial of TT and OPV at the end of a vaccination session, return the opened vial to the fridge for subsequent use
- do not keep any opened vial for >4 weeks, store vaccines in health units at +2°C to +8°C but do not keep them for longer than 6 weeks
- in district and central vaccine stores where freezers exist, polio and measles vaccine may be stored for prolonged periods at -20°C
- never use the diluents provided for vaccines to mix other injections
- do not freeze DPT-Hep B + Hib and TT vaccines (other vaccines may be kept at freezing temperatures without harm)
- never freeze the diluents for BCG and measles vaccines
- do not vaccinate in direct sunlight (always carry out immunization in a building or under shade)
- carefully follow recommended procedures to maintain the cold chain for all vaccines e.g ensure continuous supply of power/gas, record fridge temperature twice daily, and use the sponge method during each immunization session
- Record every vaccination done in the child register and tally sheet. Use the child register for tracking drop outs.

A child who received any immunization dose during national immunization program should still get the routine vaccination dose.
### 23.4. TETANUS PREVENTION

**a) Childhood immunization**
- Immunise all children against tetanus during routine childhood immunization
  - see Immunization Schedule, section 17.6

**b) Prophylaxis against neonatal tetanus**
- Immunise all pregnant women/women of child-bearing age (15-45yrs) against tetanus
- Give tetanus toxoid vaccine (TT) 0.5mL IM into the left upper arm or upper outer thigh as follows:

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommended timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TT1</strong> (1st dose)</td>
<td>at first contact with the girl or woman, during primary/secondary school, at the 1st antenatal visit, or as early as possible during pregnancy</td>
</tr>
<tr>
<td><strong>TT2</strong> (2nd dose)</td>
<td>at least 4 weeks after TT1</td>
</tr>
<tr>
<td><strong>TT3</strong> (3rd dose)</td>
<td>at least 6 months after TT2 or as early as possible during a subsequent pregnancy</td>
</tr>
<tr>
<td><strong>TT4</strong> (4th dose)</td>
<td>at least 1 year after TT3 or as early as possible during a subsequent pregnancy</td>
</tr>
<tr>
<td><strong>TT5</strong> (5th dose)</td>
<td>at least 1 year after TT4 or as early as possible during a subsequent pregnancy</td>
</tr>
</tbody>
</table>

**c) Vaccination against adult tetanus**
- School going children should get 3 booster doses at 0, 1, and 6 months intervals
- High risk groups such as farm workers, military personnel, miners and road traffic accident victims should also be vaccinated according to the schedule in the table above.
23. Childhood illnesses

- Ensure hygienic deliveries including proper cutting and care of umbilical cords

**Notes**
1. Refer to Immunization Schedule for general information on administration, storage and handling of vaccines
2. Store TT at +2 °C to +8°C. Do not freeze TT

**d) Prophylaxis in patients at risk of tetanus as a result of contaminated wounds, bites and burns**

**General measures**
- Ensure adequate surgical toilet and proper care of wounds

**Passive immunization**
- Give IM tetanus immunoglobulin human (TIG):
  - child <5 yrs: 75 IU
  - child 5-10 yrs: 125 IU
  - child >10 yrs/adult: 250 IU

  **Note:** double the dose if heavy contamination suspected or if >24 hours since injury was sustained

  - Alternative - only if TIG not available:
    - antitetanus serum (tetanus antitoxin)
      - 1,500 IU deep SC or IM

**Active immunization**

**Unimmunised or partially immunised patients:**
- Give a booster doses for patients who are partially immunized and a full course of vaccination for those who are not immunized at all

 **Fully immunised patients with 5 doses of TT administered at the correct intervals but last dose given >30 years ago:** Give one booster dose of TT 0.5mL deep SC or IM
23. Childhood illnesses

| Note:  | Fully immunised patients who have had a booster dose within the last 10 years do not need treatment with tetanus antitoxin (anti-tetanus serum) or antitetanus immunoglobulin, human or tetanus toxoid vaccination |
| Note:  | Giving TIG or TT to a fully immunised person may cause an unpleasant reaction, eg. redness, itching, swelling, fever, but with a severe injury this is justified |

**Hepatitis B Vaccination**

Hepatitis B Vaccine for adolescents and adults is recommended that Hepatitis B vaccination is done preferably after testing for Hepatitis B infection (HBsAg and Anti-HBs). Vaccination is recommended for high risk groups such as health workers particularly those in clinical settings and health workers in training, intravenous drugs users and persons who frequently receive blood transfusions.

Three doses at using any of the following schedules: 0, 1, 6 months or 0, 2, 4 months. The storage temperature for the vaccine is 2°C to 8°C

Dose: 0.5 mls given intramuscularly on the deltoid muscle (upper arm). Injections of Hepatitis B vaccine should not be given on the buttocks because of low immune response -- decreased protective antibody response-- and risks of injury to the sciatic nerve.

**Yellow fever vaccination**

The Yellow fever 17D vaccine is live attenuated and it is reconstituted before use. Ideally it should be used within an hour after reconstitution.
23. Childhood illnesses

Dose: 0.5 mls given sub-cutaneously on the upper arm as a single dose. The storage temperature for the vaccine is 2°C to 8°C.

Immunity is almost life long, but for international travel, the international travel certificate is valid for only 10 years.

**Rota Virus vaccination**
The commonest brand of Rota Virus vaccine on the market is Rotarix. It is an attenuated human rotavirus strain.
Route of administration: Oral in 2 doses. The schedule is two doses at 4 weeks interval after 6 weeks such as 6, 10 weeks. However, the schedule should be completed before 4 months of life. Rota Virus vaccine has an efficacy of about 80% against Rotavirus gastro-enteritis.

**Human Papilloma Virus vaccination**
Currently (2009) vaccination of young girls between 9-12 years is being carried out in two districts in Uganda on pilot basis. Full coverage will be done after analysis of the pilot study.
24. FAMILY PLANNING (FP)

For further detailed information on FP and Maternal Health, please refer to Procedure Manual for Family Planning and Maternal Health Service Delivery MoH March 1995

The key objective of family planning (FP) is to ensure that everyone should plan their family so that all children are born when **wanted, expected** and **welcome**. The health benefits of FP also have a major role in protecting the lives of infants, children, women and the family as a whole.

**The key steps to be followed in provision of FP services are as follows:**

1. Provide information about FP to different groups
2. Counsel clients at high risk to accept/use FP services
3. Counsel clients to make informed choice of FP method
4. Obtain and record client history
5. Perform physical assessment
6. Perform pelvic examination
7. Manage client for chosen FP method

**1. Provide information about FP to different groups**

The procedures used here are also used in the next step to recruit high-risk clients for FP and maternal health services in young child, antenatal, outpatients, outreach and postpartum clinics and in providing education on specific chosen FP methods

The objective is to:

- create awareness
- disseminate correct information to influence people to change beliefs, attitudes and practices
- recruit new clients
2. Counsel clients at high-risk of pregnancy complications to accept/use FP services

Identify high-risk clients while:
- conducting other clinics
- reviewing client records
- obtaining client history
- reviewing physical assessment findings

Look out for the following risk factors in clients:
- recent delivery-abortion
- >4 pregnancies
- >35 years old
- <20 years old
- Complicating medical conditions, e.g. diabetes, heart disease
- HIV/AIDS
- Having children with birth interval <2 years
- Bad obstetric history which is likely to recur in future pregnancies, e.g. postpartum haemorrhage, pre-eclampsia

Counsel high-risk clients on:
- Risk factors
- FP services: type, benefits, availability, procedures.

