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Standard Treatment Guidelines – Ghana

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2004

Ministry of Health
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[GNDP]

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PREFACE

The Ministry of Health has undergone reforms since the last decade as part of Ghana Government's response to the structural adjustment programme. Key components of the reforms include regular policy review and implementation of programmes that will deliver effective and efficient health services. The main objective of the current reforms is to alleviate poverty and to "bridge the inequality gap". The latter has thus become the theme for the current Programme of Work (POW).

The current POW identifies key priority areas of activities with emphasis on finding alternative sources of health care financing to ensure equitable access to health care for all Ghanaians within a resource limited environment. The reforms also take cognisance of the numerous challenges that have been identified which tend to militate against attempts at improving the health status of the population in the medium term. Key among these challenges is the need to improve quality of care and to inject efficiency into the way in which resources in the health sector are used.

The Standard Treatment Guidelines (STG) serves as one of the means by which quality of care can be provided for patients seeking health care. Through the use of well-established methods of prevention, diagnosis and treatment of common diseases seen in our health facilities, this edition brings together essential and current knowledge necessary for prescribers to provide the best of care to patients. Furthermore, by developing this document within the framework of the Essential Medicines Programme, it serves as an effective way of containing cost of treatment for both patients and the health sector. The recent implementation of the National Health Insurance Scheme (NHIS) makes this even more imperative and the STG is going to be one of the key tools to be used by managers and practitioners in the NHIS

The fifth edition of the Standard Treatment Guidelines is aimed at all levels of healthcare, both in the public and private sectors, throughout the country and will assist healthcare professionals in their treatment choices. Care was taken in the process of the review of the fourth edition to ensure a guide that will be acceptable and useful to all. This has resulted in a comprehensive and highly organised document, designed to serve as a clinical guide as well as an educational tool. I am sure that it will bring us closer to ensuring the proper management of all patients throughout Ghana in a standardised, quality and cost-effective manner.

DR. KWAKUAFRIYIE
HON. MINISTER FOR HEALTH
DECEMBER 2004

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The Royal Netherlands Government, for their support to the Ghana National Drugs Programme (GNDP).
CHAPTER 1: INTRODUCTION

The Ministry of Health in 1983 published a list of Essential Drugs with Therapeutic Guidelines to aid the rational use of drugs. This document has been reviewed in response to new knowledge on drugs and diseases and changes in the epidemiology of diseases in Ghana. The Ministry has also produced guidelines for specific disease control programmes, diseases and identifiable health providers.

The Government of Ghana, through the National Drug Policy remains committed to ensuring the availability and accessibility of good quality medicines for all people, and that these medicines are affordable and are rationally used. Achieving these objectives requires a comprehensive strategy that not only includes supply and distribution, but also appropriate and thoughtful prescribing, dispensing and use of medicines.

These Standard Treatment Guidelines have been prepared to assist and guide prescribers (including doctors, medical assistants, and midwives), pharmacists, dispensers, and other healthcare staff who prescribe at primary care facilities in providing quality care to patients. The guidelines list the preferred treatments for common health problems experienced by people in the health system and were field-tested before being finalised to ensure that the opinion of the intended users were considered and incorporated.

The guidelines are designed to be used as a guide to treatment choices and as a reference book to help in the overall management of patients, such as when to refer. The guidelines are meant for use at all levels within the health system, both public and private.

It is recognised that the treatment guidance detailed in this book may differ from current practice. It is emphasised that the choices described here have the weight of scientific evidence to support them, together with the collective opinion of a wide group of recognised national and international experts. The recommendations have been rated on the following basis:

**Evidence rating A** – requires at least one randomised control trial as part of a body of scientific literature of overall good quality and consistency addressing the specific recommendation.

**Evidence rating B** – requires the availability of well-conducted clinical studies but no randomised clinical trials on the topic of recommendation.

**Evidence rating C** – requires evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities. This indicates an absence of directly applicable clinical studies of good quality.

To use treatment other than those recommended here may have to be justified to colleagues, managers, or in law.

The content of these treatment guidelines will undergo a process of continuous review. Comments or suggestions for improvement are welcome. Those comments or suggestions for addition of diseases should include evidence of prevalence as well as a draft treatment guideline using the format set out in this book. In the case of a request for a new drug or replacing a listed product with another product, the evidence base must be clearly defined and included with the request.

These suggestions should be sent to:

The Programme Manager  
Ghana National Drugs Programme  
Ministry of Health  
PO Box MB 582  
Accra, Ghana  
West Africa

HOW TO USE THIS BOOK

To use these guidelines effectively, it is important that you become familiar with the contents. Take time to read the book and understand the content and layout.
The contents of this book have been arranged in approximately alphabetical order of ‘body systems’. Within each section, a number of disease states which are significant in Ghana have been identified. For each of these disease states the structuring of the information and guidance has been standardised to include a brief description of the condition or disease and the more common signs and symptoms. In each case the objectives of treatment have been set out, followed by recommended non-pharmacological as well as the pharmacological treatment choices.

The choice of treatment guidance used here is based on the principles of ‘evidence based medicine’. That is, it is based on the international medical and pharmaceutical literature, which clearly demonstrates the efficacy of the treatment choices.

The treatment guidelines try to take the user through a sequence of diagnosis, treatment objectives, choice of treatment and review of outcome. Prescribers are strongly recommended to adopt a similar approach to practice. Care should be taken to avoid symptomatic management of uncertain diagnoses.

When treating patients, the final responsibility for the well being of the individual patient remains with the prescriber. Prescribers must take steps to ensure that they are competent to manage the most common conditions presenting at their practice and familiarise themselves particularly with those aspects of the treatment guidelines relating to those conditions. It is important to remember that the guidance given in this book is based on the assumption that the prescriber is competent to handle patients at this level, including the availability of diagnostic tests and monitoring equipment.

In previous editions, the British Approved Name (BAN) was adopted for all medicines in the Standard Treatment Guidelines (STG). This edition uses the Recommended International Non-Proprietary Name (rINN) in line with WHO recommendations and practice. In most cases, the BAN and rINN are similar but in a few instances there are differences. Where these differences occur, the BAN has been put in parentheses to permit easy reference.

REFERRAL

These guidelines also make provision for referral of patients to other health facilities. Patients should be referred when the prescriber is not able to manage the patient either through lack of personal experience or the availability of appropriate facilities. Patients should be referred, in accordance with agreed arrangements, to facilities where the necessary competence, diagnosis and support facilities exist. The patient should be given a letter or note indicating the problem and what has been done so far, including laboratory tests and treatment. When indicated emergency treatment must be given before referring the patient. It may also be necessary for the patient to be accompanied by a member of health staff and it should be remembered that the act of referral does not remove from the prescriber the responsibility for the well being of the patient.

ABBREVIATIONS

The following abbreviations, in respect of route of administration, dose, and dosing, have been used in the text:

<table>
<thead>
<tr>
<th>Abbreviations</th>
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**PRESCRIPTION WRITING**

Medicines should be prescribed only when they are necessary in treatment following a clear diagnosis. Not all patients need a prescription for a medicine; non–drug treatment may be suitable and this has been highlighted in these guidelines.

In all cases the benefit of administering the medicine should be considered in relation to the risk involved. This is particularly important during pregnancy where the risk to both mother and foetus must be considered.

**Prescriptions should**

- be written legibly in ink or otherwise so as to be indelible
- be written by the prescriber and not left for another person to complete
- be dated
• state the full name and address of the patient

• specify the age and weight of the patient (especially in the case of children)

• be signed in ink by the prescriber and it is helpful to have contact details included (e.g. name & telephone number)

When writing a prescription the following should be noted:

a) Name of drugs and preparations should be written in full. Unofficial abbreviations should not be used because there is a high risk of misinterpretation.

b) Non-proprietary (generic) names are given in the book and they should always be used in prescribing

c) Avoid the unnecessary use of decimal points, e.g. 3 mg, not 3.0 mg.

   i. Quantities of 1 gram or more should be written 1 g.

   ii. Quantities less than 1 gram should be written in milligrams, e.g. 500 mg, not 0.5 g.

   iii. Quantities less than 1 mg should be written in micrograms, e.g. 100 microgram, not 0.1 mg.

   iv. Where decimals are unavoidable a zero should be written in front of the decimal point where there is no other figure, e.g. 0.5 ml, not 5ml.

d) ‘Micrograms’ and ‘nanograms’ should NOT be abbreviated. Similarly, ‘units’ should NOT be abbreviated.

e) Use the term ‘millilitre’ (ml or mL) NOT cubic centimetre (cc, or cm³).

f) State dose and dose frequency. In the case of ‘as required’, a minimum dose interval should be specified, e.g. ‘every 4–6 hrs as required for pain’.

g) State the quantity to be supplied or indicate the number of days of treatment required.

h) Write directions, preferably in English without abbreviation. It is recognised that some Latin abbreviations are used and these are detailed in the section on abbreviations. Do NOT use other abbreviations

• Avoid combination drugs, unless there is a significant therapeutic advantage over single ingredient preparations (e.g. Co-trimoxazole).

• Avoid the use of symptomatic treatments for minor self-limiting conditions.

• Avoid, where possible, the prescribing of placebos. Spend a little time educating and reassuring the patient.

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

• Avoid the use of the parenteral route of administration except where there are clear, clinical indications for this route. Use the oral route whenever possible.
CHAPTER 2: DISORDERS OF THE GASTROINTESTINAL TRACT

GASTROINTESTINAL DISORDERS

DIARRHOEA

Diarrhoea means passing frequent, loose, watery stools 3 or more times in a day. Diarrhoea is often accompanied by vomiting. It is very common in children. The commonest cause in this age group is viral. There is therefore usually no need to prescribe antibiotics. Fluid loss occurs quickly in children because of their size. If this is not corrected it may result in dehydration which can be fatal.

Never take the complaint of diarrhoea lightly. Always ask how many times that day and the day before the patient has been to the toilet, and the texture of the stools. To one person who usually passes stool once in 3 days, a motion every day seems like diarrhoea, but to another person this is normal.

In children, other diseases like malaria, pneumonia, ear infections, urinary infections, may cause diarrhoea; so examine the child fully to make sure there is no obvious cause for the diarrhoea – there is usually a fever if there is another cause.

Giving antibiotics may cause or prolong the diarrhoea. Malnutrition causes diarrhoea, which in turn also causes malnutrition, setting up a vicious cycle.

Features to watch out for:

- Blood or mucus in the stool
- Presence of fever
- Urine output plus colour of urine
- Presence of vomiting
- Duration of illness.

If diarrhoea plus vomiting plus no mucus plus low grade fever think viral infection

If diarrhoea (very watery) plus vomiting plus cramps plus blood plus mucus plus fever think of bacterial infection

If diarrhoea plus blood plus no fever think of amoebiasis

If profuse diarrhoea (rice water stools) plus vomiting think of cholera

If diarrhoea plus excessive vomiting (in more than one member of household or group) think of food poisoning

The following table can be used to assess the degree of dehydration in children with diarrhoea.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Lethargic or unconscious: floppy</th>
<th>Restless, irritable</th>
<th>Well, alert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Very sunken and dry</td>
<td>Sunken</td>
<td>Normal</td>
</tr>
<tr>
<td>Tears</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Mouth and Tongue</td>
<td>Very dry</td>
<td>Dry</td>
<td>Moist</td>
</tr>
<tr>
<td>Thirst</td>
<td>Drinks poorly or not able to drink</td>
<td>Thirsty, drinks eagerly</td>
<td></td>
</tr>
</tbody>
</table>
2. FEEL Skin Pinch
   - Goes back very slowly
   - Goes back slowly
   - Goes back quickly

3. DECIDE
   - If the patient has two or more signs, including at least one underlined sign, there is severe dehydration
   - If the patient has two or more signs including at least one underlined sign, there is some dehydration
   - The patient has no signs of dehydration

4. Treatment Plan
   - Weigh Patient and use Plan C
   - Weigh Patient and use Plan B
   - Plan A

5. % Dehydration
   - > 10%
   - 5 – 10%
   - <5%

Note: In adults and children older than 5 years of age, other signs of severe dehydration are absent radial pulse and low blood pressure. The skin pinch may be less useful in patients with marasmus (severe wasting) or kwashiorkor (severe malnutrition with oedema) or obese patients. Tears are a relevant sign only for infants and young children.

INVESTIGATIONS
Stool examination – may show amoebae, worms, or nothing abnormal.

TREATMENT
The next step is to treat
- Child with no dehydration (<5%), gets treatment Plan A
- Child with some dehydration (5 – 10%) gets treatment Plan B.
- Child with severe dehydration (>10%) gets treatment Plan C.

Therapeutic objectives
The aim of treatment is to:
- Prevent dehydration: this is very important since so much of the child’s body fluid is being lost through the stools and vomiting;
- Replace fluid: as much fluid as goes into the stools should be given to the child to drink for replacement.
- Maintain nutrition: mothers tend not to give a child who has diarrhoea anything or very little to eat, at a time when he needs all the food he can get! Continue to feed as will tolerate.
- Maintain personal hygiene: or else you end up taking the germs from the stools, back into the mouth, continuing the diarrhoea you are trying to stop.

If any pathogens are present, aim to eradicate them.

Treatment Plan A – No dehydration
- Child can be treated safely at home.
- Instruct mother to give
  - Home-based fluids like rice water, koko, soup, water, and ORS. Breastfed babies should be given breastmilk and ORS.
• Give as much as child wants of all the fluids.

• See table below for amount of ORS to give.

Table for Plan A

<table>
<thead>
<tr>
<th>Age</th>
<th>ORS Basic Amount</th>
<th>ORS for every stool passed i.e. extra per stool</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 years</td>
<td>500 ml or more</td>
<td>50 – 100 ml</td>
</tr>
<tr>
<td>2 – 10 years</td>
<td>1000 ml or more</td>
<td>100 – 200 ml</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>2000 ml or more</td>
<td>100 – 200 ml</td>
</tr>
</tbody>
</table>

• Child should take plenty of food.

• Ask to return to see you if child gets worse, passes more watery stools, vomits repeatedly, becomes very thirsty, eats or drinks poorly or is not better in 2 days.

• Instruct mother on how to prevent diarrhoea.

Treatment Plan B – Some dehydration

For the child with some dehydration, use treatment Plan B.

• Child to be treated in the clinic

• Give ORS in the first 4 hours as shown in the table below.

  • If child vomits, wait 10 minutes and start again.
  • Continue with other fluids the child can take.
  • Instruct mother to continue breast feeding if child is breast fed.
  • Observe stools passed and record quantity.

• Check for signs of worsening dehydration.

• If eyes become puffy, too much fluid is being given so stop ORS and continue with breastmilk or water, or other fluids if child is not breastfed.

• Reassess state of dehydration after 4 hours

  • If clinical state has improved with no dehydration – go to plan A
  • If there is still some dehydration repeat plan B
  • If condition is worsening – go to plan C

Table for Plan B

<table>
<thead>
<tr>
<th>Weight</th>
<th>&lt;6 kg</th>
<th>6–&lt;10 kg</th>
<th>10–&lt;12 kg</th>
<th>12 – 19 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age*</td>
<td>Up to 4 months</td>
<td>4 months up to 12 months</td>
<td>12 months up to 2 years</td>
<td>2 years up to 5 years</td>
</tr>
<tr>
<td>Amount of ORS</td>
<td>200 – 400 ml</td>
<td>400 – 700 ml</td>
<td>700 – 900 ml</td>
<td>900 – 1400 ml</td>
</tr>
</tbody>
</table>

* Use the child’s age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the child’s weight (in kg) times 75.
Treatment Plan C – Severe dehydration

- A child with severe dehydration requires treatment with IV fluids in hospital.

- Start IV fluids immediately. Give 100 ml/kg body weight Ringer’s lactate solution or, if not available, normal saline or cholera replacement fluid (5:4:1), divided as shown in the Table for Plan C below. If you can’t give this and can’t pass a nasogastric tube refer to a health facility that can do so. In the interim start ORS sips.

- If the child can drink, give ORS by mouth while the drip is set up.

Table for Plan C:

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30 ml/kg body weight in:</th>
<th>Then give 70 ml/kg body weight in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (under 12 months)</td>
<td>1 hour*</td>
<td>5 hours</td>
</tr>
<tr>
<td>Children (12 months up to 5 years)</td>
<td>30 minutes*</td>
<td>2½ hours</td>
</tr>
</tbody>
</table>

* Repeat once if radial pulse is still very weak or not detectable.

- Reassess the child every 1–2 hours. If hydration status is not improving, give the IV drip more rapidly.

- Also give ORS (about 5 ml/kg body weight/hour) as soon as the child can drink: usually after 3–4 hours (infants) or 1 – 2 hours (children).

- Reassess an infant after 6 hours and a child after 3 hours. Classify dehydration. Then choose the appropriate plan (A, B, or C) to continue treatment

- Start ORS as soon as patients can drink at 5 ml/kg body weight/hour.

- Assess child hourly. If not improving or dehydration is worse, increase drip rate.

- After the IV fluids have been given, ensure child is taking ORS well for the last 1 hour and his condition is good before stopping IV fluids.

- Continue ORS on treatment plan B and continue to observe child until child has no signs of dehydration, then move to Plan A.

Severe diarrhoea may be complicated by acidosis and hypokalaemia. When the patient is passing urine, start oral potassium as coconut water or banana.

If there is clinical and or laboratory evidence of severe hypokalaemia, Intravenous potassium chloride replacement may be carried out but only in a hospital where half strength Darrow’s solution or Ringer’s lactate can be given.

If possible adults and children especially should continue to eat/breastfeed during the period of diarrhoea. Also ORS and other home–based fluids can be used e.g. rice water, soup, porridge

Non–pharmacological Treatment

Prevention is very important – Clean surroundings and personal hygiene e.g. hand washing after toilet.
Pharmacological Treatment

Get a sample of stool for routine examination and culture if possible.

- If stools have blood and patient has a fever give: Co–trimoxazole oral, (for bacterial diarrhoea)

(Evidence rating: A)

**Adults:** 960 mg every 12 hours for 7 days

**Children:**
- 6 months−5 years: 240 mg every 12 hours for 7 days
- 6−12 years: 480 mg every 12 hours for 7 days

- If stools have blood but no fever give:

Metronidazole, oral, (for amoebiasis):

(Evidence rating: B)

**Adults:** 800 mg 8 hourly for 5 days;

**Children:**
- 0–3 years: 100 mg 8 hourly for 5 days
- 4–7 years: 200 mg 8 hourly for 5 days
- 8–12 years: 400 mg 8 hourly for 5 days

(For giardiasis, give Metronidazole, oral, 400 mg 8 hourly for 5 days)

- If rice– water stools (cholera):

Start IV fluids with cholera replacement fluid or Ringer’s lactate immediately, if possible. If not possible refer for IV therapy. Continue with ORS if tolerated. Also start antibiotics.

**Adults:** Tetracycline, oral, 500 mg 6 hourly for 3 days

**Children:** Co–trimoxazole, oral,
- 6 months−5 years: 240 mg every 12 hours for 3 days
- 6 years −12 years: 480 mg every 12 hours for 3 days

**How to Prepare ORS**

**ORS:** Dissolve the contents of one sachet of ORS in 600ml (one clean large beer bottle or two small Fanta bottles) of clean water. The child or adult should drink AS MUCH of it as he/she wants. If the child vomits, the mother should wait about 10 minutes and give it again.

**Note:** Anti–diarrhoeal medicines like Mist Kaolin, co–phenotrope, codeine, loperamide have **no** place in the treatment of diarrhoea and are likely to do more harm than good. Similarly, antibiotic–containing kaolin or pectin preparations are of **no** therapeutic value in diarrhoea.

**REFER**

Refer patient if condition does not improve or gets worse

**Never give enemas or laxatives to patients complaining of diarrhoea!**
CONSTIPATION

There is no objective definition of constipation because of great individual variation in normal bowel habits. Always ask a patient what he means by constipation.

Patients usually use the term constipation to mean that:

- Their faeces are too hard
- They do not defaecate often enough
- Defaecation causes straining
- There is a sense of incomplete evacuation

CAUSES

‘Medical’ Causes

- Diet deficient in roughage
- Disobeying the call to defaecate e.g. due to immobility
- Myxoedema
- Irritable bowel syndrome
- Hypercalcaemia
- Drugs e.g. atropine, codeine phosphate, morphine, tricyclic antidepressants, disopyramide
- Lazy bowel from chronic laxative use
- Lack of exercise

‘Surgical’ Causes

- Anal fissure and other painful perianal lesions
- Carcinoma of the rectum and sigmoid colon
- Foreign body
- Pelvic mass e.g. fibroid, foetus
- Any gastrointestinal obstruction

INVESTIGATIONS

It is important to evaluate what the patient means by the complaint. If frequency and/or consistency of bowel motions is outside the expected physiological variation, or has changed recently, the patient should be fully investigated for possible underlying cause. Carry out digital rectal examination.

Complaints of diarrhoea alternating with constipation may indicate a large bowel cancer especially in those aged forty (40) and above. In children and the elderly, it may indicate chronic constipation with spurious diarrhoea.

TREATMENT

The patient’s current use of non−prescription laxatives, including ‘herbal’ preparations should be ascertained.

Non−Pharmacological Treatment

- Patients, especially if ambulant and otherwise healthy, should be encouraged to control their bowel activity by attention to diet and activity.
  - Diet should include adequate amounts of fibre and fluid (four to six 250 ml glasses of fluid per day). If these measures fail, short term use of laxatives may be tried.

Pharmacological Treatment

(Evidence rating: B)
First-Line Therapy

- General bulking agents are the laxatives of choice for mildly constipated individuals e.g. Psyllium (ispaghula husk), oral, 1–2 teaspoonfuls once or twice a day. The effect is apparent within 24 hours but 2–3 days of medication is required.

- Bisacodyl, oral, 10–20 mg at night, may be used instead.

If this therapy fails, second-line therapy includes Senna tablets, oral 2–4 tablets at bedtime, Glycerol and Bisacodyl suppository.

These agents may also be used as first-line therapy in acute illness or for hospitalised patients:

- Sorbitol 70% liquid, oral, 10 ml twice a day, increasing to 30 ml, 3 times a day if required.

If constipation is resistant to the above measures, there should be a re-evaluation of the underlying cause(s), including impaction.

For further therapy use:

- Magnesium sulphate, oral, 1–2 teaspoonfuls (5–10 g) in water, once or twice daily
- Do NOT use magnesium salts in patients with impaired renal function.

Prolonged use of laxatives is very common in the community and may be habitual. Their chronic use must be discouraged to avoid hypokalaemia and its consequences.

REFER

- Patients with absent bowel sounds or not passing flatus
- Suspected surgical causes
- Cases resistant to treatment

PEPTIC ULCER DISEASE

Peptic ulcer may be duodenal, gastric or oesophageal. Duodenal ulcers are more common and occur more often in younger individuals. Gastric ulcers usually occur after middle age.

CAUSES

Many factors are probably involved but the basic ones are:

- Excessive secretion of gastric acid
- Inadequate protection of the lining of the stomach and duodenum against digestion by acid and pepsin
- \textit{Helicobacter pylori} (\textit{H. pylori}) infection
- Drugs – NSAIDs, Corticosteroids

The majority of duodenal and gastric ulcers not associated with NSAIDs are caused by \textit{H. pylori} infection.

SYMPTOMS

The major complaint is pain which
• May be described as a minor discomfort, gnawing, burning, dull ache or very severe pain
• Occurs typically in the epigastrium or right hypochondrium
• Occasionally may be high up behind the sternum or low down around the umbilicus
• In duodenal ulcer, typically comes on when the patient is hungry and may wake the patient up in the middle of the night.
• Is relieved by alkalis and food in duodenal ulcer
• Vomiting may occur in both duodenal and gastric ulcers

SIGNS

• Tenderness in the epigastrium, right hypochondrium or umbilical region during an attack may be the only sign
• There may be no signs

INVESTIGATIONS

• Haemoglobin
• Oesophago–gastro–duodenoscopy plus urease test (for \textit{H. pylori})
• Barium meal in the absence of endoscopy
• Stool examination to exclude intestinal parasites as a cause of dyspepsia

TREATMENT

Therapeutic objectives

• To relieve pain and reduce gastric acid secretion
• To promote healing of the ulcer
• To eradicate \textit{H. pylori} if present
• To prevent recurrence of the ulcer
• To avoid complications

Non–Pharmacological Treatment

• STOP smoking and avoid alcohol
• Avoid foods that aggravate the pain e.g. spicy foods
• Relief of anxiety and stress

Pharmacological Treatment

(Evidence rating: A)

• Give a proton pump inhibitor (PPI)
  Omeprazole oral, 20 mg 12 hourly for 7 days or

• Give an \textit{H}_2–receptor antagonist
  Ranitidine, oral, 300 mg with the evening meal for 6–8 weeks followed by daily maintenance of Ranitidine 150 mg for another 4 weeks.
  Repeat course if symptoms recur.

• Use antacids (e.g. Magnesium Trisilicate 15 mls 3 times daily in between meals and at bedtime to control dyspepsia). Avoid taking antacids within 2 hours of \textit{H}_2 – receptor
Presently, majority of patients presenting with duodenal ulcer are also thought to be infected with *Helicobacter pylori*. The organism is thought to play a major role in the causation of peptic ulcer disease so eradication of the organism should be done using a Triple Therapy Regime.

Recommended regimens for *Helicobacter pylori* eradication based on a 7-day course. This consists of Omeprazole plus a combination of two of the antimicrobial agents indicated in the table below (Amoxicillin plus Clarithromycin, Amoxicillin plus Metronidazole or Clarithromycin plus Metronidazole).

<table>
<thead>
<tr>
<th>Acid suppressant</th>
<th>Antibiotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin</td>
<td>Clarithromycin</td>
</tr>
<tr>
<td>Omeprazole 20 mg twice daily</td>
<td>1 g twice daily</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500 mg 3 times daily</td>
</tr>
</tbody>
</table>

**INDICATIONS FOR SURGERY**

- Chronicity – crippling periodic attacks
- Economic factors which make it difficult for the patient to persevere with medical treatment
- Complications
- Perforation
  - Gastric outlet obstruction
  - Haemorrhage that does not respond to conservative measures

**REFER**

Where surgery is indicated as stated above.

**GASTROESOPHAGEAL REFLUX DISEASE (GERD)**

This is caused by backflow of gastric or duodenal contents or both past the lower esophageal sphincter (LES) into the oesophagus without belching or vomiting.

**CAUSES/PREDISPOSING FACTORS**

- Hiatus hernia
- Increased intraabdominal pressure e.g. in pregnancy
- Obesity
- Long term use of nasogastric tube
- Agents that decrease LES pressure e.g. alcohol, cigarettes, anticholinergics (e.g. Propantheline bromide), other drugs – Morphine, Diazepam and Meperidine

**SYMPTOMS**

This can be divided into two groups

1. Asymptomatic – can be diagnosed only from endoscopy
2. Symptomatic

- Heartburn – worsens with vigorous exercise, bending forward, lying; relieved by antacids and sitting upright
- Dyspepsia
- Early satiety
- Retrosternal and epigastric pain: mimics angina pectoris radiating to neck, jaws and arms; the pain is worse on bending down e.g. sweeping
- Odynophagia: pain on swallowing
- Nocturnal regurgitation: wakes patients up with coughing, choking and mouth full of saliva
- In children: failure to thrive. Forceful regurgitation which may lead to aspiration pneumonia
- Iron deficiency anaemia especially in children

INVESTIGATIONS

Diagnosis is made through the following:

- Barium swallow with fluoroscopy especially in children
- Oesophago–gastro–duodenoscopy (OGD) or upper gastro–intestinal tract endoscopy
- Abdominal ultrasound would exclude other diseases

ENDOSCOPIC CLASSIFICATION

Based upon endoscopy findings the disease is classified into two groups:

- Non–erosive gastroesophageal disease (Non erosive GERD)
- Erosive gastroesophageal disease (Erosive GERD)

TREATMENT

Non–pharmacological Treatment

Lifestyle changes are very important in the treatment of GERD in all patients.

- Positional therapy: reverse Trendelenburg position – elevation of head of bed by 30 degrees or sleep on pillows
- Avoid sleeping immediately after eating
- Avoid smoking, alcohol and drugs which reduce LES
- Avoid over–eating and heavy meals before bedtime
- Avoidance of aggravating foods e.g. fatty and spicy food
- Moderate exercise
- Weight reduction
Pharmacological Treatment

Less severe or non erosive GERD

- Antacids & Alginates–containing antacids
- Histamine H₂-receptor antagonists

Ranitidine, oral, 300 mg daily for 6 to 8 weeks

or

Ranitidine, oral, 150 mg twice daily for 6 to 8 weeks

Severe or Erosive GERD

1. Proton pump inhibitors

Omeprazole, oral 20 mg daily for 8 weeks

2. Prokinetic drugs that stimulate gastric emptying and increase LES contractions should be added to PPI's in severe disease with bloating

Metoclopramide 10–20 mg 3–4 times daily

SURGERY

- Severe cases
- Treatment failure
- Fundoplication, antireflux procedures and repair of hiatal hernia may be indicated in severe cases

HAEMORRHOIDS

Most patients with anal conditions complain of "piles" regardless of what anorectal symptoms they have. Haemorrhoids are enlarged, displaced anal vascular cushions.

SYMPTOMS

- Passage of bright red blood at defaecation
- Mucoid discharge
- Perianal irritation or itch
- Pain occurs only during an acute attack of prolapse with thrombosis, congestion and oedema

SIGNS

- Inspection of the anus may show no evidence of internal haemorrhoids
- Redundant folds of skin (skin tags) may be seen in the position of the haemorrhoids and straining may show the haemorrhoids
• Internal haemorrhoids are not palpable inside the rectum unless thrombosed

• The patient may present with a complication of the haemorrhoids e.g. profuse bleeding, prolapse, strangulation, thrombosis, infection or ulceration or severe anaemia

INVESTIGATIONS

• Full blood count
• Proctoscopy and sigmoidoscopy (to exclude carcinoma of rectum)

TREATMENT

Therapeutic objectives

• To correct any anaemia
• To relieve symptoms
• To prevent complications

Non−Operative Treatment

(Evidence rating: B)

• No treatment is required for haemorrhoids that are asymptomatic. Treat constipation if present with liquid paraffin, oral, 10−30 mls at night or Senna granules, 1 sachet with water after supper. Avoid the use of purgatives and prolonged straining at defaecation

• To relieve itch or discomfort, a range of ointments or suppositories are available as over the counter preparations. These include those with or without steroids, applied or inserted anally: one suppository 2 times daily for 7−10 days

• For prolapsed haemorrhoids, lie patient down and elevate the foot end of the bed. Try gentle digital reduction after application of local anaesthetic cream. If this fails, apply cold compresses and sedate patient with Diazepam, oral, 10 mg. If the haemorrhoids are infected, treat with Gentamicin, IV, 2−5 mg/kg body weight and Metronidazole, oral, 500 mg 3 times daily as well as warm sitz baths 2−3 times a day

• Correct any anaemia with iron preparation (ferrous sulphate) or blood transfusion if indicated

• Haemorrhoids developing during pregnancy should be managed conservatively as most will resolve after delivery. Increase intake of fluid and roughage

Bleeding Haemorrhoids

(Evidence rating: A)

• Correct anaemia with ferrous sulphate, oral or blood transfusion if indicated
• Give stool softners and increase roughage in diet if constipation is a problem

Indications for Operative Treatment

• Second degree haemorrhoids – These prolapse and have to be replaced in the anal canal manually but some may also reduce spontaneously.

• Third degree haemorrhoids – These are prolapsed permanently.

• Profuse or persistent bleeding haemorrhoids.
The patient should be referred to a facility with resources for operative treatment if this is indicated.

HEPATIC DISORDERS

AMOEBIC LIVER ABSCESS

This is a complication of *Entamoeba histolytica* infection.

**SYMPTOMS**

- Right upper abdominal pain
- Abdominal distension
- Fever
- Cough

**SIGNS**

- Large tender liver
- Tenderness at right intercostal spaces
- Jaundice
- Right basal crepitations

**INVESTIGATIONS**

- Chest X-ray
- Stool examination
- Full blood count
- Abdominal ultrasound

**TREATMENT**

**Therapeutic objective**

- To eradicate infection and prevent further destruction of liver tissue

**Pharmacological Treatment**

*(Evidence rating: B)*

Metronidazole, oral,

**Adults:** 800 mg every 8 hours for 10 days.

**Children:**

- 1–3 years: 100 – 200 mg every 8 hours for 10 days
- 4–7 years: 200 mg every 8 hours for 10 days
- 7–10 years: 200 – 400 mg every 8 hours for 10 days
Patients with large abscess or not responding to treatment should be referred.

JAUNDICE

This is a condition in which the skin, palms and the white of the eye become yellow in colour. It is a result of elevated levels of bilirubin in the bloodstream.

CAUSES

In Adults

- Hepatitis – viral, alcoholic, drug-induced
- Haemolysis from various causes including malaria, glucose–6–phosphate dehydrogenase (G6PD) deficiency and sickle cell disease, herbal concoctions
- Chronic liver diseases – decompensated cirrhosis, biliary cirrhosis, chronic hepatitis, hepatoma
- Gall bladder diseases – stones, infections
- Carcinoma of head of pancreas
- Septicaemia

In Children

- Physiological jaundice – jaundice appearing between the 2nd to 5th day of life for which all other causes have been excluded
- Haemolysis – sickle cell disease, G6PD deficiency, drugs and herbs, Haemolytic disease of the newborn
- Haemorrhagic disease of the newborn – due to vitamin K deficiency
- Infections – particularly septicaemia
- In the newborn, congenital infections (TORCH), conditions of reduced red cell life span, impaired liver uptake and excretion of bilirubin, increased enteric reabsorption of bilirubin and biliary atresia

Neonatal jaundice is important because of the consequences of hyperbilirubinaemia on the brain of the newborn infant (kernicterus). Kernicterus causes death but infants who survive MAY suffer mental and physical handicaps with cerebral palsy, high frequency nerve deafness, poor memory, low IQ and visual–motor inco–ordination.

In Pregnancy (see section under Jaundice in Pregnancy)

INVESTIGATIONS

Newborn

Jaundice appearing on the first day in any newborn, and a bilirubin concentration >170 micromol/L in premature infants or >255 micromol/L in full–term infants warrants investigation.

- Total and direct serum bilirubin concentration
- Haematocrit, reticulocyte count, direct Coombs test
• Blood film for red cell anomalies
• Determine blood group and rhesus (Rh) group of both infant and mother
• G6PD status
• Cultures of blood, urine, and spinal fluid may be indicated by the history, physical examination or initial laboratory findings
• Abdominal ultrasound

Children and Adults

• Full blood count
• Erythrocyte sedimentation rate
• Liver function tests
• G6PD status
• Urinalysis
• Hepatitis Bs Ag
• Blood culture
• Abdominal ultrasound

TREATMENT

Newborns

There are two main methods of treatment – phototherapy and exchange transfusion.

Phototherapy is used if the jaundice is mild. E.g. term babies with physiological jaundice with serum bilirubin levels less than 340 micromol/L at which exchange transfusion would be performed.

Exchange transfusion is the definitive treatment for hyperbilirubinaemia that has reached the level where kernicterus may occur. Since there is no exact test to determine the risk of kernicterus and hence the level at which exchange transfusion is necessary the following rule of thumb has proved useful as a guide.

• Serum Bilirubin – of more than 340 micromol/L in term infant i.e. >2 kg or (body weight (kg) x 10) x 17 umol/L in newborns weighing <2 kg.
• Cord Hb <12 g/dl or Cord BR >80 umol/L
• Rate of rise of bilirubin >17 micromol/L/hr (1 mg/dL/hr)
• Rapid progression of anaemia in presence of resolving jaundice
• Hydrops fetalis (requires immediate exchange with packed cells)

For exchange transfusion, use warmed blood (37°C), cross–matched against maternal and infant serum, given via an umbilical vein. Aim to exchange 160ml/kg body weight over about 2 hours. Monitor Electrocardiogram (ECG), BUE, calcium, bilirubin and blood glucose. Further exchanges may be needed if the bilirubin level continues to rise. Stop the exchange transfusion if the heart rate fluctuates by >20 beats/min.

Threshold for intervention by phototherapy or exchange transfusion should be lower in the following cases – sick, low birth weight, asphyxia, prolonged hypoxemia, acidosis, sepsis.

Children and Adults

• Treatment should be aimed at the cause of the jaundice.
REFER

Newborns with deep jaundice or requiring exchange transfusion.

HEPATITIS

This is commonly caused by viruses and drugs. The viruses known to cause hepatitis include Hepatitis A, B, C, D and E viruses; and yellow fever virus. Immunisation against Hepatitis B and yellow fever are now available for children under the Expanded Programme on Immunisation (EPI). Adults at risk should be offered immunization against Hepatitis B infections

SYMPTOMS

• Fever, and feeling unwell for 1 week to 1 month before the jaundice appears
• Anorexia (the most common symptom), Nausea
• Yellow or dark coloured urine and pale stools
• Itching
• Right hypochondrial pain initially

SIGNS

• Jaundice
• Tenderness in the right upper part of the abdomen with or without a palpable liver.

INVESTIGATIONS

• Full blood count
• Liver function tests
• Hepatitis Bs Ag + Hepatitis C

TREATMENT

Non−pharmacological Treatment

(Evidence rating: C)

• Rest
• Plenty of fluids, especially glucose drinks, fruit drinks, water, light koko, rice−water
• Any food that the patient can tolerate
• Vitamins

REFER

Refer patients with complications such as encephalopathy, coma, bleeding, and hypoglycaemia.

HEPATIC ENCEPHALOPATHY

This describes a syndrome of neuropsychiatric symptoms and signs, including coma, which may develop in severe liver disease and liver failure.

CAUSES

Liver failure may occur from several causes. These include:
Viruses in the family Hepadnaviridae cause

• Viral hepatitis
• Cirrhosis of the liver
• Fatty liver of pregnancy
• Drugs – halothane, isoniazid, paracetamol overdose
• Terminal phase of chronic cholestasis

Precipitating factors include:

• Hypotension
• Infection
• Electrolyte imbalance
• Sedatives
• Increased gastrointestinal tract (GI) protein load e.g. heavy GI bleeding
• Alcoholic binge

Although there are several causes whose clinical features certainly differ, the overall clinical picture and treatment are similar, irrespective of the aetiology.

SYMPTOMS

• Jaundice
• Fever
• Disturbed consciousness which progresses as follows: disorder of sleep, hypersomnia and inversion of sleep rhythm, apathy and eventually coma
• Personality changes

SIGNS

• Intellectual deterioration
• Cyanosis
• Fetor hepaticus
• Speech impairment
• Neurological abnormalities – asterixis (a flapping tremor) indicates precoma and strongly supports the diagnosis of encephalopathy; inability to draw or construct objects e.g. a 5 pointed star
• Stigmata of chronic liver disease (for example ascites, gynaecomastia, palmar erythema, parotid enlargement, testicular atrophy and spider naevi)
• Coma

Clinical grading of encephalopathy

• Confused. Altered mood or behaviour psychometric defects
• Drowsy with inappropriate behaviour
• Stuporous but speaking and obeying simple commands
• Inarticulate speech and marked confusion
• Coma

Acute encephalopathy may appear spontaneously with precipitating factors, usually in a patient with chronic
liver disease in the terminal stages.

INVESTIGATIONS

- FBC, differential
- Liver function tests
- Blood urea and electrolytes
- Hepatitis Bs Ag
- Prothrombin time (INR)
- Blood glucose
- Electroencephalogram (EEG)

TREATMENT (Acute Phase)

Medical treatment of encephalopathy includes the recognition and correction of precipitating factors.

Non–Pharmacological Treatment

- Place in the coma position if unconscious
- Daily tap water enemas may be used to further reduce enteric bacteria
- Avoid protein feeds, sedatives and drugs metabolized by the liver. Increase protein intake slowly on recovery.
- Give nutrition as glucose, maintain fluid and electrolyte balance.
- Monitor temperature, pulse and respiratory count, blood pressure (BP), pupils, urine output, blood glucose, INR, urea and electrolytes, liver function tests, EEG (if available) and blood cultures.

Pharmacological Treatment

(Evidence rating: C)

- Prevent worsening coma by emptying the bowel with Magnesium sulphate, oral, 15 mls 3 times daily. Aim for 2 soft stools/day and no diarrhoea.

- Give Neomycin, oral, 1 g every 6 hours or Metronidazole, oral, 400 mg 8 hourly a day and Lactulose 30–50 mls 3 times daily

- If the patient starts bleeding, or INR is elevated give Vitamin K (Phytomenadione), IV, 10 mg/day for 2–3 days. SLOWLY AND CAUTIOUSLY Platelets, fresh frozen plasma and blood should be given as needed.

- Measure blood glucose regularly e.g. every 12 hours until acute phase over. Give 5% Glucose, IV, if levels fall below 2 mmol/L.

- Treat any infection that may be present.

TREATMENT (Maintenance Phase)

- Limit protein to level of tolerance

- Ensure at least one free bowel movement daily with Lactulose, oral, 10–30 mls 3 times daily or Magnesium sulphate 30 mls 3 times a day. The aim is to produce acid stools without diarrhoea

- Revert to management of acute encephalopathy if symptoms worsen
NUTRITIONAL DISORDERS

MALNUTRITION

Food is necessary for proper growth, development of the body and maintenance of health. A normal and properly balanced diet, consists of food that has sufficient amounts of:

- Proteins – necessary for growth and maintenance
- Carbohydrates and fats – necessary for energy
- Vitamins and Minerals – for protecting against disease

Malnutrition occurs when there is a prolonged discrepancy between food consumption and nutritional needs. It is most commonly seen in children, particularly after weaning. Malnutrition can result in a breakdown of the child’s ability to fight disease and infection. An infection in a malnourished child may thus become very severe and the child may die. Measles and Pertussis may lead to malnutrition.

SYMPTOMS AND SIGNS

A child suffering from malnutrition may have features of marasmus, kwashiorkor or both (marasmic–kwashiokor). These children lack both protein and sources of energy (Protein Energy Malnutrition, PEM)

A Marasmic child:

- Has not had enough food for a long time or might be suffering from long standing chronic disease
- Is very thin and bones in his face and chest stand out
- Has little muscle or fat
- Is always hungry
- Looks like an old man

A Child with Kwashiorkor:

- Does not eat enough proteins
- Arms look very thin and wasted but his face and legs look very puffy due to oedema
- Hair may have reddish colour
- There is ‘flaking’ skin rash especially on the legs
- In severe cases, there may be many sores on the oedematous parts of the body
- The child is miserable and apathetic and refuses food

Protein Energy Malnutrition (PEM) is divided into 3 stages using weight/age, weight/height and mid upper arm circumference.

1. Mild PEM

- Weight/age: <80% but >75%
- Weight/height: 70–80%
- Mid Upper Arm circumference: 12.5–13.5 cm

This is the commonest type. On the weighing card, the growth curve becomes flat.
• The child is thin with some muscle wasting
• The child plays less because of lack of energy.

2. Moderate PEM

• Weight/age: <75% but >60%
• Mid Upper Arm circumference: 12.0–12.5 cm
• Early signs of kwashiorkor or marasmus may be present.

The symptoms and signs of mild PEM are more pronounced.

3. Severe PEM

• Weight/age: <60% of expected weight for age
• Weight/height: <70%
• Mid Upper Arm circumference: <12 cm.

In this stage there are signs of marasmus, kwashiorkor or marasmic kwashiorkor.

TREATMENT

(Evidence rating: C)

In many cases, the malnourished child is brought to the health unit because of other complaints such as diarrhoea, fever, worms or cough. Treat the accompanying problems as you manage the malnutrition. If response is poor investigate for covert infection e.g. UTI, HIV/AIDS, and Tuberculosis.

REFER the child and parent to the Reproductive and Child Health (RCH) Unit.

The principle of treating the malnourished person is to progressively give increasing calories and protein at appropriate stages of treatment.

Acute phase

• Treatment of the complications of malnutrition e.g. correct fluid and electrolyte imbalance

• Initiation of dietary cure – give small frequent meals because these reduce the risk of diarrhoea, vomiting, hypoglycaemia and hypothermia.

Recovery phase

• Enhance growth using high energy concentrated alimentation.

• Return to family meals. Meals should be introduced progressively. Insist on the importance of the participation of mothers and their education in nutrition.

• Preventive methods should be taught as part of the RCH programme.