3. Counsel clients to make informed choice of FP method

The objectives are:
- to dispel any rumours and misconceptions about FP
- to help the client make a voluntary informed choice

Procedure:
- Prepare the room/materials needed ensuring privacy
- Receive the client & determine when she wants the next pregnancy and how many children she has
- Assess client’s knowledge & experience of FP methods
• Explain about different FP methods available
  - type
  - mechanism of action & method of use
  - advantages and disadvantages
  - indications
  - contraindications
  - side-effects
  - complications/warning signs
• Check understanding
• Help client choose appropriate method
• Explain next steps needed

4. Obtain and record client history
The objectives are:
  – to obtain clients personal and social data & information on health status
  – to identify abnormalities/problems needing treatment or referral
With FP clients, pay particular attention to:
• Social history:
  - smoking, how much/day?
  - drinking, how much alcohol/day?
• Family health history: ask about
  - diabetes mellitus
  - high BP
  - asthma
  - heart disease
• Medical history: ask about
  – excessive weight gain/loss (that is +/- 5kg/year)
  – severe headaches (relieved by analgesics?)
  – growth on neck (enlarged thyroid)
  – asthma
  – cardiac disease, high BP
  – TB (on treatment?)
  – liver disease/jaundice in last 6 months or during pregnancy
  – mental illness, epilepsy
- diabetes mellitus
- unilateral pain in thigh or calves, thrombophlebitis
- varicose veins
- allergies
- chronic anaemia, e.g. sickle-cell anaemia
- any medicines being taken and reason

**Surgical history:** ask about
- any previous or planned operations
- when operation was intended or performed
- where operation was performed or is to be performed

**Reproductive history:** ask about
- total pregnancies
- number/sex of live children
- number of abortions/miscarriages
- number of children who died
- age of youngest child
- type of delivery for her children
- any problems in previous pregnancy or deliveries
- number of children desired
- when wishes to have next child
- whether breastfeeding

**Menstrual history:** ask about
- age at onset of menstruation
- length of cycles
- periods regular or not?
- number of days and amount of blood loss
- bleeding after intercourse
- date and length of last normal period

**Gynaecological history:** ask about
- vulval sores or warts
- PID? If yes, was it treated and when
- STI? If yes, which one, was it treated and when
- lower abdominal pain
- offensive vaginal odour
- pain during intercourse
- pain on urination
- bleeding between periods

- **Family planning history:** ask about
  - how/where first learned about FP
  - whether new to FP or used FP method before
  - if used before, which method used
  - age when started using FP
  - last FP method used
  - duration of using each FP method used
  - any discontinuation of FP method and reason why
  - currently preferred method

- **Inform client:**
  - whether chosen method seems contraindicated or not
  - explain that physical assessment will confirm suitability of this method
  - next steps needed

5. **Perform physical assessment**
- Assess general health status
- Examine client from head to toe:
  - look out especially for alopecia, acne, chloasma, hirsuitism, jaundice, anaemia, enlarged glands, goiter
  - pay particular attention to breasts and abdomen

6. **Perform pelvic examination**
- Inspect external genitalia
- Perform speculum examination
- Perform bimanual examination
- Share findings with the client in simple language
- Explain next steps needed
- Advise on when to have next examination (e.g. routine, annual, follow-up, if problems)
7. **Manage client for chosen FP method**
- Take/record client’s BP and weight
- Take/record client’s history
- Use history checklist in *Procedure Manual* to assess suitability of chosen method
- Provide suitable method and ensure client understands fully how the method works and how any medicine for home use is to be taken
- Advise client on any potential problems with the chosen method and when to return immediately
- Manage any serious side-effects and complications
- Arrange for client to return for routine follow-up and for additional FP supplies

### 24.0. Condom (male)
*eg. Protector, Engabu*

**Indications**
- Couples where one or both partners have HIV/AIDS even if using another FP method
- Couples needing an immediately effective method
- Couples waiting to rule out suspected pregnancy
- Protection against exposure to STIs including HIV/AIDS
- Where back-up method is needed when woman starting or forgotten to take oral contraceptives
- Where this is preferred FP method

**Advantages**
- Man plays role in FP
- Also protects against STI and HIV infection

**Disadvantages**
- Some men may have difficulty maintaining an erection with condom on
- May cause insensitivity of the penis
- Occasional sensitivity to latex or lubricants
Management
▶ Ensure client understands correct use, storage and disposal
▶ Supply at least 40 condoms
▶ Advise client to return for more before they are finished

24.1. Condom (female)
e.g. Femidom, Care
A soft plastic prelubricated sheath with an inner and outer ring which is inserted into the vagina before intercourse

Indications
• As for 7.1 Condoms (male) above
• Women whose partners will not use the male condom
• Where there is allergy or sensitivity to condom latex

Advantages
• Woman plays active role in FP
• Can be inserted before intercourse and so does not interrupt sexual spontaneity
• Not dependent on male erection & does not require immediate withdrawal after ejaculation
• Protects against STI and HIV infection
• No special storage required

Disadvantages
• Requires special training and practice to use correctly
• New product with limited public awareness

Management
▶ Ensure client understands correct use, storage and disposal
▶ Supply at least 40 female condoms
▶ Advise client to return for more before they are finished
24.2. Combined oral contraceptive pill (COC)

e.g. Lo-femenal, Microgynon, Eugynon

Contains an oestrogen + a progestogen, the types and quantities of which may vary in different preparations.

**Indications**
- Women <35 needing highly effective FP method
- Non-breastfeeding clients or breastfeeding clients after 6 months postpartum
- Clients with dysmenorrhoea
- Clients with heavy periods or ovulation pain
- Clients concerned by irregular menstrual cycles

**Contraindications**
- Diastolic BP >100
- Cardiac disease
- Thromboembolic disease
- Active liver disease
- Within 2 weeks of childbirth
- When major surgery planned within 4 weeks
- Unexplained abnormal vaginal bleeding
- Known/suspected cervical cancer
- Undiagnosed breast lumps or breast cancer
- Pregnancy (known or suspected)

**Risk factors:**
If any 2 of the following recommend progrestogen-only or non-hormonal FP method:
- Smoking (especially if >10 cigarettes/day)
- Age >35 years
- Diabetes

**Disadvantages & common side-effects:**
- Spotting, nausea & vomiting within first few months
- May cause headaches, weight gain
- Effectiveness dependent on regular daily dosage
- Suppresses lactation
24. Family Planning (FP)

- Medicine interactions reduce effectiveness including:
  - medicines which increase hepatic enzyme activity, e.g. rifampicin (especially), carbamazepine, griseofulvin, nevirapine, phenytoin, phenobarbitone.
  - short courses of some broad spectrum antibiotics, e.g. ampicillin, amoxicillin, doxycycline.