  • Encourage breast-feeding up to 2 years
  • Introduce a weaning diet at 4–6 months, using locally available foods
  • Immunize all children and monitor growth monthly
  • Encourage family planning
  • Encourage a balanced diet for the family including pregnant and lactating women
  • Encourage nutrition education in schools and villages and include HUSBANDS
OBESITY

Excess body weight has adverse effects on health and life expectancy. It is associated with conditions that cause early disability and premature death such as type 2 diabetes, high blood pressure, heart disease, stroke, high cholesterol, gout, breathing problems, cancer, gallstones, heartburn, arthritis, skin infections and rashes, sex hormone problems (including a decreased ability to have children) and colon, kidney and endometrial cancer. Weight loss reduces the risk of these conditions.

Many people wrongly look on obesity as a sign of well being, affluence and beauty. Some individuals even self-medicate with drugs like prednisolone and cyproheptadine just to gain weight. Contrary to a commonly held notion, most cases of obesity are not ‘genetically determined’. Obesity runs in families mainly because people from a similar family background generally tend to have similar eating and lifestyle practices.

The main factor in obesity is an energy imbalance. People gain weight when they take in more energy (measured in calories) from food and drinks than they use through their physical activity and basal metabolism. The excess energy is stored as fat.

Excess body weight is easily assessed by the Body Mass Index (BMI), which is calculated by taking the patient’s weight (kilograms) and dividing it by the square of the height (metres).

Body weight is generally classified according to the BMI as follows:

- 18.5 – 24.9 kg/m²  Ideal weight
- 25.0 – 29.9 kg/m²  Overweight
- 30.0 – 34.9 kg/m²  Obese
- >35.0 kg/m²  Severely obese

COMMON CAUSES

Excess intake of food and other calories coupled with a lack of regular physical activity.

SYMPTOMS AND SIGNS

There are no specific symptoms or physical signs associated with obesity.

- Obesity that predominantly affects the upper part of the body or results in excessive abdominal fat, described as truncal obesity, is more commonly associated with one or more of the cardiovascular risk factors listed above. In general a woman's waist measurement should fall below 35 inches and a man's should be less than 40 inches.

- Dark, thickened folds of skin around the back of the neck and in the axilla (pseudoacanthosis nigricans) seen in some overweight or obese individuals is associated with the metabolic syndrome comprising type 2 diabetes, hypertension, hyperlipidaemia and obesity among others.

INVESTIGATIONS

Measurement of blood pressure and the following tests are helpful in excluding possible associated medical conditions and directing the treatment of overweight or obese individuals.

- Blood Glucose
- Blood Uric acid
- Blood Lipid profile
- ECG

TREATMENT

Treatment objective
The objective of treatment is to ensure an initial loss of about 10% of the current weight, at a rate of 2 – 4 kg per month.

Non-Pharmacological Treatment

A weight reducing diet under the supervision of a dietician is important. Any underlying or associated disorders must be treated. Weight reduction often corrects, or helps to control, these associated conditions. Regular physical activity plays a major role in ensuring weight reduction. Occasionally psychological counselling is required.

Pharmacological Treatment

Over-the-counter ‘slimming’ pills are rarely useful and may have harmful long-term effects. Special approved anti-obesity treatments are available but should only be given under expert guidance.

REFER

Obese individuals, especially those with severe and morbid obesity, and those with accompanying medical conditions must be referred for appropriate follow up by a physician or a metabolic and endocrine specialist.

CHAPTER 3: DISORDERS OF BLOOD AND BLOOD-FORMING ORGANS

ANAEMIA

Anaemia is defined as abnormally low concentration of haemoglobin (i.e below 12 g/dl in males, 11 g/dl in females, 11 g/dl in children, and below 12 g/dl in 1st week of life).

CAUSES

- Malaria
- Iron deficiency
- Blood loss (bleeding from haemorrhoids, peptic ulcers)
- Heavy menstrual bleeding
- Hookworm infestation
- Malnutrition
- Vitamin K deficiency in newborns
- Haemolysis e.g. G6PD deficiency, Sickle cell disease
- Drugs (Cytotoxics)
- Hypersplenism
- Cancer
- Vitamin B₁₂ and Folic acid deficiency

SYMPTOMS

- Easy fatiguability
- Dizziness
- Shortness of breath on exertion
- Palpitations

SIGNS

- Pale mucous membranes and palms
- Spleen and liver may be palpable
- Signs of heart failure (in severe anaemia)
INVESTIGATIONS

• Full Blood Count and blood film comment
• Blood film for malaria parasites
• Examine the stool for eggs of hookworm
• Sickling, if positive, haemoglobin electrophoresis
• Investigate cause of anaemia before initiating treatment. In an emergency, take all blood samples before treatment

TREATMENT

Therapeutic objectives

• To treat underlying cause of anaemia and restore haemoglobin levels to normal
• In sickle cell disease patients restore haemoglobin to steady state level
• In iron deficiency replenish iron stores after correction of anaemia

Non−Pharmacological Treatment

• Advise on a balanced diet i.e plenty of "nkontomire" and other leafy foods, beans, liver, meat, eggs, fish.

Pharmacological Treatment

(Evidence rating: B)

• Ferrous Sulphate or Ferric Ammonium Citrate (FAC), oral

• Continue treatment for 3 months after haemoglobin level normalises, in order to replenish iron stores.

Ferrous sulphate, oral:

**Adults:** 200 mg 3 times daily

**Children:** Syrup (BPC), 60 mg/5 ml.

Up to 1 year; 5 ml 3 times daily.

1−4yrs; 10 ml 3 times daily.

5−7yrs; 15 ml 3 times daily.

8−10 yrs; Tab 200 mg daily

>10 yrs; Tab 200 mg twice daily

Rinse mouth after administration of syrup to prevent discolouration of teeth.

Ferric Ammonium Citrate, oral:

Up to 1 year; 5 ml daily

1−4 yrs; 10 ml
5–7 yrs; 12.5 ml daily

Alternative treatment: Ferrous fumarate, oral (same dosages as the sulphate)

- In sickle cell disease patients, it may not be necessary to give iron tablets, unless there is evidence of iron deficiency. They should however, receive folic acid. Similarly, patients whose anaemia is possibly due to malaria should receive folic acid.

Folic acid, oral:

- Adults: 5 mg daily for 30 days
- Children: 2.5–5 mg daily for 30 days

- If anaemia is due to hookworms treat appropriately (See section on worm infestation)

Severe anaemia with signs of cardiac failure will need treatment of the heart failure in addition to blood transfusion with packed cells.

REFER

- Patients with recurrent severe anaemia which is not due to Sickle Cell Disease
- Patients with anaemia due to uncontrolled bleeding
- Patients whose haemoglobin levels do not improve after two weeks on the above treatment
- Patients with heavy menstrual loss to a gynaecologist

HAEMOSTATIC AND BLEEDING DISORDERS

These are diseases characterised by excessive bleeding. They may be present from birth or acquired later in life. The bleeding may be due to defective blood vessels, platelet disorders or clotting factor deficiency. A good history is important in distinguishing between the various causes. Past episodes of excessive bleeding e.g. following circumcision, a family history of bleeding and drug therapy should be enquired about.

COMMON CAUSES

- Liver disease
- Vit K deficiency especially in newborns
- Drug–induced – herbal preparations, prednisolone, NSAIDs e.g. aspirin, ibuprofen
- Bone marrow malignancy e.g. leukaemia
- Haemophilia
- Severe septicaemia resulting in Disseminated Intravascular Coagulation (DIC)

Bleeding may be spontaneous or following trauma/surgery. It may occur into the skin, gastrointestinal tract, brain, joints and muscles (haemophilia), urine, from gums and nose. In newborns with Vitamin K deficiency spontaneous bleeding occurs from various sites – umbilical cord, gastrointestinal tract, scalp, brain, and there is usually a history of failure to administer Vitamin K injection at birth.

Patients may be severely anaemic and in haemorrhagic shock if there is a large bleed.

INVESTIGATIONS

- Full blood count, platelet count and peripheral film comment.
- Liver function tests.
- Prothrombin time, partial thromboplastin time.
TREATMENT

Therapeutic objective

• To prevent or arrest life-threatening bleeding.

Non-Pharmacological Treatment

• Apply pressure dressing to minimise bleeding where possible.

Pharmacological Treatment

(Evidence rating: B)

• In bleeding newborns give injection Vitamin K, 1 mg (term), 500 micrograms (preterm) IV or IM irrespective of history of Vitamin K injection. Transfuse with fresh whole blood if patient is severely anaemic or in shock.

• In older children and adults the following measures will help to arrest bleeding depending on cause:
  
  • Fresh frozen plasma or if not available fresh whole blood.
  
  • In cases of liver disease, give Vitamin K, IM, 3–5 mg in children, 10 mg in adults. IV preparation is preferred if available.
  
  • Stop any drugs thought to be responsible for bleeding or which may aggravate bleeding (see above).

PREVENTION

• Avoid trauma in haemophiliacs
• Avoid injections and unnecessary surgical procedures.
• Prophylactic administration of Vitamin K (dosage as above) to all newborns at birth.

REFER

• After stabilisation refer all patients to specialist for further evaluation if indicated.
• Patients requiring surgery.

SICKLE CELL DISEASE

It is a hereditary disease characterized by the possession of two abnormal haemoglobins one of which is haemoglobin S. It usually presents in children and young adults as seasonal joint pains, especially in cold weather, and jaundice. It is due to sickling of red blood cells caused by various factors.

There are various types including HbSS, HbS thalassaemia and HbSC. The possession of one normal haemoglobin and an abnormal S haemoglobin does not constitute sickle cell disease. It is a trait.

Sickle cell disease may present with crises. Crises may be in the form of thrombotic crises (precipitated by cold, dehydration, infection, ischaemia, physical exertion), which cause pain often in the bones. Other types of crises may also occur. These include haemolytic, aplastic and sequestration crises. In aplastic crises there is anaemia with a low reticulocyte count. In sequestration crises, the spleen and liver enlarge rapidly due to trapping of red blood cells. Anaemia is very severe in this case.
Avoid the use of the word ‘sickler’; it has no meaning and tends to give a person an unfavourable label.

SYMPTOMS

• Joint and bone pain, especially during cold wet seasons
• Periodic jaundice
• Abdominal pain, especially in the splenic area
• Spontaneous sustained erection without sexual arousal in male patients (priapism) may occur

SIGNS

• Jaundice
• Pallor
• Hepatomegaly
• Splenomegaly
• There may be old or recent scarification marks suggesting the long history of the illness.

INVESTIGATION

• Full blood count
• Sickling test
• Haemoglobin electrophoresis

TREATMENT

Therapeutic objectives

• To prevent the development of crises
• To treat crises and complications

The patient may either present to you, in crisis, in the steady state, or with complications.

In Crisis

(Evidence rating: C)

• Prompt determination and treatment of precipitating cause e.g. infection, malaria.
• Give intravenous fluid and electrolyte therapy. (Usually Glucose in Sodium Chloride):

<table>
<thead>
<tr>
<th>Adults:</th>
<th>5% Glucose in 0.9% Sodium Chloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children:</td>
<td>4.3% Glucose in 0.18% Sodium Chloride</td>
</tr>
</tbody>
</table>

• Give pain relievers e.g. Paracetamol, oral or suppository, 6–8 hourly or Ibuprofen, oral, 8 hourly

| Paracetamol | Ibuprofen |
**Adults:** 500 mg – 1 g  |  400–600 mg
---|---
**Children:**
3 months to 1 year  |  60–12 mg  |  50–100 mg (from 9 months)
(2.5–5 ml syrup)
1–5 years  |  120 – 250 mg  |  100–200 mg
(5–10 ml syrup)
6–12 years  |  250 – 500 mg  |  200–400 mg

Pethidine, IM (if in severe pain). Do not give if there is difficulty in breathing.

**Adults:** 25 – 100 mg repeated every 4 hours as required.

**Children:** 0.5 – 2 mg/kg body weight repeated every 4 hours as required.

- Blood transfusion when needed, but not routinely. (Transfusion will be necessary if haemoglobin level <5 g/dl)

**In The Steady State**

- Maintain a good nutritional state
- Prompt treatment of infections
- Give daily folic acid supplements 5 mg; in children under 1 year give 2.5 mg
- Encourage drinking plenty of fluids
- Encourage periodic check-ups at the Sickle Cell Clinic

**PREVENTION**

- Avoid precipitating causes of crisis if possible e.g. malaria, pneumonia, exposure to cold weather, other infections
- Educate patient to tell doctor he has sickle cell disease SC, SS etc.
- Genetic counselling

**REFER**

All patients with complications such as bleeding into the eye, aseptic necrosis of the hip, priapism, haematuria, stroke and osteomyelitis.

**CHAPTER 4: CHILDHOOD IMMUNISABLE DISEASES**

**IMMUNIZATION**

The childhood diseases which can be prevented by immunization are:

- Measles
- Whooping cough
- Tetanus
- Tuberculosis
- Diphtheria
- Poliomyelitis
- Yellow fever.
These diseases can have a devastating effect on the health of the child, and can be prevented by immunization. The schedule for immunization for children is as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIRTH</td>
<td>BCG Polio O</td>
<td>0.05ml intradermally 2 drops orally</td>
</tr>
<tr>
<td>6 weeks</td>
<td>Five in One 1 Polio 1</td>
<td>0.5 ml IM 2 drops orally</td>
</tr>
<tr>
<td>10 weeks</td>
<td>Five in One 2 Polio 2</td>
<td>0.5 ml IM 2 drops orally</td>
</tr>
<tr>
<td>14 weeks</td>
<td>Five in One 3 Polio 3</td>
<td>0.5 ml IM 2 drops orally</td>
</tr>
<tr>
<td>9 months</td>
<td>Measles</td>
<td>0.5 ml deep SC or IM</td>
</tr>
<tr>
<td>9 months</td>
<td>Yellow Fever</td>
<td>0.5 ml IM</td>
</tr>
</tbody>
</table>

* Five in One” vaccine (Diphtheria, Pertussis, Tetanus, *Haemophilus influenzae* b and Hepatitis B)

To protect Ghanaian children against five of the diseases described above, a pentavalent vaccine popularly called "Five in One" has been introduced into Ghana’s immunization programme. The new vaccine will protect all children against Diphtheria, Pertussis, Tetanus, Hepatitis B and *Haemophilus influenzae* Type B. It was introduced on 1st January 2002.

It has replaced Diphtheria, Pertussis and Tetanus (DPT) in the immunization schedule and is given just like DPT, at 6, 10 and 14 weeks.

The new pentavalent vaccine, like DPT, should not be given to children above 2 years because of the increase in side effects due to the Pertussis component.

**Note:**

1. Measles – any child over 6 months admitted to hospital and not immunized previously should be given measles vaccine. Children admitted to hospital who are under 9 months and vaccinated in this way must have the vaccination repeated at 12 months of age.

2. "Five in One” – Minimum interval between doses is 4 weeks.

3. Immunization schedule should be completed if some doses have been missed.

A course of tetanus toxoid vaccinations should be given to all women, schedule is as follows:

TT1 – Give the 1st dose (0.5 ml, SC or IM) at any contact with a woman of child bearing age (15–45 years) including at the 1st antenatal visit.

TT2 – Give the 2nd dose at least 4 weeks after TT1

TT3 – Give the 3rd dose at least 6 months after
TT2 or during a subsequent pregnancy.

TT4 & TT5 – One dose in each of 2 subsequent pregnancies to make up a total of five doses. No further doses will be necessary in subsequent pregnancies.

A course of Tetanus toxoid vaccinations should also be given to any previously unimmunised patient. Dose: 0.5 ml, IM or deep SC, repeat at 4 weeks and 8 weeks. If more than 10 years have elapsed since initial course or last booster, give booster dose of 0.5 ml. In severe contaminated wounds a booster dose may be given if more than five years have elapsed in addition to Human tetanus Immunoglobulin.

**Adults:** 250 units (500 units if more than 12–24 hours have elapsed)

If human tetanus immunoglobulin is not available, Anti Tetanus Sera (ATS) may be used dose:

**Adults:** 1500 IU, IM after a test does of 150 IU (S.C.)

**Children:** Half adult dose

**Absolute Contraindications to Immunization**

- A previous vaccination is followed by anaphylaxis, encephalitis or non-febrile convulsions.
- A history of anaphylaxis with ingestion of egg; yellow fever vaccine should not be given.
- Individual with symptomatic HIV infection should not receive BCG and yellow fever vaccines

**MEASLES**

Measles is an acute infectious disease caused by a virus. It usually occurs in children between 6 months and 3 years who have not been immunized or have been incompletely or unsuccessfully immunized. It is very infectious, from up to 7 days before to 5 days after appearance of rash.

**SIGNS AND SYMPTOMS**

- High fever, present BEFORE the rash appears
- Runny nose
- Cough
- Conjunctivitis
- Sore mouth
- Rash starting from head and neck, moving down over the body
- Diarrhoea
- Child is generally miserable

**COMPLICATIONS**

These must be looked for in all patients.

- Croup
- Vitamin A deficiency leading to xerophthalmia and blindness
- Otitis media
- Deafness from otitis media
- Bronchopneumonia
- Diarrhoea
- Malnutrition
- Activation of Latent Tuberculosis

**TREATMENT**

**Therapeutic objectives**
• To prevent death by treating any complications
• To maintain good nutrition.

Pharmacological Treatment

(Evidence rating: C)

• Measles is preventable by vaccination. All non–immune child contacts over 6 months old should be immunized.

• Public health staff should be notified of all measles cases.

• There is no specific treatment for measles, since it is caused by a virus. In uncomplicated cases there is no need for antibiotics. In the presence of complications, admit to hospital and treat.

• Pneumonia: Antibiotics – Flucloxacillin, oral or Cloxacillin, IV plus Chloramphenicol, IV, IM or oral.

Flucloxacillin, oral

< 1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
6–12 years; 250 mg 6 hourly for 7 days

• Otitis media: Amoxicillin (Amoxycillin), oral

<1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
6–12 years; 250 mg 6 hourly for 7 days

• Treat pain and fever with Paracetamol, oral,

Adults: 500 mg – 1 g 3 to 4 times daily
Children:

3 mths–1 year; 60–120 mg 3 to 4 times daily
1–5 years; 120–250 mg 3 to 4 times daily
6–12 years; 250–500 mg 3 to 4 times daily

In well nourished children, with no complications:

• Wash eyes with clean water.

• Treat sores in and around mouth with Gentian Violet paint and encourage oral hygiene

• Tepid sponge and give Paracetamol for fever

• Continue feeding

• Give Vitamin A, oral, 200,000 units as a stat dose to children over 1 year. For children under 1 year give 100,000 units stat. Repeat dose on the second day.

• Manage diarrhoea according to severity of dehydration (Refer to section on diarrhoea)
**PREVENTION**

Measles is prevented by immunization. Other actions to consider include:

- Education of mothers as part of RCH programmes
- Immunize child once at 9 months of age or at any visit after this age
- If there is an epidemic, consider immunizing earlier (from 6 months of age). Re-immunize at 12 months.
- Well nourished children have less serious measles. Breast feeding and good weaning foods are important.

**REFER**

Patients with complications such as a black (haemorrhagic) rash, stridor, pneumonia, dehydration, malnutrition and great difficulty in eating or drinking which are not responding to treatment.

Report all cases to the District Disease Control Officer for appropriate action.

**PERTUSSIS (WHOOPING COUGH)**

An acute infection caused by a bacterium called *Bordetella pertussis*.

**SYMPTOMS AND SIGNS**

Initially there is cough, fever and running nose or catarrh. The child then coughs many times without stopping to breathe, eventually coughing up sticky mucus. He then takes a deep breath which may sound as a ‘whoop’ thus the name whooping cough. During this attack of coughing the child’s lips and fingers may turn blue (cyanosis). After the cough he may vomit. Small children may have episodes of breath cessation, or turn blue which may be fatal. Child may have a poor appetite and refuse his food.

**COMPLICATIONS**

- Protein–calorie malnutrition
- Bronchiectasis
- Cerebral hypoxia leading to convulsions and coma
- Secondary infections:
  - Otitis media
  - Pneumonia
  - Activation of latent TB

**TREATMENT**

**Therapeutic objective**

- To prevent death by treating any complications and maintaining good nutrition

**Non–Pharmacological Treatment**

In a healthy child or infant, treatment is symptomatic

- Feed frequently between coughing spasms
- Give extra fluids
Pharmacological Treatment

(Evidence rating: A)

In a weak malnourished child, or child under one year,

- Admit to hospital
- Treat the following conditions if they occur
  - Dehydration
  - Fever
  - Pneumonia
  - Malnutrition

Children usually present at health facilities when coughing starts.

- Give antibiotic – Erythromycin, oral,

**Adults:** 500 mg 6 hourly for 7 days

**Children:**
- Under 1 year: 62.5 mg of syrup 6 hourly for 7 days
- 1–2 years: 125 mg of syrup 6 hourly for 7 days
- 3–5 years: 250 mg of syrup 6 hourly for 7 days
- 6–12 years: 250–500 mg 6 hourly daily

Antibiotics will not influence the course of the illness but protect others from contracting the disease.

PREVENTION

- "Five in One" immunization for all children (see immunization schedule at the beginning of this chapter)
- Avoid contact with children with whooping cough.
- In a child with pertussis, continue with "Five in One" immunization to prevent the 4 other diseases it protects against.
- During epidemics or when there is a clear history of contact in a child with catarrh, antibiotics may help reduce the period of infectivity and reduce transmission.

REFER

Refer infants who have an episode of apnoea (prolonged cessation of breathing) or of turning blue.

TETANUS

Tetanus is a very dangerous infectious disease caused by *Clostridium tetani*. The bacteria produce a toxin which causes the symptoms. These bacteria live predominantly in the soil, so it is easy to get this infection whenever a break in the skin is not cleaned properly. Neonatal tetanus is tetanus that affects a newborn. Infection is usually via the umbilical cord if it is not kept clean or if non-sterilised instruments or dressings are used.

SIGNS AND SYMPTOMS
(a) In infants

- Baby cannot suck
- Umbilicus is infected
- Stiff body
- Irritability
- Spasms
- Constipation
- Tongue and lips become blue (cyanosed) during spasms

(b) In older Children and Adults

- Sardonic smile (mocking smile)
- Lock jaw (cannot open the mouth)
- Opisthotonos (stiff arched back)
- Rigid abdomen

In tetanus, noise, bright light, touching the body or moving part of the body will trigger muscle spasms.

**TREATMENT**

**Therapeutic objectives**

- Prevention of further spasms by
  - Killing *Clostridium tetani* to stop further toxin production
  - Neutralising circulating toxin
  - Administering muscle relaxants

- Provision of supportive care till spasms cease completely. Always ADMIT a suspected case of tetanus or neonatal tetanus

**Non–Pharmacological Treatment**

- Maintain a clear airway.
- Avoid noise, bright light and unnecessary touching of the body
- Remove any obvious foreign bodies
- Clean the infected umbilicus or wound with soap and water or antiseptic solution

**Pharmacological Treatment**

*(Evidence rating: C)*

- Give a stat dose of Benzylpenicillin, IV.

**Adults:** 50,000 units/kg body weight, then 4 MU every 6 hours for 5 days.

**Children:** 50,000 units/kg body weight every 6 hours

**Neonates:** 250,000 units every 6 hours for 7 days plus Gentamicin, IV, 7.5 mg 12 hourly.

If allergic to penicillin use Erythromycin, oral, 12.5 mg/kg body weight every 6 hours for 7 days

- Give Human Tetanus Immunoglobulin:
Adults and Children: 150 units/kg (or 3000–6000 units) IM, single dose.

Neonates: 500 units IM, single dose.

If Human Tetanus Immunoglobulin is not available, give anti–tetanus serum 20,000 units (adults and children) 5000 units (neonates). Half of the dose is given IV and half IM if patient does not react to a test dose of 150 units, IM.

- To control spasms

**Adults:**

Chlorpromazine, IM 50 mg every 4–8 hours **plus**

Phenobarbital (Phenobarbitone), IM 200 mg every 8–12 hours **plus**

Diazepam, IV/IM/suppository 10mg every 3–6 hours PRN. Gradually reduce sedation after about 2 weeks.

**Children:**

Chlorpromazine, IM/nasogastric tube, 12.5 – 25 mg every 8 hours **plus**

Phenobarbital (Phenobarbitone), IM/naso–gastric tube, 5 mg/kg body weight stat, then 2.5 mg/kg body weight every 12 hours **plus**

Diazepam, IV/IM/nasogastric tube/suppository, 3–10 mg every 3–6 hours PRN.

**Neonates:**

Chlorpromazine, IM/nasogastric tube, 7.5 mg every 8 hours **plus**

Phenobarbital (Phenobarbitone), IM/naso–gastric tube, 30 mg then 7.5 mg every 12 hours **plus**

Diazepam, IV/IM/nasogastric tube, 2 mg every 3–6 hours PRN

- Start immunization before discharge from hospital in all patients

**PREVENTION**

- Cut umbilical cord with sterile instrument
- Clean with methylated spirit (alcohol)
- Leave uncovered

For patients with potentially contaminated wounds

- Provide adequate wound toileting (refer section on wounds)
- Provide tetanus prophylaxis (refer section on immunization)

**REFER**

If spasms cannot be controlled.
POLIOMYELITIS

Poliomyelitis is a viral disease which is recognized in the community as weakness or paralysis, especially of the legs in children. It is preventable by immunization. It is spread via insanitary disposal of excreta, which contaminates drinking water.

SYMPTOMS AND SIGNS

The patient may have:

- Fever
- Headache
- Neck stiffness
- Muscle pain

The development of paralysis occurs in a small proportion of patients. The paralysis may affect any group of skeletal muscles, including the muscles of respiration.

TREATMENT

Non-pharmacological Treatment

(Evidence rating: C)

No specific treatment since it is viral

- Give child plenty of rest
- Avoid injections during febrile illness in children

PREVENTION

Prevention is almost certain if 4 doses of oral polio vaccine is given as in the immunization schedule.
Encourage proper excreta disposal and safe drinking water

REFER

- Refer if there are problems with breathing or swallowing
- Report all cases to the District Disease Control Officer for appropriate action

DIPHTHERIA

The disease is caused by Corynebacterium diphtheriae a bacterium which results in the production of a greyish–white membrane or patch on the throat. Diphtheria is spread by droplet infection. It has a high mortality rate. Fortunately the disease is very rare these days.

SYMPTOMS

- Sore throat
- Dysphagia
- Stridor

SIGNS

- Greyish white membrane or patch in the throat

INVESTIGATIONS
• Throat/nasal swabs for culture

TREATMENT

Therapeutic objectives

• To neutralise the effect of circulating antitoxins before they become fixed to the tissues
• To provide supportive care – respiratory and feeding where indicated
• To eradicate the organism from the pharynx

Non–Pharmacological Treatment

• Feeding by nasogastric tube for patients who cannot swallow

Pharmacological Treatment

(Evidence rating: C)

• Antitoxin – If a child is immunized according to the immunization schedule it is protected against diphtheria. Should you ever suspect diphtheria, treat with diphtheria antitoxin 10,000 to 30,000 units IM. Give a test dose first 0.1 ml of 1 in 10 dilution of antitoxin in Sodium Chloride 0.9%, intradermally.

• Antibiotic therapy – Amoxicillin (Amoxycillin), oral,

<1 year; 62.5 mg 6 hourly for 7 days.
1–5 years; 125 mg 6 hourly for 7 days
6–12 years; 250 mg 6 hourly for 7 days or

Erythromycin, oral, 125 – 250 mg 6 hourly for 7 days.

• Treat carrier state with Erythromycin, oral, 40 mg/kg body weight/day in 4 divided doses (six hourly) for 7 days

REFER

• Patients with laryngeal obstruction or respiratory paralysis – for tracheostomy or endotracheal intubation with assisted ventilation

Report all cases to District Disease Control Officers

YELLOW FEVER

Yellow fever is caused by a virus transmitted to man by a species of mosquitoes that bite infected monkeys. Classical yellow fever is usually fatal.

SYMPTOMS

• Fever
• Weakness
• Abdominal pain
• Vomiting and diarrhoea
SIGNS

- Jaundice
- Spontaneous bleeding

INVESTIGATIONS

- Urinalysis
- Blood sample for serology (to Regional Public Health Reference Laboratory)

TREATMENT

Therapeutic objectives

- To provide supportive care for hepatic, renal and circulatory failure
- To prevent further transmission

If yellow fever is suspected in a patient, admit immediately to an isolation ward. There is no specific treatment and mild cases need no more than observation. Full supportive treatment for hepatic failure and acute renal failure may be needed in patients with severe disease but the prognosis is generally poor. Yellow fever vaccination is protective against the disease and needs to be repeated every ten years.

Report all cases to the District Disease Control Officer for appropriate action.

HEPATITIS B

Refer to Section on Hepatitis

The pentavalent vaccine is available for prevention

HAEMOPHILUS INFLUENZAE TYPE B

The bacterium, *Haemophilus Influenzae* Type B (Hib), is an important cause of infections in infants and young children. Hib is typically the leading cause of acute bacteria meningitis in infants and children less than 5 years old. It is also the causative agent for acute epiglotitis and otitis media. Hib infections are preventable by the pentavalent vaccine

CHAPTER 5: PROBLEMS OF THE NEONATE

SICK NEWBORN

At birth all well newborns are active with strong cry. Any baby born ill will show signs of inactivity and may be described as "being flat".

CAUSES

- Birth asphyxia
- Neonatal Infections
- Congenital malformations e.g. of heart and central nervous system
- Prematurity
• Maternal sedation/analgesia during labour
• Metabolic e.g. hypoglycaemia, hypocalcaemia

SYMPTOMS

• Inability to cry or weak cry
• Difficulty in breathing or recurrent cessation of breathing
• Inactivity with reduced spontaneous movements or very floppy
• Refusal of feeds, vomiting
• Abdominal distension

SIGNS

• Pallor
• Abdominal distension
• Respiratory distress
• Cyanosis
• Jaundice
• Bradycardia <100 beats/min or Tachycardia >140 beats/min
• Heart murmurs
• Raised body temperature
• Low body temperature

INVESTIGATIONS

• Full blood count
• Blood cultures
• Random blood glucose
• Chest X−ray
• Urine culture
• Lumbar puncture

TREATMENT

Therapeutic objective

• To treat the cause of the sickness in the baby appropriately

Non−Pharmacological Treatment

• Keep baby wrapped up in dry clothes to maintain temperature (keep warm)
• Give oxygen by face mask or nasal prongs (2 L/min) if available

Pharmacological Treatment

(Evidence rating: C)

• Start an intravenous line with 10% Glucose at 2 drops/min/kg body weight (60 ml/kg body weight/day)

• Start antibiotics

Ampicillin, IM/IV, 50 mg/kg body weight 12 hourly for 7 days.
Gentamicin, IM/IV, 2.5 mg/kg body weight 12 hourly for 7 days.
REFER

Refer patient urgently to the hospital for further investigations and continued treatment.

NEONATAL JAUNDICE

(Also see section on jaundice)

Neonatal jaundice is important because of the consequences of excess hyperbilirubinaemia on the brain of the newborn infant. This condition is called kernicterus and may cause death. Infants who survive may be handicapped with cerebral palsy, and associated deafness, mental retardation and motor incoordination.

TREATMENT

In mild cases of neonatal jaundice appearing after the 2\textsuperscript{nd} day i.e. physiologic jaundice, Phototherapy can be used. For brief periods in the mid morning, the baby could be exposed and placed outside in its cot. However, its eyes must be covered.

Continue breastfeeding during this time.

REFER

All babies who develop jaundice within 48 hours of life

All babies who have severe jaundice if exchange transfusion cannot be done at the facilities

BIRTH INJURIES

These may result from difficult delivery including instrumental delivery and may cause:

1. Extensive caput succedaneum
2. Cephalhaematoma
3. Subgaleal haemorrhage
4. Nerve palsies
5. Fractures

1. EXTENSIVE CAPUT SUCCEDANEUM

It is a diffuse swelling of the presenting part of the scalp that may extend beyond suture lines.

TREATMENT

Leave alone and reassure parents. It resolves spontaneously over 3–4 days.

2. CEPHALHAEMATOMA

It is a haemorrhage involving the skull bones. It is confined by suture lines. Usually unilateral but occasionally bilaterally.

TREATMENT

No specific treatment is required

Leave alone. Do not perform incision and drainage. It resolves with time.

Prevention: Phytomenadione (Vitamin K), IM, 1 mg at birth.
3. SUBGALEAL HAEMORRHAGE

This is a swelling resulting from bleeding under the scalp. It may be extensive enough to distort shape of head and also cause severe pallor. Jaundice follows later.

INVESTIGATION

- Full blood count – looking for degree of anaemia.

TREATMENT

Therapeutic objective

- To arrest further bleeding and treat complications.

Non-Pharmacological Treatment

- Give phototherapy if jaundice is severe
- Transfuse with blood if Hb <12 g/l

Pharmacological Treatment

(Evidence rating: C)

- Give Phytomenadione, IM, 1 mg and refer to hospital in severe cases.

4. NERVE INJURIES

Excessive traction may result in injuries to the brachial plexus of nerves.

Types

Erbs Palsy: – Whole upper limb does not move. There’s movement only in the fingers.

Klumpke’s Palsy: – Fingers of the arm affected do not move but there is spontaneous movement in arm and fore arm.

TREATMENT

Therapeutic objective

- To re-establish near normal movement in affected area if possible.

Patient needs early and regular physiotherapy thus requires referral to hospital.

CHAPTER 6: DISORDERS OF THE CARDIOVASCULAR SYSTEM

CHEST PAIN

Chest pain is a common clinical problem with several possible causes. Not all chest pain is due to a heart problem. The history and physical examination often provide useful information for making the diagnosis.

CAUSES
Originating from the heart:

- Ischaemic heart disease (angina pectoris, myocardial infarction)
- Acute pericarditis

Originating from the lungs and pleura:

- Pneumonia with pleurisy
- Pleural effusion or empyema
- Pulmonary embolism or pulmonary infarction
- Pneumothorax
- Tumour (lung cancer)

Originating from the oesophagus:

- Reflux oesophagitis
- Hiatus hernia
- Tumours

Originating from the aorta:

- Aortic dissection

Originating from the chest wall

- Intercostal myalgia
- Costochondritis

ISCHAEMIC HEART DISEASE

The term ischaemic heart disease is used to describe any of two clinical conditions; angina pectoris or myocardial infarction.

ANGINA PECTORIS

This is recurrent chest pain often induced by exertion and relieved by rest or sublingual glyceryl trinitrate. It is associated with a reduction in blood supply to the heart without destruction of the heart muscle. Individuals who experience angina pectoris are at high risk of developing myocardial infarction or heart attack.

RISK FACTORS

- Diabetes mellitus
- Hypertension
- Cigarette smoking
- Plasma lipid abnormalities
- Obesity
- Family history of heart disease

SYMPTOMS

Central or precordial chest pain, which may radiate into the left arm, neck or jaw

SIGNS

Typically there are no signs
INVESTIGATIONS

- Full blood count (FBC)
- Erythrocyte Sedimentation Rate (ESR)
- ECG
- Cardiac enzymes (Creatinine Kinase (CK), Aspartate Transaminase (AST), Lactate Dehydrogenase (LDH)), troponin I
- Blood glucose
- Blood lipid profile

TREATMENT

Therapeutic objectives

- To minimise symptoms
- To prevent or reduce ischaemia
- To prevent myocardial infarction

Non−Pharmacological Treatment

- Reassure patient that the condition is not rapidly fatal
- Encourage cessation of smoking
- Reduce weight (in obese and overweight individuals)
- Regular exercise but avoid strenuous exercise that would produce pain

Pharmacological Treatment

(Evidence rating: A)

Immediate Treatment

Place a fresh Glyceryl trinitrate tablet (500 microgram) under the tongue.

After a few minutes the angina usually stops. Warn the patient that sublingual Glyceryl trinitrate may give headaches.

Long−term Treatment

- Antiplatelet therapy – Aspirin, oral, 150 – 300 mg daily
- Beta−blocker (if not contraindicated) – Atenolol, oral, 50 mg once daily
- Long−acting nitrates – Isosorbide dinitrate, oral, 10 mg 2−3 times daily
- Optimise or initiate treatment for hypertension
- Optimise or initiate treatment for diabetes mellitus
- Treat abnormal blood lipids to target levels or refer to specialist

ACUTE MYOCARDIAL INFARCTION

This is the damage of heart muscle resulting from abrupt cessation of blood flow to any area of the heart. Acute myocardial infarction should be prevented through regular exercise, weight reduction in obese or overweight individuals, cessation of smoking and proper control of hypertension, diabetes mellitus and dyslipidaemia.
RISK FACTORS

- Individuals with angina pectoris
- Diabetes mellitus
- Hypertension
- Cigarette smoking
- Plasma lipid abnormalities
- Obesity
- Family history of heart disease

SYMPTOMS

- Chest pain
  - Of varying degree but often severe and
  - described as tightness, heaviness or constrictive in nature
  - Persisting for more than 30 minutes
  - Not relieved by rest or glyceryl trinitrate
  - May radiate to the left arm, the neck or jaw

- Other symptoms include nausea, vomiting, shortness of breath or collapse

SIGNS

- The patient is usually restless and apprehensive
- Peripheral or central cyanosis may be present
- Pulse may be thready, fast, irregular, slow or normal
- Blood pressure may be low (following extensive damage to heart muscle)
- Jugular venous pressure is raised (with associated congestive heart failure)
- Bilateral crepitations in the chest (with left ventricular failure)
- Presence of a third or fourth heart sound

INVESTIGATIONS

- ECG
- Random blood glucose
- Cardiac enzymes: Creatinine Kinase – MB (CK–MB), serum aspartate transaminase (AST) and lactic dehydrogenase (LDH), troponin I
- Serum lipid profile
- FBC, ESR
- Blood urea, electrolytes and creatinine
- Chest x−ray when patient’s conditions is stable

TREATMENT

Therapeutic objectives

- To relieve distress and pain
- To limit further infarction
- To prevent and treat complications
- To prevent re−infarction
Non – Pharmacological Treatment

- Reassure patient and encourage bed rest in the first 48 hours

Pharmacological Treatment

(Evidence rating: A)

- Give oxygen by face mask or nasal cannula
- Give Aspirin, oral, 300 mg immediately, then 150–300 mg daily
- Give Glyceryl trinitrate, sublingual, 500 microgram
- Insert intravenous cannula for emergency intravenous medications
- Give Morphine, IV, 5–10 mg to relieve pain and anxiety
- Give Metoclopramide, IV, 10 mg to prevent vomiting induced by morphine
- Give Beta–blocker (if not contraindicated), Atenolol, oral, 50–100 mg daily
- Give ACE inhibitor (if not contraindicated), Lisinopril, oral, 2.5 – 20 mg daily
- Treat acute complications such as pulmonary oedema and cardiac arrhythmias (see appropriate section)
- Treat hyperglycaemia with insulin. Change diabetic patients previously on oral hypoglycaemic agents to insulin (see section on diabetes mellitus)

Do not give a Beta–blocker if the following are found at presentation:

- Patient is asthmatic
- Heart failure (severe breathlessness, lung crepitations, raised jugular venous pressure)
- Pulse is slow (less than 60 beats/minute)
- Severe hypotension (BP less than 90/60 mmHg)

Do not give an ACE inhibitor if the patient has:

- Severe hypotension (BP less than 90/60 mmHg)

Do not give IV fluids indiscriminately

- In view of the possibility of heart failure and cardiogenic shock in acute myocardial infarction, IV fluids must be given with extreme caution, if at all, and with regular examination of the lung bases and jugular venous pressure.

Long – term Treatment

The following treatments may prevent reinfarction and other cardiovascular complications

- Antiplatelet therapy, Aspirin, oral, 75–150 mg daily indefinitely.
- Beta–blocker (if not contraindicated), Atenolol, oral, 50–100 mg daily or Propranolol, oral 40 mg 2–3 times daily.
• ACE inhibitors or Angiotensin Receptor Blockers (ARB) e.g. Losartan (if not contraindicated).

• Treat other underlying conditions such as hypertension, diabetes mellitus, and high serum lipid levels.

NOTE

All post myocardial infarction patients should be given a statin, Fluvastatin, oral, 20 mg daily (if not contra−indicated) irrespective of lipid levels.

REFER

Refer all patients who have suffered a myocardial infarction to a physician after the initial management above.

PERICARDITIS

Pericarditis is inflammation of the pericardium.

CAUSES

• Viral
• Bacterial
• Rheumatic fever
• Post−cardiotomy
• Autoimmune diseases

SYMPTOMS

• Dull or sharp precordial pain, worsens with lying down and improves with sitting and leaning forward.

SIGNS

• Fever
• Pericardial friction rub
• Distant heart sounds if there is a large effusion

INVESTIGATIONS

• ECG
• Chest x−ray
• Echocardiogram
• FBC and ESR
• ASO titre

TREATMENT

Therapeutic objectives

• To relieve pain
• To treat underlying cause
• Urgent decompression of large effusion by pericardiocentesis
Non-Pharmacological Treatment

• Bed rest

Pharmacological Treatment

(Evidence rating: C)

• Aspirin 60 mg/kg/day in 4 divided doses till signs of inflammation subside then withdraw slowly

• Corticosteroids for severe pericarditis or post-cardiotomy syndrome

Prednisolone, oral,

Adults: 40 mg daily for 14 days and tail off

Children: 2 mg/kg/day for 2 weeks and tail off

REFER

Patients with large effusions.

PULMONARY EMBOLISM

Pulmonary embolism occurs when a thrombus, usually arising from a deep vein in the lower extremities and pelvic veins breaks off, travels through the venous circulation and becomes lodged in a pulmonary artery. The condition could be rapidly fatal. For this reason treatment must be started without delay, while awaiting confirmatory tests, whenever there is a high suspicion.

SYMPTOMS

• Sudden onset of difficulty in breathing at rest
• Severe, oppressive chest pain similar to that of myocardial infarction
• Haemoptysis (coughing up blood) occurs if pulmonary infarction has occurred
• Palpitation
• Patient may collapse

Symptoms usually occur in association with;

• Recent surgical operation e.g. pelvic or orthopaedic surgery
• Obesity
• Previous cardiac disease
• Previous oral contraceptive with high oestrogen content
• Prolonged recumbency or long road or air travel

SIGNS

• Signs of deep vein thrombosis (warm, swollen, tender calf or thigh muscle – unilaterally)
• Pulse is often fast or sometimes absent
• Blood pressure may be low or unrecordable
• Respiratory rate is fast
• Patient may be collapsed

INVESTIGATIONS
• ECG
• Chest X-ray
• Doppler scan of lower limb blood vessels
• Arterial blood gases

TREATMENT

(Evidence rating: C)

Treatment by anticoagulation is better done and monitored at the hospital, therefore refer all patients. Treatment is started with unfractionated Heparin for at least 3 days or low molecular weight Heparin for at least 5 days. Heparin treatment is followed by Warfarin, orally, at varying doses for up to 6 months. Warfarin takes several days before it becomes effective and must therefore be started 2 – 3 days before discontinuing Heparin.

Initial treatment

Anticoagulation with unfractionated Heparin

• A loading IV dose

  Adults: 5,000–10,000 units
  Small Adult or Child: 2,500 – 5,000 units

  Followed by

  • Continuous IV infusion

  Adults: 1,000–2,000 units per hour
  Small Adult or Child: 15 – 25 units/kg/hour

  or

  • Subcutaneously,

  Adults: 15,000 units every 12 hours
  Small Adult or Child: 250 units/kg every 12 hours

  • Adjust doses of unfractionated Heparin daily by laboratory monitoring of APTT (Activated Partial Thromboplastin Time) to keep the result between 1.5–2 times the normal value.

Alternatively, anticoagulation with low molecular weight Heparin may be given

• Enoxaparin, subcutaneously, 1 mg/kg daily (100 units/kg) every 12 hours,

  or

  • Dalteparin, subcutaneously

  Body weight: ? 46 kg: 7,500 units daily for 5 days
  Body weight: 46–56 kg: 10,000 units daily for 5 days
  Body weight: 57–68 kg: 12,500 units daily for 5 days
  Body weight: 69–82 kg: 15,000 units daily for 5 days
Body weight: 83 kg: 18,000 units daily for 5 days

- Treatment with the low molecular weight heparins must be for at least 5 days or until adequate oral anticoagulation is established.

- No laboratory monitoring or dose adjustment is usually needed for low molecular weight heparins.

Long-term treatment

Oral anticoagulation

- Warfarin, oral, 5–10 mg initially (starting 2 – 3 days before discontinuing Heparin)

- Dose adjustments must be carried out regularly (more frequently at the start of therapy and later at longer intervals) based on results of INR, aiming at a target INR of 2.5

PAIN ORIGINATING FROM THE OESOPHAGUS

Oesophageal pain is usually burning in quality and tends to be localized behind the sternum. It is often caused by irritation of the oesophageal mucosa by reflux of the acidic contents of the stomach or spasm of the oesophageal muscle in response to obstruction. Clues in the history are a relationship with meals, symptoms associated with regurgitation or difficulty in swallowing and worsening of pain when lying flat. A barium meal examination and/or endoscopy often confirm the diagnosis. Antacids relieve the pain.

REFER

Refer to a specialist for confirmation of diagnosis and management.

Pain originating from the neck and chest wall (musculoskeletal disorders)

Disorders of these structures account for a large proportion of complaints of chest pain.

- Muscular pain (intercostal myalgia)

This type of chest pain is aggravated by straining and on pressing (palpating) the chest. It may abate spontaneously but can recur at frequent intervals. Relief can also be obtained by reassurance, local applications of heat, gentle massage or administration of a non-steroidal anti-inflammatory drug (NSAID), Ibuprofen, oral, 400 mg 3 times daily.

- Costochondral tenderness (costochondritis)

A very common cause of chest pain which may be produced by rotation of the trunk, deep breathing or direct pressure. The condition is often self-limiting but may sometimes require a short course of analgesics.

- Diseases of the cervical or thoracic vertebrae

Severe arthritis and extrusion of the lower cervical intervertebral discs may cause symptoms of nerve root irritation, resulting in chest pain. Pain may be relieved by analgesics. Persistent pain, especially from intervertebral disc lesions, will require a referral for orthopaedic or neurosurgical assessment.

PSYCHOGENIC PAIN

In many patients with chest pain, no abnormalities are found. These patients may display evidence of psychoneurosis. Often there is a recent history of heart disease in the family. On the other hand, some patients who have genuine heart disease develop an anxiety state and complain frequently of chest pain.
which may be difficult to evaluate. This is referred to as cardiac neurosis. This may lead to repeated hospital admissions, which further worsen the patient’s anxiety.

**DYSPNOEA**

This is an abnormal awareness of breathlessness at rest or with minimal physical activity.

**CAUSES**

- Cardiac disease
- Respiratory disease
- Anaemia
- Metabolic acidosis (e.g. renal failure)

The following special points concerning the onset of breathlessness will give important clues regarding the cause:

**i. Acute onset**

- Asthma
- Pneumonia
- Pulmonary oedema
- Pulmonary embolism
- Pneumothorax
- Foreign body aspiration

**ii. Nocturnal episodes**

- Left ventricular failure
- Asthma

**iii. During exertion**

- Respiratory failure
- Left ventricular failure
- Chronic anaemia
- Congenital heart disease

**iv. After exertion**

- Left ventricular failure
- Asthma

**v. Dyspnoea with or without wheeze during the working week**

- Exposure to occupational allergen

**vi. Slow progressive increase in severity**

- Chronic respiratory disorders (chronic bronchitis, emphysema)

**vii. Deep respirations of acute onset**
• Diabetic ketoacidosis or uraemia.

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>SYMPTOMS</th>
<th>SIGNS</th>
</tr>
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<td>Cardiac</td>
<td>Orthopnoea</td>
<td>Frothy</td>
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<tr>
<td></td>
<td>Paroxysmal</td>
<td>blood–stained</td>
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<tr>
<td></td>
<td>Nocturnal</td>
<td>sputum</td>
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<tr>
<td></td>
<td>Dyspnoea</td>
<td>Hypertension</td>
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<tr>
<td></td>
<td>Wheeze</td>
<td>Cardiomegaly</td>
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<td></td>
<td></td>
<td>Murmur</td>
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<tr>
<td>Respiratory (Asthma)</td>
<td>Acute Onset</td>
<td>Rhonchi</td>
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<tr>
<td></td>
<td>Previous asthma</td>
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<tr>
<td></td>
<td>History of asthma in close family</td>
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<tr>
<td></td>
<td>Wheeze</td>
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<tr>
<td></td>
<td>Cough</td>
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<td></td>
<td>Post exertion</td>
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<tr>
<td>Respiratory (Pneumonia)</td>
<td>Fever</td>
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<td></td>
<td>Cough</td>
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<td></td>
<td>Purulent sputum</td>
<td>Bronchial breath</td>
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<tr>
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<td>Pleurisy</td>
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<td></td>
<td></td>
<td>Crepitations</td>
</tr>
<tr>
<td>Foreign body aspiration</td>
<td>Sudden onset</td>
<td>Wheezes</td>
</tr>
<tr>
<td></td>
<td>History of aspiration</td>
<td>Crepitations</td>
</tr>
</tbody>
</table>

**TREATMENT**

Treatment is based on the underlying condition. Refer to the appropriate sections.

**HYPERTENSION**

This is a condition in which the blood pressure of an adult aged 18 years or older is persistently higher than 140/90 mmHg in a non–diabetic, or above 130/80 mmHg in a diabetic, based on the average of two or more properly measured blood pressure readings. Hypertension carries an increased risk of early death from stroke, heart attack, heart failure and kidney failure if not properly controlled. Once a diagnosis of hypertension is made, the individual should be monitored regularly and treated for life with non–drug measures, or a combination of this and appropriate medications.

**CAUSES**

• In the majority of patients no specific underlying cause is identified. Such patients are said to have essential hypertension. Risk factors associated with this type of hypertension include increasing age, family history, excess body weight, excessive alcohol intake.

• In about 10–15% of cases, hypertension may be due to a specific disease or abnormality such as kidney disease, coarctation of aorta and endocrine disorders. These conditions are said to cause secondary hypertension.

**SYMPTOMS**

• There are no complaints that are specific for hypertension. Most patients with hypertension may have no complaint whatsoever and are discovered by chance during medical examinations

• Occasionally, patients may complain of:
• Headache
• Palpitation
• Dizziness
• Easy fatigability

SIGNs

• Persistent high blood pressure of more than 140/90 mmHg on at least two different occasions taken after the patient has rested for at least thirty minutes.

• Signs specific for the various kidney, blood vessel and endocrine disorders that cause secondary hypertension.

INVESTIGATIONs

• Full blood count
• Urinalysis
• BUE, creatinine
• Blood glucose
• Serum Lipids
• Serum Uric acid
• Chest x-ray
• ECG

TREATMENT

Therapeutic objectives

• To reduce cardiovascular, cerebrovascular and renal complications by maintaining blood pressure levels of 140/90 mmHg or less (130/80 mmHg or less in diabetics).

Non-Pharmacological Treatment

The following changes in lifestyle contribute significantly to reduction in raised blood pressure:

• Low salt intake
• Weight reduction in obese and overweight individuals
• Regular exercise in sedentary patients
• Reduction in alcohol consumption

These lifestyle changes must be continued even when on drug treatment.

Pharmacological Treatment

(Evidence rating: A)

The choice of drug(s) is influenced by individual patient factors such as age, sex, cardiovascular risk, associated medical conditions, adverse effects and the cost of the drug.

Among the various antihypertensive drugs, thiazide diuretics and beta-blockers have been shown to reduce mortality resulting from cardiovascular complications of hypertension.

• When a single drug is ineffective, a different drug should be substituted.

• If a single drug is partly effective, the options are to increase the dose or add a small dose of a second drug with a different mechanism of action.
Patients with severe hypertension commonly require a combination of two or more drugs.

The main drugs used to control hypertension (that has not responded to alteration in lifestyle) and further guidance on their use is given on the following table.

<table>
<thead>
<tr>
<th>Antihypertensive Class</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thiazide diuretics</strong></td>
<td>• Avoid in gout</td>
</tr>
<tr>
<td>Bendroflumethiazide (bendrofluazide), oral, 2.5 mg daily</td>
<td>• Use low doses to reduce unwanted metabolic effects</td>
</tr>
<tr>
<td></td>
<td>• Enhances effectiveness of other classes of antihypertensives when used in combination</td>
</tr>
<tr>
<td><strong>Beta–blockers</strong></td>
<td>• Useful in angina and post myocardial infarction (when not contraindicated)</td>
</tr>
<tr>
<td>Atenolol, oral, 50 mg–100 mg daily</td>
<td>• Avoid in asthma, chronic obstructive pulmonary disease and heart block</td>
</tr>
<tr>
<td><strong>Angiotensin–converting enzyme (ACE) inhibitors</strong></td>
<td>• Avoid in pregnancy and renovascular diseases</td>
</tr>
<tr>
<td>Lisinopril, oral, 5 mg daily; usual maintenance dose 10–20 mg daily, maximum 40 mg daily</td>
<td>• Can be used in heart failure, diabetes nephropathy and left ventricular dysfunction</td>
</tr>
<tr>
<td></td>
<td>• Commonest side effect is dry persistent cough</td>
</tr>
<tr>
<td><strong>Angiotensin receptor blockers</strong></td>
<td>• Useful alternate to ACE inhibitors when dry persistent cough is a problem</td>
</tr>
<tr>
<td>Losartan, oral, 25 – 100 mg daily</td>
<td>• Monitor serum potassium level especially in the elderly</td>
</tr>
<tr>
<td><strong>Calcium channel blockers</strong></td>
<td>• Particularly useful in isolated systolic hypertension</td>
</tr>
<tr>
<td>Nifedipine retard, oral, 10–40 mg twice daily</td>
<td>• Short acting formulations should not be used (see Hypertensive emergencies)</td>
</tr>
<tr>
<td><strong>Alpha blockers</strong></td>
<td>• Usually used with other antihypertensives</td>
</tr>
<tr>
<td>Prazosin, oral, 0.5 – 20 mg in 3 divided doses starting at an initial dose of 0.5 mg 3 times daily and increasing gradually.</td>
<td>• First dose given at night to avoid hypotension</td>
</tr>
<tr>
<td><strong>Centrally acting agents</strong></td>
<td>• Effective in the treatment of hypertension in pregnancy</td>
</tr>
<tr>
<td>Alpha–methyldopa, oral, 250 mg 2–3 times daily maximum 3 g daily</td>
<td>• May be used in asthma and heart failure</td>
</tr>
<tr>
<td><strong>Vasodilators</strong></td>
<td>• Used in combination with other antihypertensives</td>
</tr>
<tr>
<td>Hydralazine</td>
<td></td>
</tr>
</tbody>
</table>
Adults: Oral, 25–50 mg twice daily
Slow IV injection over 20min, 5–10mg diluted with 10 ml normal saline.
Repeat after 20–30 minutes if necessary

Children:
Oral: 0.15–0.5 mg/kg 12 hourly, gradually increasing to 2 mg/kg
IV: 0.25–0.5 mg/kg diluted in 10 ml normal saline given over 20min,
then 0.1–0.2 mg/kg 4–6 hourly (max 3 mg/kg in 24 hours)

Refer the following categories of hypertensive patients to an appropriate specialist:

- Those not achieving the target blood pressure level after several months of treatment
- Those on three or more anti–hypertensive drugs, yet have poor BP control
- Those with worsening of BP over a few weeks or months
- Those with plasma creatinine levels above the upper limit of normal
- Those with diabetes mellitus
- Those with multiple risk factors (diabetes, dyslipidaemia, obesity, family history of heart disease)
- Those not on diuretics but have persistently low potassium on repeated blood tests
- All children, young adults and pregnant women with elevated BP

Hypertensive Emergencies

- Hypertensive encephalopathy
- Acute left ventricular failure associated with severe hypertension
- Dissecting aneurysm
- Eclampsia (in pregnant women)

Patients should be admitted to hospital for blood pressure reduction with careful monitoring to ensure that blood pressure does not fall precipitously.

Treatment

Non–Pharmacological

- Bed rest

Pharmacological

- Nifedipine capsules, sublingual, 5–10 mg. The capsules should be bitten to release the liquid and the liquid held under the tongue.

  or

- Hydralazine, IV, 5–10 mg over 20 minutes. This dose may be repeated after 20–30 minutes, until the patient is conscious and can take oral medications.

  or

- Reserpine, IM, 500 micrograms–1 mg followed if necessary by 2–4 mg every 3 hours
This should be followed by oral administration of a long-acting antihypertensive medication if the patient is conscious, with dosage adjustments based on the blood pressure response.

REFER

- When the blood pressure is stabilized refer to hospital
- Patients with possible secondary hypertension should be referred to specialist centres for further investigations and management
- Uncontrolled hypertension
- Children with hypertension

STROKE

(Cerebrovascular accidents)

This is defined as a syndrome of rapidly developing clinical signs of focal (or global) disturbance of cerebral function lasting 24 hours or longer or leading to death, with no apparent cause other than a vascular origin.

CAUSES

- Cerebral infarction from
  - Thrombosis of a cerebral vessel
  - Embolism from a distant site
  - Intracerebral haemorrhage
  - Subarachnoid haemorrhage

RISK FACTORS

- Hypertension
- Diabetes mellitus
- Cigarette smoking
- Obesity
- Plasma lipid abnormalities
- Heart and peripheral vascular disease
- Excessive alcohol intake

SYMPTOMS

Symptoms are usually sudden in onset or may show progression over several hours or occasionally days. Specific neurological symptoms are determined by the site of the brain infarct or haemorrhage

- There is usually weakness of one side of the body including the face, a sudden fall, loss of speech or inability to rise up from a sitting or lying position
- Severe headache and/or neck pain in subarachnoid haemorrhage
- The patient may be conscious or unconscious at the time. If unconscious the patient may or may not regain consciousness later
- Occasionally, epileptiform seizures

SIGNS
These depend on the site of infarction.

- There is weakness of the limbs of one side of the body (hemiparesis/hemiplegia) and face
- The affected limbs are initially flaccid, but spasticity and exaggerated reflexes occur later
- There may be hemianopia (loss of one-half of visual field) and hemi-anaesthesia (loss of sensation of one-half of body) on the side of the limb weakness
- An extensor plantar response
- There may be an alteration of speech (dysarthria/dysphasia)

INVESTIGATIONS

- Full blood count
- Blood glucose
- ECG
- Blood urea, electrolytes and creatinine
- Serum cholesterol and triglycerides
- Chest X-ray
- CT scan of the head

TREATMENT

Therapeutic objectives

- To protect patients from the dangers of unconsciousness and immobility
- To treat the causal lesion if possible
- To institute measures to improve functional recovery
- To support and rehabilitate patients who survive with residual disability
- To prevent progression and recurrence of cerebrovascular lesions

Non-Pharmacological Treatment

- Admit patient if unable to walk, unconscious or blood pressure is too high.
- An adequate airway should be established in unconscious patients.
- The patient is best nursed in the lateral position. Suction should always be available.
- Prevent pressure sores by regular turning (every 2 hours) in bed.
- Maintain hydration with intravenous fluids but take care not to over-hydrate.
- Pass urethral/condom catheter to keep patient clean and dry.
- Nutrition: unconscious patients or those with swallowing difficulties should be fed by nasogastric tube as early as possible.
- Rehabilitation of the patient in the form of physiotherapy should be instituted early, as soon as blood pressure stabilises. It is helpful in relieving spasticity, preventing contractures and clearing chest secretions. It also promotes recovery of strength and co-ordination.

Pharmacological Treatment

(Evidence rating: A)
• DO NOT GIVE sublingual Nifedipine or other antihypertensive agent to reduce the blood pressure rapidly in patients with stroke. It may result in deterioration in their clinical state and death.

• Monitor blood pressure regularly but treat only if persistently more than 150 mmHg systolic.

• Reduce blood pressure **gradually over several days** irrespective of the level of blood pressure at presentation.

• If the cause of the stroke is thromboembolic, consider antiplatelet therapy, Aspirin, oral, 75 mg daily.

• Treat any identifiable cause of the stroke such as atrial fibrillation.

REFER

- Those with suspected intracranial space occupying lesion for specialist evaluation
- If the underlying cause cannot be managed
- **Refer all patients with residual muscular weakness** to a Physiotherapist.

HEART FAILURE

This is a condition in which the heart is unable to maintain adequate cardiac output to meet metabolic requirements. The cardiac dysfunction may predominantly involve the left ventricle, resulting in pulmonary congestion, or the right ventricle, resulting in oedema of the feet and lower extremities as well as congestion of the liver. Usually both left and right ventricular dysfunction co-exist and is termed congestive cardiac failure (CCF).

CAUSES

- Hypertension
- Valvular diseases
- Cardiomyopathy
- Severe anaemia
- Myocardial ischaemia/infarction
- Thyrotoxicosis
- Congenital heart disease
- Arrhythmia
- Bacterial endocarditis

SYMPTOM

**Left Heart Failure**

- Breathlessness with physical activity (exertional dyspnoea)
- Breathlessness on lying down (orthopnoea)
- Intermittent breathlessness at night (paroxysmal nocturnal dyspnoea)
- Wheezing (cardiac asthma, associated with pulmonary congestion)
- Cough with frothy sputum which may be blood-stained
- Fatigue

**Right Heart Failure**

- Swelling of the feet and lower extremities
- Abdominal swelling and discomfort
SIGNS

Left Heart Failure

• Tachypnoea (increased respiratory rate)
• Tachycardia (increased heart rate)
• Basal crackles on auscultation of chest, occasionally rhonchi may be heard.
• Gallop rhythm
• The apex beat may be displaced
• A murmur may be heard

Right Heart Failure

• Tachycardia (increased heart rate)
• Dependant pitting oedema
• Ascites
• Tender, smooth, soft hepatomegaly.
• Raised jugular venous pressure
• Gallop rhythm

In children:

Failure to thrive
Difficulty in feeding

FUNCTIONAL CLASSIFICATION

New York Heart Association (NYHA) Classification

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS I:</td>
<td>No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnoea</td>
</tr>
<tr>
<td>CLASS II:</td>
<td>Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation or dyspnoea</td>
</tr>
<tr>
<td>CLASS III:</td>
<td>Marked limitation of physical activity. Comfortable at rest, but slight activity causes fatigue, palpitation or dyspnoea</td>
</tr>
<tr>
<td>CLASS IV:</td>
<td>Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency are present at rest. If any physical activity is undertaken, discomfort is increased</td>
</tr>
</tbody>
</table>

INVESTIGATIONS

• ECG
• Chest x-ray
• Echocardiography
• Full blood count
• BUE, creatinine
• Blood glucose
• Cardiac enzymes, if myocardial infarction is suspected
• Liver function test

TREATMENT

Therapeutic objectives

• To improve cardiac output and efficiency (relieve symptoms & improve quality of life)
• To treat complications
• To treat the precipitating cause
• To increase duration of life

Non-Pharmacological Treatment

• Low salt diet
• Weight reduction
• Avoid alcohol
• Avoid smoking
• Encourage low level endurance muscular activity, such as walking
• Rest (only in acute heart failure or exacerbations of chronic heart failure)

Pharmacological Treatment

(Evidence rating: A)

Initial therapy of mild heart failure (NYHA CLASS I–II)

• Give Furosemide (frusemide), oral,

  Adults: 40–80 mg daily
  Children: 1–2 mg/kg

• Give ACE-Inhibitor (for left ventricular systolic dysfunction – LVSD), Lisinopril, oral,

  Adults: 5–20 mg daily

• Identify and treat precipitating factors

Initial therapy of moderate heart failure (NYHA CLASS III)

• Give Furosemide (frusemide), oral,

  Adults: 80–120 mg daily
  Children: 2–4 mg/kg

• Give ACE-Inhibitor (for LVSD), Lisinopril, oral,

  Adults: 5–20 mg daily

• In patients with atrial fibrillation who have not taken Digoxin within the past 2 weeks, Give Digoxin, oral,

  Adults: 250 micrograms twice daily for 24–48 hours
  Elderly: 125 micrograms twice daily for 24–48 hours
  Children: 5 micrograms/kg twice daily

• Diuretics may cause hypokalaemia, therefore monitor serum electrolytes closely,

  Give Potassium chloride sustained release tablets, oral, 600–1200 mg, 12 hourly, when necessary. (Do not give both potassium sparing diuretics such as spironolactone and
Potassium chloride supplements together in the same patient. Avoid potassium supplements in renal failure

**Initial therapy of severe heart failure (NYHA CLASS IV); example acute pulmonary oedema**

- Admit patient
- Prop patient up in bed
- Give oxygen by nasal cannula or face mask
- Insert an intravenous cannula
- Give Furosemide (Frusemide), IV, 40–80 mg, repeat after 30 minutes if necessary; Thereafter, give Furosemide (Frusemide), IV, 40–80 mg, 8 hourly;
  - If patient improves, change to Furosemide (Frusemide), oral, 40–80 mg, 3 times daily after 24 – 48 hours of IV treatment
  - If patient **does not improve**, continue
  - Furosemide (Frusemide), IV, 40–80 mg, 8 hourly and **give in addition**
    - Morphine, IV, 5–10 mg slowly and Metoclopramide, IV, 10 mg to prevent vomiting
    - If there is fast atrial fibrillation, Give Digoxin, oral, 250 micrograms twice daily for 24–48 hours
    - Monitor urine output
    - Identify and treat (if possible) precipitating causes such as hypertension, myocardial infarction, anaemia or thyrotoxicosis

**REFER**

All patients must be referred to a specialist when clinically stable for the identification and treatment of the underlying cause of the heart failure and for long-term maintenance therapy.

**CARDIAC ARRHYTHMIAS/DYSRHYTHMIAS**

These are disorders of cardiac rate, rhythm and conduction.

The following are examples of common arrhythmias:

- Atrial fibrillation
- Atrial flutter
- Complete heart block
- Extrasystoles
- Supraventricular tachycardia
- Ventricular tachycardia

**CAUSES**
• Rheumatic heart disease
• Ischaemic heart disease
• Hypertension
• Thyrotoxicosis
• Cardiomyopathy
• Hypokalaemia
• Digitalis poisoning
• Pericardial disease
• Post cardiac surgery
• Excessive ingestion of caffeine as in tea or coffee

SYMPTOMS

• Palpitation (an awareness of the heart beat)
• Dizziness
• Syncopal attacks, sudden death
• Chest discomfort, dyspnoea and headache

SIGNS

Patient with intermittent arrhythmias may have a normal cardiac rhythm on presentation. However, during an arrhythmia, examination of the peripheral pulse and the heart may give an accurate diagnosis.

• The pulse rhythm and volume are irregularly irregular in atrial fibrillation, and the rate of cardiac activity when counted (by auscultation over the heart) exceeds the pulse rate.

• In extrasystoles the pulse is basically regular, but missed beats may occur either at regular or random intervals.

• In paroxysmal supraventricular tachycardia the pulse rate is usually fast and regular between 140 and 220 beats a minute.

• In complete heart block the pulse is slow (30 to 50 beats a minute), and regular.

INVESTIGATIONS

• ECG
• Serum electrolytes
• Chest X-ray

TREATMENT

Therapeutic objectives

• To control the heart rate
• To restore sinus rhythm
• To prevent or treat associated complications
• To treat the underlying condition

Non–Pharmacological Treatment

• Reassure the patient

• Avoid excessive intake of alcohol, coffee or tea (if these are the precipitating factors)

• Massage of the carotid sinus on one side for a few seconds may terminate an attack of paroxysmal supraventricular tachycardia.
Pharmacological Treatment

(Evidence rating: A)

It will be dangerous to use an antiarrhythmic drug without doing an ECG.

Refer symptomatic patients to hospital immediately. The choice of drug treatment depends on the type of arrhythmia and severity of symptoms.

- Atrial fibrillation

  Digoxin, oral, 250 micrograms twice daily over 24–48 hours, maintenance dose, 250 micrograms daily

  or

  Atenolol, oral, 50–100 mg daily or Propranolol, oral, 10–40 mg three times daily

- Antiplatelet therapy may be given to prevent thromboembolism

  Aspirin, oral, 75–300 mg daily

- In atrial flutter treatment is the same as atrial fibrillation

- Precipitating conditions such as thyrotoxicosis should be treated

REFER

Refer all patients for specialist evaluation

CONGENITAL HEART DISEASE (CHD)

Congenital malformation of the heart, loosely referred to as "Hole in Heart", is quite a common congenital malformation with an incidence of 8 out of 1000 live births. Early recognition is important for 2 main reasons:

1. 50% of all deaths in early infancy due to congenital defects are due to congenital heart disease. With the exception of severe lesions, deaths can be prevented or the quality of life improved with medical or surgical treatment.

2. Close monitoring and care will prevent death and reduce morbidity from complications in those with mild lesions requiring no surgery.

COMMON CAUSES

For majority of patients (95%), no cause can be identified. In the remainder, identifiable causes or risk factors include;

- Maternal infections due to viruses in early pregnancy, notably rubella
- Multiple pregnancy (CHD is common in twins than singletons)
- Ingestion of drugs during early pregnancy e.g. alcohol, anticonvulsants such as phenytoin.
- Overexposure to x–rays during early pregnancy
- Maternal diabetes
- Familial predisposition. For instance, the risk of having another child with CHD is between 2−5%

- Living at high altitudes increases risk to patent ductus arteriosus (PDA)

- Preterm babies have higher incidence of PDA

There are many types of CHD but eight are commonly encountered in clinical practice. These fall into two main groups with characteristic symptoms and signs:

**Cyanotic congenital heart disease**

In these lesions, blood which has done its rounds in the body cannot be returned to the lung for oxygenation due to either an obstruction to the lung as in Tetralogy of Fallot (TOF) or abnormal connections that bypass the lung as in Transposition of the Great Arteries (TGA). The predominant feature is central cyanosis.

**Acyanotic congenital heart disease**

There are two main types;

a) Those associated with increased flow of blood into the lungs as a result of shunting of extra blood from left sided chambers of the heart to right sided chambers of the heart through defects. Main examples of this type of CHD are:

- Ventricular septal defect
- Atrial Septal Defect secundum
- Patent ductus arteriosus

b) Those associated with the obstruction of ventricular outflow.

- Aortic stenosis.
- Pulmonary stenosis
- Coarctation of the aorta

**TREATMENT**

**Therapeutic Objectives**

The management of CHD follows the following therapeutic objectives:

- Early recognition of the problem
- Treat existing heart failure promptly
- Ensure good nutrition
- Timely surgery
- Prevention of endocarditis with a good oral and dental hygiene and antibiotic prophylaxis

**REFER**

Refer all children with congenital heart disease to a paediatric cardiologist for further clinical assessment and management

The following section provides more detailed information on the common CHDs.

**CYANOTIC CONGENITAL HEART DISEASE**

**Tetralogy of fallot – 10% of all CHD**

This is the commonest cyanotic CHD after the period of infancy.
SYMPTOMS

- Blue tongue and fingernails which become worse with exertion.
- Easy fatiguability and breathlessness. The baby will stop sucking several times during a feed to catch a breath. The toddler or young child will squat several times during play.
- Attacks of increasing cyanosis leading to loss of consciousness and convulsions. This is known as ‘hyercyanotic attack’.
- Poor physical growth.

SIGNS

- Cyanosis – intensity varies with degree of obstruction. Cyanosis becomes more obvious as child grows.
- Finger clubbing more obvious after age 6 months
- A systolic heart murmur and thrill
- Plethora
- Tachypnoea
- Hypercyanotic Attack – deep cyanosis, tachypnoea, tachycardia, loss of consciousness and/or convulsions

INVESTIGATIONS

- Chest x−ray (shows normal size but boot shaped heart and decreased pulmonary vascularity)
- ECG (shows right ventricular hypertrophy and right axis deviation)
- Haemoglobin and packed cell volume. Normal values suggest iron deficiency anaemia from other causes
- Echocardiography

TREATMENT

(Evidence rating: C)

- Improve exercise tolerance and reduce severity and frequency of hypercyanotic attacks with oral Propanolol 2–6 mg/kg body weight/day in 3–4 divided doses. This relaxes the right infundibular obstruction and allows more blood flow into lungs.
- Treat iron deficiency anaemia with 8 mg/kg body weight of elemental iron.

Transposition of the great arteries (TGA)

Deeply cyanosed newborn with cyanosis out of proportion to any respiratory distress (tachypnoea but no retractions) should alert one to the possibility of TGA. There is usually no improvement in cyanosis after wrapping up, clearing the airway and providing oxygen by face mask, nasal prongs or intubation. It occurs usually in full size or big baby and commonly male.

SIGNS
• A heart murmur may or may not be present.
• Signs of heart failure present.
• Absence of other causes of central cyanosis (see problems of new born)

INVESTIGATIONS

• Chest x−ray (shows cardiomegaly with ‘egg−on−side’ appearance and increased pulmonary vascularity)
• Echocardiography

TREATMENT

• Refer to the Cardiothoracic Centre.
• Before and during transfer;
  • Correct metabolic derangements like hypoglycaemia and hypocalcaemia and metabolic acidosis (See section on Problems of the Newborn).
  • Give oxygen to correct hypoxia

Acyanotic Congenital Heart Disease

Symptoms are absent for mild obstruction and small defects.

Clinical features for moderate to severe obstruction and moderate to large defects may be as follows:

SYMPTOMS

• Easy fatiguability
• Breathlessness
• Poor physical growth
• Feeding problems (Poor feeding)
• Cold sweats on head especially forehead
• For obstructive lesion exertion may lead to chest pains, syncope or sudden death
• In older children puffy eyelids, swollen feet and/or distended abdomen.

SIGNS

• Heart murmurs in all patients usually systolic.
• Signs of heart failure for moderate to severe lesions include:
  • Tachycardia or gallop rhythms
  • Tachypnoea with dyspnoea
  • Weak thready pulse
  • Cold sweaty skin especially of the head of infants
  • Orthopnoea
  • Crepitations and ronchi in the chest
  • Puffy eyelids
  • Hepatomegaly
  • Cardiomegaly
  • Distended neck veins and ankle oedema are not seen in infants and small children as in older children and adults

• A weak femoral pulse compared to normal brachial pulse suggests coarctation of the aorta.
• Hypertension in the arms in coarctation of the aorta

INVESTIGATIONS

• Chest X−ray (shows cardiomegaly in moderate to severe lesions especially with heart failure and increase pulmonary vascularity)
  • ECG
  • Echocardiography

TREATMENT

Non−pharmacological Treatment

• Educate parents on importance of good dental hygiene.

Pharmacological Treatment

• For children in heart failure
  • Nurse propped up (cardiac position)
  • Give humidified 40% oxygen
  • Diuretic therapy
    i) Furosemide (frusemide)
      a) IV, 1 mg/kg body weight/day in 2 divided doses
      b) Oral 2−3 mg/kg body weight/day in 2 divided doses
    ii) Add Spironolactone, oral, 2−3 mg/kg body weight/day in 2 divided doses
        (for persistent heart failure).

REFER

Refer all children with congenital heart disease to a paediatric cardiologist for further clinical assessment and management.

HYPERCYANOTIC ATTACK

This is a paediatric cardiac emergency. It can lead to death or long term complication of the central nervous system. Parents should be educated to recognise clinical features of attacks and to give the initial care.

• Attack commonly occurs in the infants aged between 2−4 months and is precipitated by crying, feeding or defaecation.

• The infant become irritable and cries incessantly. The breathing becomes deep and rapid and cyanosis increases in intensity.

• On auscultation there is tachycardia and murmur is decreased in intensity

• In severe attack the infant becomes limp, progresses into coma or convulses. Hemiparesis or death may follow.

TREATMENT
Therapeutic objective is to reverse the obstruction and correct metabolic derangement of severe hypoxia

- The mother should pick up the infant and hold over the shoulder and soothe gently or hold in knee chest position.
- Give Morphine, SC, 200 micrograms/kg body weight
- Propranolol, IV, 500 micrograms/kg body weight slowly over one minute.
- Oxygen nasally
- Correct acidosis with Sodium Bicarbonate, IV, 1 mEq/kg body weight slowly

(1 ml of 8.4% of Sodium Bicarbonate is equivalent to 1 mEq of Sodium Bicarbonate)

**Signs of Response to Treatment**

- Increased intensity of murmur and
- Decreased cyanosis.

Hypercyanotic attack is an indication for early surgery. Refer to Cardiothoracic Centre.

**RHEUMATIC FEVER**

This febrile illness is a complication of inadequately treated Group A streptococcal infection of the throat. There is inflammation of several systems but mainly the joints and heart. It is a major cause of permanent damage to the heart in developing countries. The disease occurs mainly in children of school going age. The onset of symptoms occurs 1−3 weeks after the throat infection.

**SYMPTOMS**

- Persistent fever
- Joint pain which moves from one joint to another (knees, ankles, wrists, elbows)
- Palpitations
- Tires easily
- Chest pain

**SIGNS**

- Child looks unwell and is febrile
- Tenderness with or without swelling of any of the joints mentioned above
- Carditis – rapid heart rate (>100/min), murmur, heart failure, pericardial rub

Less commonly,

- Skin rash, subcutaneous nodules over bony prominences
- In our setting this illness may mimic malaria, typhoid fever, sickle cell disease, myocarditis, tuberculosis

**INVESTIGATIONS**
• Full blood count (raised white cell count)
• ESR – raised
• Sickling status
• Chest X–ray (heart may be enlarged)
• Throat swab for culture
• Antistreptolysin O titre (if available)
• Electrocardiogram

TREATMENT

Therapeutic objectives

• To eradicate streptococcal throat infection
• To prevent recurrent episodes of rheumatic fever and further heart damage

Non–Pharmacological Treatment

• Admit patient. Bed rest until rheumatic activity subsides

Pharmacological Treatment

(Evidence rating: C)

• Eradicate streptococci – give Phenoxymethyl penicillin (Penicillin V), oral for 10 days.

  Adults: 500 mg every 6 hours.

  Children:
  1–5 years; 125 mg every 6 hours
  6–12 years; 250 mg every 6 hours

  If patient is allergic to penicillin give Erythromycin, oral:

  Adults: 500 mg every 6 hours.

  Children:
  1–5 years; 125 mg every 6 hours
  6–12 years; 250 mg every 6 hours

• Suppress rheumatic activity with:

  Aspirin, oral, 100 mg/kg body weight/24 hours in 4–6 divided doses for 2 weeks then 75
  mg/kg body weight/24 hours for 4–6 weeks then gradually withdraw drug over 2 weeks

  or

  • If patient has carditis with heart failure or enlarged heart on x–ray, give prednisolone, oral, 2
    mg/kg body weight/day for 2 weeks and then gradually taper off. Gradually reduce dose to
    zero over 2 weeks. When the tapering of prednisolone is started, add Aspirin 75 mg/kg body
    weight/day for 6 weeks and then withdraw aspirin over 2 weeks

  • Treat heart failure initially with diuretics and intranasal oxygen. Digoxin may be required in
    children in severe heart failure (refer to appropriate text for digoxin doses or refer patient to a
    specialist)
(See section on heart failure for dosage for diuretics)

- Prevent further episodes of streptococcal infection with Phenoxyethyl penicillin, oral

<table>
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<td>250 mg every 6 hours</td>
</tr>
</tbody>
</table>

or

Benzathine Penicillin, IM 1.2 M units monthly for adults; for children more than 30 kg, 900,000 units per month and those less than 30 kg, 600,000 units monthly (more reliable).

or

For patients with penicillin allergy give Erythromycin, oral,

<table>
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Continue until age 21 years or indefinite if valvular damage present.

- Patients with rheumatic heart disease will require antibiotic prophylaxis against endocarditis prior to dental and other surgical procedures.

REFER

- Patients who have been treated for heart failure should be referred for further evaluation.
- Suspected rheumatic fever where facilities are not available for basic investigations.

CHAPTER 7: DISORDERS OF THE CENTRAL NERVOUS SYSTEM

NON–PSYCHIATRIC DISORDERS

HEADACHE

Headache is a common complaint. However, it is only in a few cases that it turns out to have a serious cause. Headaches are associated with acute systemic or intracranial infection, intracranial tumour, head injuries, severe hypertension and many diseases of the eye, nose, throat, teeth and ear.

DIFFERENTIAL DIAGNOSIS OF HEADACHE

Infections

a) Malaria and Typhoid Fever
Headache is moderate, generalized, pulsating and constant. Other associated symptoms are fever, chills and rigors

b) Meningitis

Headache is of recent onset, severe, generalized, constant, radiates down the neck. There is malaise, fever, vomiting. Patient is usually acutely ill, febrile and may be confused. They have a stiff neck and a positive Kernig’s sign

Subarachnoid Haemorrhage

This is suggested by the sudden onset of severe occipital headache, often associated with collapse, brief unconsciousness and confusion, stiff neck and positive Kernig’s sign. Blood pressure may be elevated. Diagnosis is confirmed by CT scan if available on site or lumbar puncture.

Severe Hypertension

Headache is throbbing or paroxysmal. There is a history of cardiovascular or renal disease. BP is elevated on examination and there may be retinal changes.

Expanding lesions which lead to increased intracranial pressure

a) Brain Tumour

Headache is a common presenting symptom. The headache may worsen progressively and be associated with vomiting, progressive weakness on one side, convulsions, visual changes, aphasia and mental changes. Diagnosis is confirmed by skull x-ray and CT scan

b) Brain Abscess

Headache may be mild to severe, localized or generalized. There may be a history of ear disease, sinusitis, bronchiectasis, lung abscess, rheumatic or congenital heart disease.

c) Subdural Haematoma

This usually follows a head injury, which is sometimes trivial and occurs particularly in the elderly. A clue to the diagnosis is fluctuating neurological signs and symptoms which usually worsen in the course of time.

Migraine

Headaches may be episodic and generalized but are characteristically one–sided, throbbing, beginning in and around the eye, spreading to involve one or both sides, accompanied by anorexia, nausea and vomiting. Onset is usually in adolescence and a positive family history is present in 60% of cases.

Cases of migraine that need further investigation to exclude an aneurysm or vascular anomaly are those with:

- Ophthalmoplegic migraine
- Migraine that is complicated by a residual neurological deficit
- Migraine that starts later in adult life

Temporal Arteritis

This diagnosis should be entertained in every patient over the age of 60 who complains of headache originating in the temporal area. The headache may be associated with fever and malaise. Tenderness over the temporal region is a reliable sign. Urgent ESR should be requested. If ESR is elevated, start the patient on prednisolone, oral, 60 mg daily. Diagnosis is confirmed by biopsy of the temporal artery. It is important to treat the condition with steroids urgently on strong clinical suspicion as blindness can develop.
Extra–cranial Causes

a) Lesions of the eye (glaucoma, refractive error, iritis)

Headache is frontal or supra–orbital. Moderate or severe pain occurs, frequently worse after eye strain. Ophthalmic examination is required.

b) Lesions of middle ear (otitis media, mastoiditis)

Headache is temporal or aural, unilateral, intermittent or stabbing sensations. Feeling of fullness in the ear, increasing deafness, tinnitus, otorrhea with fever may be present. There is tenderness over the mastoid area; ear–drum is red, congested or retracted. Otoscopic examination is required.

c) Lesions of nasal sinuses

Headache is frontal or over the maxillary area, dull or severe, usually worse in the morning, improves in the afternoon, worse in cold, damp weather. A history of preceding upper respiratory infection and purulent nasal discharge may be present. X–ray of the sinuses is indicated.

d) Lesions of the oral cavity (teeth, tongue, pharynx):

Headache may be bilateral or unilateral, variable in intensity, periodic. There is also pain in the mouth, jaw or throat. Dental evaluation is required.

Post–Traumatic

Headache is localized to the site of injury or generalized. It is variable in intensity, frequency, duration and made worse by emotional disturbances. Irritability, insomnia and inability to concentrate may occur. Psychological assessment is required and organic disease should be excluded.

Psychogenic

a) Conversion hysteria, anxiety states

Headache is frequently bizarre, bitemporal, constant, generalized, made worse by emotional disturbances. Pain is present all day, every day with no physical abnormalities. Patient may appear apprehensive. Studies to rule out organic disease are required. Evaluation of psychological and personality factors are required.

b) Muscle Tension

Headache – intermittent, moderate, and fronto–occipital or general associated with feeling of tightness and stiffness. Muscles may be tender, otherwise no physical findings. Rule out organic disease and do an evaluation of personality and psychologic factors.

TREATMENT

Non–pharmacological Treatment

Psychotherapy for psychogenic and post–traumatic headache

Pharmacological Treatment

(Evidence rating: C)

• Treat underlying cause

• Analgesia – Paracetamol, oral,
Adults: 500 mg – 1 g 3 to 4 times daily

Children:
3 months–1 year; 60–120 mg 3 to 4 times daily
1–5 years; 120–250 mg 3 to 4 times daily
6–12 years; 250–500 mg 3 to 4 times daily

SEIZURES
These are paroxysmal unintentional movements of the whole or part of the body. Patient may lose consciousness during the attack and may bite the tongue or become incontinent of stool or urine. Before then, there may be a warning or they may feel they are about to have one. After a convulsion, the patient may sleep for some time.

CAUSES
• Fevers, especially in children (aged 6 months to 6 years)
• Cerebral malaria;
• Infections e.g. meningitis, TB, HIV, abscesses in the brain
• Metabolic causes: hypoglycaemia, hypocalcaemia, hypernatraemia, hyperosmolar diabetic state, uraemia, hepatic failure
• Idiopathic (Epilepsy)
• Eclampsia
• Hypertensive encephalopathy
• Tumour or cystic formations of the brain
• Head Injury
• Drugs and toxins: – alcohol, antidepressants, metronidazole, drug and alcohol withdrawal

TREATMENT

Therapeutic objectives
• To stop the convulsion
• To treat underlying cause

Non–Pharmacological Treatment
• Turn the patient on the side, with one leg bent and the other leg straight
• Bend the head back
• Remove any secretions or vomitus from the mouth or nose.
• Remove false teeth if present
• Monitor fits (fits chart)

Pharmacological Treatment

(Evidence rating: C)
If the patient is still fitting, give Diazepam, IV:

**Adults:** 10 mg slowly over 1 – 3 minutes

**Children:** 0.2–0.3 mg/kg body weight slowly over 1 – 3 minutes or if not possible then give the same injectable form into the rectum after removing the needle. This may be repeated 10 minutes later if the fit continues.

- Find the cause of the convulsion and treat (see appropriate section).

**REFER**

Refer the following patients:

- All eclampsia cases to the obstetrician
- Repeated fits despite treatment (status epilepticus)

**DIZZINESS AND BLACKOUTS (FUNNY TURNS)**

Dizziness is a word patient’s use for a wide variety of complaints ranging from a vague feeling of unsteadiness to severe, acute vertigo. It is also frequently used to describe the light−headedness that is felt in anxiety and ‘panic attacks’, during palpitations, and in syncope or chronic ill health.

Like dizziness, "blackouts" is a vague, descriptive term implying either altered consciousness, visual disturbance or falling. A careful history, particularly from an eye−witness, is essential.

Episodes of transient disturbance of consciousness and falls are common clinical problems. It is usually possible to distinguish between a "fit" (a seizure), a "faint" (syncope) and other types of attack from the history given by the patient and the account of an eye witness.

Dizziness or faintness occurs as a result of reduction of oxygenation to those parts of the brain which subserve consciousness. This may be the result of reduced blood flow to the brain or altered state of blood to the brain.

**CAUSES**

**CIRCULATORY:** (Decreased blood flow to the brain)

(a) Vasovagal – (Fainting)

(b) Postural hypotension

- Occurs in patients with impaired autonomic reflexes e.g. In the elderly or people taking some types of antihypertensives like Metyldopa, Hydralazine and Phenothiazines or Tricyclic antidepressants.

(c) Acute haemorrhage

- Acute blood loss, usually within the gastrointestinal tract, or from a ruptured ectopic pregnancy or injury may lead to faintness or loss of consciousness.

(d) Cardiac Arrhythmias

- Atroventricular block with Stokes–Adams attacks
- Ventricular asystole, ventricular tachycardia, supraventricular tachycardia.
These are important causes particularly in the elderly.

(e) Vertebro–basilar Insufficiency

- As occurs in cervical spondylosis.

**TREATMENT**

In dealing with patients who feel dizzy or have fainted, think first of those causes of fainting or dizziness that constitute an emergency and treat them accordingly. For example:

- Massive internal haemorrhage (e.g. ruptured ectopic pregnancy)
- Myocardial infarction
- Cardiac arrhythmias

In elderly persons a sudden faint, without obvious cause, should arouse the suspicion of complete heart block, even though all findings may be negative when the patient is seen.

Patients seen during the preliminary stages of fainting or after they have lost consciousness should be placed in a position which permits maximal cerebral blood flow, that is, in the supine position and if possible legs raised.

All tight clothing and other constrictions should be loosened, and the head turned so that the tongue does not fall back into the throat blocking the airway.