An additional FP method must be used during course of treatment and for at least 7 days after completion

Complications & warning signs:
- Severe headaches + blurred vision
- Depression
- Acute severe abdominal pain
- Chest pain plus dyspnoea
- Swelling or pain in calf muscle

Management:
- Give 3 cycles of COC and explain carefully:
  - how to take the tablets
  - that strict compliance is essential
  - what to do if doses are missed or there are side-effects or warning signs

If starting COC within 5 days of period:
- Supply and show how to use back-up FP method
- Ask client to return when <7 tablets remain in last cycle

24.3: Progrestogen-only pill (POP)

e.g. Ovrette (also known as the 'mini-pill')

Indications:
- Breastfeeding clients after 3 weeks postpartum
- Women who cannot take COC but prefer to use pills
- Women >40 years
Contraindications:
- Breast or genital malignancy (known or suspected)
- Pregnancy (known or suspected)
- Undiagnosed vaginal bleeding

Disadvantages & common side-effects:
- Spotting, amenorrhoea
- Unpredictable irregular periods
- Not as effective as COC
- Medicine interactions: effectiveness reduced by medicines which increase hepatic enzyme activity

Management:
- Give 3 cycles of POP: explain carefully how to take the tablets and what to do if doses are missed or there are side-effects
- Supply and show how to use back-up FP method for first 14 days of first packet, eg. condoms or abstention from sex
- Ask client to return 11 weeks after start of using POP
  - use the last pill packet to show when this will be

24.4: Injectable progestogen-only contraceptive
A slowly absorbed depot IM injection which provides contraceptive protection for 3 months (e.g. Depo-Provera)

Indications:
- Proven fertile women requiring long-term contraception
- Breastfeeding postpartum women
- Known/suspected HIV positive women who need an effective FP method
- Women with sickle-cell disease
- Women who can't use COC due to estrogen content
- Women who don't want more children but do not (yet) want voluntary surgical contraception
- Women awaiting surgical contraception
**Contraindications:**
- As for POP above *plus*
- Women without proven fertility unless have HIV/AIDS

**Disadvantages & common side-effects:**
- Amenorrhoea
  - often after 1st injection & after 9-12 months of use
- Can cause heavy prolonged vaginal bleeding during 1st 1-2 months after injection
- Weight gain
- Loss of libido, delayed return to fertility
  - up to 10 months after stopping injection

**Complications & warning signs:**
- Headaches
- Heavy vaginal bleeding
- Severe abdominal pain
- Excessive weight gain

**Management:**
- **medroxyprogesterone acetate depot injection** 150mg deep IM into deltoid or buttock muscle
- do **not** rub the area as this increases absorption and shortens depot effect

*If given after day 1-7 of menstrual cycle:*
- Advise client:
  - to abstain from sex or use a back-up FP method, e.g. condoms, for the first 7 days after injection
  - to return for the next dose on a specific date 12 weeks after the injection (if client returns >2-4 weeks later than the date advised, *rule out pregnancy* before giving the next dose)
  - on likely side-effects
  - to return promptly if there are any warning signs
24.5. Intrauterine device (IUD)

Easily reversible long-term non-hormonal FP method effective for up to 8 years which can be inserted as soon as 6 weeks postpartum (eg. Copper T380A)

Indications
- Women in stable monogamous relationships wanting long-term contraception
- Breastfeeding mothers
- When hormonal FP methods are contraindicated

Contraindications
- Pregnancy (known or suspected)
- PID or history of this in last 3 months
- Undiagnosed abnormal uterine bleeding
- Women at risk of STIs (including HIV), e.g. women with, or whose partners have, multiple sexual partners)
- Reduced immunity, e.g. diabetes mellitus, HIV/AIDS
- Known or suspected cancer of pelvic organs
- Severe anaemia or heavy menstrual bleeding

Disadvantages & common side-effects
- Mild cramps during first 3-5 days after insertion
- Longer & heavier menstrual blood loss in 1st 3 months
- Vaginal discharge in first 3 months
- Spotting or bleeding between periods
- Increased cramping pains during menstruation

Complications & warning signs
- Lower abdominal pain
- Foul-smelling vaginal discharge
- Missed period
- Displaced IUD/missing strings
- Prolonged vaginal bleeding
- PID
Management

- Insert the IUD closely following recommended procedures and explaining to the client as each step is undertaken
- Carefully explain possible side-effects and what to do if they should arise
- Advise client:
  - to abstain from intercourse for 7 days after insertion
  - to avoid douching
  - not to have >1 sexual partner
  - to check each sanitary pad before disposal to ensure the IUD has not been expelled, in which case to use an alternative FP method and return to the clinic
  - how to check after menstruation is finished to ensure the IUD is still in place
  - to report to the clinic promptly if: late period or pregnancy, abdominal pain during intercourse, exposure to STI, feeling unwell with chills/fever, shorter/longer/missing strings, feeling hard part of IUD in vagina or at cervix
  - to use condoms if any risk of STIs including HIV

24.6. Progestogen-only sub-dermal implant

Flexible progestogen-releasing plastic rods surgically inserted under the skin of the woman’s upper arm which provide contraceptive protection for 5 years (e.g. Norplant)

Indications

- Women wanting long-term highly-effective but not permanent contraception where alternative FP methods are inappropriate or undesirable

Contraindications

- As for POP
Advantages
- Highly effective (1-3% failure rate)
- No delay in return to fertility after removal
- Long-acting
- Low user-responsibility

Disadvantages & common side-effects
- Irregular bleeding, spotting or heavy bleeding in first few months; amenorrhoea
- Possibility of local infection at insertion site
- Must be surgically inserted & removed by specially trained service provider
- May not be as effective in women >70kg

Warning signs (require urgent return to clinic)
- Heavy vaginal bleeding
- Severe chest pain
- Pus, bleeding or pain at insertion site on arm

Management
▶ Insert the implant subdermally under the skin of the upper arm following recommended procedures
▶ Carefully explain warning signs and need to return if they occur
▶ Advise client to return:
  – after 2 weeks: to examine implant site
  – after 3 months: for first routine follow-up
  – annually until implant removed: for routine follow-up

24.7. Natural FP: Cervical mucus method (CMM)

CMM is a fertility awareness-based method of FP which relies on the change in the nature of vaginal mucus during the menstrual cycle in order to detect the fertile time. During this time, the couple avoids pregnancy by changing sexual behaviour as follows:
24. Family Planning (FP)

- **Abstaining from sexual intercourse**: avoiding vaginal sex completely (also called periodic abstinence)
- **Using withdrawal**: taking the penis out of the vagina before ejaculation (also called coitus interruptus)
- **Using barriers methods**: eg. condoms

Guidance on correct use of the method is only available at centres with specially trained service providers

**Management**
- Ensure client understands how the method works
- Explain how to distinguish the different types of mucus
- Show client how to complete the CMM chart
- Carry out a practice/trial period of at least 3 cycles
- Confirm that the chart is correctly filled
- Advise client:
  - to always use condoms as well as CMM if there is any risk of exposure to STIs/HIV
  - to return on a specific follow-up date after one menstrual cycle

24.8. Natural FP: Lactational amenorrhoea method (LAM)

LAM relies on the suppression of ovulation through exclusive breastfeeding as a means of contraception. Guidance on correct use of the method is only available at centres with trained service providers

**Management**
- Ensure client understands how the method works
- Explain to client that:
  - she must breastfeed her child on demand, on both breasts at least 10 times during day and night
24. Family Planning (FP)

- she must not give the child any solid foods or other liquids apart from breast milk.
- Advise the client that LAM will no longer be an effective FP method:
  - if the baby does not feed regularly on demand or
  - if menstruation resumes and that she will then need to use another FP method
- Advise the client:
  - to use condoms as well as LAM if there is any risk of exposure to STIs/HIV
  - to return after 3 months for a routine follow-up or earlier if she has any problem or wants to change to another FP method

24.9. Voluntary surgical contraception (VSC) for men: Vasectomy

This permanent FP method involves a minor operation carried out under local anaesthetic to cut and tie the two sperm-carrying tubes (vas deferens). It is only available at centres with specially trained service providers

**Indications**
- Fully aware, counseled clients who have voluntarily signed the consent form
- Males of couples:
  - who have definitely reached their desired family size and want no more children
  - where the woman cannot risk another pregnancy due to age or health problems

**Management**
- Ensure client understands how the method works and that it is permanent, not reversible and highly effective
- Explain to client that:
  - vasectomy is not castration and sexual ability/activity is not affected
- the procedure is not immediately effective and that the client will need to use a condom for at least 15 ejaculations after the operation

- After the operation, advise client:
  - on wound care
  - to return for routine follow-up after 7 days or earlier if there is fever, excessive swelling, pus or
  - tenderness at the site of operation.