Turning the head to the side also helps prevent aspiration since vomiting

**ALTERED STATE OF BLOOD TO THE BRAIN**

- Anaemia.
- Hypoxia – Reduced oxygenation to the brain
- Hyperventilation.
- Hypoglycaemia – see section on hypoglycaemia

**CEREBRAL CAUSES**

a) Cerebral Ischaemic Attacks

These occur in some patients with occlusion of the major arteries of the brain. Symptoms vary from patient to patient and include dim vision, hemiparesis, numbness of one side of the body and impaired speech. This may be transient lasting less than 24 hours without any residual effect.

b) Hysterical fainting/Emotional disorders/ attacks

The absence of change in pulse and blood pressure or colour of mucous membranes distinguishes it from the vasodepressor faint. Nothing should be given by mouth until the patient has regained consciousness.

Patients should not be permitted to rise until the sense of physical weakness has passed, and they should be watched carefully for a few minutes after rising. The cause of dizziness or fainting should be investigated and the appropriate treatment given.

*(See appropriate sections for treatment of the various causes)*
THE UNCONSCIOUS PATIENT

Unconsciousness is a common clinical problem and may be associated with diseases of several organs in the body. The unconscious patient is unresponsive to stimuli. The cause of unconsciousness is often not immediately evident, and a systematic approach to its diagnosis and management is therefore important. Obtain a history from accompanying relatives, friends, the police etc.

CAUSES

Some common treatable causes are:

Adults

- Infections e.g. meningitis, cerebral malaria
- Hypoglycaemia (diabetes–related or alcohol induced)
- Diabetic ketoacidosis
- Severe hypertension with encephalopathy
- Cerebrovascular Accident (CVA) or stroke
- Drug overdose e.g. alcohol, salicylates, barbiturates
- Epilepsy
- Head injury
- Major organ failure e.g. hepatic failure, renal failure and myocardial infarction.

Children

- Infections e.g. meningitis, cerebral malaria
- Epilepsy
- Hypoglycaemia
- Drug ingestion
- Poisoning e.g. kerosene

Guidelines for the Management of the Unconscious Patient

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<th>Diagnosis</th>
<th>Action</th>
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<td>*Test blood for glucose using test strip or glucose meter. • Give IV Glucose</td>
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<td>Support respiration • IV Glucose to prevent hypoglycaemia. In chronic alcoholics • Precede IV glucose with IV Thiamine, IV fluid administration.</td>
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<tr>
<td>Presence or absence of – history of diabetes; – polyuria, polydipsia – hyperventilation – gradual onset of illness – evidence of infection – Urine sugar and ketone positive – Blood glucose&gt; 18mmol/l</td>
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<td>*Give Soluble Insulin and Sodium Chloride 0.9% infusion</td>
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### Fever, fits, headache, neck stiffness, altered consciousness etc

- Meningitis or Cerebral Malaria

### History of previous fits, sudden onset of convulsions; with or without incontinence.

- Epilepsy

### Patient with hypertension or diabetes; sudden onset of paralysis of one side of body.

- Stroke

### Patient with hypertension, headaches, seizures

- Hypertensive encephalopathy

### Sudden onset associated with cardiac arrhythmia or emotional crisis.

- Syncope

### History of injury, or alcoholism, signs of trauma

- Head Injury

### History of heavy alcohol ingestion over many years. History of jaundice and gradual onset of changes in sensorium

- Hepatic Failure

**NOTE:** If the cause cannot be easily determined, the following tests should be done if they have not been done already.

### INVESTIGATIONS

- Hb, WBC
- B/F for MPs
- Blood glucose
- Urea and electrolytes
- Liver function tests
- ECG

### MANAGEMENT

**General Measures**

- Examine the airway and ensure that it is clear
- Check the pulses
- Check blood pressure
- Observe the respiratory rate and pattern
- Perform cardiopulmonary resuscitation if appropriate.
- Assess the size and reaction of the pupils to light
- Place the patient in a position that would prevent aspiration in case of vomiting

Start a glucose infusion, and **REFER** to a regional or teaching hospital. Nothing should be given by mouth because of the danger of aspiration.

### EPILEPSY

Epilepsy is a disorder of the central nervous system (CNS) which is characterized by spontaneous recurrent seizures.
Epileptic seizures may be classified as follows:

- Primary generalized seizures
  - Grand mal (tonic–clonic) seizures
  - Petit mal (absence) seizures

- Partial or focal seizures
  - Temporal lobe seizures
  - Jacksonian (motor) seizures
  - Status epilepticus

CAUSES

- Idiopathic
- Post–trauma, surgery and encephalitis
- Intracranial mass lesions

SIGNS

Examine carefully for neurological localizing signs

INVESTIGATIONS

- Electroencephalogram (EEG)
- Full blood count, ESR
- Blood glucose
- BUE
- Calcium,
- LFTs,
- Chest x-ray, skull x-ray
- CT scan (head)

TREATMENT

Non–Pharmacological Treatment

Remove false teeth if present

Immediate emergency measures:

- If patient is seen convulsing:
  - Ensure that the patient does not harm himself and that the airway is clear
  - Clothing about the neck should be loosened

- After convulsions cease, turn the patient into semi–prone position, ensure the airway is clear
- To offset cerebral hypoxia, give oxygen at high concentration; if available

Pharmacological Treatment

(Evidence rating: A)

Anti–convulsant drug therapy:
Traditionally, a single seizure has been regarded as an indication for investigation and assessment, but not for drug treatment unless a second attack follows closely. Drug treatment should certainly be considered after two seizures and the type of drug depends on the type of seizure.

**Guidelines for Use of Anti-convulsant drugs**

- Begin with a single drug at the lower dose
- If seizures not controlled, increase dose to upper limit of dose or until side-effects appear.
- If seizures poorly controlled, change to a different drug by gradually reducing dose of initial agent while simultaneously introducing the new one. This usually takes 3–4 weeks.
- Try 3 single drugs before resorting to drug combinations, which help in only a minority of cases.
- Treatment can be stopped ONLY after 3 years free of fits and full discussion with patient.

<table>
<thead>
<tr>
<th>Type of Seizure</th>
<th>Drug Dose</th>
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<tr>
<td></td>
<td>Adult</td>
</tr>
<tr>
<td>Generalized seizure</td>
<td></td>
</tr>
<tr>
<td>Phenytoin (daily)</td>
<td>300–500 mg</td>
</tr>
<tr>
<td>Phenobarbital (daily)</td>
<td>60–180 mg</td>
</tr>
<tr>
<td>Primidone (2 times daily)</td>
<td>250–1000 mg</td>
</tr>
<tr>
<td>Carbamazepine (2 times daily)</td>
<td>800–1200 mg</td>
</tr>
<tr>
<td>Sodium valproate (2–3 times daily)</td>
<td>600–2000 mg</td>
</tr>
<tr>
<td>Generalized absence (petit–mal) seizure</td>
<td></td>
</tr>
<tr>
<td>Sodium valproate (2–3 times daily)</td>
<td>600–2000 mg</td>
</tr>
<tr>
<td>Ethosuximide (daily)</td>
<td>500–1500 mg</td>
</tr>
<tr>
<td>Partial seizure</td>
<td></td>
</tr>
<tr>
<td>Carbamazepine (12 hourly)</td>
<td>800–1200 mg</td>
</tr>
<tr>
<td>Sodium valproate (2–3 times daily)</td>
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</tr>
</tbody>
</table>

**STATUS EPILEPTICUS**

Status epilepticus is said to exist when a series of seizures occurs without the patient regaining consciousness between attacks. This condition is life-threatening.

**INVESTIGATIONS**
As for epilepsy

MANAGEMENT

Non-pharmacological Treatment

- Remove false teeth if present
- Insert a Brook’s airway (oropharyngeal tube) to maintain airway
- Give oxygen

Pharmacological Treatment

- If hypoglycaemia is suspected treat as appropriate for adult or child (see section on hypoglycaemia)
- Give Diazepam, IV or rectal (see appropriate section)
- If seizures continue set up IV infusion of Diazepam in Sodium Chloride 0.9% 40–80 mg per litre to be infused over six hours. Give at 5 mg/min until seizures stop or 20 mg given or significant respiratory depression occurs
- If seizures still uncontrolled 60 minutes after it began, paralyze and ventilate under anaesthesia. Transfer to a facility where this can be done

DON’TS FOR EPILEPTIC PATIENTS

- Driving of a vehicle
- Swimming
- Working at heights
- Excessive alcohol ingestion
- Machine operation

PSYCHIATRIC DISORDERS

THE ACUTELY DISTURBED PATIENT

The acutely disturbed patient presents in an excited, agitated or even aggressive state. There may be perceptual changes and hallucinations that overwhelm the patient. Disorientation and alteration in consciousness are often prominent when the cause is organic.

COMMON CAUSES

Acute Functional Psychiatric Disorders

- Mania or Hypomania
- Acute schizophrenia
- Agitated depression

Acute Organic Psychiatric Disorders

- Toxic psychosis secondary to drug intoxication with cocaine, marijuana, heroin etc.
- Delirium tremens (Acute Alcoholic Withdrawal Syndrome)
- Alcoholic Intoxication
- Infective causes e.g. typhoid, malaria, encephalitis, acute hepatitis
SYMPTOMS

• Restless, agitated or even combative patient
• Talking excessively and loudly, mute in some cases
• Disinhibited in behaviour or speech
• Often brought in forcibly restrained by more than two people or the police
• Hallucinations – auditory or visual
• Changes in mood

TREATMENT

Therapeutic objectives

• Rapid tranquilisation – to calm down the patient as quickly as possible using the safest drugs available without necessarily inducing sleep

• To treat underlying cause

Non-Pharmacological Treatment:

• Restrain patient when necessary without causing injuries

• It is often helpful to keep lines of communication open by talking to the patient in a firm but friendly manner until the situation is under control

• Avoid long periods of silence

Pharmacological Treatment

(Evidence rating: C)

Adults:

1. Diazepam, IV, 10–20 mg slowly in 2–4 minutes is often effective.

Up to twice this dose may be required in very agitated patients under toxicity by marijuana etc.

Children: Diazepam, IV, 200–400 microgram/kg slowly over 4 minutes or Rectally

< 1 year; 2.5 mg
1–3 years; 5 mg
> 4 years; 5–10 mg. Repeat if necessary after 5 minutes

2. Chlorpromazine, IM, 50–150 mg. This may be given in addition to Diazepam, IV, in very agitated patients or repeated after 30–40 minutes if necessary.

NEVER GIVE Chlorpromazine IV because of serious risk of hypotension, which may occur even after IM administration. Blood pressure monitoring half hourly for 2 hours is essential to prevent life-threatening hypotension.

For older patients: (>60 years) slow IV over 2–4 minutes of Haloperidol, 5–10 mg or IM, 10–20 mg is preferred to chlorpromazine because of lower risk of causing hypotension. Otherwise, use Chlorpromazine, IM, 50–75 mg and repeat if necessary.
Definitive treatment should be instituted only when diagnosis has been established. It is particularly important to exclude organic causes. Treat underlying organic state.

**ACUTE DYSTONIC REACTIONS**

Acute dystonic reactions (severe muscle spasms) may occur and can be particularly frightening. They are more likely with Haloperidol but also with Chlorpromazine. They usually involve tongue (sticking out), neck (torticollis or retrocollis), hands, eyes (oculogyric crisis) etc. They are common between 12–48 hours after the initial dose of antipsychotic agent and in younger patients.

**TREATMENT OF DYSTONIC REACTIONS**

- Reassure patient.
- Give Benztropine, IV (slowly) or IM:
  - **Adults:** 2–4 mg
  - **Children:**
    - > 3 years: 1–2 mg

In the absence of parenteral Benztropine,
- Give Diphenhydramine, IV or IM
  - **Adults:** 25–50 mg
  - **Children:** half adult dose

Or
- Diazepam, IV
  - **Adults:** 10–20 mg slowly over 2–4 mins
  - **Children:** 200–400 micrograms/kg body weight slowly over 4 mins

Excitement may occur soon after administering IV whilst respiratory depression and hypotension may follow IV Diazepam or Promethazine.

Follow-up with Benztropine oral, 2 mg 2 or 3 times daily for the next one week Trihexyphenidyl (Benzhexol), oral 5mg is an alternative or

Diphenphenydramine, oral, 25 mg or

Chlorphenamine (Chlorpheniramine), oral, 4 mg over same period

In children, give half of adult dose.

For reactions to depot antipsychotics (anticholinergic) drugs treatment may have to be continued over the period of the antipsychotic effect e.g. up to a month in the case of Fluphenazine deconoate.

Reduce dose of antipsychotic if possible.
If diagnosis cannot be made

DEPRESSIVE ILLNESS

Depression is the commonest of the major psychiatric disorders. It is more common in females than men by a ratio of 2:1. In most countries over 20% of women are estimated to experience major depression at least once in their lifetime.

Depression frequently goes unrecognised and is often undiagnosed. Many people who get depressed do not seek treatment. Instead, they get treated for nonexistent physical illnesses or end up in ‘spiritual’ homes and church houses.

Depression occurs in all age groups though the symptoms are usually different in children. It has a tendency to recur, though some may become bipolar.

The diagnostic criteria for major depression should include at least 5 of the following symptoms for two weeks. (Criterion 1 or 2 is essential for diagnosis)

1. Depressed mood
2. Loss of interest or pleasure
3. Significant weight loss or gain
4. Insomnia or hypersomnia
5. Psychomotor agitation or retardation
6. Fatigue or loss of energy
7. Feelings of worthlessness or excessive guilt
8. Impaired thinking or concentration; indecisiveness
9. Suicidal thoughts/thoughts of death
10. Hallucinations/delusions of morbid themes in severe cases

In children symptoms may consist only of altered behaviour like

- Truancy or school refusal, impaired performance at school
- Bedwetting in a previously ‘dry’ child
- Odd behaviour, aggressive or defiant
- Irritability
- Disorders of appetite

Some of the ‘adult’ symptoms may be present

TREATMENT

- Recurrent depression or unipolar depression is treated differently (with antidepressants) from bipolar depression which responds more to mood stabilizers.

Non–Pharmacological Treatment

- Counselling
- Psychotherapy – (especially in children this may be all that is required.)

Pharmacological Treatment

(Evidence rating: A)

Selective Serotonin Reuptake Inhibitors (SSRI)

Adults and Children above 8 years
• Fluoxetine, oral, 20–60 mg daily as a single dose in the morning,

or

Alternatively give Tricyclic antidepressant Imipramine or Amitriptyline (more sedating), oral

**Adults:** Initially, 25–50 mg, oral taken early evening – once a day. Increase by 25 mg every 3–5 days up to 150 mg orally at night by end of second week. The patient’s tolerance will determine the rate of increase of the dose.

**Children:**
6–12 years; 5–15 mg, oral, 12 hourly

If night sedation is required, Diazepam 10 mg or Lorazepam 2 mg orally may be given

• Give the maximum tolerable dose for at least 6 weeks before deciding the antidepressant is not effective. If there is no improvement in patient's condition, it is possible to raise the dose of the Tricyclics in adults to 200 mg or even 250 mg provided side effects are tolerable.

• Antidepressants should be continued for at least 6 months after a single episode of depression as there is a high risk of relapse in this period.

**CAUTION**

• Stop antidepressants immediately if manic swing occurs.

• Admit patients with suicidal tendencies and keep under close observation.

**REFER**

Refer the following to a psychiatrist:

• Patients with atypical, hysterical or phobic features
• Non response to treatment
• Children suspected to suffer from depression.

**INSOMNIA**

Insomnia is the inability to obtain adequate sleep, irrespective of whether the patient has trouble getting to sleep, suffers frequent nocturnal arousals, or awakens too early. Assessing a complaint of sleep disorders requires a thorough medical examination and specific sleep–wake history. Drug use, especially alcohol, hypnotics, antihistamines and caffeine, greatly influence sleep. Insomnia usually suggests some underlying medical, psychological or environmental problem. Patients without an underlying problem e.g. pain, depression, nocturia, and those who complain of ‘never sleeping’ are sometimes found to sleep normally.

**TREATMENT**

**Therapeutic objectives**

• To manage any underlying cause
• To educate patient on variation of sleep patterns
• To reassure patient

**Non–Pharmacological Treatment**

Insomnia is best managed in the first instance by correcting any underlying problem.
An important first step is to educate the patient and to encourage the patient to adopt a lifestyle that promotes good sleep. The patient should be advised:

- To undertake regular exercise
- To avoid strenuous exercise close to bedtime
- To establish a routine for ‘winding down’, going to bed and preparing for sleep
- To avoid alcohol and caffeine-containing beverages close to bedtime
- To ensure a comfortable and quiet environment for sleep

- Relaxation therapy reduces muscle tension, and may also assist mental relaxation by helping the patient to concentrate on specific calming thoughts
- Stimulus control treatment of sleep helps the patient to learn to associate the bed and bedroom with sleep. It requires the patient to go to bed only when sleepy and to get out of bed if sleep is interrupted

Pharmacological Treatment

(Evidence rating: C)

- If non-pharmacological treatments have failed, use of hypnotic drugs could be considered, for example, the benzodiazepines like Diazepam, oral, 2–5 mg at night as a last resort.

Treatment should normally be limited to less than 4 weeks because of the risk of dependency.

REFER

Patients who fail to respond to treatment

BIPOLAR DISORDERS

These refer to patients who experience mood swings between the two extremes of mood disorder – depression and mania. Bipolar Disorders are referred to in older literature as Manic–Depressive illness. It is important to note that the affected patient usually presents with one predominant mood state at a time; either Depression or Mania.

A single manic episode and a history of depression qualify for classification as Bipolar Disorder. A current episode of Depression without a past manic episode or with a past history of depression is NOT diagnostic of Bipolar Disorder. Repeated Depressive episodes are diagnosed as Recurrent Depression.

CAUSES

The cause is not known but there is a tendency to run in families.

TREATMENT

Treatment is directed at the current episode i.e. either mania or depression and returning mood to normal.

MANIA (or hypomania – mild form)

This is characterised by a persistently elevated mood – euphoria, expansiveness, feeling ‘high’ or irritability. The history should include any past similar episodes or depressive illness. Substance (cocaine, marijuana, amphetamine) abuse may precipitate the condition. There is no point arguing with a manic patient or challenging their grandiose claims.
TREATMENT

Therapeutic objectives

- To reduce the level of activity to a manageable state.
- To lower the elevated mood to a normal state.
- To abolish psychotic symptoms (delusions and hallucinations) if present.

Pharmacological Treatment

Start oral medication as soon as possible with
Haloperidol, oral, 5–10 mg, 2–3 times daily or
Risperidone 1–4 mg once or twice daily (maximum 8 mg daily) or
Chlorpromazine 50–200 mg 2–3 times daily
Add Lorazepam, oral, 2 mg, 2–3 times daily for very restless patients.

Continue or resume definitive treatment with mood stabilizers e.g. Carbamazepine or Valproic acid for known patients with bipolar disorder. The benzodiazepines are withdrawn as soon as the patient is calm, but this should be done slowly by tapering the dose. The antipsychotics are continued at a dose just enough to control the symptoms and should be continued for at least 3–4 weeks.

REFER

- All patients suffering a first episode must be referred
- Non response of patients to treatment after one month

ALCOHOLISM

Dependence on alcohol and development of related problems is a common and often unrecognized disorder. Alcoholism is often associated with many physical health problems.

The greatest problem is the recognition and diagnosis of alcoholism since affected individuals are often in denial of their problem and under–declare their amount of alcohol consumption and usually appear in hospital only with complications. The coexistence of other psychiatric illnesses like Depression with alcoholism is common.

Common Features

- Recurrent use of alcohol resulting in failure to fulfill major obligations at work, school or home
- Recurrent use in situations where it is physically hazardous e.g. driving
- Continued use despite having persistent or recurrent social or interpersonal problems caused by effects of alcohol
- Development of tolerance
- Withdrawal syndromes
- Taking increasingly larger amounts over longer periods than intended
- Previous unsuccessful attempts at stopping

SIGNS

(Not required for diagnosis)
• Reddening of lips
• Smooth red palms
• Painless enlargement of liver
• Bruises from minor accidents etc.
• Parotid gland enlargement

INVESTIGATIONS

May be useful but none is diagnostic.

• Mean Corpuscular Volume (MCV) is increased in 95% of alcoholic patients
• Liver Enzymes (AST, ALT) are often increased
• Serum Gamma Glutamyltransferase (GGT) is increased in majority of alcoholics

TREATMENT

Therapeutic objectives

• To treat complications
• To achieve total abstinence from alcohol use

Non−Pharmacological Treatment

• Most alcoholics will benefit from joining groups like Alcoholics Anonymous or religious organisations that encourage abstinence from alcohol
• Adequate nutrition

Pharmacological Treatment

(Evidence rating: A)

A. Uncomplicated Alcohol Dependence

Phase 1 − Detoxification (Best achieved under in−patient conditions)

Out−patient care possible for the highly motivated.

• Admit for one week. Stop all alcohol use.

• Give Diazepam, oral, as follows:
  
  Day 1 Diazepam 10 − 20 mg twice daily  
  Day 2 Diazepam 10 − 20 mg twice daily  
  Day 3 Diazepam 5 − 10 mg twice daily  
  Day 4 Diazepam 5 − 10 mg twice daily  
  Day 5 Diazepam 10 mg at night  
  Day 6 Diazepam 10 mg at night  
  Day 7 Diazepam 5 mg at night  

  2nd week: Tab Diazepam 5 mg once daily for 2–7 days then STOP.

If there is a history of concomittant diazepam abuse, this may not be effective therefore consult a psychiatrist.

Give Thiamine, oral, 50–100 mg daily
Give Folic Acid, oral, 5 mg daily
ALCOHOL WITHDRAWAL SYNDROMES

These occur following sudden withdrawal from alcohol. They are often seen in patients admitted to hospital for other problems e.g. arising from accidents or physical illnesses which keep them from drinking.

Minor Withdrawal ("shakes")

**Onset:** 12 to 18 hours after last drink and peaks between 24–48 hours but may occur earlier.

**Symptoms:** Insomnia, tremors, nausea, vomiting

**Signs:** Increased pulse rate and blood pressure.

**Treatment:** As for uncomplicated alcoholism. Without treatment, symptoms subside within a week, occasionally last longer.

Alcoholic Seizures

**Onset:** 7–36 hours after last drink

Consist of sudden generalised seizures and occurs mostly in chronic alcoholics.

May precede Delirium Tremens

**Treatment:** See treatment for delirium tremens

Alcoholic Hallucinosis

**Onset:** within 48 hours of cessation of drinking

Consists of vivid unpleasant auditory hallucinations occurring in the presence of clear sensorium.

**Treatment:** As for uncomplicated withdrawal. If hallucination persists add Haloperidol 5 mg twice daily until symptoms settle.

Alcoholic Delirium Tremens

This is the most dramatic withdrawal syndrome. Usually starts 2–3 days after drinking stops. On average, syndrome lasts 3 days but may continue for much longer. Without good supportive care and adequate treatment, Delirium Tremens is associated with significant mortality.

In delirium tremens, patients may have:

- Tremors
- Psychomotor agitation
- Sweating, vomiting
- Disorientation
- Intermittent visual, tactile or auditory hallucinations or illusions. Visual hallucinations are frequently of small objects or frightening animals on walls etc.
- Rise in body temperature >38°C.
- Pulse >100/min, Blood Pressure >160/100 mmHg
TREATMENT

1. Diazepam (always administer slowly)
   - Day 1 – 20 mg 6 hourly x 24 hours intravenously
   - Day 2 – 20 mg 8 hourly x 24 hours intravenously
   - Day 3 – 20 mg 12 hourly x 24 hours intravenously
   - Day 4 – 10 mg 8 hourly x 24 hours intravenously
   - Day 5 – 10 mg 12 hourly x 24 hours intravenously then stop

   Withhold if patient is asleep or has slurred speech, ataxia, nystagmus or is very sedated.

2. Thiamine, IM or IV, 100 mg stat before any IV Glucose load.

3. Ensure adequate hydration and electrolyte balance using intravenous fluids (Sodium Chloride 0.9% in 5% Glucose) and/or oral fluids.

4. Add Haloperidol, IV, 5–10 mg daily if hallucinations occur. Discontinue if they cease.

5. Phenytoin, oral, 100 mg 3 times daily x 5 days may be used if seizures persist and are not controlled by Diazepam alone.

   Seclusion and restraints as necessary.

ANXIETY DISORDERS

Anxiety is a common symptom that occurs in all psychiatric disorders including depressive illness and psychoses. Some patients have a mixture of anxiety and depressive symptoms but pure states exist. It may be difficult to differentiate an anxiety state from a minor depressive illness because of similarity of symptoms.

Anxiety disorders include

- Generalised Anxiety Disorder
- Panic Disorders
- Phobias
- Obsessive Compulsive Disorders
- Acute Stress disorder
- Post traumatic stress disorder.

The commonest of these seen in general practice are Generalised Anxiety Disorders and Panic Disorders.

GENERALISED ANXIETY DISORDER

- Excessive anxiety and worry, occurring on most days for at least 6 months about events or activities like school performance or work.

Diagnostic criteria:

- The anxiety or worry is associated with at least 3 of the following:
  - Muscle tension (often reported as pain in
    - the neck and back or headaches)
  - Crawling and burning sensation around
    - the body.
  - Restlessness or feeling on edge
  - Being easily fatigued
  - Difficulty concentrating or mind going
• blanket
• Irritability
• Sleep disturbance (difficulty falling asleep or frequent wakening)

INVESTIGATIONS

Exclude any underlying physical disease especially hyperthyroidism, cardiac disease or hypertension. Anxiety may significantly overshadow many serious illnesses.

TREATMENT

Therapeutic objectives

• To reduce anxiety
• To attain relief of somatic symptoms.

Non−Pharmacological Treatment

• Reassurance
• Teach relaxation methods
• Regular exercise
• Encourage healthy social activities
• Psychotherapy

Pharmacological Treatment

(Evidence rating: B)

• Diazepam, oral, 2−5 mg twice daily for 2 weeks and gradually tailed off over next 2 weeks. Do NOT give for more than a month continuously.

• Propranolol, oral, 20−80 mg twice daily or especially when somatic complains are prominent. AVOID in Asthmatics

• Fluoxetine, 20 mg, oral, as a single morning dose

• Imipramine or Amitryptiline is effective and can be used in doses of 25−50 mg as a single oral evening dose.

• With the exception of diazepam, the other drugs may be used for longer periods without fear of dependence

REFER

Referral is only necessary in severe cases not responsive to treatment.

PANIC DISORDER

Panic disorder refers to a pattern of recurrent unexpected panic (or anxiety) attacks accompanied by a period of persistent concern about having another attack or worrying about implications of having an attack.

Diagnostic criteria for panic attack:

A discrete period of intense fear or discomfort in which 4 or more of the following symptoms develop abruptly and reaches a peak within 10 minutes.
• Fear of dying or going ‘crazy’
• Palpitations, pounding heart or rapid heart rate
• Trembling or shaking
• Sensation of shortness of breath
• Feeling of choking
• Chest pain or discomfort
• Feeling dizzy, unsteady or faint
• Numbness or tingling sensations
• Chills or hot flushes
• Derealisation (feeling of unreality) or depersonalisation (feeling detached from oneself)
• Nausea or abdominal distress

In children especially, partial complex seizures may mimic panic attacks

**TREATMENT**

**Therapeutic objective**

• To stop the attacks of panic or at least reduce the frequency and intensity of symptoms to a minimum.

**Non−Pharmacological Treatment**

• Cognitive Therapy – Refer to Clinical Psychologists

• Relaxation Training

• Rebreathing into a paper bag. (Do NOT use a polythene bag)

• Panic disorder patients should be advised to eliminate caffeine from their diets as it tends to worsen anxiety. Caffeine containing foods include coffee, tea, cola and chocolates

**Pharmacological Treatment**

*(Evidence rating: B)*

Give drugs only if panic attacks occur frequently enough to cause distress.

• Diazepam, oral, 5–10 mg daily, allays anxiety. Give for maximum of one week usually at least 3 times a week

• Fluoxetine, oral – 20 mg daily as single morning dose

• Imipramine, oral, – Build up dose from 50 to 150 mg gradually as a single dose in late afternoon/evenings (Refer to section on treatment of depression)

Duration of treatment – at least 6 weeks and should be continued for up to 6 months or more after attacks have remitted to prevent early relapse. Tail off slowly over a month or more.

**REFER**

• Children with symptoms suggestive of panic disorder should be referred to the paediatrician to exclude seizure disorder.

• Patients who do not respond to drug therapy should be referred for psychotherapy.
SCHIZOPHRENIA

Schizophrenia occurs in about 1% of the people in every community worldwide. It is probably the most severe and potentially disabling form of mental illness.

Schizophrenia may present as an acute or chronic illness. Features are:

- Characteristic ‘positive’ or ‘negative’ symptoms
- Deterioration in social, work or interpersonal relationships
- Continuous signs of disturbance for at least 6 months

Psychosis associated with substance abuse and mood disorders with psychotic features may mimic schizophrenia. The clinical findings are many and can change over time.

SYMPTOMS

‘Positive’ symptoms:

- Hallucinations
- Delusions
- Incoherent speech or illogicality
- Odd or disorganised behaviour
- Disorders of thought possession

‘Negative’ symptoms include:

- Poverty of speech or of content of speech
- Apathy
- Reduced social contact
- Flattened affect (showing little facial expressive responses)

Delusions may be persecutory (undue suspicion) or totally bizarre like being controlled or being made to feel emotions or sensations.

Hallucinations – may involve any of the senses but auditory ones are most common; experienced as voices speaking clearly or in mumbled tones.

Disorders of thought possession include feeling of the patient’s thoughts being accessible to others. Motor disorders often occur but are not essential for diagnosis

TREATMENT

Treatment of schizophrenia is probably best left to the psychiatrist though treatment for acute episodes can be started and follow up treatment continued by most health care givers.

Therapeutic objectives

- To abolish symptoms and restore functioning to the maximum level possible
- To reduce the chances of recurrence

Non–Pharmacological Treatment

- Supportive psychotherapy
- Rehabilitation

Pharmacological Treatment
Antipsychotic drugs are the mainstay of treatment.

Recommended antipsychotics:

- In acute attack, give:
  
  Chlorpromazine, IM, 100–150 mg 6–8hourly

- Maintenace, give:
  
  Chlorpromazine, oral, 100–600 mg daily in divided doses not exceeding 200 mg per dose

- Haloperidol, oral, 5–20 mg daily or

- Trifluoperazine, oral, 10–30 mg daily or

- Depot antipsychotics e.g. Fluphenazine Decanoate, IM, 25 mg monthly for recurrent and chronic patients

- Risperidone, oral, 2–6 mg in 2 divided doses or single daily dose

Adjunct treatment

Antiparkinsonian drugs should only be used if reactions occur or at higher doses of antipsychotics likely to cause reactions. Any of the following could be given.

- Trihexyphenidyl (Benzhexol), oral, 5 mg one to 3 times daily
- Biperidine, oral, 2 mg one to 3 times daily
- Biperidine, IV, 2 mg SLOWLY 2–4 minutes for acute dystonic reactions.

In the absence of these antiparkinsonian drugs Promethazine, oral or IM, 25–50 mg or Chlorphenamine (Chlorpheniramine), oral, 4–8 mg or

Diazepam, oral or IV, 5–10 mg may be used as a substitute.

Duration of Treatment

A clearly diagnosed schizophrenic patient must be on medication for at least 18 months after remission of symptoms for a first episode.

After two or more episodes especially if they follow within a year or two of each other – treatment should probably continue for life although ‘drug holidays’ may be discussed from time to time.

REFER

Since a diagnosis of schizophrenia carries probable life long implications and treatment may be of life long duration:

- Refer after treatment of acute episode
- Refer recurrent cases
- Refer patients who cannot be controlled with drugs and may require Electroconvulsive Therapy.
CHAPTER 8: DISORDERS OF THE SKIN

BACTERIAL SKIN INFECTIONS

BOIL (FURUNCLE)

A boil is a bacterial infection of hair follicles of the skin. It is caused by *Staphylococcus aureus*.

SYMPTOMS

- Swellings with pus in them which may be warm and painful.
- In case of multiple or recurrent boils screening for diabetes mellitus or immunodeficiency is indicated.

TREATMENT

Therapeutic objectives

- To treat infection
- To identify and treat any predisposing condition

Pharmacological Treatment

(Evidence rating: B)

Flucloxacillin, oral,

- **Adults:** 250–500 mg 6 hourly for 7 days
- **Children:**
  - >1 year: 62.5 mg 6 hourly for 7 days
  - 1–5 years: 125 mg 6 hourly for 7 days
  - 5–12 years: 250 mg 6 hourly for 7 days

  - Incision and drainage – if boil becomes fluctuant and large.

If patient is allergic to penicillin, use Erythromycin, oral:

- **Adults:** 500 mg 6 hourly for 7 days
- **Children:**
  - <1 year: 62.5 mg 6 hourly for 7 days
  - 1–5 years: 125 mg 6 hourly for 7 days
  - 6–12 years: 250 mg 6 hourly for 7 days
IMPETIGO

Common in children. It is a staphylococcal or streptococcal or combined skin infection. It presents as superficial, fragile blisters and irregular spreading sores with shiny yellow crusts. It may be associated with conditions such as scabies, eczema, lice infestation and herpes simplex infection and is contagious.

TREATMENT

Therapeutic objectives

• To eradicate infection
• To identify and treat any predisposing condition
• To prevent transmission

Pharmacological Treatment

(Evidence rating: B)

Flucloxacillin, oral,

Adults: 250 – 500 mg 6 hourly for 7 days

Children:

1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
5–12 years; 250 mg 6 hourly for 7 days

• Treat the associated condition as well.

If severe enough to require admission, use Benzylpenicillin, IM/IV, 2 MU 6 hourly for 7 days plus

Flucloxacillin, IV,

Adults: 250 mg 6 hourly for 7 days.

Children:

<2 years; 62.5 mg 6 hourly for 7 days
2–10 years; 125 mg 6 hourly for 7 days

If patient is allergic to penicillin, use Erythromycin, oral:

Adults: 500 mg 6 hourly for 7 days

Children:

<1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
6–12 years; 250 mg 6 hourly for 7 days

CELLULITIS/ERYSIPELAS

This is a diffuse inflammation of the soft tissue under the skin. Usually it follows an infected wound or prick by a pin, nail, thorn, insect bite or cracks between the toes. Diabetes mellitus may be a predisposing factor.
CAUSES

• *Streptococcus pyogenes* (the commonest cause)
• *Staphylococcus aureus*

SYMPTOMS

• Pain and swelling at the affected parts
• Fever, malaise

SIGNS

• Swelling of affected part
• Swollen part feels hot and tender (painful)
• Regional nodes may be enlarged and tender

INVESTIGATIONS

• Fasting blood glucose

TREATMENT

Therapeutic objectives

• To relieve pain
• To control the infection
• To treat predisposing conditions

Non–Pharmacological Treatment

• Rest and elevation of the affected part
• Clean and dress the wound

Pharmacological Treatment

(Evidence rating: C)

• Paracetamol, oral

  Adults: 500 mg–1 g 3 to 4 times daily

  Children:
  3 months–1 year; 60–120 mg 3 to 4 times daily
  1–5 years; 120–250 mg 3 to 4 times daily
  6–12 years; 250–500 mg 3 to 4 times daily

• Penicillin V, oral,

  Adults: 500 mg 6 hourly for 7 days.
• Amoxicillin, oral

Children:
<1 year; 62.5 mg 6 hourly for 7 days
1−5 years; 125 mg 6 hourly for 7 days
6−12 years; 250 mg 6 hourly for 7 days
If severe enough to require admission, use Benzylpenicillin, IM/IV, 2 MU six hourly for 7 days plus.

• Flucloxacillin, oral or Cloxacillin, IV

Adults: 250−500 mg 6 hourly for 7 days

Children:
<2 years; 62.5 mg 6 hourly for 7 days
2−10 years; 125−250 mg 6 hourly
If patient is allergic to penicillin, use Erythromycin, oral:

Adults: 500 mg 6 hourly for 7 days

Children:
<1 year; 62.5 mg 6 hourly for 7 days
1−5 years; 125 mg 6 hourly for 7 days
6−12 years; 250 mg 6 hourly for 7 days

Late Signs
• The area is red, swollen, hot and painful
• There may be pus
• The wound has an offensive smell

Admit to hospital and start treatment with Benzylpenicillin, IV, 2 MU 4 to 6 hourly for at least 7 days. Swab the wound for culture and sensitivity tests. Carry out incision and drainage if pus has formed.

REFER
• Septicaemia
• Large abscess
• Gangrene

BURULI ULCER
This is an indolent necrotising, relatively painless ulcer with undermined edges caused by *Mycobacterium ulcerans*. The mode of transmission remains unclear but trauma, insect bite and inhalation have been suggested.

There are various pre-ulcerative stages of the disease:

Nodule: Painless firm lesion 1−2 cm in diameter situated in the subcutaneous tissue and attached to the skin.
Plaque: Painless, well demarcated elevated and indurated lesions more than 2 cm in diameter with irregular edges.

Oedematous type: Diffuse, extensive non-pitting swelling with ill-defined margin, often painful, with or without ulceration.

TREATMENT

Therapeutic objectives

• To limit the extent of tissue destruction
• To prevent disability

Non-Pharmacological Treatment

• Early complete excision of nodule, preferably with primary closure if possible. Currently this is the treatment of choice. For this to be achieved it is important to educate the public on early recognition and early reporting of the disease.

• Skin grafting of ulcers if facilities are available.

Pharmacological Treatment

(Evidence rating: C)

• Currently there is no definite efficacious medication for the disease, even though a number of candidate drugs are at clinical drug trial stage.

• Note: To prevent the development of resistance, mono-antituberculous drug therapy should NOT be used.

Ulcers should be dressed with antiseptic solution (cetrime/chlorhexidine/povidone iodine) prior to skin grafting.

REFER

Refer to higher centres if nodulectomy is not possible or other stages of presentation are seen.

TUBERCULOSIS (SCROFULODERMA)

This is tuberculosis of the skin overlying a caseous lymph node in the neck region. It presents as a sore or group of sores usually of the side of the neck that keeps opening and healing. It is preceded by soft often painless swellings.

TREATMENT

(Refer to section on tuberculosis)

FUNGAL SKIN INFECTION
RINGWORM

Ringworm is a fungal infection, commonly found in children, on the scalp and body. It shows as pale, round scaly patches with thickened edges and clear centre on the skin and scaly bald patches of the scalp. Flexures of the toes, fingers, armpits, groins, and skin below the breasts as well as nails may be affected.

INVESTIGATION

• Microscopical examination of Potassium hydroxide treated specimen where possible

TREATMENT

Therapeutic objectives

• To eradicate infection
• To prevent transmission

Pharmacological Treatment

(Evidence rating: C)

• Topical Benzoic acid compound ointment (Whitfield’s ointment) or Miconazole twice daily to patches till clearance. Avoid Whitfield ointment in flexures because it is irritant.

• Oral antifungal agent if rash is extensive or affects the nails or scalp

Griseofulvin, oral:

Adults: 500 mg daily (double in severe infection)

Children:
< 5 years; 125 mg daily
6–12 years; 250 mg

Duration

For skin and scalp; 4 weeks
For nails and hands; 6–9 months
For toes; 9–12 months
Terbinafine: 250 mg daily.

Duration

For finger nails; 2–4 weeks
For toe nails; 2–6 weeks

NOTE: Griseofulvin & Terbinafine

Avoid pregnancy during and for 1 month after treatment; men should not father children within 6 months of treatment.
PITYRIASIS VERSICOLOR

It is caused by fungi (*Pityrosporum orbicularis*) which produce depigmented diffusely scaly patches.

**TREATMENT**

**Therapeutic objectives**

- Same as for ringworm

**Pharmacological Treatment**

*(Evidence rating: C)*

Treatment is with topical imidazole solution daily or Selenium sulphide shampoo applied daily on moist skin for 3 days. May add Ketoconazole, oral, 200 mg daily for 2 weeks if extensive.

INTERTRIGO

Erythematous lesions in the skin folds e.g. armpit, groins and under the breasts. This may be caused by monilia, fungi, eczema as well as psoriasis and erythrasma.

**TREATMENT**

**Pharmacological Treatment**

*(Evidence rating: C)*

- Topical imidazole cream (Miconazole) apply twice daily
- Refer if not improving after 4 weeks.

**VIRAL SKIN INFECTIONS**

**HERPES SIMPLEX INFECTION**

This is known as ‘cold sores’ and is caused by the *Herpes simplex* virus. The sores usually occur around the lips and gums. The first time the patient has cold sores (usually a small child), there may be a high fever and the mouth may be covered with small blisters and superficial sores. The sores are painful. They are usually precipitated by other illnesses which must be identified and treated separately. Recurrence is common.

**TREATMENT**

*(Evidence rating: C)*

- Apply antiseptic lotion (Gentian Violet)

Treat pain and fever with Paracetamol, oral,

**Adults:** 500 mg – 1 g 3 to 4 times daily

**Children:** 3 months – 1 year;
HERPES ZOSTER INFECTION (SHINGLES)

An acute infection caused by the Varicella–zoster virus. It presents as painful blistering reaction of one half (dermatome) of any part of the body preceded, a few days earlier, by pains on the affected site. Severe eye damage may occur if it affects the upper part of the face (ophthalmic branch of the 5th cranial nerve). Suspect immunosuppression (e.g. HIV, malignancies) if lesions are hemorrhagic or extensive.

TREATMENT

Therapeutic objective

- To provide adequate pain relief

Pharmacological Treatment

(Evidence rating: C)

- Adequate analgesia (Amitriptyline, oral, 25–50 mg daily or Carbamazepine, oral, 100–300 mg daily or Diclofenac, oral, 50 mg 3 times daily)
- Local application of antiseptics (e.g. Gentian Violet paint)
- Aciclovir 5% cream. Apply to lesions every 4 hours (5 times) daily.

Start at first sign of lesion.

REFER

Refer to hospital if lesions are haemorrhagic, extensive, affect the eyes or are recurrent.

CHICKEN POX

Chicken pox is a communicable disease caused by the Varicella–zoster virus.

SYMPTOMS

- Mild headache, fever and malaise about 2 weeks after exposure and 2–3 days before rash appear.

SIGNS

- Rash – lesions are groups of macules, papules and vesicles and crusting seen mainly on the trunk. There is an intense itching. In children, it is usually not severe, but may be severe in adults and in immuno–compromised patients.
Non-Pharmacological Treatment

Adults:
- Avoid scratching

Children:
- Hands should be kept clean and nails clipped short.
- Avoid scratching if possible.
- Should be bathed with soap and water often.

Pharmacological Treatment

(Evidence rating: C)

Adults:
- Apply Calamine lotion 2–3 times daily to the skin
- Give Paracetamol, oral, 500 mg–1 g 3 to 4 times daily.
- Give antibiotics if lesions are infected. Flucloxacillin, oral, 500 mg 6 hourly for 5–7 days.
- Antihistamines may be given in severe cases of itching e.g. Promethazine, oral, 25 mg 1 to 3 times daily

Children:
Treat pain and fever with Paracetamol, oral,

3 months–1 year; 60–120 mg 3 to 4 times daily
1–5 years; 120–250 mg 3 to 4 times daily
6–12 years; 250–500 mg 3 to 4 times daily

*AVOID ASPIRIN in children under 16 years because of risk of Reye's syndrome.*
- Apply Calamine lotion 2–3 times daily to the skin
- Give Promethazine, oral, to relieve itching.

Children:
2–5 years; 5 mg twice daily
5–10 years; 10 mg twice daily

- Give antibiotics only if lesions are infected. Give Flucloxacillin, oral, 125 – 250 mg 6 hourly for 5–7 days.

If patient is allergic to penicillin, use Erythromycin, oral:
### Adults
- 500 mg 6 hourly for 7 days

### Children:
- < 1 year; 62.5 mg 6 hourly for 7 days
- 1−5 years; 125 mg 6 hourly for 7 days
- 6−12 years; 250 mg 6 hourly for 7 days

### LARGE CHRONIC ULCERS

An ulcer or sore is a breach in the continuity of the skin and the underlying tissue.

### CAUSES

Common types and causes are:

- Specific ulcers e.g. buruli ulcers, yaws ulcers, tuberculous ulcers
- Non−specific ulcers e.g. traumatic, pyogenic, diabetic, sickle cell, guinea worm
- Malignant ulcers e.g. squamous cell carcinoma, melanoma, Kaposi’s sarcoma

### SYMPTOMS

- The sore may be painful or painless
- May be associated with discharge which may be offensive
- May cause severe disfigurement and disability.

### SIGNS

- Non−specific ulcers have sloping edges
- Buruli and tuberculous ulcers have undermined edges
- Yaws ulcers have punched out edges
- Malignant ulcers have raised everted edges
- Deformity of affected part.

### INVESTIGATIONS

- Haemoglobin level and sickling test
- Fasting blood glucose
- VDRL/RPR test
- X−ray of underlying bone
- Wound swab for culture and sensitivity, Ziel Nielsen staining
- Biopsy of ulcer
- If the patient has no sensation of pain in the sore, suspect diabetes, leprosy and yaws or syphilis.

### TREATMENT

**Therapeutic objectives**

- To deslough the sore and promote healthy granulation tissue formation
- To promote healing
- To treat any underlying cause
Non–Pharmacological Treatment

- Keep wound clean with normal saline solution. **Do not use Eusol**
- Change dressing each day
- Elevation of lower limb on sitting

Pharmacological Treatment

**(Evidence rating: C)**

- Topical antiseptics such as Chlorhexidine or Cetrimide
- Specific antimicrobial treatment as indicated by culture and sensitivity results.
- No topical antibiotics should be used except those that are not used for systemic purposes

REFER

- If sore fails to show signs of healing with above treatment
- Surgery is required e.g. skin grafting, excision or amputation.
- Malignant ulcers

**PRURITUS (ITCHING)**

Pruritus or itching is a sensation that the patient instinctively attempts to relieve by scratching. Itching may accompany a primary skin disease or may be a symptom of a systemic disease.

Skin disease in which itching is most severe includes:

- Scabies
- Contact dermatitis
- Pediculosis (body lice)
- Intertrigo
- Onchocerciasis
- Urticaria
- Insect bites (fleas, bed bugs)
- Lichen planus
- Dry skin (especially in the elderly) often causes severe generalized itching.
- Miliaria (prickly heat)
- Atopic eczema – (common in children)
- Dermatitis herpetiformis

Systemic conditions associated with generalized itching include:

- Obstructive liver disease (cholestasis)
- Uraemia (in renal failure)
- Malignancies e.g. lymphomas, leukaemias, polycythemia rubra vera
- Pregnancy – during the latter months of pregnancy itching may occur
- Drugs e.g. chloroquine and other antimalarial drugs
- Psychogenic – that is no obvious cause but itching occurs from the patient’s mind

**TREATMENT**

**Therapeutic objectives**

- To relieve symptoms
- To identify and treat underlying condition
First and foremost, the cause of the itching should be found and treated. If no skin disease is seen, an underlying systemic disorder or drug-related cause should be sought.

**Non–Pharmacological Treatment**

- Avoid contact with substances known to cause itching
- Stop all medications likely to cause itching
- Irritating clothing e.g. nylon should be avoided

**Pharmacological Treatment**

*(Evidence rating: C)*

- Antihistamines may be helpful – Chlorphenamine (Chlorpheniramine), oral, 4 mg 3 times daily for 5 days
- Calamine lotion may provide a soothing effect
- Treat the underlying cause or refer to higher level if necessary

**Guidelines to Treatment of Itching**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scabies</td>
<td>Apply Benzyl benzoate over the whole body (except the face) after a warm bath; repeat without a bath on the following day and wash off 24 hours later; a third application may be required in some cases.</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>Topical Nystatin or Ketoconazole; if severe use oral Fluconazole 50 mg daily for 2–4 weeks.</td>
</tr>
<tr>
<td>Miliaria (Prickly heat, heat rash)</td>
<td>Cooling and drying of the involved areas and avoiding conditions that induce sweating.</td>
</tr>
<tr>
<td>Atopic eczema</td>
<td>Avoid offending agents as much as possible. Steroid containing cream may be helpful.</td>
</tr>
<tr>
<td>Urticaria</td>
<td>Oral antihistamines e.g. Chlorphenamine (Chlorpheniramine), oral, 4 mg 2–4 times a day is useful.</td>
</tr>
<tr>
<td>Contact dermatitis</td>
<td>Avoid exposure to offending agents. Topical corticosteroid (e.g. 1% hydrocortisone cream) is often required.</td>
</tr>
<tr>
<td>Pediculosis</td>
<td>In severe cases 1% lindane (gamma benzene hexachloride) in lotion form is effective.</td>
</tr>
<tr>
<td>Insect bites e.g. fleas bed bugs</td>
<td>Sources of infestation such as combs, hat, clothing or bedding should be decontaminated by thorough washing and ironing or dry cleaning, in scabies, pediculosis and bed bugs. Promethazine, oral</td>
</tr>
</tbody>
</table>

**Adults:** 25–50 mg

**Children:** 12.5 – 25 mg, topical corticosteroid cream, with or without antiseptic cream

**URTICARIA (WHEALS)**

Transient itchy swelling of the skin lasting less than 24 hours; when the duration of each episode is longer it is termed vasculitic urticaria. When the reaction has occurred over a period longer than 6 weeks it is termed chronic urticaria. It may be caused by allergic e.g. (foods, drugs) or non–allergic factors.
**TREATMENT**

**Therapeutic objectives**

- To provide immediate relief
- To prevent complications such as shock or asphyxiation

**Non–Pharmacological Treatment**

- Identification and avoidance of allergens if possible.

**Pharmacological Treatment**

*(Evidence rating: C)*

- Topical Calamine lotion for relief.
- Oral antihistamines Chlorphenamine (Chlorpheniramine), oral, 4 mg 3 times daily for 5 days
  or
  - Promethazine, oral or IM

  **Adults:** 25–50 mg twice daily for 5 days  
  **Children:** 12.5 – 25 mg twice daily for 5 days
  or

  Cetirizine (a relatively non sedating antihistamine), oral, may be used. Not recommended for children under 1 year.

  **Adults and children above 6 years:** 10 mg daily.  
  **Children:** 2–6 years; 5 mg daily

**REACTIVE ERYTHEMA/BULLOUS REACTION**

**ERYTHEMA MULTIFORME**

Reactive erythema presenting as itchy, target–like, non–scaly reaction of the palms, soles, legs and forearms.

**STEVENS JOHNSON SYNDROME**

This is characterized by blister formation and involvement of the mucous membranes (conjunctiva, mouth, genitals etc). These are commonly caused by allergic reactions to viral infections (e.g. *Herpes simplex*) and drugs. Malignancy or retroviral infection may be a rare association.

**TOXIC EPIDERMAL NECROLYSIS (TEN)**

A generalized scalded type of skin reaction, often due to allergic reaction to drugs. A similar reaction occurs in children termed staphylococcal scalded skin syndrome which is caused by *Staphylococcus aureus*.

**TREATMENT**
Therapeutic objectives

- To maintain adequate hydration
- To prevent secondary infection
- To identify and eliminate underlying condition

Pharmacological Treatment

(Evidence rating: C)

Erythema multiforme, Steven Johnson Syndrome and TEN should be considered as emergencies requiring intensive care.

- Rehydration by IV, nasogastric or oral routes
- Withdrawal of identifiable causative factors
- Do not give antibiotics unless there is frank pus or microbiological evidence of infection
- Where there is frank pus and microbiological evidence is unavailable, Erythromycin and Metronidazole could be used
- Systemic steroids have been used but conclusive evidence of their efficacy is lacking
- Relieve pain with Paracetamol, oral, 6 hourly

**Adults:** 500 mg – 1 g

**Children**

- 3 months–1 year: 60–120 mg
- 1–5 years: 120–250 mg
- 6–12 years: 250–500 mg

    or

    if severe, Pethidine, IM,

**Adults:** 25–100 mg 4 hourly as required

**Children:** 0.5–2 mg/kg body weight repeated every 4 hours as required

- Apply Gentian violet, Mercurochrome or topical antiseptic e.g. cetrimide to skin only.

Strict input/output chart maintenance to ensure adequate urine output.

REFER

Refer to appropriate centres if local facilities are inadequate.

Refer to eye specialist if eyes are involved

ACNE VULGARIS (PIMPLES)

A disorder of the hair follicle and sebaceous gland. The contributing factors identified in its occurrence are increased sebum secretion, abnormal keratinisation of the hair follicles, increased sensitivity of the sebaceous
glands to male hormones, presence of corynebacterium and heredity. It presents mainly in adolescence as commodities (blackheads), papules, pustules, cysts and scars over skin areas of the face, chest and shoulders. It is a condition which usually resolves by late teens. Severe acne may require evaluation to exclude an underlying hormonal disorder.

TREATMENT

Treatment objectives

- To improve cosmetic appearance
- To prevent complications particularly scarring
- To reassure patient

Non – Pharmacological Treatment

- Regular washing of affected skin areas with soap and water.

Pharmacological Treatment

(Evidence rating: A)

- Mild to moderate cases apply Benzoyl peroxide 1–2 times daily avoiding mouth, eyes and the mucous membranes or 1% Clindamycin solution (apply twice daily).

  For severe cases or non–responders to topical treatment, Add Tetracycline, oral, 250 mg twice daily for a minimum of 6 weeks up to clearance, but not exceeding 6 months.

ECZEMA (DERMATITIS)

An itchy skin reaction to a number of factors, either exogenous (e.g. contact dermatitis) or endogenous (e.g. seborrhoea and atopy). Papules, blisters (vesicles, pustules and bullae) and oozing characterise the lesions when acute. There is thickening (lichenification), prominent skin lines and scaling when chronic.

ATOPIC ECZEMA

Onset is in childhood and often has a familial background of atopy (asthma, hay fever, eosinophilia and similar skin problem). It presents as a remitting and relapsing itchy condition of the face, wrists, ankles, cubital and popliteal fossae. Spontaneous resolution often occurs by the teenage.

SEBORRHOEIC ECZEMA

This occurs in infancy, adolescence or adulthood. It may be associated with dandruff and Pityrosporum ovale infection. It presents as scaly weeping rash of the scalp, eyebrows, perinasal and periauricular skins; sometimes it presents as hypopigmented macules. Presternal and interscapular skin as well as axillae, sub mammary and inguinal skins are other skin areas of involvement. Extensive forms are associated with immunosuppressive state, particularly AIDS.

CONTACT ECZEMA

It may be an irritant (concentration dependent) or allergic (idiosyncratic) reaction to specific chemicals such as metals, rubber etc. In contrast to the endogenous types, the skin reaction is confined to the areas directly in contact with the offending chemical. Closed patch testing may be used for identification of allergens.
TREATMENT

Therapeutic objectives

- To eliminate symptoms
- To identify and avoid predisposing factors

Non-Pharmacological Treatment

- Avoidance of identifiable precipitating factors

Pharmacological Treatment

(Evidence rating: C)

- Use emollients in atopic eczema e.g. Aqueous cream and 2% Salicylic acid ointment
- Use topical steroids, limiting to 1% Hydrocortisone cream for not more than 2 weeks
- Topical Clotrimazole with or without steroids (1% Hydrocortisone) in seborrhoeic eczema
- Topical antiseptics and/or oral antibiotics when secondary infection is suspected.

CAUTION

More potent steroid creams e.g. Clobetasol propionate should only be used under specialist supervision

REFER

- Non-response to 1% Hydrocortisone cream
- For identification of allergen

CHAPTER 9: DISORDERS OF THE ENDOCRINE SYSTEM

DIABETES MELLITUS

Diabetes mellitus is a common disorder characterised by persistently high blood glucose levels. It is due to multiple genetic and environmental factors, which result in defects in the action or secretion of insulin thereby causing a disturbance in the metabolism of carbohydrates, fat and protein. Many individuals with diabetes do not complain of symptoms. There is therefore the need to screen all patients (including pregnant women) attending health facilities to exclude diabetes.

A diagnosis of diabetes is suggested when the fasting whole blood glucose level is 6.1 mmol/L or more and/or random blood glucose, taken 2 hours after a meal or 75 g glucose load (1.75 g/kg body weight in children) is 10.0 mmol/L or more.

COMMON CAUSES

Three common forms of diabetes are encountered in practice:

- Type 1 diabetes – (formerly called insulin–dependent diabetes mellitus)
- Type 2 diabetes – (formerly called non–insulin–dependent diabetes mellitus)
- Gestational Diabetes (diabetes developing during pregnancy in previously non–diabetic individuals). See section on Diabetes in Pregnancy
SYMPTOMS

Many patients with diabetes do not have symptoms. Their diabetes is only detected on screening tests. Patients presenting with symptoms may have the following:

- Polyuria – passage of large amounts of urine
- Thirst and excessive drinking of water
- Unexplained weight loss
- Blurred vision
- Recurrent boils
- Pruritus vulvae
- Complications of diabetes (e.g. foot gangrene, poor vision, stroke, heart attack, impotence, infertility, large babies, recurrent still births, miscarriages)

SIGNS

Diabetes does not usually present with any typical signs.

INVESTIGATIONS

Newly diagnosed patient

- Blood glucose
- Urine ketones
- Urine protein
- Blood urea, electrolytes and creatinine
- Blood lipid profile (adults)
- ECG (adults)

Subsequent monitoring

- Blood glucose
- Glycated haemoglobin (HbA$_1c$) – twice or thrice a year, if available
- Blood lipid tests – annually, but more frequently if levels abnormal
- Blood urea, electrolytes and creatinine – annually, but more frequently if levels abnormal
- Urine protein – annually
- Eye examination – annually, but more frequently if findings abnormal
- Other tests as clinically indicated

NOTE: Urine glucose should not be used for the diagnosis and management of diabetes. The correlation between urine tests and simultaneous blood glucose is poor. In occasional circumstances, it may be used to monitor patients with diabetic ketoacidosis when blood glucose testing is unavailable. In such a situation, a fresh urine sample, taken several minutes after complete emptying of the urinary bladder, or while a urethral catheter is in place, must be used whenever urine is used for glucose testing.

TREATMENT

Therapeutic objectives

The objectives of long–term diabetes treatment are to:
• Relieve symptoms and maintain fasting (4–6 mmol/L) and 2-hour post-meal (4–8 mmol/L) blood glucose levels within the normal limits.

• Prevent acute diabetes complications such as hypoglycaemia, ketoacidosis and the hyperosmolar state.

• Prevent the chronic complications of diabetes, namely; blindness, limb amputation, kidney disease, nerve damage, strokes, heart attacks and neonatal abnormalities.

These objectives can only be achieved by strict blood glucose control and regular screening for diabetes complications. Regular follow-up of all individuals with diabetes is therefore important to assess their metabolic control.

Non-Pharmacological Treatment

Diet

All patients with diabetes require diet therapy. All patients (and close relations who cook or control their meals) must be referred to a dietician or diet nurse for individualized meal plans. In general, patients must avoid ‘free’ or refined sugars, such as in soft drinks, or adding sugar to their beverages. ‘Diet’ soft drinks, which contain a sweetener and not glucose, may however be used. Complex carbohydrates are to be encouraged.

Most of a day’s diet must consist of carbohydrates (60%), protein (15%) and fat (25%) mostly of plant-origin and low in animal fat. The total caloric content (portions) of meals must be reduced and the amount of fibre in the meal increased in those who are also overweight or obese. Some healthcare professionals advice patients to eat only unripe plantain (‘apem’ in the Twi language). This practice is improper and must be discouraged.

Exercise

Regular, simple exercise (e.g. walking 1 hour daily) is helpful in ensuring good blood glucose control. All advice on exercise must give consideration to the patient’s age and the presence of complications and other medical conditions.

Pharmacological Treatment

(Evidence rating: A)

• In older patients, who usually have Type 2 diabetes, diet alone should be tried first.

• When diet fails to achieve satisfactory control, non-obese patients are usually treated with a sulphonylurea drug, and obese patients with a biguanide (metformin).

• Avoid metformin and long-acting oral anti-diabetic drugs, such as chlorpropamide and glibenclamide in the elderly and other individuals with poor kidney and liver function.

• Oral anti-diabetic drugs should be avoided in Type 1 patients and should not be used during pregnancy and breast-feeding.

• Insulin is always indicated in a patient who has been in ketoacidosis, and in most young patients who usually have Type 1 diabetes. Insulin is also indicated in older or Type 2 patients when oral anti-diabetic drugs cease to be effective and in all pregnant and breast-feeding women

• The starting dose of any long-term treatment for diabetes must initially be low, with increments in the dose over several days or weeks according to results of blood glucose testing

• Hypoglycaemia is a potential side-effect with all oral anti-diabetic drugs (except Metformin) and Insulin
**Sulphonylureas**

All sulphonylureas are of equal potency and efficacy. The recommended total daily doses for the commonly available ones are:

- **Tolbutamide**, oral, 250 mg – 1 g, 8–12 hourly
- **Gliclazide**, oral, 40–160 mg 12 hourly
- **Glibenclamide**, 2.5–10 mg as a single dose in the morning (if required, not more than 5 mg could additionally be given in the evening – maximum total dose 15 mg per day)
- **Chlorpropamide**, 100 – 500 mg as single dose daily

Sulphonylureas are best taken with meals. Tolbutamide and Gliclazide are short–acting and are preferred in the elderly and those with mild kidney disease. In general sulphonylureas should be avoided in all patients with liver disease and used with care in kidney disease.

**Biguanides**

The only biguanide available in Ghana is Metformin.

Dose: **Metformin**, oral, 500 mg – 1 g 12 hourly

Metformin is best taken with, or soon after, meals.

**Combined oral therapy**

Type 2 individuals not responding to maximum tolerable doses of sulphonylureas or Metformin alone, could be given a combination of a Sulphonylurea and Metformin. Two different sulphonylureas should never be used together.

**Insulin**

- Insulin therapy should usually begin with teaching the patient the correct technique for subcutaneous injections, as self– injections are to be strongly encouraged.

- Patients should be made aware of the different appearance of different kinds of insulin (soluble/regular which is fast–acting = gin clear; NPH or Lente which are intermediate–acting = cloudy; pre–mixed insulin preparations containing both soluble and NPH insulin = cloudy)

- Cloudy Insulins (intermediate–acting or pre–mixed) can only be given subcutaneously and SHOULD NOT be injected IM or IV. Only soluble/regular insulin may be given by the IM or IV route during emergency treatment.

- Patients should be made aware of the strengths of insulin and the kind of syringes to be used. To avoid confusion, 100 U/ml insulin must be administered ONLY with 0.3 ml, 0.5 ml or 1 ml U–100 syringes calibrated for this strength of insulin.

- Insulins currently available in Ghana are preferably injected 15–30 minutes before a meal.

- Two injections daily (before breakfast and dinner) of an intermediate–acting or pre–mixed Insulin give better blood glucose control than once daily injections. Older patients and those with kidney disease may sometimes manage adequately on a single daily injection.

- Two–thirds of the total daily insulin requirement is given before breakfast, and the remainder before the evening meal.

- Insulin requirements vary from patient to patient irrespective of age and body weight.
REFER

Referral of individual patients to a dietician or diet nurse is highly recommended where the service is available. **All pregnant women and children with diabetes** as well as diabetes patients who have any of the following must be referred to a regional or teaching hospital for specialist care:

- Persistently poor blood glucose control
- Poor blood pressure control
- Frequent diabetes–related admissions
- Visual impairment
- Foot ulcers or gangrene
- Other chronic complications of diabetes
- Persistent proteinuria

MANAGEMENT OF DIABETIC EMERGENCIES

HYPOGLYCAEMIA

Blood glucose levels below the lower limit of the normal range (hypoglycaemia) may present with mild, moderate or severe clinical features. It is commoner in the elderly, those with kidney function impairment as well as those on long–acting anti–diabetic drugs. Severe hypoglycaemia (blood glucose less than 2.2 mmol/L) may result in alteration of consciousness, fits, self–injury and various degrees of irreversible brain damage. Following successful treatment of hypoglycaemia, its cause must be determined and measures, including patient education and revision of anti–diabetic drug doses, taken to prevent its recurrence.

CAUSES

It may occur in individuals with diabetes on any anti–diabetic medication especially with

- Excessive dose of medication
- Omitted or inadequate amount of food
- Unaccustomed physical over activity
- Alcohol intake

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>SIGNS</th>
</tr>
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<tbody>
<tr>
<td>Dizziness</td>
<td>Sweating</td>
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<tr>
<td>Blurred vision</td>
<td>Tremors</td>
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<tr>
<td>Headaches</td>
<td>Tachycardia</td>
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<tr>
<td>Palpitation</td>
<td>Confusion</td>
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<tr>
<td>Sweating</td>
<td>Unconsciousness</td>
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<tr>
<td>Shaking of the hands and body</td>
<td>Convulsions</td>
</tr>
<tr>
<td>In children, irritability and abnormal behaviour</td>
<td></td>
</tr>
</tbody>
</table>

INVESTIGATIONS

Take blood sample for random blood glucose and initiate immediate treatment.

TREATMENT

**Therapeutic Objective**
• To quickly bring the level of blood glucose within the normal range to prevent serious neurological damage.

• To maintain the level of blood glucose within the normal range until the patient can begin eating normally.

Treat as soon as the diagnosis is suspected, especially if there is no means of quick confirmation of the blood glucose level. Do not wait for a laboratory test result. The immediate response to treatment is in itself diagnostic. A blood glucose test with a test strip or glucose meter is adequate. The normal range of blood glucose is 3.6–6.1 mmol/L.

Successful treatment results in a prompt response and full recovery within 10–15 minutes.

Non-Pharmacological Treatment

Mild hypoglycaemia: – Give 2–3 teaspoons of granulated sugar or 3 cubes of sugar or ½ a bottle of soft drink (‘mineral’).

DO NOT GIVE ‘DIET’ DRINKS. They do not contain glucose.

A glass of milk or fruit drink and a tablespoonful of honey are also useful. These should be followed by a meal or snack.

Moderate hypoglycaemia: – Same as above but repeat after 10 minutes.

If no improvement is observed, treat as for severe hypoglycaemia.

Pharmacological Treatment

Severe hypoglycaemia: –

Adults: 50% Glucose, IV, 25–50 ml over 1 to 3 minutes through a large vein followed by 5–10% Glucose, IV, 500 ml, 4 hourly until the patient is able to eat normally.

Alternatively,

Glucagon, IV, IM or subcutaneous, 1 mg statim if available.

Children: 10–20% Glucose, IV, 2–4 ml/kg body weight 1 to 3 minutes through a large vein followed by 5–10% Glucose, IV, according to total daily fluid requirement until the patient is able to eat normally

Alternatively,

Glucagon, IV, IM or subcutaneous,

• Age over 8 yrs (or body weight over 25 kg); give 1 mg statim if available
• Age less than 8 yrs (or body weight less than 25 kg); give 500 microgram statim if available

REFER

If the patient remains unconscious exclude a stroke or other neurological deficit and medical conditions. (See the section on the unconscious patient). If necessary, refer to a regional or teaching hospital.

DIABETIC KETOACIDOSIS

Diabetic ketoacidosis is the commonest cause of death among diabetes patients in Ghana. It is a common presentation in newly diagnosed diabetes in children, young adults and other Type 1 diabetes patients. In this condition there is a severe lack of insulin. For this reason the blood glucose, although very high, can not be
utilized for energy production. Fat is broken down instead, producing toxic chemicals called ketones. Additionally there is severe dehydration and electrolyte imbalance.

**CAUSES**

- Previously undiagnosed diabetes
- Interruption of insulin therapy (usually for financial reasons or for alternative treatment)
- Stress of intercurrent illness (e.g. infection, myocardial infarction, stroke etc)

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>SIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Passing excess urine</td>
<td>• Dehydration with dry skin, reduced skin turgor or sunken eyes</td>
</tr>
<tr>
<td>• Drinking excess amounts of water</td>
<td>• Deep and fast breathing</td>
</tr>
<tr>
<td>• Nausea, vomiting</td>
<td>• Low blood pressure</td>
</tr>
<tr>
<td>• Abdominal pain</td>
<td>• Fast and weak pulse</td>
</tr>
<tr>
<td>• Relatives may report alteration in sensorium or collapse</td>
<td>• Confusion, stupor or unconsciousness</td>
</tr>
</tbody>
</table>

**INVESTIGATIONS**

- Blood glucose (usually >18 mmol/L)
- Urine glucose (usually >3+)
- Urine ketones (usually >2+)
- Blood urea and electrolytes (usually low potassium, however if in renal failure urea and potassium are high)
- Blood film for malaria parasites
- Full blood count (raised white cell count would suggest bacterial infection)
- Blood and urine cultures if indicated
- Chest x-ray – for pneumonia or tuberculosis.
- Electrocardiography in older patients to exclude acute myocardial infarction as a precipitating factor

**TREATMENT**

**Therapeutic objectives**

- To replace the fluid losses
- To replace the electrolyte losses and restore acid–base balance
- To replace deficient insulin
- To seek the underlying cause and treat appropriate

<table>
<thead>
<tr>
<th>ADULTS</th>
<th>Blood/Urine Glucose and Urine Ketone results</th>
<th>Intravenous Fluids</th>
<th>Soluble/Regular Insulin</th>
<th>Potassium Chloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiating Management</td>
<td>Type of Fluid</td>
<td>Rate of IV fluid infusion</td>
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<tr>
<td>Monitor Blood or Urine Glucose every 4 HOURS</td>
<td>When Blood Glucose 13 mmol/L or less or Urine Glucose 2+ or less</td>
<td>Glucose 5% This measure is necessary to prevent subsequent hypoglycaemia</td>
<td>Continue Glucose 5% 1 litre every 6 hours or to meet requirements</td>
<td>Give soluble insulin subcutaneously by sliding scale (see Fig. 1 below)</td>
</tr>
<tr>
<td>Monitor Urine Ketones twice daily</td>
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<tr>
<td>Blood Glucose &gt;18 mmol/l or Urine Glucose &gt;2+ or Urine Ketones &gt;2+</td>
<td>Sodium Chloride (0.9%)</td>
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<tr>
<td>1st litre in 30 minutes</td>
<td>Give 10–20 units soluble/regular insulin IV o r IM immediately</td>
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<td>2nd litre over next 1 hour</td>
<td>Thereafter</td>
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<tr>
<td>3rd litre over next 4 hours</td>
<td>5 units IM, HOURLY until</td>
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<tr>
<td>4th litre over next 4 hours</td>
<td>Blood Glucose 11 mmol/L or less</td>
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<tr>
<td>Subsequently, 1 litre every 6 hours</td>
<td>Start 2 hours after initiating insulin and Sodium Chloride 0.9% Infusion</td>
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<tr>
<td>Place 10 –20 mmol Potassium Chloride in 500 ml Sodium Chloride 0.9%</td>
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<tr>
<td>Run IV infusion over at least one hour</td>
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<td>Check for adequate urine output (&gt;30 ml/hour)</td>
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<tr>
<td>Blood Glucose &gt;18 mmol/l or Urine Glucose &gt;2+ or Urine Ketones &gt;2+</td>
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<tr>
<td>Monitor Blood Glucose <strong>Twice daily</strong> (pre−breakfast and pre−supper)</td>
<td>Blood Glucose Maintained between 6−11 mmol/L Urine Ketones Negative or Trace</td>
<td>Patient eating normally (recommended diet)</td>
<td>Change to twice daily subcutaneous intermediate−acting insulin (see Fig.1 below)</td>
<td>Give Slow K, 1200 mg, orally twice daily if needed</td>
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<tr>
<td><strong>CHILDREN</strong></td>
<td>Blood/Urine Glucose and Urine Ketone results</td>
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<td>Type of Fluid</td>
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<tr>
<td>Monitor Blood or Urine Glucose <strong>HOURLY</strong> Monitor Urine Ketones twice daily</td>
<td>Blood Glucose &gt; 18 mmol/l or Urine Glucose &gt; 2+ Urine Ketones &gt; 2+</td>
<td>Sodium Chloride (0.9%)</td>
<td>1st hour − 15 ml/kg body weight minutes 0.15 unit/kg body weight immediately IV or IM Thereafter 0.1 units/kg body weight IM, HOURLY until blood glucose 11mmol/l or less</td>
<td>Start 2 hours after initiating insulin and Sodium Chloride 0.9% Infusion Check adequate urine output (&gt;30 ml/hour) 0.2 −0.4 mmol/kg body weight (maximum 10 mmol/L in IV fluids) Run over at least one hour</td>
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<tr>
<td><strong>Maintaining Management</strong></td>
<td>?</td>
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</tr>
</tbody>
</table>
Monitor Blood or Urine Glucose every 4 HOURS
Monitor Urine Ketones twice daily

When Blood Glucose 13 mmol/L or less or Urine Glucose 2+ or less

1/5 Sodium Chloride in 4.3% Glucose
This measure is necessary to prevent subsequent hypoglycaemia

Set infusion rate to meet requirements
Give soluble insulin subcutaneously by sliding scale (see Fig. 1 below)
Check blood Potassium level twice Daily
Repeat Potassium after 2 hours if necessary
Withhold if blood level > 6 mmol/L

<table>
<thead>
<tr>
<th>Regular Treatment</th>
<th>?</th>
<th>?</th>
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</tr>
</thead>
</table>

Blood Glucose Maintained between 6−11 mmol/L Urine Ketones Negative or Trace
Patient eating normally (recommended diet)

Change to twice daily subcutaneous intermediate−acting insulin (see Fig. 1 below)
Give oral Potassium supplements if needed

**Note** that the example of the sliding scale given below is not a fixed standard. The requirement of insulin for each level of blood glucose measured differs from patient to patient. The corresponding insulin doses may therefore need to be adjusted up or down to suit each patient. Urine glucose is an unreliable test for monitoring diabetes patients and should not be used when facilities such as portable blood glucose metres are available for blood glucose monitoring.

**EXAMPLE OF A SLIDING SCALE CHART**

<table>
<thead>
<tr>
<th>Blood Glucose Result</th>
<th>Urine Glucose Result</th>
<th>Amount of Soluble/Regular Insulin to be given</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ADULTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHILDREN</td>
</tr>
<tr>
<td>Less than 6 mmol/L</td>
<td>Negative Blue</td>
<td>No Insulin No Insulin</td>
</tr>
<tr>
<td>6.1 – 9.0 mmol/L</td>
<td>1+ Green</td>
<td>4 units 0.06 units/kg body weight</td>
</tr>
<tr>
<td>9.1 – 12.0 mmol/L</td>
<td>2+ Yellow</td>
<td>6 units 0.09 units/kg body weight</td>
</tr>
<tr>
<td>12.1–15.0 mmol/L</td>
<td>3+ Brown</td>
<td>8 units 0.12 units/kg body weight</td>
</tr>
<tr>
<td>15.1–18.0 mmol/L</td>
<td>4+ Brick Red</td>
<td>10 units 0.15 units/kg body weight</td>
</tr>
</tbody>
</table>

For both adults and children, continue the sliding scale, making appropriate adjustments to the doses of insulin, until the patient is eating normally and the urine is free of ketones. This may take on average between 12 – 72 hours.

Thereafter, determine the average total daily requirement of soluble insulin while on the sliding scale and give two−thirds of this amount subcutaneously in the form of intermediate−acting insulin (NPH or Lente) in 2 divided doses – two−thirds before breakfast and the remaining one−third before the evening meal.
Addition of Potassium Chloride to an IV fluid is a dangerous procedure and is best carried out in the pharmacy.

Other measures

- Take a history and carry out a full physical examination to help identify the cause of the Diabetic Ketoacidosis.
- Give broad-spectrum antibiotics for suspected infections. (Refer to appropriate section). Treat malaria if suspected or confirmed.
- Monitor urine output. Urine flow less than 30 ml/hr may indicate acute renal failure. It may be necessary to catheterise the patient.
- If the patient is unconscious pass an NG tube for feeding and also to prevent gastric dilatation and aspiration
- Review fluid, insulin and potassium regimes frequently

REFER

If there are inadequate resources for managing the patient, start 0.9% Sodium Chloride, IV, and give initial dose of soluble/regular insulin IV or IM after confirming blood glucose (or urine glucose) and urine ketone levels and refer to a nearby regional or teaching hospital. If the patient remains comatose or fails to pass adequate amounts of urine despite management, refer to a regional or teaching hospital for further care.

HYPEROSMOLAR NON-KETOTIC DIABETES STATE (HONK)

This state, which occurs primarily in Type 2 diabetes patients, is similar in its clinical presentation to diabetic ketoacidosis in many respects. A major difference, however, is the absence of a significant amount of ketones in the urine and the presence of severe dehydration. Follow the guidelines for the management of DKA.

ADRENAL INSUFFICIENCY

When the adrenal gland is destroyed by disease, or atrophies following pituitary failure or chronic corticosteroid use or abuse, the amount of cortisol produced from it is insufficient to meet the body’s needs during periods of stress. This situation is associated with a marked drop in blood pressure, blood glucose and electrolytes to very low levels. Vomiting and diarrhoea, which are often present in acute adrenal insufficiency, worsen the fluid and electrolyte imbalance. Acute adrenal insufficiency is a medical emergency.

COMMON CAUSES

- Sudden cessation of corticosteroid therapy after prolonged use
  - In patients on oral or topical corticosteroids, such as prednisolone, dexamethasone, hydrocortisone, cortisone, or preparations containing any of these drugs.
  - In patients, especially women who abuse corticosteroids for cosmetic reasons e.g. for skin bleaching or weight gain.

- Stress (e.g. fever, severe trauma, surgery, and dental procedures) in a patient with undiagnosed adrenal insufficiency or patients on chronic corticosteroid treatment e.g. for asthma.
• Severe postpartum haemorrhage resulting in pituitary failure.

• Destruction of the adrenal gland by auto–antibodies, tuberculosis or severe infections (e.g. HIV, meningococcus).

• In children certain bacterial infections (e.g. meningococcus) and congenital adrenal hyperplasia

SYMPTOMS
• Nausea
• Vomiting
• Weakness
• Tiredness
• Collapse
• Abdominal pain
• Diarrhoea
• Failure of lactation after post–partum
• Haemorrhage

SIGNS
• Conscious, semi–conscious or unconscious at presentation
• Dehydrated from excessive vomiting or diarrhoea
• Low or unrecordable blood pressure
• Dark patches on oral mucosa, gums, skin, palms and soles in some patients
• Evidence of skin bleaching with thin and fragile skin
• In children, ambiguous genitalia, failure to thrive,
• Short stature may be additional features

INVESTIGATIONS
• Blood urea and electrolytes
• Blood glucose
• Plasma cortisol – morning sample

Confirmatory tests are available only in teaching hospitals.

TREATMENT

Therapeutic objectives
• To correct the fluid and electrolyte imbalance
• To replace corticosteroids
• To identify and treat any precipitating factor

Non–Pharmacological Treatment
Monitor blood pressure, fluid input/output and electrolytes regularly

Pharmacological Treatment

Acute
• Intravenous fluid replacement
Adults: 0.9% Sodium Chloride, IV and 5% Glucose, IV (or Dextrose Saline), 1 litre 4 – 6 hourly

Children: 0.45% Sodium Chloride, IV and 5% Glucose, IV, according to total fluid requirement.

- Intravenous hydrocortisone

**Adults:**
200 mg, IV stat, then 100 mg, IV 6 hourly until condition is stable

**Children:**
- Up to 1 year: 5 mg 6 hourly
- 1–5 years: 50 mg 6 hourly
- 6–12 years: 100 mg 6 hourly

- Treat infection (e.g. malaria, pneumonia, UTI), if present or suspected, with appropriate medication.
- When the patient’s condition is stable go on to maintenance therapy.

**NOTE:** The IV hydrocortisone therapy may be required for several days. Do not rush to change to maintenance therapy.

**Maintenance**

- For patients with previous or newly diagnosed adrenal or pituitary disease

**Adults:**
Prednisolone, oral, 5 mg morning and 2.5 mg evening each day or Hydrocortisone, oral, 20 mg morning and 10 mg evening each day

**Children:**
Prednisolone 140 micrograms/kg body weight in 2 divided doses or Hydrocortisone 560 micrograms/kg body weight in 2 divided doses

**NOTE:**
The above doses should be doubled when the patient has an infection or is undergoing dental and surgical procedures. Revert to hydrocortisone, IV for even minor surgical procedures including labour and delivery.

- For patients requiring steroids for other medical condition (e.g. asthma)

**Adults and Children:** restart previous doses of oral corticosteroids given for the condition.

- For adult patients who abuse corticosteroids

Restart oral corticosteroids (or replace topical corticosteroids with), Prednisolone, oral, 20–40 mg daily, and gradually taper off the dose over several months (e.g. reducing by 2.5 mg per month) and eventually discontinue.

**PREVENTION**

- Long-term corticosteroid therapy requires specialist supervision
• Patients on corticosteroids should report to a hospital if they become ill and should tell their doctor, dentist, nurse or pharmacist they are on corticosteroids

• Patients SHOULD NOT stop treatment if they become ill, have an infection or are undergoing a dental procedure. Rather a doubling of the regular doses of corticosteroids is needed

• Revert to hydrocortisone, IV for even minor surgical procedures including labour and delivery

• The dose of corticosteroids must be reduced gradually if treatment has been for longer than 3 weeks and is to be stopped

• Discourage the abuse of oral or topical corticosteroids.

REFER

All patients, including children, suspected to have adrenal insufficiency should be referred to a regional or teaching hospital for further assessment after resuscitation.

CUSHING’S SYNDROME

This condition results from high levels of cortisol or other corticosteroids in the blood and is associated with various changes in the body including the development of obesity, hypertension, diabetes and osteoporosis. The prolonged use or abuse (especially by women for cosmetic reasons) of oral or topical corticosteroids such as prednisolone, dexamethasone, hydrocortisone or cortisone, or preparations containing any of these drugs, is also a cause.

COMMON CAUSES

• Pituitary tumour
• Adrenal tumour
• Prolonged and excessive intake or abuse of corticosteroids

SYMPTOMS

• Weight gain
• Excess body hair
• Easy bruising of skin
• Menstrual irregularity and
• Weakness of the thigh muscles

SIGNS

• Rounded or ‘moon’ face
• Hypertension
• Acne
• Striae (purplish stretch marks)
• Thin skin from bleaching and steroid abuse
• Truncal obesity

INVESTIGATIONS

• Blood and urine glucose (commonly elevated)
• Blood electrolytes (may show low potassium)
• Plasma cortisol (commonly elevated, low in corticosteroid abuse)
• Skull x-ray (may show evidence of a pituitary tumour)

TREATMENT

Treatment is dependent on the cause and requires specialized investigations. Manage hypertension and diabetes along standard lines (see appropriate sections) and refer patient.

REFER

Refer all suspected cases to an Endocrinologist or Specialist Physician in a Regional or Teaching Hospital for the appropriate investigations and management.

DYSLIPIDAEMIAS

Abnormally high levels of blood fats (lipids) are associated with increased mortality from cardiovascular disease especially in patients with a personal or family history of other cardiovascular risk factors. There is ample clinical trial evidence that drug treatment of elevated blood lipids in patients 70 years old or less is beneficial. The treatment of patients over 70 years old must be at the discretion of appropriate specialists. The commonly assessed blood lipid parameters are total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides. The blood lipid profile is considered abnormal (dyslipidaemia) if either total and LDL cholesterol or triglycerides are above expected levels and/or HDL cholesterol is lower than expected.

COMMON CAUSES

• High dietary intake of saturated fats (animal fat)
• Lack of physical activity
• Diabetes mellitus, especially if poorly controlled
• Obesity
• Metabolic syndrome X (a combination of several disorders including obesity, hypertension, type 2 diabetes, dyslipidaemia)
• Hereditary factors
• Primary hypothyroidism

SYMPTOMS

Patients with abnormal blood fats usually do not have any symptoms. Individuals with high triglycerides may occasionally experience abdominal pain associated with pancreatitis.

SIGNS

Patients with abnormal blood fats usually do not have any physical signs. Occasionally, there may be a whitish ring around the cornea (corneal arcus) or yellowish skin eruptions around the eyes (xanthelasma).

INVESTIGATIONS

Total cholesterol (TC), which does not require a fasting blood sample, may be requested alone as a screening test. However, a full blood lipid assessment, including HDL cholesterol and triglycerides (TG), is best carried out on a fasting blood sample. The result of LDL cholesterol is often calculated from the results of the 3 other tests.

A full blood lipid profile should be obtained in patients with
• Coronary heart disease (CHD)
• Cerebrovascular disease (stroke and transient ischaemic attacks)
• Peripheral artery disease
• Diabetes mellitus
• Hypertension
• A family history of dyslipidaemia
• Other risk factors for CHD e.g. obesity, smoking etc.

TREATMENT

Therapeutic objective

• To normalise the blood lipid profile
• To reduce the risk of cardiovascular events and cardiovascular–related deaths
• To reduce the risk of cerebrovascular events and cerebrovascular–related deaths
• The recommended target cholesterol levels are:

  • For the general population and individuals without CHD or CHD risk equivalents: TC <5.2 mmol/L, LDL−C <3.4 mmol/L, TG <2.0 mmol/L.

  • Patients with previous or symptomatic CHD or CHD risk equivalents: TC <4.1 mmol/L, LDL−C <2.6 mmol/L, TG <1.8 mmol/L

Non–Pharmacological Treatment

• Assessment and management of all risk factors is essential.

• Dietary measures – A low calorie, low saturated fat (animal fat), high polyunsaturated fat (plant fat) diet is recommended under the supervision of a dietician.

• Weight reduction in patients who are overweight.

• Reduction in alcohol consumption, where this is excessive.

• Regular physical activity or exercise tailored to the individual patient.

Pharmacological Treatment

All patients who remain outside the target values despite adequate dietary and exercise therapy and who require drug therapy should be referred to the appropriate specialist.

Priorities for drug treatment should be given to those individuals who are at the highest risk e.g. patients with pre–existing Coronary Heart Disease (CHD), or CHD risk equivalents, namely, diabetes, stroke, transient ischaemic attacks and peripheral artery disease.

REFER

The timing and duration of lipid–lowering drug treatment requires referral to a physician or metabolic specialist in a Regional or Teaching Hospital.

THYROID DISORDERS

GOITRE
A goitre is a swelling of the neck due to enlargement of the thyroid gland. Goitres occurring in certain localities may suggest the lack of iodine in the diet or the presence of goitre–inducing agents. However, the presence of a goitre does not always suggest iodine deficiency. Indeed, taking excess iodine (e.g. in iodated salt) in such situations will actually be harmful by inducing excess production of thyroxine with severe clinical consequences. Goitres may be associated with normal function of the thyroid gland as well as with abnormalities of thyroid hormone production. A reduction in production of thyroid hormones results in hypothyroidism while an excess results in thyrotoxicosis or hyperthyroidism. These abnormalities of thyroid hormone production may also occur in the absence of a goitre.

COMMON CAUSES

- Simple non toxic goitre (endemic goitre)
- Hypothyroidism (see section below)
- Thyrotoxicosis or Hyperthyroidism (see section below)
- Thyroid neoplasm: – benign or malignant

SYMPTOMS

- A swelling in the neck – If very large may cause obstructive symptoms with problems in breathing and swallowing
- Hoarseness of the voice
- Symptoms of hypothyroidism (see below)
- Symptoms of hyperthyroidism (see below)

SIGNS

- Irregular or diffused thyroid swelling
- Slow pulse (< 60 per minute) – associated hypothyroidism is likely; look for other signs
- Fast pulse (> 90 per minute) – associated thyrotoxicosis is likely; look for other signs

INVESTIGATIONS

Special x–rays, ultrasound examination of the neck and thyroid function tests are best carried out and interpreted at the Regional and Teaching Hospital level. Refer patients for assessment.

TREATMENT

Therapeutic Objectives

- To assess and correct level of thyroid hormone production
- To reduce or prevent obstructive symptoms

Treatment of benign and malignant goitres may be surgical or non–surgical. This can be determined only by full clinical assessment and investigations. Treatment is not necessarily by increasing iodine intake e.g. in salt. Excess iodine intake may actually be HARMFUL.

REFER

Refer patients to a Physician or Surgical Specialist at a Regional or Teaching Hospital.
HYPOTHYROIDISM

The body requires thyroid hormone for normal metabolism. Hypothyroidism, which implies reduction in thyroid hormone production, has major consequences on intellectual development and growth in infants and children (cause of cretinism). In adults it may be the cause of heart disease and reversible dementia.

COMMON CAUSES

- Antibody−related thyroid destruction
- After surgical removal of the thyroid (post−thyroidectomy)
- Congenital
- Severe iodine deficiency

SYMPTOMS

- Cold intolerance
- Constipation
- Heavy menstrual periods
- Lethargy
- Weight gain
- Hoarse voice
- In children, parents may notice poor growth, development and poor school performance

SIGNS

**Neonate:**

- Persistence of neonatal jaundice
- Excessive sleep
- Feeding problems

**Children:**

- Cretinism (mental subnormality, short stature, large tongue, dry skin, sparse hair, protuberant abdomen, umbilical hernia)

**Adults:**

- Slow pulse (usually <60 per minute)
- Dry coarse skin
- Puffy face
- Pallor
- Deep hoarse voice
- Slow relaxing deep tendon reflexes
- Dementia

INVESTIGATIONS

Thyroid function tests are best carried out and interpreted at the Regional and Teaching Hospital level. Refer patients for assessment and treatment.