**24.10. Voluntary surgical contraception (VSC) for women: Tubal ligation**

This permanent FP method involves a minor 15 minute operation carried out under local anaesthetic to cut and tie the two egg-carrying fallopian tubes. It is only available at centres with specially trained service providers

**Indications**
- As for 7.10 vasectomy (above) but for females

**Management**
- Ensure client understands how the method works and that it is:
  - permanent and irreversible
  - highly & immediately effective
- Explain to client that:
  - there may be some discomfort/pain over the small wound for a few days
- Advise client:
  - on wound care
  - to use condoms if there is any risk of exposure to STIs/HIV
  - to return after 7 days for routine follow-up or
  - earlier if there is fever, excessive swelling, pus or
  - tenderness at the site of operation.
25. EARLY DETECTION AND MANAGEMENT OF CHRONIC KIDNEY DISEASE

CKD is a major public health problem in Uganda, Africa and worldwide and is associated with significant morbidity and mortality. Its treatment is characterized by very expensive medical treatment and its early detection prevention which treatment are currently not available to the majority of our population.

**Definition:**
Presence of markers of kidney disease for 3 or more months or a glomerular filtration rate (GFR) of <60 mls/min

These markers are:
- Proteinuria
- Hematuria
- Abnormal radiological studies e.g. Ultrasound

**Causes /Risk factors for chronic kidney disease**
- Diabetes mellitus
- Hypertension / Cardiovascular disease
- Age>50 years
- Family history of kidney disease
- HIV/AIDS

**Clinical features:**
- May present with features of predisposing risk factor
- Anemia Lethargy, easy fatigue, appetite loss nausea vomiting, skin itching, bone pains
- May have body swelling
- Lab / imaging abnormalities
  - Proteinuria
  - Hematuria
  - Abnormalities on kidney imaging (ultrasound/x-rays/CT etc)
25. Early detection and management of chronic kidney diseases

Differential diagnosis
- Other causes of chronic anemia
- Protein-energy malnutrition
- Chronic liver disease

Investigations
GFR / Creatinine
Glomerular filtration rate is determined from serum creatinine using the **Cockcroft-Gault** formula below:

\[
\text{GFR} = \left[ \frac{140 - \text{age (years)}}{\text{weight (Kg)}} \times 0.85 \text{ if female} \right] \times \frac{\text{Serum creatinine (mg/dl)}}{72}
\]

Note that serum creatinine alone does not accurately reflect kidney function therefore attempt should be made to estimate GFR at all times.

In children the Swartz formula should be employed to calculate GFR as shown below:

\[
\text{GFR} = K \times \text{Height (cm)} \times \frac{\text{Serum creatinine (mg/dl)}}{88.5}
\]

Where K is:
- Low birth weight infant: 30
- Normal infants 0 - 18 months: 40
- Girls 2 - 16 year: 49
- Boys 2 - 13 years: 49
- Boys 13 – 16 years: 60

How to screen for CKD
- Urine dipslicks (for protein and blood) and blood pressure measurement at least once a year in high risk patients
- In diabetics Urine microalbumin where possible or a spot urine for Protein: creatinine ratio at least once a year
- Abnormal kidneys on imaging studies e.g. Ultrasound
25. Early detection and management of chronic Kidney diseases

- Patients with detected abnormalities should have a serum creatinine test performed and GFR calculated as suggested above

**Management**

**The following patients should be considered for referral for an opinion**

- Persistent proteinuria or haematuria
- GFR < 60 ml/min or creatinine > 1.9 mg/dl
- Familial kidney disease e.g. polycystic kidney disease

NB: All children with renal problems must be referred as soon as possible

**The aim of referral of patients with CKD is**

- Establish diagnosis and treat reversible diseases
- Identify co-morbid conditions and manage further complications of CKD
- Slow progression of CKD by optimizing treatment
- Plan renal replacement therapy well before and stage kidney disease is reached

**Treatment to preserve kidney function in patients with CKD**

- **Life modification:** Weight loss, stop smoking, exercise, healthy balanced diet, lipid control, salt restriction
- **Blood pressure control**- target 130/80 mmHg-lower in children. Use ACE inhibitors 1st line antihypertensives for diabetics and patients with proteinuria, low salt diet.
- **In Diabetics** BP control paramount
- **Optimal blood sugar control** (HbA1C < 7%)
- **Proteinuria** Reduce using AcE inhibitors and/or ARBs – target < 1 g/day
• **Avoid nephrotoxic medicines** Especially; NSAIDs, CIXIBs, Aminoglycosides, contrast agents

• **Anemia;** develops early in CKD and should maintain target Hb of 11-12g/dl
### 26. OCCUPATIONAL ILLNESSES

**Causes**

Occupational illnesses vary depending on the nature of work, type illness that can be physical injury, chemical injury or poisoning, infections from biological agents to psycho-social trauma. Potential hazards range from physical, chemical, biological, ergonomic and psycho-social. For example, Health care workers are exposed to a wide range of hazards such as micro-organisms (HIV, Hepatitis, and T.B, etc.), radiation, chemicals, ergonomic/postural problems, among others.

The table below highlights examples of potential occupational illnesses in some high risk occupations in Uganda.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Occupational disease</th>
<th>Physical injuries</th>
<th>Chemical injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Health Sector.</strong></td>
<td>HIV/AIDS,</td>
<td>Radiation injuries</td>
<td>Acute/chronic</td>
</tr>
<tr>
<td>All health workers</td>
<td>Hepatitis A, B, C</td>
<td>UV keratitis</td>
<td>poisoning</td>
</tr>
<tr>
<td>especially:</td>
<td>Ebola,</td>
<td>Needle sticks</td>
<td>Contact &amp;</td>
</tr>
<tr>
<td>Surgeons,</td>
<td>Tuberculosis</td>
<td>Bruises</td>
<td>Allergic</td>
</tr>
<tr>
<td>Nurses &amp; Midwives,</td>
<td>Tetanus</td>
<td>Cut wounds</td>
<td>dermatitis</td>
</tr>
<tr>
<td>Laboratory,</td>
<td>Emerging &amp; re-emerging viral &amp; microbial infections</td>
<td>Burns/</td>
<td>Occupational asthma</td>
</tr>
<tr>
<td>Mortuary</td>
<td>Hospital - acquired infections</td>
<td>scalds</td>
<td></td>
</tr>
<tr>
<td>Blood transfusion units</td>
<td>e.g. Staph. Aureus</td>
<td>Work overload,</td>
<td>Occupational cancers</td>
</tr>
<tr>
<td>Renal dialysis units</td>
<td></td>
<td>Stress, Cardiovascular disorders, Mental illnesses</td>
<td></td>
</tr>
<tr>
<td>Intensive care units</td>
<td></td>
<td>Ergonomic injuries</td>
<td>Medicine and Antiseptics causing e.g. Allergies, Dermatoses</td>
</tr>
<tr>
<td>Emergency units</td>
<td></td>
<td>(tenosynoviti s, backache, etc)</td>
<td></td>
</tr>
<tr>
<td>Ambulance workers</td>
<td></td>
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</tr>
</tbody>
</table>
### 26. Occupational illnesses

<table>
<thead>
<tr>
<th>Sector</th>
<th>Occupational disease</th>
<th>Physical injuries</th>
<th>Chemical injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Radiology &amp; Radiotherapy units</td>
<td></td>
<td>Assault and violence at work place e.g. mental clinics, medicine addicts.</td>
<td>Cytotoxic medicines and other Immuno suppressants (oncology)</td>
</tr>
<tr>
<td>• STI clinics</td>
<td></td>
<td>Ergonomical Musculo-skeletal disorders. Poor design of work places, work processes and tools.</td>
<td>Steroid medicines</td>
</tr>
<tr>
<td>• Handling of Biological active agents e.g.</td>
<td></td>
<td>Musculo - skeleton disorders e.g. lifting heavy loads and patients.</td>
<td>Anaesthetic Agents</td>
</tr>
<tr>
<td>Enzymes, vaccines, Laboratory specimen,</td>
<td></td>
<td>Needle stick injuries and other traumatic injuries e.g. in theatres.</td>
<td>Cleaning, pesticides</td>
</tr>
<tr>
<td>experimental animals etc.</td>
<td></td>
<td></td>
<td>Others, e.g. Formaldehyde</td>
</tr>
<tr>
<td>• Poor environmental design (Lighting,</td>
<td></td>
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<tr>
<td>heating, ventilation, noise, vibration</td>
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</tr>
<tr>
<td>etc.). These can lead to accidents, fatigue</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>and spread of contagious disease.</td>
<td></td>
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</tr>
<tr>
<td>Work stress and work overload, with their</td>
<td></td>
<td>Air pollution, odour e.g. in mortuary, Laboratories. Radiation Exposure. Non-ionising Radiation</td>
<td></td>
</tr>
<tr>
<td>effects on C.N.S, C.V.S. Immune system,</td>
<td></td>
<td>Infra Red U.V light Laser beam</td>
<td></td>
</tr>
<tr>
<td>Ageing process, and the negative effect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>on work efficiency and job satisfaction.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Shift work -</td>
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</tbody>
</table>

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## 26. Occupational illnesses

<table>
<thead>
<tr>
<th>Sector</th>
<th>Occupational disease</th>
<th>Physical injuries</th>
<th>Chemical injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading to chronobiologic disturbances e.g. sleep and social disruption e.g. Divorces, Accidents on night shifts. Medicine, Alcohol, Tobacco Abuse. This is one of the commonest and most Serious occupational health hazard in health workers.</td>
<td></td>
<td>e.g. used in surgery V.D.U's Electromagnetic fields Ionising Radiation, X-ray and Imaging Departments Radiotherapy and</td>
<td>Radioisotope work Laboratory and Research work with Radioactive chemicals during Treatment of patients with Radioactive medicines. Noise and vibration - e.g. electric drills and motors. Psycho - social disorders</td>
</tr>
<tr>
<td>Working in unusual places and doing unusual jobs e.g. in pathology department and mortuary. The aged health worker and his/her dilemma as retirement come in.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
### 26. Occupational illnesses

<table>
<thead>
<tr>
<th>Sector</th>
<th>Occupationa l disease</th>
<th>Physical injuries</th>
<th>Chemical injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slaughter house &amp; butcheries</td>
<td>Trypanosomiasis</td>
<td>Stress, Heat over exposure, Cardiovascular disorders, Mental illnesses</td>
<td>Allergic reactions to animal, plant or chemical irritants, Extrinsic allergic alveolitis, Occupational asthma, Occupational cancers</td>
</tr>
<tr>
<td>Laboratories Waste handlers</td>
<td>Q- fever</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure to &amp; ingestion of</td>
<td>Psitacosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mineral &amp; organic</td>
<td>Avian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dusts and volatile</td>
<td>Influenza</td>
<td></td>
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<tr>
<td>organic chemical fumes</td>
<td>Trichinosis</td>
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<td></td>
</tr>
<tr>
<td>(pesticides &amp; other agro-chemicals)</td>
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<tr>
<td></td>
<td>Chancrosporiasis</td>
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<td></td>
<td>Hookworms</td>
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<td></td>
<td>Malaria</td>
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<tr>
<td></td>
<td>Schistosomiasis</td>
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<td></td>
<td>Tuberculosis</td>
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<td></td>
<td>Tetanus</td>
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<td></td>
<td>Typhoid</td>
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<td></td>
<td>Agro - chemical poisoning</td>
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<tr>
<td>3. Construction Industry</td>
<td>Crush &amp; traumatic injuries</td>
<td></td>
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<tr>
<td>Exposure to &amp; inhalation of</td>
<td>Ergonomic injuries (tenosynovitis, backache, etc)</td>
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<tr>
<td>mineral &amp; organic dusts,</td>
<td>Electrical injuries (shocks, burns, VS arrest)</td>
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<tr>
<td>volatile organic chemical</td>
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<tr>
<td>fumes due to machining,</td>
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<tr>
<td>drilling, sanding,</td>
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<tr>
<td>milling, welding, cutting,</td>
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<tr>
<td>sawing and grinding.</td>
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<tr>
<td>Electrocution</td>
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<tr>
<td>4. Mining, Quarrying,</td>
<td>Work overload, Heat over exposure, Cardiovascular disorders, Mental illnesses</td>
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<tr>
<td>Tunneling</td>
<td>Ergonomic injuries (tenosynovitis, backache, etc)</td>
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<tr>
<td>exposure &amp; inhalation of</td>
<td></td>
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<tr>
<td>mineral dusts, chemical</td>
<td></td>
<td></td>
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<tr>
<td>fumes, exposure to noise</td>
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<tr>
<td>Radiation (radon)</td>
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<td></td>
<td>Hookworms</td>
<td></td>
<td>Mercury poisoning in gold miners, Acute &amp; chronic obstructive airways diseases, Asbestosis, Silicosis, Pneumoconiosis, Occupational asthma</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Sector</th>
<th>Occupational disease</th>
<th>Physical Injuries</th>
<th>Chemical injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>etc) Crush &amp;</td>
<td>Occupational cancers</td>
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<tr>
<td></td>
<td></td>
<td>traumatic injuries</td>
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<td></td>
<td></td>
<td>Auditory injuries &amp; deafness</td>
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<tr>
<td>5. Iron mongers /welding</td>
<td></td>
<td>Ergonomic injuries</td>
<td>Acute &amp; chronic obstructive airways</td>
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<tr>
<td></td>
<td></td>
<td>(tenosynovitis, backache, etc)</td>
<td>diseases</td>
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<tr>
<td></td>
<td></td>
<td>Traumatic injuries</td>
<td>Occupational asthma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auditory injuries and deafness</td>
<td>Occupational lung cancer</td>
</tr>
<tr>
<td>Wood works, Carpentry &amp; joinery, Grain milling</td>
<td></td>
<td>Inhalation of mineral dusts</td>
<td>Contact &amp; Allergic dermatitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exposure to organic wood &amp; grain dust, fungal spores, microbes, chemicals, enzymes</td>
<td>Byssinosis</td>
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<tr>
<td></td>
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<td></td>
<td>Acute &amp; chronic obstructive airways</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>diseases</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bronchitis, Occupational asthma</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Occupational lung cancers</td>
</tr>
</tbody>
</table>
Prevention
Emphasis should be put on instituting preventive measures through sensitization, awareness and training of workers in Good Work Practices, proper use of and maintenance of working tools & equipments, Standard Operating Procedures (SOPs), proper and adequate use of protective wear & equipment, and for Health workers orientation in application of the Universal Hygiene Precautions and Infection Control Procedures.