TREATMENT

(Evidence rating: B)

Thyroid hormone replacement therapy is recommended. However the dose of Thyroxine required varies from patient to patient and needs to be regularly monitored. Cretinism must be treated without delay to prevent
further intellectual impairment. Iodine replacement is NOT the treatment for hypothyroidism.

REFER

- Refer diagnosed or suspected cases of all ages, especially children, to a Regional or Teaching hospital.

THYROTOXICOSIS (HYPERTHYROIDISM)

Excess thyroid hormones in the blood result in thyrotoxicosis. The patient is in a high metabolic state. If left untreated, significant weight loss and cardiac complications, including heart failure, may occur.

COMMON CAUSES

- Toxic multi–nodular goitre
- Grave’s disease

SYMPTOMS

- Weight loss despite increased appetite
- Excessive sweating
- Heat intolerance
- Tremors
- Nervousness and irritability
- Menstrual irregularity.

SIGNS

- Staring or protruding eyes
- Tremors
- Moist palms
- Rapid pulse rate which may be irregular
- Heart failure
- Goitre often present but not always
- Smooth and diffuse goitre in Grave’s disease
- Irregular goitre in toxic multi–nodular goitre.

INVESTIGATIONS

Thyroid function tests are best carried out and interpreted at the Regional and Teaching Hospital level. Refer patients for assessment and treatment.

TREATMENT

Therapeutic objective

Treatment is aimed at reducing the thyroid hormone levels. This may be achieved either by anti–thyroid drugs, radio–iodine therapy or partial thyroidectomy. These treatments are best reserved for specialists. Early patient referral is important.

Non–Pharmacological Treatment

Addition of extra iodine to the diet (e.g. as in iodated salt) IS NOT the recommended treatment.

Pharmacological Treatment
Propranolol, oral, 10–40 mg 3 times daily, helps to reduce many of the symptoms of thyrotoxicosis and may be started prior to referral. Propranolol is contraindicated in asthmatics.

REFER

Refer all cases to specialists in a Regional or Teaching Hospital for investigations and management.

CHAPTER 10: DISORDERS OF THE GENITO–URINARY SYSTEM

GYNAECOLOGICAL DISORDERS

DYSMENORRHOEA

This refers to cyclical lower abdominal pain associated with menstruation. The pain is thought to result from uterine contractions.

SYMPTOMS

- Lower abdominal pain that is cramping or colicky in nature but may be dull and constant.
- Pain may radiate to the lower back or legs.
- Nausea, vomiting, headaches and dizziness may sometimes be associated with the pain.

INVESTIGATIONS

- FBC, Sickling.
- Pelvic ultrasound scan to rule out pelvic lesions such as fibroids.

TREATMENT

Therapeutic objective

- To relieve pain

Pharmacological Treatment

(Evidence rating: A)

- Mild cases – Aspirin, oral, 600 mg 3 times daily or Paracetamol, oral, 1g 3 to 4 times daily may be used.
- Severe cases may require Ibuprofen, oral, 200–400 mg 3 times daily.

REFER

If pains interfere with normal activity and if simple treatment is not effective.

ABORTION

Abortion refers to the expulsion of the foetus and other products of conception before the 28th week of pregnancy.
TYPES OF ABORTION

1. Spontaneous
   • Threatened
   • Inevitable
   • Incomplete
   • Complete
   • Missed.

2. Induced
   • Therapeutic
   • Criminal
   • Septic

THREATENED ABORTION

SYMPTOMS

There is usually scanty to moderate painless vaginal bleeding. There may be mild discomfort.

SIGNS

• The uterine size is compatible with the gestational age.
• There is no cervical effacement or dilatation.

INVESTIGATIONS

• Full blood count and sickling
• Ultrasound scan confirms viable foetus in utero with closed cervix

TREATMENT

Non−pharmacological Treatment

• Explain the condition to the patient.
• Bed rest at home or hospital.
• To abstain from sexual intercourse.
• To report back if bleeding or pain increases.

INEVITABLE ABORTION

SYMPTOMS

• There is heavy bleeding associated with lower abdominal pain.

SIGNS

• The cervix is dilated with the membranes bulging.
• The uterine size is compatible with the gestational age.
• There may be signs of shock – pallor, collapsed peripheral vessels, rising pulse with reducing volume, falling BP and cold clammy skin.

INVESTIGATIONS
• Full blood count and Sickling.

• Ultrasound scan shows the foetus (dead or alive), dilated cervix with membranes bulging through it. This is necessary only if the diagnosis is in doubt.

TREATMENT

(Evidence rating: C)

• Resuscitation with IV fluids and blood transfusion as necessary.

• Keep the patient nil by mouth.

• Give Analgesics to relieve severe pain.
  • Pethidine, IM, 75−100 mg and Promethazine hydrochloride, IM, 25 mg.

• Allow the patient to abort. Give Oxytocics if the contractions are not strong.

• Oxytocin, IV, 10−20 units/litre of IV Fluids.

• Evacuation of the uterus is done after the expulsion of the foetus or before the expulsion of the foetus if it is less than 12−14 weeks size.

• The following techniques are used:
  • Manual Vacuum Aspiration (MVA) with or without paracervical block anaesthesia
  • Uterine curettage under general anaesthesia especially when the uterine size is larger than 12−14 weeks size

• Allow the patient home on ferrous sulphate, oral when her condition is stable.

INCOMPLETE ABORTION

SYMPTOMS

• The patient may complain of the passage of large clots or the foetus per vaginam.

SIGNS

• There may be signs of shock – pallor, collapsed peripheral vessels, rising pulse with reducing volume, falling BP and cold clammy skin.

• The uterine size is smaller than the dates.

• The cervix is dilated with the foetus already aborted.

• The whole placenta or parts thereof may be palpable within the uterine cavity.

During vaginal examination digital curettage may be done to remove as much of the placental tissue as possible. This helps to minimise the haemorrhage but it may be uncomfortable or painful to the patient.

INVESTIGATIONS
• FBC, Sickling
• If doubt exists in the diagnosis (especially in early pregnancies) request an ultrasound scan

TREATMENT

Therapeutic objectives

• To resuscitate patient
• To evacuate the retained products of conception from the uterus.

Non−pharmacological Treatment

• Arrange for evacuation of the retained products of conception under general anaesthesia or MVA with or without anaesthesia.
• Counselling and psychological support.

Pharmacological Treatment

(Evidence rating: C)

• Resuscitate with IV fluids and blood transfusion as necessary.
• Give Oxytocics
• Ergometrine, IM/IV, 500 microgram statim.
• Oxytocin, IV, 20 units into 1 L of Sodium Chloride 0.9% and infuse at 30–60 drops per minute.
• Rh (D) Negative women should be given Anti D Rh Immune Globulin 250 Units (150 mg) within 72 hours.

In addition advise patient

• To abstain from sexual intercourse for at least 2 weeks.
• To report back to hospital if there is lower abdominal pains, bleeding, fever and malodorous vaginal discharge.

Discharge on ferrous sulphate as soon as patient is fit to go home and review in 2 weeks.

COMPLETE ABORTION

SYMPTOMS

• The bleeding stops after the patient bleeds profusely with passage of clots and/or the foetus and placenta.
• There is no more pain.

SIGNS

• The uterus is smaller than the gestational age.
• The cervix is closed and firm.
**INVESTIGATIONS**

- FBC
- Ultrasound scan

**TREATMENT**

- Treat anaemia if present

**SEPTIC ABORTION**

**SYMPTOMS**

- Lower abdominal pain
- Fever and other constitutional symptoms like vomiting and headache
- Most often a history of criminal interference with the pregnancy
- Offensive, bloody vaginal discharge

**SIGNS**

- Fever
- Tachycardia
- Peritonism
- Foetus may or may not be retained
- May be associated with uterine damage, Clostridial infection (tetanus and gas gangrene)

**INVESTIGATIONS**

- FBC, Sickling, Platelet count
- Clotting Screen
- Blood culture and sensitivity
- Urine culture and sensitivity
- Endo−cervical swab for culture and sensitivity
- Blood urea and electrolyte.
- Abdominal x−ray to find out if there is: gas under the diaphragm; foreign body, or uterine perforation
- Chest x−ray
- Abdomino−pelvic Ultrasonography to assess for intra− abdominal, pelvic abscesses, peritonitis and gas in the pelvis

**TREATMENT**

**Therapeutic objectives**

- To resuscitate patient
- To evacuate uterus when patient is fit for anaesthesia

**Non−pharmacological Treatment**
1. Evacuate the retained products of conception under general anaesthesia within 6 hours of initiation of antibiotic therapy. Extreme care is needed in order not to perforate the uterus (if it has not been perforated already). Do gentle digital curettage followed by the instrumental curettage.

2. Psychological support and counseling.

Pharmacological Treatment

(Evidence rating: C)

1. Allow to abort or set up Oxytocin drip if the foetus is still in–situ.

2. Adequate Resuscitation with IV fluids and blood transfusion as necessary.

3. Analgesics – Pethidine, IM, 100 mg 4–6 hourly with Promethazine, IM, 25 mg 8–12 hourly.

4. Antibiotics (triple regime)
   
a. Ampicillin, IV, 1−2 g 6 hourly for 24−72 hours plus
   b. Gentamicin, IV, 80 mg 8 hourly for 5 days plus
   c. Metronidazole, IV, 500 mg 8 hourly for 24−72 hours.

• Broadspectrum antibiotics
   Co–amoxiclav, IV, 1.2 g 12 hourly.

Switch over from IV to oral therapy when appropriate. Continue with Gentamicin either IM or IV for at least 5 days. The culture and sensitivity test results will direct the antibiotic therapy.

5. Tetanus prophylaxis
   • Tetanol – 0.5 mg statim (complete the course later).
   • IM Human Immune Tetanus Globulin (Tetagam) – 250–500 units statim.

REFER EARLY FOR SPECIALIST CARE IF THE UTERUS IS FOUND TO BE PERFORATED OR IF COMPLICATIONS ARE SEVERE.

Complications

• Septic Shock
• Peritonitis
• Haemorrhage
• DIC
• Acute Renal Failure
• Adult Respiratory Distress syndrome

MISSED ABORTION

This refers to foetal death in utero before 20 weeks gestation.

SYMPTOMS

• There is reversal of the symptoms of pregnancy.
• There is recurrent bloody vaginal discharge.
• Absent maternal perception of foetal movements (if quickening has already occurred).

SIGNS
• Uterus is smaller than dates.

• Foetal heart tones are not heard either with the Pinards stethoscope or with a foetal Doppler device such as Sonicaid.

INVESTIGATIONS

• FBC, Sickling.
• Blood clotting profile for the larger pregnancies.
• Pregnancy test
• Ultrasonic scan

TREATMENT

Therapeutic objectives

• To make patient fit for uterine evacuation.

Non–pharmacological Treatment

• Evacuate of the uterus by curettage. Suction curettage (manual or with machine) is preferred for first trimester cases.

This must be done gently to avoid uterine perforation. The procedure must be covered adequately with oxytocics, as haemorrhage can be a problem.

Pharmacological Treatment

(Evidence rating: C)

• IV fluids must be set up before starting procedure.

• For larger retained foetuses abortion must be induced with Prostaglandin E1 followed by Oxytocin drip. (Hysterotomy may be indicated in resistant cases).

• There is a higher incidence of DIC in this category of missed abortions and the platelet count and the blood clotting profile should be checked and adequate preparation made (with blood grouped and crossmatched, fresh frozen plasma and IV fluids) before the abortion procedure.

ABNORMAL VAGINAL BLEEDING

This refers to bleeding which deviates from the normal menstrual pattern (in terms of the amount, duration or interval).

CAUSES

The causes depend on the age of the patient.

Infancy

Newborn girls may have some spotting for a few days because of stimulation of the endometrium in utero by oestrogen produced by the placenta.

Childhood
Bleeding may result from:

- Accidental traumatic lesions of vulva and vagina
- Rape and defilement
- Vaginitis (as a result of a foreign body)
- Urethral mucosal prolapse
- Rarely, tumours

**Young Adolescents**

Bleeding may result from:

- Complications of pregnancy
- Coital lacerations including rape and defilement.
- Accidental traumatic lesions of vulva and vagina.
- Dysfunctional uterine bleeding.
- No cause for the bleeding is found on investigation. It is common in this age group. This may be mild or severe and life threatening.

**Women of Child Bearing Age**

Bleeding may be due to:

- Complications of pregnancy, including ectopic pregnancy
- Coital lacerations
- Hormonal method of contraceptive or intrauterine contraceptive device (IUCD)
- Cervical cancer
- Fibroids
- Dysfunctional bleeding
- Choriocarcinoma

**Post-Menopausal Women**

Postmenopausal bleeding is said to occur when a woman who has stopped having menstruation for 6 or more months begins to bleed per vaginam.

The causes of postmenopausal bleeding include:

- Pelvic cancers such as cervical cancer, endometrial cancer, vaginal or vulval cancer and ovarian tumours
- Withdrawal from oestrogen therapy
- Atrophic vaginitis/endometritis
- Coital tears
- Urethral caruncle
- Occasionally bleeding from the rectum and urethra may be confused with genital tract bleeding

**INVESTIGATIONS**

- FBC, platelet count, sickling
- Blood clotting screen e.g. Prothrombin time
- Pelvic ultrasound scan to rule out pelvic lesions
- Urine analysis
TREATMENT

Therapeutic objectives

- To find the cause of bleeding
- To stop the bleeding
- To replace the blood loss or to treat anaemia

Pharmacological Treatment

(Evidence rating: C)

Treatment is directed at the cause found. For example:

- Vaginal coital tear? suturing in theatre
- Inevitable or incomplete abortion? uterine evacuation

Dysfunctional uterine bleeding:

- For mild cases control bleeding with Norethisterone acetate, oral, 5 mg 3 times daily for 10–12 days.
- For life threatening bleeding admit patient to hospital and resuscitate with IV fluids and possibly blood transfusion. Control bleeding with conjugated Oestrogen 1.25–2.5 mg daily. When the bleeding is controlled continue treatment with Norethisterone (as above) or Medroxyprogesterone Acetate 5 mg twice or 3 times daily for 10–12 days or Low dose oral contraceptive pill for 3–6 cycles. If heavy menses return, the tablets can be continued for as long as necessary.

- Atrophic vaginitis responds to vaginal oestrogen cream treatment such as Conjugated oestrogen cream.

REFER

The pelvic cancers need hospital treatment with radical surgery, radiotherapy and or chemotherapy.

FEMALE INFERTILITY

Primary infertility is said to occur when a woman has never achieved a pregnancy despite at least one year of uninterrupted and adequate unprotected sexual intercourse. Secondary infertility implies that there has been a previous pregnancy.

CAUSES

- Failure of ovulation
- Pelvic factors
  - Tubal disease
  - Pelvic adhesions
  - Endometriosis
Clinical evaluation and treatment is best done at the hospital by a specialist.

**INVESTIGATIONS**

At the district level a few investigations can be carried out to try to find the cause of the infertility.

- FBC, sickling.
- Hystero–salpingogram which is best done under fluoroscopic guidance.
- Mid–Luteal phase serum Progesterone levels to check for ovulation.
- Semen analysis for the quality of the husband’s semen.

**TREATMENT**

**Therapeutic objectives**

Treatment is given according to the cause found.

- For tubal disease sophisticated surgery is indicated and specialist gynaecological care is therefore advised.
- For failure of ovulation it may be necessary to induce ovulation with Clomifene (Clomiphene) citrate.

**CAUTION**

- **PATIENTS TAKING CLOMIFENE (CLOMIPHENE) NEED CAREFUL SUPERVISION BEST DONE BY A SPECIALIST.**

- **CLOMIFENE MAY CAUSE SEVERE HYPERSTIMULATION SYNDROME WHICH MAY ULTIMATELY RESULT IN THE PATIENT’S DEATH IN THE ABSENCE OF A HIGH–DEPENDENCY CARE UNIT.**

Clomifene citrate is given as 50 mg daily for 5 days, starting from the 5th day of the menstrual cycle. If treatment is not successful (i.e. pregnancy not achieved) it is better to refer for specialist care.

**REFER**

Patients who require ovarian stimulation must be referred to a gynaecologist. In the presence of poor semen analysis the patient’s partner must be referred to an Urologist.

**MENOPAUSE**

Menopause refers to the point in time when permanent cessation of menstruation occurs usually due to loss of ovarian function. The age of onset is usually between 45 and 55 years. It may however occur earlier. A woman is considered to be postmenopausal if there is no menstruation for a period of at least 6 months and she is not pregnant.

It is associated with physical, emotional and psychological upheaval of varying intensity in the affected individual.
CAUSES

• Natural onset due to the age of the individual
• Due to surgical extirpation of the ovaries (bilateral oophorectomy)
• Pelvic irradiation
• Premature
  • Ovarian failure
  • Pituitary damage from primary post-partum haemorrhage (PPH)
    (Sheehan’s syndrome)
  • Cytotoxic (anticancer) therapy

SYMPTOMS

Sixty percent of menopausal women may be asymptomatic. When symptoms occur they can be mild or severe. The following symptoms may be particularly distressing:

• Hot flushes (heat or burning in the face, neck and chest with resultant sweating. The flushes may be associated with palpitations, faintness, dizziness, fatigue and weakness)

• Vaginal dryness

• Emotional and psychological problems include:
  • Mood changes
    • Depression
    • Anxiety
    • Nervousness
    • Irritability
    • Loss of libido

• Atrophic changes in the genital tract may give rise to the following:
  • Increased frequency of micturition and dysuria.
  • Stress incontinence (urinary incontinence with coughing or straining).
  • Vaginal dryness

Long term problems include:

• Osteoporosis with resultant fractures:
  • Vertebral compression fractures in the thoraco–lumbar spine causing backache, reduced body height and kyphosis. (refer to appropriate sections for management)

• Cardiovascular problems:
  • Increased cardiac problems including heart attacks. (refer to appropriate sections for management)

INVESTIGATIONS

• FBC, sickling
• Hormone tests if available (serum LH, FSH, Oestradiol)
• Blood chemistry – blood glucose, lipid profile
• Pelvic ultrasound scan
• X-ray long bones and thoraco–lumbar spine
• Mammography

TREATMENT

Therapeutic objectives

• To control symptoms.
• To replace lost calcium.

Non–Pharmacological Treatment

• Patients need counselling and reassurance. Explain the problem and its treatment. For mild symptoms patients may benefit from counselling and reassurance alone.

Pharmacological Treatment

(Evidence rating: A)

1. Severe cases would benefit from hormone replacement therapy.

   • Conjugated oestrogens and progestogen – 28 tablets each containing conjugated oestrogens, 625 micrograms and 12 tablets, each containing norgestrel, 150 micrograms

   Dose: menopausal symptoms, in women with intact uterus. 1 conjugated oestrogen tablet daily continuously, starting on day 1 of menstruation (or at any time if cycles have ceased or are infrequent), and 1 norgestrel tablet daily on days 17 – 28 of each 28–day treatment cycle; subsequent courses are repeated without any interval

   • Conjugated oestrogens – 625 microgram daily. To be given only to patients with previous hysterectomy and NEVER to those with an intact uterus

CAUTION:

Current evidence suggests an increased risk of coronary heart disease and strokes in healthy post–menopausal women who have been given hormone replacement therapy.

2. ADD calcium supplements, oral, 500 mg twice or 3 times daily.

   • Indications for treatment include:
   • Severe hot flushes
   • Atrophic vaginitis
   • Premature menopause
   • Osteoporosis
   • Recurrent cystitis

Contraindications to hormonal treatment include: previous thrombo–embolic phenomena, chronic liver disease, breast cancer and endometrial cancer, hypertension and diabetes mellitus.
ANTE-NATAL CARE

Antenatal care refers to the care given to a pregnant woman to ensure that she goes through pregnancy, labour and the puerperium very healthy with the delivery of a healthy baby born to a happy family.

To this end a good history and examination should be done at each visit to identify problems that are likely to have an adverse effect on the pregnancy (risk factors). Any problems (or risk factors) identified are treated. High risk pregnancies (pregnancies that are likely to have one or more risk factors) should be referred to a hospital or obstetrician.

Notes

- It is important to keep accurate records of all findings
- High risk mothers should go to a hospital for antenatal care
- It is very useful to bring all the mothers together for health talks and discussions (health education)

Examine the mother:

- Does the mother look ill?
- Does she look well nourished?
- Anaemia: Check to see if the mother is anaemic
- Weight: Should gain about half kilogram per week. Sudden weight gain or weight loss are both very worrying
- Blood pressure: The upper limit of normal is 140 mmHg for the systolic pressure, and 90mmHg for the diastolic pressure
- Uterine size (symphysio–fundal height after 20 weeks gestation)
- Presentation and position of the baby: Near the time of delivery, the head of the baby should be above the pelvis. Women with abnormal presentation should be referred to a hospital
- Foetal heart sounds: Usually between 120 and 160 beats per minute

INVESTIGATIONS

- Full blood count
- Blood film for malaria parasites
- Sickling (if necessary Hb electrophoresis)
- G6PD activity
- Urine and stool analysis
- Blood glucose
- Blood group and antibody screen
- VDRL or RPR test

REFER

High–risk mothers include:

- Bleeding at any time in the pregnancy before labour
• Young (<18 years) and elderly (>35 yrs) mothers in their first pregnancy

• Severe anaemia, hypertension, diabetes mellitus and asthma, chronic cough such as pulmonary tuberculosis

• Sickle−cell disease

• Women with more than 5 children (the grand multiparous mother)

• Past history of bleeding after delivery or retained placenta

• Abnormal presentation and position of the baby in the womb at term – transverse lie or breech presentation

• Multiple pregnancies

• Prolonged pregnancy (when the pregnancy lasts longer than 42 weeks)

• Contracted pelvis (pelvis too small for the baby to be delivered safely per vaginam). This is obvious when the mothers are short (<154 cm tall or have small feet

• Big baby at term – when the symphysio−fundal height is more than 39–40 cm at term or when the estimated foetal weight is 4 kg or higher

• Past history of stillbirths or children who die within the first week of life, especially if they die of the same problem

• Past pregnancy history of miscarriages around the same gestational age

• Decrease in growth of the baby – uterine size smaller than the gestational age

• Uterine size much bigger than the gestational age with one foetus present

• Previous instrumental delivery (vacuum extraction or forceps delivery)

• Previous operation on the womb such as Caesarean section, myomectomy or when the uterus is repaired after perforation during D&C

• Preterm labour (labour before 37 completed weeks)

• HIV positive pregnant women

TREATMENT

Therapeutic Objectives

• To ensure that the patient goes through pregnancy delivery and the puerperium in good health

• To ensure delivery of a healthy baby

Non−Pharmacological Treatment

Health education including a healthy balanced diet and exercise.

Pharmacological Treatment

• Ferrous sulphate, oral, 200 mg 3 times a day

• Folic acid, oral, 5 mg once daily

• Calcium, oral, 500 mg−1 g once daily

• Malaria prophylaxis (see Section on Malaria in Pregnancy)
• Tetanus prophylaxis
• IM Tetanol 0.5 ml: 1st dose from 20th week gestation; 2nd dose 1(one) month after initial dose, if patient has not previously had anti-tetanus immunisation

HYPEREMESIS GRAVIDARUM

This refers to excessive vomiting during the early part of pregnancy. It is quite common. Often, no cause for the vomiting is found; however, it may be associated with multiple pregnancy or molar pregnancy.

INVESTIGATIONS

• Full blood count
• Blood film for malaria parasites
• Sickling test
• Urine analysis and culture
• Blood urea and electrolytes
• Ultrasound examination

TREATMENT

Therapeutic objectives

• To stop the vomiting
• To improve the mother’s well-being.

Non-pharmacological Treatment

• Mild cases can have treatment at home.
• Frequent small meals alternating with fluid intake.

Pharmacological treatment

(Evidence rating: C)

Mild cases

• Promethazine, oral, 25–50 mg twice or thrice daily or
• Metoclopramide, oral, 10 mg twice or thrice times daily.

Severe cases

• Normal saline or Ringer’s lactate alternating with 5% Dextrose IV, given to meet requirements
• Promethazine, IM or IV, 25–50 mg 8–12 hourly or
• Metoclopramide, IM or IV, 5–10 mg 8 hourly (body weight <60 kg, give 5 mg. Do not exceed 500 microgram/kg body weight body weight in a day)
• Introduce oral fluids gradually 48 hours after cessation of vomiting

REFER

Severe cases, with dehydration and metabolic disturbance must be referred to a hospital for intravenous fluid replacement and anti-emetic therapy.
HYPERTENSION IN PREGNANCY

Hypertension denotes a systolic blood pressure of 140 mm Hg or higher and/or diastolic pressure of 90 mm Hg or higher.

CAUSES

- Pregnancy induced hypertension
  - Gestational hypertension (without proteinuria)
  - Hypertension with proteinuria (pre–eclampsia)
  - Eclampsia
- Chronic hypertension (existing before pregnancy)
  - Essential hypertension
  - Secondary hypertension
  - Renal hypertension
  - Hormonal
- Chronic hypertension with super–imposed Pre–eclampsia or Eclampsia

PRE–ECLAMPSIA

Pre–eclampsia is a disease specifically associated with pregnancy. It usually occurs in the second half of pregnancy and it is characterized by the presence of two out of three major features:

- Elevated blood pressure (hypertension)
- Protein in the urine (Proteinuria)
- Oedema or excessive weight gain

CAUSES

It is found more commonly in:

- Primigravidae and in first pregnancies with new husbands
- Women over 35 years
- Multiple pregnancies
- Hydatidiform mole
- Patients with chronic hypertension

SYMPTOMS AND SIGNS

Pre–eclampsia is classified as mild or severe.

Mild cases

- The systolic blood pressure is between 140 and 159 mmHg
- The diastolic blood pressure is between 90 and 109 mmHg
- There is proteinuria of 1+ or 2+
Severe cases

• The systolic blood pressure is 160 mmHg or higher
• The diastolic blood pressure is 110 mmHg or higher
• There is proteinuria of 3+ or 4+

INVESTIGATIONS

• Full Blood Count and Platelet count
• Serum Uric Acid
• BUE and Creatinine
• Urine for analysis and culture
• Liver function tests
• Random blood glucose

TREATMENT

Therapeutic objectives

Mild pre−eclampsia

• To control blood pressure
• To allow foetus to grow and mature for delivery
• To prevent or treat any complications that may arise

This is best given in hospital under Specialist care

Non−pharmacological Treatment

• Admit for bed rest if possible
• Encourage patients to lie on their sides to avoid supine hypotension
• Urine proteins must be determined daily
• 4 hourly BP chart
• Weigh patient on alternate days.

Pharmacological Treatment

(Evidence rating: B)

No need for drug treatment for the hypertension unless the BP rises above 150 mmHg systolic or 100 mmHg diastolic. If treatment of the hypertension is needed then use Methyldopa or Nifedipine.

• Methyldopa, oral, 250 mg twice daily to 500 mg 3 times daily
• Nifedipine retard, oral, 10−40 mg twice daily

Monitor the foetal growth closely with ultrasound.

SEVERE PRE−ECLAMPSIA AND IMMINENT ECLAMPSIA

This is an obstetric emergency and must be treated seriously. Treatment is the same as that of eclampsia.

SYMPTOMS AND SIGNS

• Sharp rise in the blood pressure
• Frontal headaches
• Vomiting

• Visual disturbances such as double vision (diplopia), blurred vision, flashes of light in front of the eyes

• Epigastric pain with or without liver tenderness

• Decrease in urine production (oliguria) i.e. urine production of 400ml or less in 24 hours

• Increased tendon reflexes with or without clonus

TREATMENT

Therapeutic objectives

• To reduce the blood pressure not lower than 140/90 mmHg. (NOTE: lowering the blood pressure further may cause foetal distress)

• To prevent fits

• To stabilise the patient and deliver her if eclampsia is imminent

Non–Pharmacological Treatment

• Assess progress by 15–30minutes BP monitoring till the BP is reduced and the patient is stable. Thereafter monitoring can be done by 2–4 hourly BP readings

• Daily weighing

• Daily urine protein examination

• If eclampsia is imminent stabilise mother and deliver her

• If the patient is not symptomatic and the pregnancy is less than 34 weeks allow pregnancy to continue if the foetal condition would allow

• If the pregnancy is 34 weeks or more consider delivery after stabilisation

• When the "obstetrician" considers that the foetus is not viable, the patient should be transferred to a hospital with an associated Neonatal Intensive Care unit capable of looking after the immature baby

Pharmacological Treatment

(Evidence rating: C)

• Pre–hydration with 0.9% Sodium Chloride, IV or Ringer’s lactate, IV 300 ml over 30 minutes.

• Give Hydralazine, IV, 5–10 mg slowly over 20–30 minutes or Nifedipine, sublingual, 10 mg

• Subsequently, Nifedipine retard, oral and/or Methyldopa, oral, may be used to control the blood pressure and allow delivery to be delayed appropriately

• Give Magnesium sulphate as shown below

REFER

Immediate referral to Hospital or Obstetrician
ECLAMPSIA

Eclampsia occurs when the blood pressure rises rapidly followed by an eclamptic fit which is similar to an epileptic fit, with tonic and clonic phases. The fits are often repeated at frequent intervals.

TREATMENT

Therapeutic objectives

• To lower the blood pressure
• To prevent further fits
• To deliver when stable
• To protect patient from injury

Non−Pharmacological Treatment

During a fit:

• Turn the woman on her side and maintain the airway by either holding up the chin or, if possible, inserting a mechanical airway to hold down the tongue
• She should be stopped from biting her tongue
• She should be stopped from falling

After the fits:

(Evidence rating: C)

• Insert a wide bore intravenous cannula and take blood for investigations
• Connect the cannula to Sodium Chloride 0.9% or Ringer's Lactate drip
• Prevent further fits by giving the following:

  • Magnesium Sulphate, IV, 20 ml of the 20% solution (4 g) and Magnesium Sulphate, IM, 10 ml of the 50% solution (5 g) into each buttock (total of 10g)

  • If fits recur within 20 minutes, only protect patient. But if fits recur after this time repeat IV Magnesium Sulphate 10 ml of the 20% solution (2 g) once if patient is small or twice if patient is large

  • If the fits cannot be controlled with Magnesium Sulphate, Diazepam, IV, 10 mg slowly may be given. It may be necessary to take over the respiration and give Thiopentone. This is a critical care situation and needs the services of a competent anaesthetist

  • The patient should be kept on her side and turned every hour to prevent aspiration pneumonitis, as she is likely to be unconscious or semi−conscious. Quite often they regain consciousness fairly early

  • Hydralazine, IV, 5−10 mg may be given if the BP is high, followed by 20–40 mg Hydralazine in 500 ml of Sodium Chloride 0.9% and titrated against the blood pressure readings. If the drip runs unattended profound hypotension may ensue. Hydralazine, IV, is best given as multiple bolus doses at 20–30 minute intervals till the BP is reduced. The diastolic pressure should not go below 90 mmHg as placental perfusion may be impaired with resultant foetal distress
• An indwelling urethral catheter is inserted to measure urinary output. It will also prevent the patient from being stimulated by a filling bladder

• Observe closely for infection of the urinary and respiratory tracts

• If after a few hours, there are no further fits; delivery of the foetus should be done by the most appropriate method to ensure safety of both mother and baby

• Maintenance dose of Magnesium Sulphate is given as 10 ml of the 50% solution (5 g) into alternate buttocks every four hours and it is continued till 24 hours after the last fit or delivery. Toxicity to Magnesium Sulphate presents as slowing or arrest of the heart beat and the respiration and loss of the deep tendon reflexes. Before giving a dose ensure that the following parameters are normal:

  • Respiratory rate >12–16 per minute
    • Urine output – 100 ml or more over the previous 4 hours
    • Presence of knee jerk or other deep tendon reflexes
    • In case of toxicity to Magnesium Sulphate administer 10 ml of 10% Calcium Gluconate IV slowly

• Labour and Caesarean section. Induce labour if the cervix is ripe. If she is already in labour augmentation may be needed. Pethidine, IM, 100 mg and Promethazine, IM, 25 mg given intra–muscularly would relieve pain and quieten the patient. Caesarean section is done when there is foetal distress, the cervix is unfavourable for induction and when there are other problems precluding safe vaginal delivery

• At the health centre or post attempt setting up an IV line of Sodium Chloride 0.9% or Ringer's lactate and administer the IV dose of Magnesium Sulphate slowly. Follow this with the IM dose and accompany the patient to the hospital

• If the IV dose cannot be given still give the IM dose of 5 g into each buttock and accompany the patient to hospital

REFER
Immediate referral to hospital or obstetrician

• DO NOT GIVE FUROSEMIDE (FRUSEMIDE) AS PART OF THE TREATMENT FOR THE HYPERTENSION UNLESS THERE IS PULMONARY OEDEMA PRESENT.

• DO NOT GIVE ACE–INHIBITOR ANTIHYPERTENSIVES SUCH AS CAPTOPRIL AS THEY MAY DAMAGE THE DEVELOPING FOETUS.

MALARIA IN PREGNANCY

Refer to section on Malaria

ANAEMIA IN PREGNANCY

The WHO definition of anaemia of pregnancy is a haemoglobin concentration of less than 11 g/dl. In Ghana the accepted value is 10 g/dl.

SYMPTOMS

(See section on Anaemia)
• Dizziness
• Swelling of feet
• General weakness
• Easy tiredness
• Palpitations
• Jaundice (with haemolytic anaemia)

SIGNS

• Mucosal pallor
• Jaundice (may or may not be jaundiced)
• Hepato–splenomegaly (may or may not be present)
• Heart failure in severe anaemia

INVESTIGATIONS

• Hb, PCV, peripheral blood film comment
• Blood film for malaria parasites
• Sickling and Hb electrophoresis
• G6PD activity
• Stool analysis for hookworm ova
• Urinalysis for schistosome ova and urobilinogen
• Other tests include serum iron, total iron binding capacity

TREATMENT

Therapeutic Objectives

• To improve the level of haemoglobin
  To identify other causes of the anaemia and give appropriate treatment

Non–pharmacological Treatment

• The patient’s diet is very important during pregnancy especially in the presence of anaemia. Refer the patient to a dietician or diet nurse.

Pharmacological Treatment

(Evidence rating: C)

• Ferrous sulphate, oral, 200 mg 3 times daily. This may be increased to 400 mg 3 times daily in severe cases if no gastric symptoms occur

• Folic acid, oral, 5mg daily

• Multivitamin, oral, one tablet 3 times daily may be added

• For those with iron deficiency anaemia who are unable to tolerate oral iron, parenteral iron may be given. This should be given under careful observation and a small test dose should first be given. Contra–indications to the use of parenteral iron like iron dextran includes asthma, renal or liver disease, previous pyelonephritis and reaction to the drug

• In severe anaemia, blood transfusion may be necessary. One unit of blood increases the haemoglobin by approximately 1 g/dl. Use only screened blood for transfusion

• In labour it is better to transfuse the patient.
When there is heart failure the blood (packed cells) is transfused with Furosemide (Frusemide), IV, 20–40 mg. Partial exchange transfusion may be necessary if the Hb is 4 g/dl or less.

TREATMENT FOR SEVERE ANAEMIA IS BEST GIVEN IN HEALTH FACILITIES WITH BLOOD TRANSFUSION CAPABILITY

DIABETES MELLITUS IN PREGNANCY

Gestational diabetes refers to glucose intolerance of any degree that develops or is first recognized during the pregnancy, irrespective of whether it resolves after delivery or not. Types 1 and 2 diabetes mellitus may, however, be present before the pregnancy. The management of diabetes mellitus in pregnancy must be by a combined team of physicians, obstetricians, dieticians and nurses.

Screening of patients

- Test for urine sugar at each antenatal visit
- Glycosuria of 1+/2+ on 2 occasions or 3+/4+ on one occasion warrants a full oral glucose tolerance test (OGTT). Those found to have a normal curve can be tested again later in pregnancy after 32 weeks
- Those with impaired glucose tolerance or frankly diabetic curves should have treatment
- Fasting blood glucose test and 2–hour post-prandial blood glucose test must be done on all pregnant women at booking and also at 28–32 weeks

INVESTIGATIONS

- Detailed 16–22 weeks ultrasound scan to exclude major foetal anomalies. Serial ultrasound scan from 32 weeks – Biparietal diameter, Head Circumference, Femur Length, Abdominal Circumference or trunk diameter and weight estimation
- Full Blood Count
- Mid Stream Specimen of Urine for culture and analysis monthly
- High vaginal swab for vaginal candidiasis
- Blood Urea and Electrolytes and Creatinine
- Do the fasting blood glucose and 2–hour post-prandial blood glucose every 2–4 weeks. NB: There is no place for urine glucose estimation in the management of diabetes in pregnancy except for screening only.

TREATMENT

Therapeutic objectives

- To achieve normoglycaemic state
- To reduce maternal and foetal complications

Non-pharmacological Treatment

Diet
This is very important as some patients may improve on diet alone. The diet is taken care of by the dietician or diet nurse.

**Pharmacological Treatment**

*(Evidence rating: A)*

- If diet alone cannot control the blood glucose level then give insulin

- Type 2 diabetic patients on oral medication who become pregnant should be switched to insulin treatment. (Ideally, insulin should be given to optimise glycaemia in known diabetics before they become pregnant)

- Oral anti-diabetic agents should not be given during pregnancy and throughout lactation

- Insulin requirements vary from patient to patient

- Insulin therapy should usually begin with teaching the patient the correct technique for subcutaneous injections

- Start with small doses (e.g. total daily dose of 6–10 units) of NPH insulin or premixed insulin (which has 30% of regular and 70% of NPH insulin), subcutaneously.

- Give approximately two-thirds of the total daily dose before breakfast and one-third before dinner

- Adjust the insulin doses by plus or minus 2 units according to results of blood glucose tests

- Monitor insulin therapy with 2–4 weekly FBS and 2-hour post-prandial blood glucose up to 34 weeks then weekly till delivery

- Keep fasting glucose levels between 4–6 mmol/L and post-prandial glucose between 4–8 mmol/L

- This is often achievable on an out-patient basis, however, some patients would need to be admitted to hospital for short periods to ensure good glycaemic control

**DELIVERY**

- Deliver by 40 weeks if diabetes is well controlled and there are no complications. If complications exist then earlier delivery may be indicated

- Indications for Caesarean section include severe pre-eclampsia, previous caesarean section, advanced maternal age, malpresentation or foetal macrosomia

- If elective preterm delivery is necessary, confirm pulmonary maturity with amniocentesis (if facilities are available). There may be the need to mature the foetal lungs with corticosteroids

- **Labour (induced or spontaneous) and caesarean section are best done in hospital under specialist observation**

- Insulin requirements during labour should be given according to a sliding scale (see section on diabetic ketoacidosis and sliding scale)

- Insulin requirements during Caesarean section and other operative procedures (using a sliding scale or Glucose–Potassium–Insulin infusion or GKI) should be discussed with the anaesthetist

**PUERPERIUM**
• Insulin requirements reduce dramatically after delivery, hence, post-delivery insulin doses must be tailored to each individual patient’s needs

• Insulin may not be required in the first 24–48 hours for gestational and Type 2 diabetics. The blood glucose levels may reach up to 11 mmol/L without any problems

• Check blood glucose 2 hourly. If level is > 6.0 mmol/L in Type I diabetes give insulin according to a sliding scale (see section on diabetes mellitus)

• If patient does not require insulin again repeat OGTT at 6 weeks and if abnormal refer to a physician diabetic clinic

• Encourage breast-feeding

• Encourage contraception with progestins or sterilisation

• The baby needs special care and is best managed by a Paediatrician

• Hypoglycaemia in the baby in the first few hours of birth is a problem hence feeding must start within 2 hours of birth if there is no contraindication to oral route e.g. severe respiratory distress or vomiting

CARDIAC DISEASE IN PREGNANCY

It is very important to diagnose cardiac disease early and to institute the correct management as early as possible if the excess morbidity and mortality associated with it are to be reduced. Cardiac disease may be present before the pregnancy or develop during the pregnancy or puerperium (peripartum cardiomyopathy).

Some of the signs of pregnancy may mimic cardiac disease. Examples are the increasing pulse and presence of cardiac murmurs and a slight rise in the JVP.

CAUSES

• Rheumatic heart disease – e.g mitral incompetence and stenosis
• Hypertension
• Cardiomyopathy
• Anaemia

SYMPTOMS

The cardiac problem may be asymptomatic – hence cardiac examination is essential in all antenatal patients. Symptoms include:

• Palpitations
• Easy fatigability
• Angina
• Dyspnoea – orthopnoea, paroxysmal nocturnal dyspnoea
• Cough
• Peripheral oedema

SIGNS

• Significant cardiac murmurs
• Other signs of cardiac disease depending on the type of lesion
• Presence or absence of heart failure (See section on heart failure)

INVESTIGATIONS
• Full Blood Count
• Fasting or Random Blood Glucose
• Blood urea and electrolytes
• Electrocardiogram
• Echocardiogram

TREATMENT

The management depends on the functional classification of the New York Heart Association.

Class I – Asymptomatic
Class II – Symptomatic with heavy work
Class III – Symptomatic with light work or light exercise
Class IV – Symptomatic even at rest.

Antenatal Care

1. Known patients must book early in hospital
2. Assess the severity of the disease early in pregnancy and at each antenatal visit
3. Refer to the Cardiologist or General Physician for advice. Further management should be between Obstetrician and Cardiologist/Physician
4. Those in Class III & IV are admitted to hospital till delivery. Those in Classes I and II are treated at out-patient level till 34 weeks when they are admitted Heart disease by itself is not an indication for induction of labour.

REFER

All patients with cardiac disease must be attended to by a specialist Physician and Obstetrician.

JAUNDICE IN PREGNANCY

Jaundice occurring in pregnancy may be a sign or symptom of a severe disease and should not be underestimated.

CAUSES

1. Obstetric
   • Severe pre-eclampsia/eclampsia/HELLP Syndrome (Haemolysis, Elevated Liver enzymes, Low Platelets syndrome)
   • Severe hyperemesis gravidarum
   • Cholestatic jaundice of pregnancy
   • Acute Fatty Liver of pregnancy

2. Non-obstetric
   • Viral hepatitis
   • Haemolytic jaundice – malaria, sickle cell disease, G6PD defect, septicaemia
• Surgical causes of jaundice – acute cholecystitis, cholelithiasis, obstructive jaundice

INVESTIGATIONS

• FBC, Blood film for malaria parasites, sickling status
• G6PD status
• Liver function tests
• Hepatitis B surface antigen
• Abdominal ultrasound scan with emphasis on the hepato–biliary system and pancreas

TREATMENT

Depends on the underlying cause

REFER

Severe cases of jaundice and those associated with abdominal pain must be referred to a physician specialist.

POSTPARTUM HAEMORRHAGE

Primary Postpartum Haemorrhage

This refers to bleeding of more than 500 ml from the genital tract within the first twenty–four hours of delivery. It usually occurs during or immediately after the third stage of labour.

The bleeding may occur with the placenta retained or after its expulsion from the uterus. Postpartum haemorrhage becomes life threatening if the mother is already anaemic.

Blood loss of more than 500 ml may lead to shock. If such a haemorrhage occurs and the placenta is retained in the uterus, the following should be the course of action:

• Rub up a contraction by manual pressure on the uterine fundus
• Pass a urethral catheter to empty the bladder
• Give 1ml of IM Ergometrine maleate (500 microgram)
• Attempt removal of the placenta by controlled cord traction as soon as a contraction is felt
• If the placenta cannot be expelled in this fashion, manual removal under anaesthesia should be employed
• Insert a wide bore intravenous cannula and take blood for Hb, packed cell volume and grouping and cross matching
• Set up IV infusion of 500 ml Sodium Chloride 0.9% If the facilities for manual removal under anaesthesia are not immediately available refer to hospital. Meanwhile maintain uterine contractions by massaging the fundus and infusing Oxytocin at a fast rate. e.g. 10 units of Oxytocin in 500 ml 5% Glucose in Sodium Chloride 0.9%. It is better to accompany the patient to hospital

If bleeding continues or is heavy:

• Cross–match and transfuse a minimum of 2 units of blood
• If the placenta has been delivered and is incomplete, explore the uterus
• If the placenta is complete and the uterus is well contracted examine the patient in the lithotomy position with adequate analgesia and good lighting to check for and repair lacerations in the cervix or vagina with effective suturing using through-and-through sutures. If the tear extends into the uterine body, effective suturing cannot be performed and repair will involve a laparotomy. For ruptured uterus repair or hysterectomy is done.