Other preventive measures include:
- Immunization against some diseases like tetanus, Hepatitis B for those workers at high risk e.g. Farm workers, Surgeons, Midwives, Laboratory and Mortuary attendants.
- Inspection of workplaces to ascertain good working conditions and safe guard against Occupational accidents, diseases and injuries,
- Identifying Occupational hazards and putting in place measures to control their occurrences/reoccurrences.
- Ensure the provision of adequate Occupational Health Services e.g. First-Aid, Clinics on site health services etc,
- Ensure compliance with all provisions of the Factories Act and its subsidiary legislation,
- Carry out specific inspections with regard to working methods, production methods and processes and planning of agricultural activities with an aim of improving productivity,
- Ensure safe handling and use of toxic chemicals, materials and other dangerous materials, including proper waste management.
- Carry out medical inspections of workplaces,
26. Occupational illnesses

- Monitor record and interpret statistical data of agricultural accidents, diseases and health hazards,
- Investigate illness arising out of different economic activities
- Organize training courses/Seminars on Occupational safety and Health for both employees, employers and other stakeholders to stimulate interest in matters connected with Occupational Safety and Health related to agricultural activities,
- Setting Occupational Safety and Health Standards and enforcing their compliance throughout the country.

Treatment
Clinical management including rehabilitation should therefore be specifically tailored to the cause, nature and status of illness of a given individual patient. Treatment (pre-exposure prophylaxis, post-exposure management and treatment of clinical onset) for diseases acquired via occupational exposure should be given following the guidelines spelt out in relevant sections of this Treatment Guide especially for the following diseases:
1. Hepatitis B
2. HIV/AIDS
3. Ebola
4. T.B
5. Tetanus
6. Other highly infectious viral diseases
1. Minor toxic reactions
All anti-TB drugs are likely to cause minor subjective intolerance. These minor toxic reactions are basically like the general side-effects of other drugs and should be managed in a similar manner.

2. Major toxic reactions
The reactions are mainly of four types:
2.1 Hypersensitive reactions
2.2 Hepatitis
2.3 Neurotoxicity
2.4 Pyrazinamide arthralgia
If any of these reactions occurs, all anti-TB treatments should be stopped immediately and each reaction managed accordingly as described below.

2.1 Hypersensitivity reactions
Most anti-TB drugs cause hypersensitisation between week 3 and week 8 of treatment. These reactions are characterised by:
- sudden onset of fever - often accompanied by headache
- vomiting
- the appearance of an itchy erythematous rash
Other manifestations include:
- malaise
- lymphadenopathy
- splenomegaly, hepatomegaly
- albuminuria
- occasionally, and particularly with thiacetazone, exfoliative dermatitis or erythema multiforme (Stevens-Johnson syndrome) occurs
Management of hypersensitivity reactions

This is done in three stages:

**Stage A: Treat the reaction**

- Stop all anti-TB drugs and any other drugs which the patient was taking before the reaction occurred
- Give an antihistamine,
  - eg. **chlorphenamine** 4mg every 4-6 hours
    - max: 24mg/day
  - or **promethazine hydrochloride** 25mg at night
    - increase to 25mg twice daily if required

  *If the reaction is severe:*
  - Give **prednisolone**: in severe reactions like exfoliative dermatitis and Stevens-Johnson Syndrome, the initial dose should be high (eg. 45-60mg daily)

Occasionally, the reaction is too mild to justify withdrawal of the anti-TB drugs. In such cases, it is permissible to add an antihistamine for a few days while continuing with the anti-TB drugs

At times, the TB is so severe that it is an immediate threat to life (eg. miliary TB, meningitis). In such cases the anti-TB drugs must be continued under steroid cover

**Stage B: Identify the offending drug**

When the fever and skin rash have subsided, proceed to confirm hypersensitivity and identify the drug to which the patient is hypersensitive as follows:

a) In all cases, test for hypersensitivity to all the drugs in use at the time of the hypersensitivity reaction

b) First test for isoniazid, then for the other drugs in any order
Appendix 1

Test for hypersensitivity as follows:

i) Give 1/8 of the normal daily dose on the day 1

ii) If there is no reaction to i), give ¼ of the normal daily dose on the following day (day 2)

iii) If there is no reaction to ii), give ½ of the normal daily dose on the following day (day 3)

iv) If there is no reaction to iii), give a full daily dose on the following day (day 4)

The first test dose at i) may be omitted except in those cases where the original hypersensitive reaction was severe.

d) If there is a reaction to the drug and dosage as at c) iv) above, it should be allowed to subside completely before starting the hypersensitivity test for the next drug.

Desensitisation

If drug hypersensitivity is confirmed, desensitise as follows:

a) Start with 1/8 normal daily dose
   - if on hypersensitivity testing above a severe reaction was produced by the initial 1/8 dose, desensitisation should begin with a lower dose

b) If there is no reaction to the 1/8 desensitisation dose, increase the dose by a similar amount each day (eg. 1/8, 1/4, 3/8, 1/2, etc) until a full dose is reached, provided there is no reaction to any of the increased doses
   - if a reaction occurs after any dose, allow it to subside, then repeat that same dose daily and for as long as necessary, until it can be given without any reaction occurring. Then proceed to the next higher dose

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Note:
If the hypersensitivity is severe at the start of treatment (eg. Stevens-Johnson Syndrome), change the Anti-TB regimen immediately

**Stage C: Reintroduce anti-TB therapy**
When the patient has reached full dose as above for each offending drug, restart the regimen. If desensitisation fails, change to another regimen

**2.2 Hepatitis**
Hepatitis occasionally occurs in patients receiving isoniazid, rifampicin or pyrazinamide. In all cases where there is any manifestation of liver toxicity, liver function tests should be performed if possible and supportive therapy given while awaiting full recovery before treatment can be reinstated

**2.3 Neurotoxicity**

**Streptomycin**: The most serious complication of streptomycin treatment is neurotoxicity and, in particular damage to the vestibular branch of the 8th cranial nerve, especially in older patients. There may be tinnitus, severe giddiness and ataxia - if severe, stop the drug and substitute it with ethambutol or change to another regimen

**Isoniazid**: Peripheral neuritis or mental confusion may occur. Give pyridoxine 10mg daily or a vitamin B compound preparation containing pyridoxine - this almost invariably resolves the peripheral neuropathy and may resolve the mental confusion

**2.4 Pyrazinamide arthralgia**
If troublesome and not responding to paracetamol, the drug should be stopped and the regimen changed to one without pyrazinamide.

Advise on adequate intake of oral fluids
### Appendix 2: WHO Staging for HIV Infection and Disease in Adults & Adolescents

#### Clinical Stage I:
1. Asymptomatic
2. Persistent generalised lymphadenopathy

**Performance Scale 1: Asymptomatic, normal activity**

#### Clinical Stage II:
1. Moderate weight loss (less than 10% of presumed or measured body weight)
2. Minor mucocutaneous manifestations (seborrhoeic dermatitis, prurigo, fungal nail infections, recurrent oral ulcerations, angular stomatitis)
3. Herpes zoster within the last 5 years
4. Recurrent upper respiratory tract infections, e.g., bacterial sinusitis, tonsillitis, otitis media and pharyngitis

**And/or Performance Scale 2: Symptomatic but normal activity**

#### Clinical Stage III:
1. Severe weight loss (more than 10% of presumed or measured body weight)
2. Unexplained chronic diarrhoea for more than 1 month
3. Unexplained prolonged fever, intermittent or constant, for more than 1 month
4. Oral candidiasis
5. Oral hairy leukoplakia
6. Pulmonary tuberculosis (current)
7. Severe bacterial infections such as pneumonias, pyomyositis, empyema, bacteremia or meningitis
8. Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
9. Unexplained anemia (<8gm/dl), neutropenia (<0.5×10^9 per litre), or chronic thrombocytopenia (<50×10^9 per litre)

**And/or Performance Scale 3: Bed-ridden for less than 50% of the day during the last month**
Clinical Stage IV:

1. HIV wasting syndrome – weight loss of more than 10%, and either unexplained chronic diarrhoea for more than 1 month, or chronic weakness or unexplained prolonged fever for more than 1 month
2. Pneumocystis pneumonia (PCP)
3. Recurrent severe bacterial pneumonia
4. Toxoplasmosis of the brain
5. Cryptosporidiosis with diarrhoea for more than 1 month
6. Chronic isosporiasis
7. Extrapulmonary cryptococcus including meningitis
8. Cytomegalovirus infection (retinitis or infection of other organs)
9. Herpes simplex virus (HSV) infection, mucocutaneous for more than 1 month, or visceral at any site
10. Progressive multifocal leukoencephalopathy (PML)
11. Any disseminated endemic mycosis such as histoplasmosis, coccidioidomycosis
12. Candidiasis of the oesophagus, trachea, bronchi or lungs
13. Atypical mycobacteriosis, disseminated
14. Recurrent non-typhoid salmonella septicaemia
15. Extrapulmonary tuberculosis
16. Lymphoma
17. Invasive cancer of the cervix
18. Kaposi’s sarcoma
19. HIV encephalopathy – disabling cognitive and/or motor dysfunction interfering with activities of daily living, progressing slowly over weeks or months, in the absence of concurrent illness or condition other than HIV infection that could account for the findings
20. Atypical disseminated leishmaniasis
21. Symptomatic HIV-associated nephropathy or symptomatic HIV associated cardiomyopathy

And/or Performance Scale 4: Bed-ridden for more than 50% of the day during the last month
### Appendix 3: WHO Clinical Staging of HIV for infants & children with HIV infection

<table>
<thead>
<tr>
<th>Clinical Stage I:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Asymptomatic</td>
</tr>
<tr>
<td>2. Persistent generalised lymphadenopathy</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Stage II:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unexplained persistent hepatosplenomegaly</td>
</tr>
<tr>
<td>2. Papular pruritic eruptions</td>
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<tr>
<td>3. Extensive wart virus infection</td>
</tr>
<tr>
<td>4. Extensive molluscum contagiosum</td>
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<tr>
<td>5. Recurrent oral ulcerations</td>
</tr>
<tr>
<td>6. Unexplained persistent parotid enlargement</td>
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<tr>
<td>7. Lineal gingival erythema</td>
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<tr>
<td>8. Herpes zoster</td>
</tr>
<tr>
<td>9. Recurrent or chronic upper respiratory tract infections (otitis media, otorrhoea, sinusitis, tonsillitis)</td>
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<tr>
<td>10. Fungal nail infections</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Stage III:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unexplained moderate malnutrition not adequately responding to standard therapy</td>
</tr>
<tr>
<td>2. Unexplained persistent diarrhoea (14 days or more)</td>
</tr>
<tr>
<td>3. Unexplained persistent fever (above 37.5 °C, intermittent or constant, for longer than one month)</td>
</tr>
<tr>
<td>4. Persistent oral candidiasis (after first 6 weeks of life)</td>
</tr>
<tr>
<td>5. Oral hairy leukoplakia</td>
</tr>
<tr>
<td>6. Acute necrotizing ulcerative gingivitis/periodontitis</td>
</tr>
<tr>
<td>7. Lymph node TB</td>
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<tr>
<td>8. Pulmonary TB</td>
</tr>
<tr>
<td>9. Severe recurrent bacterial pneumonia</td>
</tr>
<tr>
<td>10. Symptomatic lymphoid interstitial pneumonitis</td>
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<td>11. Chronic HIV-associated lung disease including bronchiectasis</td>
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<td>12. Unexplained anaemia (&lt;8.0 g/dl), neutropenia (&lt;0.5 x 10^9/L^3) or chronic thrombocytopenia (&lt;50 x 10^9/L^3)</td>
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### Clinical Stage IV:

1. Unexplained severe wasting, stunting or severe malnutrition not responding to standard therapy
2. Pneumocystis pneumonia (PCP)
3. Recurrent severe bacterial infections (e.g. empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia)
4. Chronic herpes simplex infection; (orolabial or cutaneous of more than one month's duration, or visceral at any site)
5. Extrapulmonary TB
6. Kaposi sarcoma
7. Oesophageal candidiasis (or Candida of trachea, bronchi or lungs)
8. Central nervous system toxoplasmosis (after the neonatal period)
9. HIV encephalopathy
10. Cytomegalovirus (CMV) infection; retinitis or CMV infection affecting another organ, with onset at age over 1 month
11. Extrapulmonary cryptococcosis (including meningitis)
12. Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiomycosis)
13. Chronic cryptosporidiosis (with diarrhoea)
14. Chronic isosporiasis
15. Disseminated non-tuberculous mycobacteria infection
16. Cerebral or B cell non-Hodgkin lymphoma
17. Progressive multifocal leukoencephalopathy
18. HIV-associated cardiomyopathy or nephropathy
## Appendix 3: Antiretroviral Drug Toxicity

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<th>Minor toxicities</th>
<th>Monitoring/Management</th>
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<td>Zidovudine (ZDV)</td>
<td>Hematological (Anemia, neutropenia, thrombocytopenia), myopathy, GI intolerance</td>
<td>Blue to black discoloration of nails, nausea and headache</td>
<td>For severe anemia: • Reduce dose or change to d4T or transfuse For myopathy: • Discontinue if CPK high</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>Painful peripheral neuropathy, pancreatitis</td>
<td>Skin rash, headache</td>
<td>Do serum amylase. Stop if elevated. Restart when resolved or change to ABC</td>
</tr>
<tr>
<td>Stavudine (d4T)</td>
<td>Painful neuropathy, lipatrophy, lactic acidosis, hepatitis, pancreatitis</td>
<td>Insomnia, anxiety, panic attacks</td>
<td>Severe peripheral neuropathy, abnormal serum amylase and transaminases, discontinue therapy</td>
</tr>
<tr>
<td>Didanosine (ddI)</td>
<td>Pancreatitis, painful peripheral neuropathy</td>
<td>Abdominal cramps, diarrhea</td>
<td>Discontinue if neuropathy severe, raised serum amylase and transaminases</td>
</tr>
<tr>
<td>Tenofovir (TDF)</td>
<td>Renal dysfunction</td>
<td></td>
<td>Monitor renal function at baseline, and every 6 months. Avoid use in pregnant women except if other alternatives are not available.</td>
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<tr>
<td>Abacavir (ABC)</td>
<td>Hypersensitivity reaction, lactic acidosis</td>
<td></td>
<td>Discontinue therapy and don’t restart when resolved</td>
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<tr>
<td>Antiretroviral Drug</td>
<td>Primary toxicities</td>
<td>Minor toxicities</td>
<td>Monitoring/Management</td>
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</tr>
<tr>
<td>Nevirapine (NVP)</td>
<td>Skin rash, Stevens-Johnson syndrome, hepatotoxicity</td>
<td></td>
<td>Low-dose over first 2 weeks minimizes rash occurrence. If mild or moderate continue cautiously or substitute with EFV. If severe stop NVP and permanently if hepatitis +ve</td>
</tr>
<tr>
<td>Efavirenz (EFV)</td>
<td>Nightmares, rash, hepatitis</td>
<td>Dizziness,</td>
<td>Rash in 10% but rarely severe &lt;1%; CNS symptoms often resolve 2-4 weeks. Stop if hepatitis is confirmed.</td>
</tr>
<tr>
<td>Lopinavir/Rotinavir</td>
<td>Diarrhea, skin rash</td>
<td>Headache, weakness</td>
<td>Diarrhea rarely severe</td>
</tr>
<tr>
<td>Nelfinavir (NFV)</td>
<td>Diarrhea, lipid, glucose &amp; liver abnormalities,</td>
<td></td>
<td>Diarrhea occurs 10-30% at start of therapy but often resolves on its own</td>
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<tr>
<td>Indinavir (IDV)</td>
<td>Nephrolithiasis, hepatitis, lipid, glucose abnormalities</td>
<td>Headache, rash, retinoid-like effects, alopecia,</td>
<td>Ensure adequate re-hydration (1.5 L/day). Monitor liver enzymes</td>
</tr>
<tr>
<td>Emtricitabine (FTC)</td>
<td>Lactic acidosis with hepatic steatosis</td>
<td>Hyperpigmentation Skin coloration</td>
<td>Do serum lactate if suspicious symptoms exist</td>
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Appendix 3: HIV/AIDS
HEALTH WORKER SAFETY & UNIVERSAL HYGIENE PRECAUTIONS