• Check that blood is clotting. (5 ml of blood placed in a 10 ml round-bottomed glass tube should clot in 6 minutes). Platelet count and PTT may be done.

• If the uterus is poorly contracted (atonic) and the placenta is complete continue the IV fluids, blood transfusion and oxytocics and manual compression of the uterus. Prostaglandin F2 alpha (if available) should be administered directly into the myometrium. Prostaglandin E1 (Misoprostol) 200 microgram inserted rectally may be helpful in getting the uterus contracted.

• Rarely, hysterectomy is needed to stop the bleeding.

Secondary Postpartum Haemorrhage

This is defined as excessive vaginal bleeding occurring from twenty-four hours to six weeks after delivery.

It may be caused by:

• Retention of small pieces of placental tissue within the uterine cavity
• Infection within the uterine cavity (endo-myometritis)

If there is doubt about whether or not there are retained fragments in the uterine cavity, an ultrasound scan will often prove helpful.

MANAGEMENT

(Evidence rating: C)

• With mild blood loss, which does not stop spontaneously, the patient may be treated conservatively with antibiotics (Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly plus Metronidazole, oral, 400 mg 8 hourly for one week and Ergometrine, oral, 500 microgram 3 times daily for 3 days).

• If the woman shows any effects of severe blood loss, it may be necessary to explore the uterine cavity under anaesthesia and remove the contents.

• Always cross-match 2 units of blood pre-operatively.

• Exploration of the uterus should always be done gently since the uterine muscle will be soft and perhaps infected, and can easily be injured by sharp instruments.

• Provided the uterus is curetted gently and no damage is done, the blood loss usually ceases soon afterwards and the patient may be discharged.

POSTPARTUM PYREXIA

Oral temperature of 38°C on 2 or more occasions during the first 10 days of the puerperium excluding the first day.

CAUSES

• Malaria
• Puerperal sepsis
• Breast problems (engorgement, mastitis, abscess formation)
- Urinary tract infection
- Respiratory tract infection

SYMPTOMS AND SIGNS

Related to cause

INVESTIGATIONS

- Full blood count
- Blood film for malaria parasites
- Blood for culture and sensitivity (if found necessary)
- Urine for culture and sensitivity (if necessary)
- Blood Urea and Electrolytes
- Fasting or Random Blood Glucose
- Pelvic scan to exclude retained products of conception or pelvic abscess

TREATMENT

(Evidence rating: C)

The treatment given depends on the cause (see appropriate sections).

The treatment for breast problems is as follows:

- Engorgement – Encourage frequent emptying of breasts and give Paracetamol, oral, 1 g 3 times daily
- Mastitis – Flucloxacillin, oral, 500 mg 4 times daily for 5–7 days Abscess – incision and drainage plus Flucloxacillin, oral, 500 mg 4 times daily for 5–7 days.

ANALGESIA IN LABOUR

Fear, anxiety and uncertainty may lower the pain threshold during labour. Adequate pain relief during labour results in less anxiety and good progress.

1. INDICATIONS FOR ANALGESIA

First stage of labour:

In the first stage of labour analgesics are given when the uterine contractions are painful. Patients may therefore request for analgesia.

Second stage of labour:

Analgesia is required for instrumental delivery and when an episiotomy is given.

2. TYPES OF ANALGESIA

(Evidence rating: C)

a. Pethidine, IM,

- This is given as 50–100 mg together with Promethazine, IM, 25–50 mg during the first stage of labour. Given IM the maximum analgesic effect of Pethidine is obtained after 45 minutes and lasts for 3–4 hours. It is best not given when delivery is anticipated within 4 hours i.e. up to 6–7 cm dilatation. However, it should not be withheld from patients who need analgesia when the cervix is already 6–7 cm dilated in which case 50–75 mg Pethidine with 12.5–25
mg. Promethazine may be given intravenously. The IV dose of Pethidine begins to act within 5 minutes and its duration of action is also very short.

- The maximum safe total dose of Pethidine in labour is 300–400 mg in 24 hours.
- Promethazine is given to reduce the chances of vomiting and to potentiate the analgesic effect.

NB. If the baby is born within 6 hours of Pethidine administration it may be depressed and narcotic antagonists such as Naloxone must be given to the newborn, 100 microgram/kg body weight body weight, IM or IV. Resuscitation with oxygen via facemask or through endotracheal tube and Ambu bag should continue till the depression is reversed.

b. Inhalational

50% Nitrous Oxide/50% Oxygen

This is used in the late first stage when delivery is expected within 1 hour. It is very safe, acts very quickly and is short acting.

c. Epidural

This is a very effective way of reducing labour pains. When it is given in the first stage its use extends through the second stage of labour.

d. Local Anaesthetics

This is used for episiotomy and instrumental delivery.

Usually 1% Lidocaine (Lignocaine) with or without adrenaline is used to infiltrate the perineum before an episiotomy is given. The same drug may be used for pudendal block anaesthesia which facilitates instrumental delivery.

3. OTHER SUPPORTIVE THERAPY

When there is prolonged labour with increased labour pains and dehydration it may be necessary to infuse some IV fluids such as Sodium Chloride 0.9% and 5% Glucose.

PRE−TERM LABOUR AND PREMATURE DELIVERY

Pre−term labour refers to labour occurring before thirty−seven completed weeks. Premature delivery is one that occurs before thirty−seven completed weeks of gestation. The immature foetus is at risk of cerebral haemorrhage because the fragile cranial bones provide insufficient protection for the brain and there is increased susceptibility to infection and impaired clotting mechanisms.

CAUSES

It may occur spontaneously as is often seen in:

- Mothers of young age group
- Poor socio-economic class
- Smoking
- Infections e.g. pyelonephritis
- Incompetent cervix
- Multiple pregnancies
- Abruptio placentaes
• Malaria

INVESTIGATIONS

• FBC
• Fasting or Random Blood Glucose
• Ultrasound scan (if available) for the gestational age, foetal lie and presentation, amniotic fluid volume (normal or reduced), and the placental site. Estimate the foetal weight

TREATMENT

Therapeutic objectives

• To stop uterine contractions if foetus is not mature
• To allow foetal growth and maturity
• To allow labour to progress if it is already well established

Treatment is best done in a hospital where the facilities can support the adequate treatment of the neonate.

Non−Pharmacological Treatment

• Pre−term labour may often be prevented by increased rest and it should be suggested that, from mid−pregnancy onwards, the woman lies down in the middle of the day.

• Should the cervix be incompetent, a cervical suture may be inserted close to the level of the internal os.

Pharmacological Treatment

(Evidence rating: A)

• Rehydration and Tocolytic agents, such as b−sympathomimetic drugs e.g. Salbutamol and Magnesium Sulphate are often employed to prevent and treat preterm labour.

• Treat any underlying cause (e.g. malaria, pyelonephritis).

• Attempts to delay labour are unlikely to succeed if membranes are ruptured or the cervix is greater than 4 cm dilated.

Salbutamol, IV

Place 2.5 mg of Salbutamol into 500 ml of 5% Glucose. This gives a concentration of 5 micrograms per ml.

Start infusion at 10 micrograms/minute (2 ml/minute) and increase rate gradually to 45 micrograms/minute (9 ml/minute) until contractions cease, then gradually reduce the rate.

• Dexamethasone, IM, 6 mg 12 hourly for 4 doses may promote foetal surfactant production and decrease respiratory distress syndrome.

   • Repeat 1 dose weekly till 34 weeks or delivery. It is not advisable to use it after 34 weeks.

   • AVOID in severe pre−eclampsia and when infection is present.

   • Dangers of steroid use include infection, fluid retention and pulmonary oedema and maternal postpartum collapse.
PREMATURE RUPTURE OF THE MEMBRANES

This is the rupture of the membranes before the onset of labour. The two types are Preterm (before 37 completed weeks) and Term (³37 weeks, but ³ 1 hour before onset of labour).

SYMPTOMS

• Gush or leakage of fluid from the vagina.

SIGNS

• Exclude signs of chorioamnionitis – fever, purulent vaginal discharge, maternal tachycardia and uterine tenderness
• Examine the abdomen for the symphysio–fundal height, presentation, lie and the foetal heart rate.

INVESTIGATIONS

• FBC
• Sterile speculum examination including swab for culture
• Ultrasound scan (if available) for the gestational age, foetal lie and presentation, amniotic fluid volume (normal or reduced), and the placental site. Estimate the foetal weight.

Patients should be referred to hospital or specialist for further management

NEPHROLOGICAL AND UROLOGICAL DISORDERS

ACUTE GLOMERULONEPHRITIS

This is a disease characterised by intraglomerular inflammation and cellular proliferation following bacterial infection and deposition of immune complexes in autoimmune diseases.

COMMON CAUSES

A. Infections

• Post streptococcal infections
• pharyngeal infection
  • skin sepsis (impetigo)
  • infected scabies
  • Other bacterial Infections e.g.. Salmonella, Brucella

REFER

If the clinic cannot adequately care for the immature neonate it is better to transfer the foetus in utero to the referral centre.
• Hepatitis B virus, Hepatitis C virus, Yellow Fever, HIV, Dengue, Hanta viruses
• Parasitic e.g. Toxoplasma, Trypanosoma, Schistosoma, Malaria

B. Systemic Lupus Erythematosus

C. Systemic Vasculitis

• Polyarteritis nodosa
• Wegener’s granuloma

SYMPTOMS

Common symptoms in children are:

• A history of preceding infection
• Generalized oedema most marked around the eyes
• Breathlessness
• Anorexia: sometimes associated with vomiting and abdominal pain
• Fever
• Seizures
• Urinary abnormalities: oliguria, haematuria

SIGNS

Patients often present with:

• Oedema
• Oliguria (urine volumes <400 ml/day)
• Hypertension
• Haematuria, dark coloured urine.
• Acute Heart Failure
• Coma

INVESTIGATIONS

• Urinalysis
  • Sediment shows erythrocytes, leukocytes and a variety of casts including erythrocyte casts
  • Proteinuria usually less than 2 g/24 hours but may be in the nephrotic range
• Full Blood Count
• BUE and Creatinine
• Throat cultures (in children may be useful)
• Chest X-ray (may show pulmonary oedema)
• ECG
• Immunology
  • ASO (antistreptolysin O) titres

TREATMENT

(Evidence rating: C)
Post Infectious Glomerulonephritis

**Adults:** Control fluid retention by restricting daily fluid intake to 800 ml plus previous day’s urine output.

**Children:** Restrict fluids to 400 ml/m² of body surface area and previous day’s urine output.

- Diuretics – Furosemide (Frusemide) 40 mg daily, increasing to 2 g daily in adults
- Treat complications when detected i.e. renal failure, cardiac failure and hypertensive crisis.

**REFER**

- This may be done when complications such as renal failure, severe cardiac failure and hypertensive encephalopathy arise following Post Infectious Glomerulonephritis
- Patients with other causes such as lupus nephritis or systemic vasculitis, who need more intensive investigations, including renal biopsy, should be referred.

**NEPHROTIC SYNDROME**

Defined by proteinuria in excess of 3–3.5 g daily accompanied by hypoalbuminaemia, oedema, hyperlipidaemia and hypercoagulable state.

**CAUSES**

1. **Primary Glomerular Disease**
   - Minimal Change Disease (MCD); – supposedly common in children, probably not the commonest in Ghana
   - Focal and Segmental Glomerulosclerosis (FSGS)
   - Membranous nephropathy
   - Membranous Proliferative Glomerulonephritis (MPGN)

2. **Infections**
   - Viral – Hepatitis B and C, HIV, Infectious mononucleosis, Cytomegalovirus
   - Bacterial (Post streptococcal infection)
   - Parasitic (*Plasmodium malariae* malaria, *Schistosoma mansoni*, Filariasis)

3. **Associated with Systemic Diseases**
   - Diabetes mellitus
   - Systemic Lupus Erythematosus
   - Amyloidosis
   - Vasculitides

4. **Drug Related**
   - Gold, Mercury
   - Lithium
   - Captopril
   - Diamorphine (Heroin)
SYMPTOMS AND SIGNS

• Periorbital or peripheral oedema
• Pleural effusion
• Protein malnutrition particularly in children with long standing diseases
• Some 10% of adults with minimal change disease present with episodes of Acute Renal Failure

INVESTIGATIONS

• Urinalysis
• Plasma proteins
• Serum lipids
• Fasting blood glucose
• Serology – Hepatitis B, C, HIV

TREATMENT

Treatment Objectives

Management of the oedema

Non−Pharmacological Treatment

Low salt diet; adequate protein diet; 0.6−0.8 g/kg body weight of high class protein per day

Pharmacological Treatment

(Evidence rating: C)

Diuretic therapy includes:

• Furosemide (Frusemide), oral, 40 mg daily, increasing to 2 g daily in divided doses in adults
  or
• Bendrofluazide, oral, starting with 2.5 mg daily increasing to 5 mg once daily or
• Metolazone, oral, 2.5 mg to 20 mg once daily

REFER

All patients to a nephrologist or physician specialist

ACUTE RENAL FAILURE

This is a clinical syndrome of sudden onset with frequently reversible reduction of renal function and usually associated with oliguria i.e. urine volumes <400 mls/day or anuria i.e. urine volumes <100 mls/day

COMMON CAUSES

1. Obstetric Causes

• Septic abortion
• Post−Caesarean section
• Eclampsia
• Postpartum Haemorrhage (PPH),
• HELLP (Haemolysis Elevated Liver Enzymes Low Platelet) Syndrome
2. Gynaecologic Cause

- Bilateral ligation of ureters following abdominal hysterectomy

3. Medical (Adult and Paediatric Causes)

- Acute Glomerulonephritis
- Haemolysis due to:
  - Malaria
  - Infection
  - Herbal medicines
  - Typhoid fever
  - Diarrhoea, vomiting and dehydration

4. Surgical Causes

- Haemorrhage
- Peritonitis
- Acute Pancreatitis
- Obstructive uropathy
- Burns

**SYMPTOMS**

- History of fluid or blood loss or severe infection, burns, peritonitis or diarrhoea and vomiting
- Symptoms of dehydration, shock or anaemia

**SIGNS**

There are no specific findings in Acute Tubular Necrosis

**INVESTIGATIONS**

- Urinalysis
- BUE, creatinine, uric acid
- Repeated blood and urine cultures
- Abdominal/Renal ultrasound scan to exclude urinary tract obstruction
- Plain x-ray of abdomen

**TREATMENT**

**Therapeutic objectives**

- To restore renal blood flow
- To increase tubular flow of urine
- To repair ongoing intracellular injury

**Non–Pharmacological Treatment**

- Nutrition: Give protein of high biological value at 40 g protein/day
- Strict fluid input and output chart
- Daily weight
- In adults restrict fluid intake to 600 ml plus previous day’s output
- Beware of hyperkalaemia – avoid potassium containing foods e.g. banana
Pharmacological Treatment

(Evidence rating: C)

Treatment of fluid losses

- Correct fluid losses vigorously and early with appropriate fluid replacement as follows:
  - 0.9% Sodium Chloride, IV, in cases of diarrhoea and vomiting
  - Blood transfusion in severe bleeding
  - Plasma replacement in cases of severe burns

- Give Furosemide (Frusemide), IV, 80 mg when fluid volume has been replaced adequately

Treatment of hyperkalaemia

- 10% Calcium gluconate, IV, 10−20 ml over 2−5 minutes
- Sodium Bicarbonate 8.4% 44 mEq, IV, over 5 minutes (NOTE: Do not mix calcium gluconate and bicarbonate in the same delivery system)
- Regular Insulin 10 units in 50−100 ml Glucose 50%.

Treatment of hypertension crises/encephalopathy

Refer to section on hypertension.

REFER

All patients with clinical indications for dialysis e.g. those with:

- Congestive heart failure
- Electrolyte abnormalities (hyponatraemia, hyperkalaemia) not controlled by conservative means
- Severe metabolic acidosis (bicarbonate less than 10 mmol/L after bicarbonate treatment)
- Real or impending uraemic symptoms (seizures, pericarditis)
- Hypertensive Crises/Encephalopathy

CHRONIC KIDNEY DISEASE (CKD)

In the year 2000 the National Kidney Foundation’s Kidney Disease Outcome Quality Initiative Advisory Board approved guidelines to classify stages on the progression of chronic kidney disease. The term Chronic Renal Failure has been replaced by Chronic Kidney Disease.

Chronic kidney disease includes conditions that affect the kidney with the potential for progressive loss of kidney function or for complications resulting from decreased kidney function.

COMMON CAUSES

- Hypertensive renal disease
- Glomerulonephritis
- Pyelonephritis
- Diabetes mellitus
- Obstructive uropathy
- Renal calculi
- Polycystic kidney disease

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SYMPTOMS

No symptoms are experienced in the early stages. Symptoms occur only in advanced renal failure.

- Reduced concentration
- Anorexia, nausea, vomiting
- Gastrointestinal bleeding
- Hiccups
- Breathlessness on exertion
- Thirst
- Nocturia
- Muscle Cramps
- Paraesthesia
- Pruritus

Early Signs

- Earlier stages detected through laboratory tests in serum creatinine and estimation of GFR
- Measurement of urinary albumin excretion can identify some but not all
- Screening of asymptomatic individuals at increased risk could allow early detection of CKD

Late Signs

- Lethargy
- Bleeding tendency
- Pallor
- Hypertension
- Pericarditis
- Peripheral neuropathy
- Peripheral oedema
- Asterixis (flapping tremor)

INVESTIGATIONS

- Hb, WBC, Sickling, Platelet Count, Blood film comment
- Urea, Electrolytes
- Creatinine
- Calcium, Phosphate
- Alkaline phosphatase
- Lipids
- Urinalysis
- Chest x-ray
- Fasting blood glucose

TREATMENT

Therapeutic Objectives

- Early detection of chronic kidney disease
- Control of hypertension to acceptable levels i.e. 120/80 mmHg
- Control of diabetes mellitus and strict blood glucose control (if present)
- Control of other underlying causes
All patients with or without proteinuria and serum creatinine greater than 150 µmol/L should be referred to renal centres for determination of aetiology and scheme of management.

**URINARY TRACT INFECTION**

Refers to any bacterial infection of the urinary tract.

**CAUSES**

- Ascending infection by organisms of the gut flora
- Following bacteraemia or septicaemia
- Urinary obstruction e.g. enlarged prostate in adult males, posterior urethral valves in infants/children

**SYMPTOMS**

- Frequent painful urination, occasional haematuria and loin pain
- Fever
- In children, Fever may be persistent and unexplained
- There may be feeding problems, diarrhoea, and failure to thrive as well

**SIGNS**

- Fever
- Loin tenderness
- Suprapubic tenderness

**INVESTIGATIONS**

- Mid-stream specimen of urine for microscopy, culture and sensitivity

**TREATMENT**

**Therapeutic objectives**

- To eradicate causative agent
- To prevent serious complications
- To identify patients with abnormalities of the genito-urinary tract

Treatment will depend on severity of infection as well as the age of the patient

**Non-Pharmacological Treatment**

- Liberal oral fluids to encourage good urinary output
- Personal hygiene and proper cleaning after defaecation

**Pharmacological Treatment**

(*Evidence rating: C*)

In Mild/Moderate Cases

**Adults & Children:**
Use co-trimoxazole, while awaiting culture results

Change to appropriate antibiotics based on culture and sensitivity results

Repeat urine culture after treatment

REFER

• Congenital abnormalities of the genito–urinary tract predispose children to UTI. If UTI is proven in children, the patient will need referral for further evaluation of the genito–urinary tract in a hospital, e.g. Abdominal ultrasound, micturating cystourethrogram, intravenous pyelography etc.

• Very ill patients

• Patients with recurrent UTI

• Patients with persistent haematuria in association with UTI

ACUTE CYSTITIS

Acute inflammation of the bladder is the commonest lower urinary infection in women. Women are affected 10 times more than men due to the shortness of their urethra compared to that of men. 20–40% of all women will develop cystitis in their lifetime. The ascending faecal–perineal–urethral route is the primary mode of infection. Occasionally sexually transmitted organisms are involved. The commonest organisms are *E. coli* (about 80%), Klebsiella, Proteus, Gonococcus, *Staphylococcus saprophyticus* and Enterococci.

SYMPTOMS

• Fever
• Irritative voiding symptoms: frequency, urgency and dysuria
• Haematuria
• Cloudy, foul smelling urine
• Low back and suprapubic pain
• Honeymoon cystitis. If there is history of recent marriage you should consider the coital factor

SIGNS

• Low grade fever
• Suprapubic tenderness

INVESTIGATIONS

• Urinalysis: bacteriuria, pyuria and haematuria
• Midstream urine for culture and sensitivity
• Imaging of urinary tract in recurrent or persistent cases to exclude anatomical abnormalities
• Fasting blood glucose etc. in risk cases
• Urethrocystoscopy in selected cases

TREATMENT

Non–Pharmacological Treatment

• Liberal oral fluids to encourage good urinary output
• Pre–coital and post–coital emptying of the bladder
• Personal hygiene and proper cleaning after defaecation
Pharmacological Treatment

Antibiotics:

Any one of the following regimens is effective:

Ciprofloxacin 500 mg twice daily for 3−5 days

or

Nitrofurantoin 50−100 mg 4 times daily for 3−5 days

Other treatment:

Add Mist. Potassium Citrate 10 ml 3 times daily if urine is acidic (pH of 6 or below)

RECURRENT CYSTITIS OR CHRONIC CYSTITIS

This results from persistent infection, re−infection or abacterial cystitis.

REFER

Refer all cases of recurrent cystitis and those with persistent haematuria to a higher centre for evaluation and further management.

PROSTATITIS

ACUTE PROSTATITIS

This is usually caused by Gram−negative bacteria like E. coli, Pseudomonas, Streptococcus faecalis, Gonococcus and Chlamydia. This could be sexually transmitted. Other possible routes of infection include ascent from urethral reflux of infected urine into prostatic duct, spread from rectum and spread from bloodstream.

SYMPTOMS

• Fever
• Chills
• Low back and waist pain
• Urinary urgency and frequency
• Nocturia, dysuria
• Difficulty in urination with occasional haematuria

SIGNS

Rectal examination reveals a tender prostate. The rectum feels hot from the inflammation. Avoid prostatic massage as this could lead to septicaemia.

INVESTIGATIONS

• Urine analysis and culture
• White blood cell count, ESR
• In septicaemia, blood culture

TREATMENT
General Measures

Bed rest, hydration, analgesics for fever and pain and stool softeners.

Hospitalisation may be required in acute retention of urine and in severe cases. Insert suprapubic catheter and do not pass urethral catheter for retention of urine.

Specific Treatment

(Evidence rating: C)

Ciprofloxacin, oral, 750 mg twice daily plus Doxycycline, oral, 100 mg, twice daily for a minimum of 14 days and a maximum of 21 days.

Follow up should be for at least 4 months

CHRONIC PROSTATITIS

This usually follows inadequately treated acute prostatitis. Diagnosis and management are difficult. REFER to a higher level medical facility.

BENIGN PROSTATIC HYPERPLASIA

This refers to benign enlargement of the prostate gland which is giving rise to symptoms. The average age of patients is about 66 years. The two main aetiological factors are aging and the presence of testosterone. There is no correlation between sexual activity and the aetiology.

SYMPTOMS

Lower Urinary Tract Symptoms (LUTS), previously referred to as prostatism.

A. Obstructive

• Hesitancy – delay in initiating urination
• Poor/weak urinary stream
• Straining
• Terminal dribbling
• Overflow incontinence
• Urinary retention

• Acute retention – sudden, painful over-distention of the bladder due to inability to void urine
• Chronic retention – bladder distention which is painless, gradual in onset and associated with some inability of the patient to completely empty the bladder on voiding

B. Irritative

• Frequency by day or night (nocturia)
• Urgency
• Urge incontinence

SIGNS

• A tender bladder will be palpable in acute urinary retention
• In chronic retention the distended bladder is non-tender. There may be associated uraemic signs
• The kidneys may also be palpable due to hydronephrosis
• Rectally the prostate gland is enlarged (size assessed in grades or grams); firm in consistency, smooth surface, non−tender and the median sulcus is palpable. The rectal mucosa moves freely over the prostate which has well defined edges.

INVESTIGATIONS

• Full blood count
• Blood urea, electrolytes and creatinine
• Prostate specific antigen (PSA)
• Urinalysis
• Urine (mid stream) for culture and sensitivity
• Abdominal ultrasound and transrectal ultrasound (TRUS) of the prostate if available

TREATMENT

Therapeutic objectives

• Identify and correct associated complications which may be life−threatening
• To relieve the obstruction to urinary flow

Depending on the severity of symptoms, treatment may be pharmacological (drug therapy) or non−pharmacological (surgery).

Immediate Treatment

Acute retention of Urine

• Urethral catheterisation
• Suprapubic cystostomy – if urethral catheterisation fails REFER.
• Suprapubic needle puncture and aspiration/drainage of urine – partially decompresses the bladder and relieves pain, when suprapubic cystostomy is delayed.

Definitive Treatment

(Evidence rating: A)

Patients with very mild symptoms which are not bothersome may be put on a programme of monitoring (watchful waiting) through regular checkups.

Patients with mild symptoms:

Drug therapy

• Prostate smooth muscle relaxants (selective alpha−adrenergic blockers)

These medications may have side effects such as lowering of blood pressure and dizziness. Some are therefore only recommended to be taken at night.

Terazosin, oral, 2 to 10 mg at night. Initial start dose of 1 mg at night; this may be doubled at weekly intervals according to response up to a maximum of 10 mg or

Tamsulosin 400 microgram once daily.

• Androgen Suppression

These drugs block the enzyme that is responsible for growth of the prostate. Their use will cause shrinkage of the prostate and relief of the attendant obstruction.
Finasteride, oral, 5 mg daily.

Treatment is indefinite

• Combined Drug Therapy

A combination of a selective alpha blocker and androgen suppression may produce better response than either used alone.

REFER

Refer patients with moderate to severe symptoms to a Urologist or Surgical specialist.

CARCINOMA OF PROSTATE

Ninety-five per cent of these tumours are adenocarcinomas. The majority of men affected are between 65 and 85 years. The incidence increases with age. The main aetiological factors are ageing, presence of functional testes, family history of prostate cancer and an unknown genetic factor which makes blacks more affected than other races.

SYMPTOMS

• Retention of urine
• Haematuria
• General debility – anorexia, weight loss, listlessness
• Bone pain (commonly in the waist or limbs)
• Paralysis in the lower limbs or inability to walk

SIGNS

The findings on rectal examination are essential aids to diagnosis except in very early stages of the disease. The prostate gland is hard with an irregular surface and the edges may be irregular. The median sulcus is obliterated and the rectal mucosa adherent.

It is worth noting that not every hard prostate is malignant. A prostatic biopsy is therefore necessary to establish a diagnosis.

Signs of advanced metastatic disease may include:

• Anaemia
• Uraemia
• Wasting
• Bone tenderness
• Paraplegia
• Pathological fracture

INVESTIGATIONS

• Full blood count
• Blood urea, electrolytes and creatinine
• Prostate specific antigen (PSA)
• Liver function tests
• Abdominal ultrasound and transrectal ultrasound of the prostate with prostate biopsies when available
SCREENING

It is recommended that every male of age 40 years and above should have annual screening for prostatic cancer (PSA tests, Digital Rectal Examination) since early detection is associated with better prognosis.

TREATMENT

Patients presenting with urinary retention will require relief of their retention by urethral catheterisation. Definitive treatment depends on the stage (extent of progression or spread) of the cancer. It aims at cure for early disease. Advanced disease is at best kept in check by hormonal manipulation which inhibits growth of the tumour by depriving it of androgens.

REFER

To specialist centre for evaluation and management.

ERECTILE DYSFUNCTION (IMPOTENCE)

It means the persistent inability of a man to achieve an erection which is adequate in terms of hardness and duration for satisfactory sexual intercourse. So long as a man can achieve a hard enough erection to permit vaginal penetration, with a long enough staying power to perform the sexual act till ejaculation is attained, he is judged to be potent. The number of “rounds” per session is irrelevant.

The condition may be classified as primary (never been able to attain and/or maintain an erection for satisfactory sexual intercourse) or secondary, where impotence occurs in men who have a past history of satisfactory sexual performance.

CAUSES

1. Psychogenic
   - Anxiety
   - Depression
   - Stress
   - Marital conflict

2. Organic
   - Vasculogenic: arterial insufficiency/occlusion; venous incompetence
   - Neurogenic: peripheral neuropathy; spinal cord lesions
   - Traumatic: penectomy; pelvic fracture (with urethral rupture); perineal trauma
   - Endocrine: diabetes mellitus, hypogonadism; hyperprolactinaemia; adrenal disorders; thyroid disorders
   - Drugs: antihypertensives; antidepressants
   - Post–operative: Cystectomy; Radical Prostatectomy; Abdominoperineal resection
   - Inflammation; urethritis; prostatitis
   - Mechanical: congenital penile abnormalities; Peyronies disease
   - Endurance related: heart/renal/liver failure; pulmonary insufficiency
   - Priapism

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INVESTIGATIONS

• Full blood count and sickling status
• Lipid profile
• Urinalysis
• Fasting blood glucose

TREATMENT

As far as possible treatment should be directed at the cause.

• Psychogenic:
  • Psychosexual counselling

• Drug–related:
  • Change or discontinue medication in consultation with the patient’s physician

Caution: potency enhancing drugs like Sildenafil citrate must only be used under specialist care.

REFER

Referral to a specialist centre is necessary in most cases.

Refer also for testosterone and prolactin test, intracavernosal injection test and other tests depending on clinical findings.

MALE INFERTILITY

Infertility is the failure of a couple to achieve conception within 12 months of adequate unprotected coitus. About one third of cases of infertility result from pathologic factors in men, one third from factors in both men and women and one third from factors in females. Male causes therefore account for 50% of infertility. Based on reported cases about 15% of all married couples experience reproductive difficulties.

CAUSES

For practical purposes the main causes can be divided into three:

• Treatable causes
• Potentially treatable causes
• Untreatable causes

<table>
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<th>Treatable causes</th>
<th>Potentially treatable causes</th>
<th>Untreatable causes</th>
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<tbody>
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<td>• Varicocele</td>
<td>• Idiopathic</td>
<td>• Congenital abnormalities e.g. absence of both testis</td>
</tr>
<tr>
<td>• Infections of testis, epididymis, urethra, prostate.</td>
<td>• Undescended testis</td>
<td>• Bilateral testicular atrophy</td>
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<tr>
<td>• Ejaculatory dysfunction</td>
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<tr>
<td>• Gonadotoxins (drugs, radiation)</td>
<td>• Erectile dysfunction</td>
<td>• Blockage of vas deferens</td>
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<td>----------------------------------</td>
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<tr>
<td>• Hyperprolactinaemia</td>
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<tr>
<td>• Hypogonadotropic hypogonadism</td>
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</tbody>
</table>

**SYMPTOMS**

- Patients usually complain of their wives’ inability to give them a child. Such patients are quite often very apprehensive, frustrated and reluctant to undergo investigations.

- Ask for a history of STI, UTI, mumps, previous genital, pelvic or inguinoscrotal surgery and injuries.

**SIGNS**

- Look for male secondary sexual characteristics and abnormal features like gynaecomastia
- Examine external genitalia:
  - Testes: presence or absence, size and consistency
  - Epididymis
  - Vas deferens: absence, thickening, inguinoscrotal scar e.g. from herniorrhaphy
  - Varicoceles
  - Penis: size, curvature, hypospadias, epispadias
  - Urethra: discharge, meatal stenosis, urethral stricture

**INVESTIGATIONS**

- Semen analysis
- Urine analysis
- Specific investigations relating to various causes
- Specialised investigations like hormone profile should be done by specialists
- Female partner should be evaluated

**TREATMENT**

**Non-Pharmacological Treatment**

- Sexual counselling
- Stop smoking, stop alcohol ingestion and gonadotoxic drugs if sperm count is not optimal
- Occupational hazards: avoid exposure to excessive heat, cold and chemicals
- Avoid tight underwear. Use of boxer shorts and cotton material (not silk) is recommended. This reduces heat around the testes to promote spermatogenesis

**REFER**

Refer all cases that require special investigation, pharmacological or surgical treatment to specialist.

**HAEMATURIA**

This is the passage of blood in the urine.
CAUSES

Common causes include the following:

- Vesical schistosomiasis (Bilharzia)
- Benign prostatic hyperplasia (BPH)
- Carcinoma of prostate, bladder and kidney
- Urinary tract infection
- Trauma
- Urinary calculi
- Medical causes e.g., sickle cell disease, acute glomerulonephritis and anticoagulant therapy

Certain drugs and food products may colour urine red and these should be differentiated from haematuria. Examples of such substances are rifampicin and rhodamine B food colouring used in cakes, cookies and soft drinks.

SYMPTOMS

- Passage of blood in urine
- Pain/discomfort on passing urine

SIGNS

Depending on severity and aetiology, the following signs may be present

- Pallor
- Abdominal masses e.g kidney, bladder
- Low or suprapubic tenderness from urinary tract infection or calculus

INVESTIGATIONS

- Full blood count and sickling status, (do Hb electrophoresis if sickling test is positive)
- Blood urea, electrolyte and creatinine
- Urinalysis
- Urine culture and sensitivity

TREATMENT

This will depend on the cause.

- Urinary Schistosomiasis
  Praziquantel (See section on schistosomiasis)

- Urinary Tract Infection
  Give appropriate antibiotics (See section on urinary tract infection)

If patient presents with clot retention, then catheterise and refer

REFER

Refer all other cases as well as those with persistent haematuria after treatment for schistosomiasis and urinary tract infection for urine cytology, intravenous urogram, abdominal ultrasound and urethrocystoscopy.
Urinary schistosomiasis is caused by a blood fluke *Schistosoma haematobium*. This disease is common in Ghana. There are many endemic areas in Ghana along the lakes or slow-flowing rivers and irrigation systems. The commonest body sites affected is the bladder, ureters and pelvic organs.

**SYMPTOMS**

Initial complaints may include:

- Itching and redness of skin at site of penetration of parasite.
- Fatigue, low grade fever, excessive sweating and headache.

Later:

- Terminal haematuria
- Urination may be painful (dysuria)
- Lower abdominal pain (bladder pain)

**SIGNS**

- Pallor
- Haematuria
- Palpable kidney from hydronephrosis due to ureteric stricture
- Palpable bladder from bladder cancer or retention of urine due to clots or bladder neck stenosis

**INVESTIGATIONS**

- Urine for red blood cells, pus cells, and Schistosoma ova (midday urine specimen preferably taken after exercise is ideal)
- Midstream urine for culture in associated urinary tract infections
- Full blood count
- Imaging: Ultrasound scan; Intravenous urogram (IVU) may show calcification of bladder, ureters, hydronephrosis and hydroureters

**TREATMENT**

Prevention: Avoid contact with infested water.

**Pharmacological Treatment**

(Evidence rating: A)

- Praziquantel, oral
  For both adults and children: 40 mg/kg body weight as single dose.

**REFER**

Refer patient after adequate treatment if:

- Haematuria persists
- Symptoms of urinary infection persist
- Complications like hydronephrosis, bladder mass, retention of urine, severe wasting and
severe anaemia are present

SCROTAL MASSES

These are swellings found in the scrotum.

CAUSES

These could be divided into two:

• Painless scrotal swellings
  • Testicular tumour
  • Inguinoscrotal hernia
  • Hydrocele
  • Hydrocele of spermatic cord
  • Spermatocele/epididymal cysts
  • Varicocele
  • Epididymal tumours
  • Chronic epididymoorchitis

• Painful Scrotal Swellings
  • Testicular torsion
  • Acute epididymitis
  • Acute epididymoorchitis
  • Strangulated inguinoscrotal hernia
  • Testicular tumour (usually painless except rapidly growing type or tumour necrosi)
  • Varicoceles are occasionally accompanied by pain/discomfort

SYMPTOMS

• Swelling of scrotum or its contents
• Sudden onset, e.g. torsion of testis
• Gradual onset, e.g. spermatocele, hydroceles
• Gradual onset becoming suddenly painful, e.g. obstructed hernia
• Fever, may be present in infections like acute epididymitis and acute epididymoorchitis

SIGNS

• Tender or non−tender swelling restricted to the scrotum (except a hernia which may extend into the inguinal area)

• Fever may be present in infections

• Transillumination for cystic swellings like hydroceles and spermatoceles

INVESTIGATIONS

• Ultrasound scan
• Laboratory investigations are tailored towards cause and specific treatment

TREATMENT
Non–Pharmacological Treatment

• Surgery

Pharmacological Treatment

(Evidence rating: C)

• For sexually transmitted infection treat with Ciprofloxacin, oral, 500 mg single dose (or Ceftriaxone, IM, 250 mg single dose) plus Doxycycline, oral, 100 mg 12 hourly for 10 days

• For non–sexually transmitted infections: Co–trimoxazole 960 mg, oral, 12 hourly for 14 days.

REFER

Refer all cases which require specialist attention.

THE EMPTY SCROTUM

Undescended testes and rarely agenesis of the testes are the causes of the empty scrotum syndrome. Cryptorchidism or undescended testis and ectopic testis are common. Seventy–five percent of full term infants with undescended testes and 90% of premature infants would have spontaneous descent of testes by the age of one year.

CAUSES

• Unknown/idiopathic; most cases are congenital
• Premature birth

SYMPTOMS

• Patient notices one or both testes are absent. In children, parents or the health worker should notice this at birth

SIGNS

• The testes are absent from the scrotum. Patients must be examined in both supine and upright positions

INVESTIGATIONS

• Ultrasound scan of abdomen, pelvis and inguinal canal

TREATMENT

Therapeutic objectives

• To decrease potential for cancer
• To improve fertility
• To repair hernia
• To decrease risk of torsion
• To avoid social and psychological complications
Prevention of complications: All health workers who see neonates and children should do routine examination of the scrotum and testis to prevent late presentations and complications.

REFER

Refer to a urologist or surgical specialist.

PRIAPISM

A prolonged, persistent, usually painful erection which is unwanted and is not relieved by coitus. Patients are usually shy and reluctant to come to the hospital due to stigmatisation. Late presentation is therefore common and herbal applications may have been tried to relieve symptoms.

CAUSES

Common causes are:

- Idiopathic or unknown in 60% of cases
- Other causes are:
  - Leukaemia
  - Sickle cell disease: SS, SC, S.Thalasaemia.
  - Penile trauma
  - Spinal cord injury
  - Pelvic infections
  - Pelvic tumour
  - Iatrogenic e.g. intracavernosal prostaglandin E1 for impotence, sildenafil citrate
  - Drugs e.g. marijuana, antipsychotics and herbal concoctions

SYMPTOMS

- Painful persistent erection

SIGNS

- Clinical signs of sickle cell disease
- Erect, tender penis

INVESTIGATIONS

- Full blood count, blood film comment
- Sickling status – Hb electrophoresis
- Urine analysis

TREATMENT

(Evidence rating: C)

- Hydration with Sodium Chloride 0.9%, IV, 1 L six hourly and liberal oral fluids.
- Sedation with Pethidine, IM, 100 mg and Diazepam, IV, 10 mg stat. (given slowly over 1–3 minutes) then refer.

REFER
Immediate referral to a urologist or surgical specialist is important.

POSTERIOR URETHRAL VALVES

These valves or folds of tissue are congenital. They obstruct urinary outflow from the bladder but permit easy urethral catheterisation. Because the condition is congenital, secondary changes in the bladder and upper urinary tract are advanced at birth. Some patients may be born with severe renal impairment or develop one soon after birth if recognition is delayed.

NOTE: All male newborn babies should be closely watched to ensure good stream of urine.

Most patients present as neonates or infants. Occasionally presentation is late in childhood. Prenatal diagnosis is possible using ultrasound.

SYMPTOMS

• Poor urinary stream
• Cries while voiding
• Straining to void with dribbling of urine
• Failure to thrive
• Fever
• Poor feeding
• Abdominal distention

SIGNS

• Respiratory distress
• Sepsis
• Poor physical growth/growth retardation
• Palpable bladder and kidneys

INVESTIGATIONS

• Full Blood Count
• Blood Urea, Electrolytes and Creatinine
• Urine analysis
• Urine culture
• Abdominal ultrasound
• Micturating cysto–urethrogram

TREATMENT

Therapeutic objectives

• Prompt bladder decompression and continuous drainage to protect the upper tract from back pressure damage

• Treatment of urinary tract infections

• Removal or destruction of the valve

REFER

Refer immediately after diagnosis for specialist evaluation and treatment.229
URINARY TRACT CALCULI

These are crystal-like objects, which form in various parts of the urinary tract. They consist mainly of mineral salts i.e. crystal forming ions. Some of the common stone-types include calcium oxalate, calcium phosphate, magnesium ammonium phosphate and uric acid.

CAUSES

- Hypercalcaemia
- Hyperuricaemia
- Urinary stasis
- Urinary tract infection
- Foreign body – including urinary catheter and suture material
- Idiopathic hypercalciuria
- Dehydration
- Immobilisation especially in the elderly
- Inborn errors of metabolism e.g. cystinuria

<table>
<thead>
<tr>
<th>LOCATION OF CALCULI</th>
<th>SYMPTOMS</th>
<th>SIGNS</th>
</tr>
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</table>
| Kidney/Ureter       | • Loin Pain  
• Ureteric colic  
• Sudden acute agonizing paroxysymal pain, which begins in the loin, then radiates around the flank towards the bladder and testis in the male and labium majus in the female. May be associated with nausea, vomiting and sweating.  
• Haematuria | • Signs may be few but tenderness in the loin and abdomen would be felt during a painful attack.  
• Sometimes there may be associated abdominal distension and fever if there is superadded infection.  
• A hydronephrotic kidney may be palpable. |
| Bladder/Urethra     | • Suprapubic pain  
• Frequency  
• Urgency  
• Haematuria  
• Strangury – An uncontrollable and often painful desire to pass urine which results in little or no urine (may be blood-stained) being voided.  
• Retention of urine | • Suprapubic tenderness  
• Palpable bladder (from retention or a large stone)  
• Hard urethral lump (impacted stone)  
• Haematuria |

INVESTIGATIONS

- Urinalysis
- Urine culture
- Blood urea, electrolytes and creatinine
- Plain x-ray of abdomen.
- Ultrasound scan of abdomen

The following tests are usually available in Teaching and Regional hospitals:

- Serum calcium, uric acid, phosphorus, oxalates
- 24 hour urine calcium, and phosphorous
- Intravenous urogram
- Retrograde ureteropyelogram
- Stone analysis

TREATMENT
Therapeutic objectives

- To control pain during acute attack
- To aid passage of the calculus or ensure complete removal of calculus
- To prevent recurrence if the cause is known

Treatment depends on the location of the calculus

A. Kidney/Ureteric stone

(Evidence rating: C)

- Admit
- Give parenteral analgesic for pain e.g. Pethidine, IM, 100 mg 4 hourly as required or Diclofenac, IM or by suppository, 75 mg 12 hourly

CAUTION: Avoid morphine as it may cause further ureteric spasm and worsening of symptoms

- Give antibiotics if urinary tract infection is present. (see section on urinary tract infection)
- Encourage fluid intake.

B. Bladder/Urethral stone

- Manage acute urinary retention by urethral catheterisation or suprapubic cystostomy

REFER

Refer to a Regional or Teaching hospital for definitive treatment after initial management.

URETHRAL STRICTURE

This refers to a narrowing or complete obstruction of the urethral lumen due to fibrosis (scarring).

CAUSES

Most urethral strictures are acquired.

- Gonococcal or nongonococcal urethritis
- External trauma e.g. road traffic accidents, falls.
- Urethral instrumentation e.g. catheterisation, endoscopy.

SYMPTOMS

- LUTS e.g. Poor urinary stream
- Urinary incontinence
- Urinary retention (acute or chronic)

SIGNS

- There may be none
- Bladder may be palpable if there is retention
- Localized induration may be felt along the urethra
- Failure of catheterisation – this heightens the suspicion of a stricture
- Complications
• Periurethral abscess
• Superficial extravasation of urine
• Urethrocutaneous fistula

INVESTIGATIONS

• Urinalysis
• Urine culture and sensitivity
• Blood urea, electrolytes and creatinine
• Retrograde urethrogram
• Antegrade urethrogram – provided a suprapubic catheter is in place

TREATMENT

Non–pharmacological Treatment

• Try catheterisation – a gentle attempt is made to pass a urethral catheter, which will be held up, at the site of stricture. Confirmation of site of obstruction is still needed

• Manage associated complications first as follows

Initial Treatment

• Acute retention of urine. Urethral catheterisation will not be feasible
• Try suprapubic cystostomy or suprapubic needle puncture and aspiration – try this procedure if facilities for suprapubic cystostomy are lacking. Aspirate as much urine as possible to decompress the bladder and relieve pain before referral

Definitive treatment

In most cases REFERRAL to a specialist centre will be necessary

REFER

Refer to specialist for further investigations prior to definitive treatment

VASECRETOMY

Vasectomy is a permanent male contraceptive method which is a simple and safe day surgical procedure. It is carried out by trained surgeons usually under local anaesthesia after careful counselling and informed consent. Vasectomy is the most effective male family planning method. Involving males in reproductive health and family planning has several benefits and has a positive impact on society. Vasectomy should be encouraged for appropriate clients. It is less invasive and simpler than female sterilisation.