Take the following universal hygiene precautions when managing HIV+ patients and also whenever high levels of hygiene must be observed, eg. surgical procedures, deliveries, newborn resuscitation:

- **Wash your hands** thoroughly with soap and water or use a suitable disinfectant:
  - before and after each procedure
  - when any skin area is contaminated with body fluids
  - after removing gloves (which may have holes in them)
  - after changing soiled bed sheets or clothing

- **Wear protective gloves:**
  - Wear sterile or high-level disinfected gloves when performing procedures
  - Wear clean gloves for handling body fluids/secretions, contaminated waste, instruments, and for cleaning body fluid spills

- **Protect yourself from body fluids:**
  - wear gloves (as above)
  - cover wounds or cuts with a waterproof bandage
  - wear protective boots and gloves and where possible, wear a water-proof apron when working in a heavily contaminated area, eg. Toilets
  - wear eye protection to protect from blood splashes (normal spectacles are adequate)
  - avoid mouth to mouth resuscitation and pipetting by mouth where possible
  - avoid unnecessary procedures, eg. episiotomy
  - in surgical procedures, use a needle holder, use an appropriate sized needle, wear double gloves, wear eye shield
Appendix 3

- **Ensure safe sharps handling and disposal**
  - avoid accidental pricks and cuts with contaminated sharp instruments (e.g. needles) by careful handling and proper disposal
  - keep a puncture-resistant container nearby
  - use each needle and syringe only once
  - do not recap, bend or break needles after use
  - drop all used disposable needles, plastic syringes and blades directly into the sharps container without recapping or passing to another person
  - empty or send for incineration when container is ¾ full

- **Practice safe waste disposal:**
  - dispose of placenta or blood/body-fluid contaminated items in leak-proof containers
  - burn or bury contaminated solid waste
  - wash hands, gloves and containers after disposal of infectious waste

- **Ensure proper handling of linen/laundry**
  - collect clothing/sheets stained with blood/body-fluids wearing gloves or using a plastic bag & keep separate from other laundry - *never* touch them directly
  - rinse off blood/body fluids before washing with soap

- **Ensure correct cleaning & sterilisation**
  - thoroughly clean/disinfect (according to instructions) any equipment which contacts intact skin

  Properly sterilise all instruments which penetrate the skin and ensure reusable needles and syringes are:
  - carefully and thoroughly cleaned after use and rinsed in clean water
  - kept in disinfectant solution before (re-sterilisation)
Appendix 3

− cleaned again in clean water before sterilisation in an autoclave or by boiling for at least 30 minutes

**Post-exposure prophylaxis**

The risk of a health worker acquiring HIV infection at work is extremely small if the above measures are followed. However, if significant exposure to HIV has occurred:

- Immediately wash the skin with soap and water
- flush mucous membranes with lots of water
- Evaluate the source (if known) of HIV including serology and stage of the disease
- Initiate post-exposure prophylaxis (PEP) with specific antiretroviral drugs (if available) within 1-2 hours of exposure to HIV-infected material
- Monitor the health worker and provide initial and follow-up counselling and medical evaluation
- Do HIV serology at baseline, 6 weeks, 3 months and 6 months
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AMENDMENT FORM

Use the format shown on this form to propose amendments to any part of these guidelines. Forward your proposals, together with relevant supporting documentation/ references, by post, fax or e-mail to:

The Permanent Secretary
Ministry of Health, PO Box 7272, Kampala
Attention: The Commissioner for Clinical Services
Tel: (+256) 41 231576 Fax: (+256) 41 231584
E-mail: dghs@health.go.ug

Name: .................................................................

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Position: ...........................................................

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Address: ...........................................................

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UCG Section number: ...........................................

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Condition: ........................................................

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Suggested amendments:

UCG 2010  584
Glossary

Alopecia: absence of hair in areas where it usually grows
Alveoli: microscopic blind-ended air sacs in the lung
Anorexia: loss of appetite
Anthropometry: measurement of the human body or its parts
Arthrotomy: surgical incision of a joint capsule to inspect the contents and drain any pus present
Bullae: large blisters containing serous fluid
Chloasma: ill-defined but symmetrical brown patches on the face
Conjuntiva: mucous membrane lining the eye and inside of the eyelids
Dorsiflexion: backward flexion of the foot or hand or their digits, ie. bending towards the upper surface
Dyspnoea: difficult breathing
Dysuria: painful or difficult urination
Effusion: escape of pus, serum, blood, lymph or other fluid into a body cavity as a result of inflammation or presence of excess blood or tissue fluid in an organ or tissue
Fornix: any of the 3 vaulted spaces at the top of the vagina around the cervix
Gibbus: sharply angled curvature of the backbone
Hernia, herniation: protrusion of an organ or tissue out of a body cavity in which it normally lies
Hirsuitism: presence of coarse pigmented hair on face, chest, upper back or abdomen in a female as a result of excessive male hormone production
Homans’ sign: where pain from muscular causes is absent or minimal on dorsiflexion of the ankle with the knee flexed but maximal with the knee extended or
during straight leg raising
Keratinization: the process by which cells become
horny due to deposition of keratin within them, eg. as
in the epidermis of the skin
Kyphosis: excessive outward curvature of the spine
causing hunching of the back
Metritis: inflammation of the uterus
Oedema: excessive build up of fluid in body tissues
Oliguria: reduced renal output (production of
abnormally small amount of urine)
Paracentesis: tapping – the process of drawing off
excess fluid from a part of the body through a hollow
needle or cannula
Paroxysm: sudden, violent attack, especially a spasm
or convulsion (paroxysmal adj)
Partogram: a graphic record of the course of labour
Pneumatocoele: herniation of lung tissue
Rhinoscleroma: formation of nodules in the interior of
the nose and nasopharynx which become thickened;
caused by bacterial infection
Sciatica: pain and sensation in the area of distribution
of sciatic nerve
Septum: partition or dividing wall within a bodily
structure, eg. nasal septum
Stridor: noise heard on breathing when trachea or
larynx is obstructed - usually louder than a wheeze
Thrombophlebitis: inflammation of the wall of a vein
Uvula: small extension of the soft palate which hangs
from the roof of the mouth above the root of the
tongue