Misconceptions

• Vasectomy is ligation of the vas deferens and NOT CASTRATION

• Vasectomy does not affect erection

• Vasectomy does not affect ejaculation and orgasm. There would be normal ejaculation but the semen does not contain spermatozoa.

• Vasectomy does not work immediately. A back–up method of contraception until after at least 20 ejaculations or 3 months after the procedure or until examination of semen shows no sperm.
Effectiveness rates of various male contraceptive methods:

- Vasectomy – 99.85%
- Male condom – 86%
- Withdrawal method – 81%

Preoperative requirements

- Detailed counselling and informed consent
- Medical history
- Physical examination
- Laboratory investigations e.g. Hb, sickling, urine analysis

REFER

Referral to Family Planning Units or Urologists if available

LYMPHATIC FILARIASIS

Lymphatic filariasis is a parasitic infection by the microfilarial worm Wuchereria bancrofti involving the lymphatic channels of the extremities, the breasts and the genitalia. Anopheles mosquito is the vector. It is the second commonest cause of disability in the world.

SYMPTOMS and SIGNS

Lymphatic filariasis presents in three forms:

- Asymptomatic in which there may be no symptoms at all. Diagnosis can only be made through blood film smear for microfilariae, immunochromatographic antigen test (ICT) and ultrasound scan of lymphatics
- Acute presentations: Infection of entry skin lesions with fever, chills, pain and swelling, epididymitis, epididymoorchitis, adenolymphangitis, and acute filarial lymphangitis
- Chronic manifestations: hydroceles, lymphangiectasia, lymphoedema and elephantiasis

INVESTIGATIONS

- Night blood smears for microfilariae. The blood should be taken between 11pm and 2am
- ICT antigen test
- Full blood count
- Urinalysis for chyluria, red blood cells
- Ultrasound scan

TREATMENT

Non–Pharmacological Treatment

- Hygiene and washing affected areas with soap and water and keeping them clean
- Elevation of affected limbs in lymphoedema and elephantiasis. Surgery should be avoided in elephantiasis of the limbs because it worsens the disease in the long run
- Gentle controlled exercises of affected limbs
• Application of cold compresses during acute attacks

Pharmacological Treatment

(Evidence Level: A)

• Ivermectin, oral, 150 microgram/kg body weight plus Albendazole, oral, 400 mg given every 6–12 months

• Antibiotics for infected skin lesions
  Flucloxacillin or Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly for 5 days.

• NSAIDs for pain and inflammation – Diclofenac, oral, 25–50 mg 3 times daily

Surgical

Hydrocelectomy for hydroceles.

CHAPTER 11: SEXUALLY TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs) form a major health problem because of their frequency of occurrence and their potential for chronic morbidity. They result in complications with sequelae such as infertility, ectopic pregnancy, urethral stricture, cervical cancer, congenital syphilis, foetal wastage, low birth weight, prematurity and ophthalmia neonatorum. STIs also facilitate the transmission of the HIV virus.

DIAGNOSIS

In dealing with patients with STIs, privacy and confidentiality are essential especially with respect to history taking and examination.

With most STIs, one cannot usually tell which organism is causing the problem from the history and physical examination alone. Therefore, one must treat, on clinical grounds, the most common causes of the collection of symptoms and signs that are presented (syndromic management).

MANAGEMENT OF CLINICAL SYNDROMES

URETHRAL DISCHARGE

This is the presence of exudate from the anterior urethra sometimes accompanied by dysuria or urethral discomfort on urination.

COMMON CAUSES

• Neisseria gonorrhoea
• Chlamydia trachomatis

SYMPTOMS AND SIGNS

• Urethral discharge
• Dysuria/Discomfort on urination
• Genital sore

Gonococcal urethritis tends to produce more severe symptoms and has a shorter incubation period (2–3 days). The discharge is also purulent and abundant.
Chlamydia urethritis (also called non-Gonococcal urethritis) produces a scanty to moderate white mucoid or serous discharge and is often seen 1–3 weeks after sexual intercourse.

**TREATMENT**

**Therapeutic objectives**

- To treat gonorrhoea and chlamydia urethritis
- To prevent further transmission to sexual partners
- To reduce risk of HIV infection

**Pharmacological Treatment**

*(Evidence rating: C)*

Treatment must be effective for both gonococcal and non-gonococcal urethritis.

**Gonorrhoea**

- Ciprofloxacin, oral, 500 mg as a single dose.* or Ceftriaxone, IM, 250 mg as a single dose)*
  plus

**Chlamydia**

- Doxycycline, oral, 100 mg 12 hourly for 7 days;* or Tetracycline, oral, 500 mg 6 hourly for 7 days or Erythromycin, oral, 500 mg 6 hourly for 7 days

Patients have to be counselled to complete treatment as given, even when symptoms subside. All sexual partners of the patient within the last 3 months need to be seen and treated.

If the urethral discharge persists after treatment consider:

1. Non adherence to therapy
2. Re-infection
3. Treatment failure

For (i) and (ii), repeat treatment and counsel patient. In case of treatment failure, refer the patient to a facility where microbiology culture and antimicrobial susceptibility can be done on the discharge.

The flow chart below may be applied in the management of a patient with urethral discharge.
Every woman at a point in her menstrual cycle has a vaginal discharge. It is important for all women to know what their "normal" discharge is. When there is a change in the colour, odour, consistency or an increase in the flow of this discharge, or when the discharge is accompanied by symptoms such as itching, dysuria (discomfort or pain on urinating), genital swelling, lower abdominal pain or back pain, then she needs to seek medical assistance.

**CAUSES**

- Candidiasis
- Trichomoniasis
- Bacterial vaginosis
- Gonorrhoea
- Chlamydia
- Foreign bodies
- Herbal preparations

**SYMPTOMS AND SIGNS**

Discharges due to the following conditions may be characteristic:

- Candidiasis – white, lumpy or thick discharge associated with itching.
- Trichomoniasis – green or yellow, smelly, bubbly or frothy discharge associated with itching.
- Bacterial vaginosis – grey or white, fishy smelling discharge, especially after sexual intercourse.

Vaginal discharge of STI origin may arise from the vagina (vaginitis) or from the cervix (cervicitis).

**Risk Assessment**
Parameters used in the risk assessment for cervicitis are:

i. Patient’s partner is symptomatic (i.e. partner has a urethral discharge)
ii. Patient is less than 21 years old
iii. Patient is single
iv. Patient has more than one sexual partner
v. Patient has had a new sexual partner in the last 3 months

The risk assessment is said to be positive if

a. The answer to (i) is yes or
b. The answer to any 2 of items (ii) – (v) is yes.

Therefore, if a woman has a vaginal discharge, and also a positive risk factor, she is treated for both vaginitis and cervicitis. If she has a vaginal discharge with no positive risk factor, she is offered treatment for vaginitis alone.

TREATMENT

Therapeutic objectives

• To treat for vaginitis
• To treat for cervicitis if indicated
• To stop transmission/reinfection

Considerations for selecting treatment include pregnancy status, patient discomfort, and the most likely aetiology.

Vaginitis:

• Metronidazole, oral, 400 mg 8 hourly for 5 days or Metronidazole, oral, 2 g stat (for trichomoniasis and bacterial vaginosis)

NB: Metronidazole is contraindicated during 1st trimester of pregnancy. May use 2% Clindamycin cream in pregnancy. plus

Candidiasis:

• Clotrimazole vaginal tablets 200 mg inserted into vagina at night for 3 days or Miconazole vaginal tablets 200 mg inserted into vagina at night for 3 days
• Vulval irritation may be relieved with Clotrimazole cream applied twice a day.

If risk assessment is positive, add the following for cervicitis:

Gonorrhoea:

• Ciprofloxacin, oral, 500 mg as single dose (avoid in pregnancy) (or Ceftriaxone, IM, 250mg as a single dose.)

Plus

Chlamydia:

• Doxycycline, oral, 100mg 12 hourly for 7 days or
• Tetracycline, oral, 500mg 6 hourly for 7 days
• Erythromycin, oral, 500mg 6 hourly for 7 days

NB: Avoid doxycycline and tetracycline in pregnancy and nursing mothers.

The following flow chart below may be used in the syndromic management of vaginal discharges

**VAGINAL DISCHARGE FLOWCHART**

Risk Assessment Positive

- Treat for cervicitis and vaginitis only
- Educate
- Counsel if needed
- Promote/provide condoms
- Partner Management
- Return if necessary

Risk Assessment is Positive when

- Partner symptomatic or any two of the following:
  
  • Age <21 years
  • Single
  • >1 partner
  • New partner in past 3 months.

**LOWER ABDOMINAL PAIN IN A WOMAN**

Lower abdominal pain in a woman may have many causes. These include:

- Pelvic inflammatory disease
- Ruptured ectopic pregnancy

**SOME OF THESE CAUSES ARE SURGICAL EMERGENCIES AND EXTREME URGENCY IS NEEDED IN THEIR MANAGEMENT.**

Pelvic inflammatory disease (PID) refers to pelvic infections in women including infections of the fallopian tubes, uterus, ovaries or other structures in the pelvis. It is caused by organisms which ascend from the lower genital tract and invade the endometrium, fallopian tubes, ovaries and the peritoneum.

PID may be caused by STI related organisms or other bacteria. STI related causes include:
• Gonorrhoea
• Chlamydia infection
• Anaerobic organisms

In any sexually active woman with suspected PID who has not recently delivered, or who has no history of uterine instrumentation, STI related organisms are the likely cause.

SYMPTOMS

• Fever
• Lower abdominal pain
• Pain with sexual intercourse (dyspareunia)
• Vaginal discharge.

SIGNS

• A bimanual vaginal examination will cause pain on moving the cervix (cervical excitation).
• Lower abdominal tenderness

TREATMENT

(Evidence rating: C)

Treat for gonorrhoea plus chlamydia plus anaerobic bacteria with:

**Gonorrhoea**

- Ciprofloxacin, oral, 500 mg single dose or Ceftriaxone, IM, 250 mg stat plus

**Chlamydia**

- Doxycycline, oral, 100 mg 12 hourly for 7 days.
  Alternatively,
  Tetracycline, oral, 500 mg 6 hourly for 7 days or
  Erythromycin, oral, 500 mg 6 hourly for 7 days

**plus**

**Anaerobic Bacteria**

- Metronidazole, oral, 400 mg 8 hourly for 10 days
GENITAL ULCERS IN A MAN OR WOMAN

Genital ulcers may be painful or painless and frequently are accompanied by inguinal lymphadenopathy (a break in the continuity of the skin or mucosa of the genitalia). They increase a patient's susceptibility to HIV infection.

CAUSES

- Syphilis
- Chancroid
- Lymphogranuloma venereum
- Herpes simplex
• Granuloma inguinale

SYMPTOMS AND SIGNS

• Classical herpes lesions can be recognized by their appearance, which is a painful cluster of vesicles. These vesicles later break down into superficial ulcers in crops. The patient often gives a history of past episodes of similar lesions

• Ulcers due to chancroid are painful and have undermined ragged edges. The base is covered with a dirty purulent exudate and easily bleeds on touch

• Painless, indurated lesions with regular edges are most often due to syphilis

• A red beefy looking ulcer with an offensive discharge may be granuloma inguinale

However, because genital ulcers often do not correspond to classic descriptions, *in the syndromic management*, initial management should be directed at both syphilis and chancroid.

TREATMENT

If lesions are typical of herpes, then treat accordingly i.e. keep dry and clean and give analgesics if needed.

SYPHILIS

• Benzathine Penicillin, IM, 2.4 million units in 2 divided doses during one clinic visit; give one injection in each buttock.

  or

• Aqueous Procaine Benzylpenicillin (Procaine Penicillin), deep IM, 1.2 million units daily, for 10 days

For persons allergic to penicillin use:

• Doxycycline, oral, 100 mg 12 hourly for 15 days or
  Tetracycline, oral, 500 mg 6 hourly for 15 days or
  Erythromycin, oral, 500 mg 6 hourly for 15 days

plus

CHANCROID

• Ciprofloxacin, oral, 500mg 2 times daily for 3 days

  or

  Ceftriaxone, IM, 250mg stat or
  Erythromycin, oral, 500mg 6 hourly for 7 days

If the ulcer is improved after treatment, but not healed, repeat the treatment.

REFER

If the ulcer is no better or worse after treatment, refer to a facility with microbiology support to exclude other causes
Genital ulcers may be managed via the flow chart below

**GENITAL ULCER DISEASE FLOW CHART**

- **Patient complains of genital sore(s)**
  - Examine
  - **Ulcera Present?**
    - **NO**
      - **NO**
        - **Urethral or vaginal discharge present**
          - **EDUCATE**
          - **Counsel if needed**
          - **Promote /provide condoms**
          - **YES**
        - **YES**
          - **Treat for syphilis and chancroid**
          - **Educate**
          - **Counsel if needed**
          - **Partner management**
          - **Advise to return**

**HEALTH EDUCATION**

Management of STIs is not complete without patient education and counselling.

Necessary education to each STI patient includes the following:

1. **Notification of partner(s) (Contact tracing)**
   - Tell the patient that the ailment they have was acquired through sex
   - Tell the patient to inform his/her sexual partners in the last 3 months so that they may also be treated.

2. **Compliance**
   - Tell the patient how to take the medicine
   - Tell the patient to refrain from sex until all symptoms are gone and treatment of patients and their partners have been completed
   - Tell the patient to return to the clinic if treatment fails
   - The patient should avoid self medication and traditional remedies
3. Condom use

- Provide condoms and show how to use them

4. Risk reduction education

- Explain the risks and possible complications of the various STIs
- Counsel patients to reduce the number of sexual partners they have
- Counsel patients to avoid sex with persons who have multiple sexual partners

Remember that the patient with one STI may have another infection such as HIV.

CHAPTER 12: HIV INFECTION AND AIDS

HIV INFECTION

Acquired Immune Deficiency Syndrome (AIDS), caused by the Human Immune Deficiency Virus (HIV) is a disease which currently cannot be cured. It is transmitted through:

- Sexual contact with an infected person. The virus can pass from woman to man, man to woman as well as men who have sex with men
- Transfusion of HIV contaminated blood and blood products
- Use of contaminated needles and surgical instruments
- Traditional scarification, tattoos and circumcision practices (male and female) using contaminated instruments
- From mother to baby (vertical transmission) – through the placenta, during delivery or through breast milk.

Studies have shown that HIV is not transmitted by everyday social contact such as hugging or kissing, through food or water, or by mosquitoes and other biting insects.

A patient infected with HIV may remain healthy for many years but can still pass on the infection.

AIDS can affect both adults and children. The diagnosis of HIV infection is made by testing for antibodies in a blood test. AIDS which is a late stage of HIV infection is diagnosed clinically and confirmed by a positive HIV test.

Case definition of AIDS in adults and children: (modified Bangui Classification)

CHILDREN

Paediatric AIDS is suspected in an infant or child presenting with at least 2 of the following major signs associated with at least two of the following minor signs, in the absence of known cases of immunosuppression such as cancer or severe malnutrition or other recognized cases. The baby must also test positive for the HIV antibody.

Major Signs

- Weight loss or abnormally slow growth
- Chronic diarrhoea > 1 month
• Prolonged fever > 1 month

**Minor Signs**

• Generalized lymphadenopathy
• Oro–pharyngeal candidiasis
• Repeated common infections (otitis media, pharyngitis)
• Persistent cough
• Generalized dermatitis
• Confirmed maternal HIV infection

**ADULTS**

AIDS in an adult is defined by the existence of at least 2 of the major signs associated with at least 1 minor sign, in the absence of known causes of immunosuppression such as cancer or severe malnutrition or other recognized causes. The patient must also test HIV positive.

**Major Signs**

• Weight loss of more than 10% of body weight
• Chronic diarrhoea > 1 month
• Prolonged fever > 1 month (intermittent or constant)

**Minor Signs**

• Persistent cough for > 1 month
• Generalized pruritic dermatitis
• Recurrent herpes zoster
• Oro–pharyngeal candidiasis
• Chronic progressive and disseminated herpes simplex infection.
• Generalized lymphadenopathy

Apart from the above criteria, the presence of generalized Kaposi sarcoma or cryptococcal meningitis in an HIV positive patient is sufficient by themselves for the diagnosis of AIDS.

**TREATMENT**

**Therapeutic objectives**

• To prevent the transmission of HIV infection
• To treat opportunistic infection
• To provide psychosocial support
• To ensure appropriate and adequate nutrition

**Prevention of HIV Infection**

HIV infection is currently not curable. Therefore, the only way to stop the spread of HIV is by preventive methods. The main preventive method is to PROMOTE SAFER SEXUAL PRACTICES − abstinence, faithfulness and condom use.

**Pharmacological Treatment**

Anteretroviral treatment is only a part of the continuum of care for People Living with HIV/AIDS (PLWHAs). Consult the National Guidelines for Anti Retroviral Therapy (ART) in Ghana for guidance in the management of PLWHA. Available referral mechanisms to national treatment centres, linkages with PLWHA associations and home based care providers should be used as part of the management of patients.
Antiretroviral drugs are potentially toxic and should only be prescribed by trained teams who have experience with their use and the facilities to monitor patients.

Within health institutions, **NEVER USE:**

- Used needles
- Used syringes
- Used scalpels or blades
- Instruments that have not been properly decontaminated and sterilised
- Unscreened blood for transfusion.

**OCCUPATIONALLY ACQUIRED HIV INFECTION**

Health care workers (HCW) are at risk of acquiring HIV infection at the work place due to contact with body fluids from patients which may contain the virus. To prevent this from happening, HCW need to adopt universal precautions in their dealing with all patients and also in the handling of all body fluids. This includes amongst others, careful disposal of sharp objects e.g. needles and scalpels, and the use of protective barriers e.g. gloves and eye glasses.

Body fluids that have been implicated in the transmission of HIV include:

- Semen
- Vaginal secretions
- Breast milk
- Blood or other body fluids visibly contaminated with blood.

Transmission of HIV through cerebrospinal, synovial, pleural, pericardial and amniotic fluids has not been determined. In the same vein, even though the virus has been found in urine, tears, sweat and saliva, the infectiousness of these body fluids has not been determined. Nevertheless, these body fluids need to be handled with care.

Exposures at the work place that place HCW at risk of HIV infection include:

- Percutaneous injury i.e. a needle stick injury or cut with a sharp object
- Contact of mucous membranes (e.g. eyes) with body fluids
- Contact of non-intact skin (chapped, abraded, or skin afflicted with dermatitis) with body fluid
- Contact of intact skin with body fluid when the duration of contact is prolonged

Other factors that put the HCW at risk of HIV infection include a deep injury with a sharp instrument when there is visible blood on the device causing the injury, when the device has previously been placed in the source patient’s vein or artery (e.g. after a venepuncture), and when the source patient dies of an AIDS related illness.

**Management of exposure**

Not all exposures to HIV contaminated body fluid end up in HCW infections. It is estimated that the risk of transmission after percutaneous injury is 0.3% and 0.09% after a mucous membrane exposure. The risks after skin exposure to HIV infected blood is < 0.1%. The majority of exposures therefore do not lead to infection.

Thus, in the management of an exposed HCW it is important to evaluate the type of exposure (percutaneous, mucous membrane, skin), source material (blood, peritoneal fluid, urine etc), severity of exposure (deep injury, size of exposed surface, quantity of body fluid, integrity of skin), and HIV status of source material. The highest risk exposures are from a large volume of blood (e.g. deep injury with large diameter hollow needle previously in source patient’s vein or artery) and when the source patient is known HIV positive.
Health facilities need to keep a log book of records of such accidental exposures and periodically audit the records and plan preventive strategies to forestall such accidents.

Management of the exposed site includes:

- Washing wounds and skin sites that have been in contact with blood or body fluids with soap and water
- Flushing mucous membranes with water

There is no evidence that the use of antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk for HIV transmission.

As mentioned previously, the only way of preventing occupationally acquired HIV infection by HCW is the adoption of universal precautions at the work place.

**Post exposure prophylaxis (PEP)**

Within 24–48 hours of exposure, antiretroviral therapy when given may be able to prevent infection. It is important that it is initiated as soon as possible after the exposure (preferably within 1–2 hours).

The antiretrovirals used are potentially toxic, and PEP does not always work. In consideration for the initiation of PEP therefore, issues discussed above including nature, and type of exposure and HIV sero–status of source patient need to be addressed. When the sero–status of the source patient is not immediately known, PEP if deemed necessary, should be started, pending HIV antibody testing of source patient after appropriate counselling. If test results turn out negative, stop PEP. Otherwise it should be continued for 4 weeks. Patients taking PEP need to be counselled among other things on adherence to treatment, the toxicity of the drugs used and also that PEP may not prevent HIV infection all the time.

PEP needs to be initiated quickly when there is a recognised risk. Health facilities are therefore advised to keep emergency stocks of PEP medication, and designate a responsible official who can be called upon at all times to evaluate the risk, counsel a patient and start PEP.

**Assessment of exposure risk**

- Low risk exposure is described as:
  - Exposure to a small volume of blood or blood–contaminated fluids from asymptomatic HIV–positive patients with low viral load
  - An injury with a solid needle
  - Any superficial injury or mucocutaneous exposure

- High risk exposure is described as:
  - Exposure to a large volume of blood or potentially infectious fluid
  - Exposure to blood or blood contaminated fluids from a patient with a high viral titre i.e., in the AIDS phase or early sero–conversion phase of HIV
  - Injury with a hollow bore needle
  - Deep and extensive injury exposure

**INVESTIGATIONS**

Baseline tests:
• Full blood count
• Liver and renal function tests
• Hepatitis B surface antigen
• HIV serology/PCR if available

Two weeks:
• Full blood count
• Liver and renal function tests

Six weeks:
• HIV serology

Three and Six months:
• HIV serology

TREATMENT
The drugs and regimen used for PEP include:

(Evidence rating: A)

Low risk exposure:
Zidovudine, oral, 300 mg 2 times daily for 28 days plus
Lamivudine, oral, 150 mg 2 times daily for 28 days

High risk exposure:
Zidovudine, oral, 300 mg 2 times daily for 28 days plus
Lamivudine, oral, 150 mg 2 times daily for 28 days plus
Nelfinavir, oral, 750 mg 3 times daily (or 1250 mg 2 times daily) for 28 days

CHAPTER 13: INFECTIOUS DISEASES AND INFESTATIONS

FEVER
Fever is a common complaint, which is usually related to an infection of viral, bacterial or parasitic origin. It may be a valuable guide to the diagnosis and severity of infections.

Fever is defined as an axillary temperature above 37.5°C, read after keeping the thermometer in place for 5 minutes. Fever above 38°C in children and adults often need urgent attention especially if the patient is restless/delirious.

NOTE: In neonates and the elderly, severe infections may not be accompanied by a fever. In infants and young children, fever may be associated with:
• Convulsions
• Dehydration
INVESTIGATIONS

- Full blood count: raised white cell count, predominantly neutrophils, suggests a bacterial infection.
- Thin blood film for malaria parasites: presence of ring forms (trophozoites) suggests malaria.
- Cultures: urine, blood, sputum, ear, throat, wound, cerebrospinal fluid would confirm which bacterium is causing the infection.

TREATMENT

Non–pharmacological Treatment

Adults

- Keep the patient well hydrated with fluids
- Maintain nutrition
- Treat the cause of the fever (see table below)

Children

- Sponge the child with lukewarm water (pour it over them and leave it to dry on the skin).
- Keep the child well hydrated with a lot of fluids e.g. water, fruit juices, light koko, rice water or coconut milk.
- Keep the child well fed. Continue breast-feeding in babies.

Pharmacological Treatment

Adults:

- Give Paracetamol, oral, 1 g 3 to 4 times daily
- Treat the cause of the fever appropriately (see appropriate section)

Children:

- Give Paracetamol, oral, according to the dosage schedule below. Repeat 3 to 4 times daily up to a maximum of 4 doses/day

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 3 months;</td>
<td>10 mg/kg body weight</td>
</tr>
<tr>
<td>3 months–1 year;</td>
<td>60–120 mg</td>
</tr>
<tr>
<td>1–5 years;</td>
<td>120–250 mg</td>
</tr>
<tr>
<td>6–12 years;</td>
<td>500 mg</td>
</tr>
</tbody>
</table>

NOTE: DO NOT give Aspirin to children under the age of 16 years.
• Find the cause of the fever and treat (see guidelines)
• Control convulsions with Diazepam (see section on seizure disorders)

Guidelines for the Treatment of the Patient with Fever

Every fever should be investigated and treated appropriately. NOT EVERY FEVER IS DUE TO MALARIA OR TYPHOID. A thorough history, physical examination and appropriate investigation would usually reveal the cause of the fever.

<table>
<thead>
<tr>
<th>Complaints</th>
<th>Diagnosis* (See appropriate section)</th>
<th>Action* (See appropriate section)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigors, periodic fevers, sweating, general malaise, joint pains</td>
<td>* Malaria</td>
<td>* Take a blood film for malaria parasites and treat appropriately</td>
</tr>
<tr>
<td>Rigors, fever, sweating, general malaise, altered sensorium</td>
<td>* Cerebral Malaria</td>
<td>* Take a blood film for malaria parasites and treat appropriately</td>
</tr>
<tr>
<td>Headache, vomiting, drowsiness, stiff neck, seizures</td>
<td>* Meningitis</td>
<td>* Do not delay treatment while awaiting lumbar puncture.</td>
</tr>
<tr>
<td>Cough, brown sputum, rapid breathing, pain on deep breathing</td>
<td>* Pneumonia</td>
<td>* Give appropriate antibiotic</td>
</tr>
<tr>
<td>Increased frequency of urination and/or painful micturition, loin pain</td>
<td>* Urinary tract infection</td>
<td>Do urine examination plus culture and sensitivity; Give appropriate antibiotic</td>
</tr>
<tr>
<td>Fever, constipation or diarrhoea (may be with blood), headache, abdominal pain, general malaise</td>
<td>* Typhoid</td>
<td>Start appropriate treatment</td>
</tr>
<tr>
<td>Warm, swollen, painful, reddish looking limb</td>
<td>* Cellulitis or impetigo</td>
<td>Give appropriate antibiotic</td>
</tr>
<tr>
<td>Fever in a child with cough, sore throat and red ear drums</td>
<td>Otitis media</td>
<td>Give appropriate antibiotic</td>
</tr>
<tr>
<td>Fever during pregnancy with loin pain</td>
<td>Pyelonephritis</td>
<td>Take sample for urine c/s and give appropriate antibiotic</td>
</tr>
<tr>
<td>Pain in a bone (usually a limb bone), painful to touch</td>
<td>* Osteomyelitis</td>
<td>X–ray the affected part; treat as for osteomyelitis</td>
</tr>
<tr>
<td>Jaundice preceded by feeling unwell, anorexia, low grade fever</td>
<td>Viral hepatitis</td>
<td>Do liver function tests, Hepatitis B surface antigen; treat conservatively, bed rest</td>
</tr>
<tr>
<td>Headache, body ache, running nose, sneezing</td>
<td>Common cold or influenza</td>
<td>Give Paracetamol if required</td>
</tr>
<tr>
<td>Long standing fever, weight loss, chronic diarrhoea, lymphadenopathy</td>
<td>Acquired immunodeficiency syndrome</td>
<td>Manage as appropriate (see section on HIV)</td>
</tr>
<tr>
<td>Tonsilitis and Pharyngitis</td>
<td>Upper Respiratory Tract Infection</td>
<td>Manage as appropriate</td>
</tr>
</tbody>
</table>
TUBERCULOSIS

This is a disease caused by *Mycobacterium tuberculosis*. It is spread through droplets when a patient with 'open' tuberculosis of the lungs coughs out. It may affect any part of the body but the commonest site is the lung. Since it is CURABLE, it is better to get help for the person who has the disease rather than deny them appropriate treatment.

All children should have the BCG vaccination for protection at birth.

Tuberculosis is airborne and thus spreads easily. Persons with lowered resistance to infection like HIV/AIDS patients, are especially at risk of developing TB. Tuberculosis may be the initial illness in a patient with AIDS.

SYMPTOMS

Adults:

- Cough that lasts for more than 3 weeks
- Chest pain
- Loss of weight
- Cough with sputum containing small amounts or a lot of bright red blood.
- Mild fever
- Evening or night sweating

Suspect tuberculosis in a case of a productive cough of at least three weeks standing that is not resolving despite adequate antibiotic treatment intended for pneumonia.

Children:

Susceptibility to infection is increased with chronic illness or malnutrition. Presenting symptoms usually are minimal and include:

- Slightly elevated temperature that is persistent (lasting 2–3 weeks)
- Weight loss
- Fatigue
- Irritability
- Malaise
- Late symptoms include chest pain, and cough

Suspect tuberculosis in any child with severe malnutrition who is showing poor response to dietary treatment.

INVESTIGATIONS

- Sputum test for the presence of acid fast bacilli (AFB). A patient is said to have sputum smear positive TB if AFBs are found in his sputum smear microscopy.
  - Chest x-ray
  - Full blood count, ESR

Reassess any patient who continues to cough for more than 3 weeks after appropriate antibiotic treatment and has had 3 negative sputum smears. If TB is still suspected, a chest x-ray may be done. Be aware that no chest x-ray pattern is absolutely typical of TB. However, classically in TB, there are upper lobe infiltrates or bilateral infiltrates, with cavitation and pulmonary fibrosis. This classical pattern is seen more in HIV negative patients.

In both adults and children, other parts of the body may be affected. These are:
• Spine (bone)
• Skin and lymph nodes
• Brain and meninges
• Disseminated throughout the body (Miliary tuberculosis)

TREATMENT

Treatment objectives

• To cure the disease
• To prevent further transmission
• To offer psychosocial support

Treating tuberculosis means that the patient has to take the medicines continuously for many months. The patient must be told this so he/she does not stop taking the medication just because he/she feels well. Close contacts must be examined or investigated to rule out TB disease (Refer to the National Tuberculosis Programme (NTP) guidelines).

Where a child is affected, always check adult contacts with productive cough. The patient should eat well, especially foods with plenty of protein and vitamins, and must try to get enough rest.

Severely ill TB patients including patients with extrapulmonary tuberculosis like tuberculous meningitis, miliary tuberculosis, spinal tuberculosis with paralysis should be admitted for initial intensive phase of treatment.

Pharmacological Treatment

(Evidence rating: C)

There are three main types of treatment regimes:

a) Short course – Direct Observed Therapy (DOT)
b) Standard Course
c) Retreatment

A. Short Course – Direct Observed Therapy (DOT)

• Eight months duration of treatment
  This course is for:

  • New, smear-positive pulmonary tuberculosis patients and
  • Patients whose sputum smears are negative, but who are seriously ill.

  Streptomycin, IM,
  Adults: 1 g each day for 2 months (reduce dose for the elderly and emaciated)
  Children: 20 mg/kg body weight each day for 2 months

  Isoniazid, oral
  Adults: 300 mg daily for 6 months
  Children: 10 mg/kg body weight daily for 6 months

  Rifampicin, oral
  Adults: 600 mg daily for 6 months
  Children: 10 mg/kg body weight daily for 6 months

  Pyrazinamide
  Adults: 2 g daily (4 tablets) for 1st 2 months only
  Children: 35 mg/kg body weight daily for 1st 2 months only.
To prevent the development of drug resistance to Rifampicin it is recommended that RIFINAH (Isoniazid + Rifampicin) is used. Prescribing Rifampicin alone must be discouraged.

During this phase the patient must swallow all the oral drugs preferably on an empty stomach under direct observation before the streptomycin injection. The patient needs to be under close supervision by a health worker or any responsible person or member of the community with support from health staff during the full duration of treatment.

This is followed by 6 months continuation phase with Isoniazid plus Thiacetzone (Red/Blue tablet)

**Adults:**

One red tablet daily

If there is a high suspicion of HIV infection in a patient, the drugs for the continuation phase may be changed to Isoniazid plus Ethambutol.

Thiacetzone causes severe adverse reactions (skin reactions) in patients with HIV/AIDS.

**B. Standard Course:**

- This is of 12 months duration for
  
  a) Smear negative pulmonary tuberculosis and
  b) Extrapulmonary tuberculosis.

- Consists of 2 months intensive treatment with Streptomycin, Isoniazid and Thiacetzone (Red/Blue tablet). This is followed by a 10−month continuation phase of Isoniazid plus Thiacetzone.

**C. Retreatment Regimen:**

This is for:

- a) Relapse
- b) Treatment failure

It consists of an initial intensive phase of five drugs – Rifampicin, Isoniazid, Pyrazinamide and Ethambutol daily for at least 3 months, supplemented with Streptomycin for the first 2 months.

This phase should be strictly supervised and possibly the patient admitted. The continuation phase is with Rifampicin and Isoniazid and Ethambutol 3 times weekly for a further 5 months.

During the course of the treatment, smear positive TB patients should have their sputum periodically examined (at 2, 5 and 8 months). Refer to NTP guidelines.

**Prevention of Tuberculosis**

(a) For the individual:

- BCG immunization of new−born or at first contact
- Isoniazid in new−born babies of mothers with tuberculosis and children with a BCG abscess.
- Isoniazid chemoprophylaxis for children under 5 with a history of contact of infectious TB cases (refer NTP) Guidelines

(b) For the community
• Seek out and treat infective cases. Encourage affected community members to seek treatment.
• Improve housing and nutritional status
• Examine close contacts of infectious cases.
• Good nutrition, refrain from alcohol and smoking
• Avoid contracting HIV infection

MENINGITIS

This is an infection of the coverings of the brain, and is most commonly caused by bacteria. One type, cerebrospinal meningitis (CSM), caused by Neisseria meningitides, is common in the Northern and Upper regions of Ghana, and usually occurs in epidemics during the harmattan season. This type is contagious and usually presents with a short history. The presentation may sometimes be confused with cerebral malaria. Sometimes meningitis may be caused by Mycobacterium tuberculosis; following spread from another site of the body e.g. the lungs. The presentation for this type of meningitis is usually one of gradual onset.

Adults and older children:

SYMPTOMS

The patient complains of or is brought in with:

• Fever
• Neck pains
• Severe headaches
• Photophobia
• Coma
• Convulsions
• Vomiting

SIGNS

• Fever
• Neck stiffness
• Positive Kernig's sign
• Altered consciousness

Children less than 1 year old:

Diagnosis is more difficult, so a high index of suspicion is needed. Symptoms and signs are non−specific and include:

• Irritability
• Refusal to eat
• Poor sucking
• Vomiting
• Drowsiness and weak cry
• Neck may be retracted and arched backwards
• Focal or generalized convulsions after which the child is sleepy
• Presence or absence of fever
• Presence or absence of neck stiffness
• Baby may be hypotonic – no strength in any of his limbs
• Bulging fontanelle
• Coma

INVESTIGATIONS
• Full blood count
• Blood film for malarial parasites (to exclude cerebral malaria)
• Lumbar puncture
• Blood culture and sensitivity

TREATMENT

Non-pharmacological Treatment

• Fever in children – sponge frequently
• Convulsions: Diazepam, IV (see section on seizure disorders)
• Maintain good nutrition
• In patients in coma, pass a nasogastric tube, and feed often with small quantities of sweetened milky “akasa”. (Heavy feeds would cause vomiting and aspiration of the food)
• Keep the airway clear
• With epidemic meningitis the local and regional authorities need to be informed urgently

Pharmacological Treatment

(Evidence rating: A)

Adults:

Antibiotics should be given for a total of 14 days. All treatment should be intravenous initially for a minimum of 7 days and should be started without delay. This may subsequently be changed to oral therapy with significant clinical improvement

Benzylpenicillin, IV, 4 MU 4 hourly (subsequently Amoxicillin (Amoxycillin), oral 500 mg 8 hourly for remainder of treatment course)

plus

Chloramphenicol, IV, 1 g 6 hourly (subsequently Chloramphenicol, oral, 500 mg 6 hourly for remainder of treatment course)

Alternatively for all types of bacterial meningitis, Ceftriaxone may be administered.

Ceftriaxone, IV, 2–4 g daily for 7 days. (subsequently Amoxicillin (Amoxycillin), oral 500 mg 8 hourly for remainder of treatment course)

Children:

All treatment should be intravenous for a minimum of 10 days in children, and should be started without delay.

Benzylpenicillin, IV, 0.2 MU/kg body weight 6 hourly

plus

Chloramphenicol, IV, 25mg/kg body weight 6 hourly

Alternatively for all types of bacterial meningitis, Ceftriaxone may be administered

Ceftriaxone, IV, 50–60 mg/kg body weight once daily for 7 days.
If cerebrospinal meningitis is suspected give Benzylpenicillin, IV

**Adults:** 4 MU 4 hourly for 14 days  
**Children:** 0.2 MU/kg BW 6 hourly for 14 days  

**plus**  
Chloramphenicol, IV  

**Adults:** 1 g 6 hourly for 14 days  
**Children:** 25 mg/kg BW 6 hourly for 14 days  

**Prophylaxis for CSM**  
Prophylactic treatment is recommended for patients 2 days prior to discharge and also for their close contacts  

Ciprofloxacin, oral:  

**Adults:** 500mg as a single dose  
(Avoid in pregnancy)  

**Children**  
5–12 years: 250 mg as a single dose  

Or  
Ceftriaxone, IM:  

**Adults:** 250 mg as a single dose.  
**Children:**  
Under 12 years: 125 mg as a single dose  

**TYPHOID FEVER**  
Typhoid fever (enteric fever) is a common disease wherever sanitary conditions are poor. The infection is caused by consumption of food or water contaminated by faeces. It is caused by a bacterium, *Salmonella typhi*. The S. typhi invades the intestinal wall and spreads through the bloodstream to all organs. Typhoid fever can be a serious illness characterised by fever, abdominal symptoms, and may end fatally. However, typhoid fever is over diagnosed by many practitioners in Ghana based on only a Widal test, which is an unreliable indicator of typhoid infection. The indiscriminate use of antibiotics for this condition has resulted in the resistance of S. typhi to previously effective treatments such as chloramphenicol. Evidence from many centres in Ghana show some resistance to chloramphenicol.  

**SYMPTOMS**  
- Fever which increases gradually to a high fever and persists for weeks (fever does not respond to antimalarials)  
- Constipation in the early stages  
- Abdominal pain and diarrhoea in the second week of illness  
- Severe headache  
- Dry cough  
- Psychosis and confusion in 10% of adults
SIGNS

- High fever with a relatively slow pulse rate (occasionally pulse is fast especially with myocarditis or intestinal perforation)
- Abdominal tenderness
- Hepato–splenomegaly
- Mental confusion

COMPLICATIONS

- Intestinal perforation with peritonitis (rapidly fatal, refer urgently to a surgeon) – presents as severe abdominal pain, tenderness, rebound tenderness and guarding
- Acute psychosis (never refer any patient with fever and psychosis to the psychiatric hospital)
- Severe intravascular haemolysis leading to acute renal failure especially in G6PD deficiency

INVESTIGATIONS

- FBC, differential, blood film for malaria parasite
- Blood culture
- Stool culture
- Urine culture
- Widal test – unreliable

SPECIAL NOTE

- Diagnosis of typhoid fever is based on a strong clinical suspicion backed by
  - blood cultures, positive during first 10 days of fever
  - stool cultures, positive after tenth day up to fourth or fifth week
  - urine cultures, positive during second and third week

- The above tests are superior to the Widal test, which is unreliable and rarely useful, in confirming a diagnosis of typhoid fever

- A Widal test with 'O' titres of 1/160 or less seldom suggests typhoid fever in the absence of positive blood and stool cultures

- The Widal test, if done, must be repeated after 10 days

- A two–fold or more increase in titre on the repeat test increases the possibility of typhoid

- Positive Widal's test may occur in non–specific febrile illnesses (anamnestic reaction) and autoimmune disease

- More than 10% of patients with typhoid fever have a negative Widal's test

TREATMENT
Pharmacological Treatment

(Evidence rating: B)

Ciprofloxacin, oral

**Adults:** 500 mg 12 hourly for 14 days  
**Children:** 10 mg/kg BW 12 hourly for 14 days  

or

Ciprofloxacin, IV, may be given in severely ill patients who cannot take oral medication. Revert to oral medication as soon as clinically indicated.

**Adults:** 200 mg 12 hourly  
**Children:** 10 mg/kg body weight 12 hourly

**CAUTION:**

Ciprofloxacin should be used with caution in children. Ciprofloxacin may rarely cause tendinitis. At the first sign of pain or inflammation, patients must discontinue treatment and alternative treatment (e.g. Ceftriaxone) started.

Alternatively

Ceftriaxone, IV,

**Adults:** 1−2 g daily for 7 days

**REFER**

Refer very ill if patients who require hospitalisation for intravenous fluids or antibiotics or are suspected to have intestinal perforation or intravascular haemolysis. Before referral, start oral antibiotics. If peritonitis is suspected give the antibiotics intravenously.

**MALARIA**

Malaria is one of the commonest causes of fever in children and adults in Ghana. Most often patients complaining of fever are treated for malaria. However, malaria is only one of several causes of fever.

The malaria parasite is transmitted through the bite of an infected female anopheline mosquito. The commonest parasite responsible for malaria in this country is *Plasmodium falciparum*. Other species are *Plasmodium ovale*, and *Plasmodium malariae*.

Education of the public on personal protection against mosquito bites, maintenance of clean domestic surroundings and use of insecticide treated materials e.g. bed nets, will help reduce the level of the disease in the community.

**REMEMBER: NOT EVERY ‘FEVER’ IS DUE TO MALARIA!!**

**SYMPTOMS**

**Adults and Older Children:**

- Fever, usually high and intermittent
- Feeling cold, with sweating and rigors
- Body aches and pains and weakness
- Headaches and bitter taste in the mouth
- Sometimes vomiting, diarrhoea and abdominal pain
• Poor appetite

Young children:
• Poor appetite, diarrhoea, fever
• May progress to fits and coma

SIGNS
• Warm to touch
• May be anaemic
• No other obvious cause of fever (see section on fever)

Signs suggesting complicated malaria or severe infection requiring urgent hospital admission include:
• Dark coloured urine
• Drowsiness or coma
• Jaundice
• Inability to stand or support oneself
• Persistent vomiting
• Temperature over 39°C
• Anaemia
• Poor urine output

INVESTIGATIONS
• Full Blood Count
• Blood film for malaria parasites (shows trophozoites or ring forms)

TREATMENT

(Evidence rating: B)

Amodiaquine–Artesunate is currently the drug combination of choice for the treatment of uncomplicated malaria in Ghana.

Recommended dosages for amodiaquine, oral

Adults: 25–30 mg/kg body weight over 3 days or 3 tablets of Amodiaquine (200 mg base/tablet), daily for 3 days

Children: 25–30 mg/kg BW given over 3 days

The recommended dosage regime for the artesunate–amodiaquine combination is as follows:

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Age (years)</th>
<th>Artesunate tablets</th>
<th>Amodiaquine base tablets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
</tr>
<tr>
<td>5–10</td>
<td>Infants</td>
<td>25 mg</td>
<td>25 mg</td>
</tr>
<tr>
<td>11–24</td>
<td>1–6</td>
<td>50 mg</td>
<td>50 mg</td>
</tr>
<tr>
<td>24–50</td>
<td>7–13</td>
<td>100 mg</td>
<td>100 mg</td>
</tr>
</tbody>
</table>
Artesunate should not be used in the treatment of malaria in pregnant women in the first trimester. Artesunate can, however, be used in the second and third trimesters if treatment is considered to be lifesaving for the mother and other antimalarials are considered to be unsuitable.

Additional Treatment

In children sponge with water if temperature is high. Give Paracetamol syrup 3–4 times a day as shown below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 3 months</td>
<td>10mg/kg body weight</td>
</tr>
<tr>
<td>3 months–1 year</td>
<td>60–120 mg</td>
</tr>
<tr>
<td>1–5 years</td>
<td>120–250 mg</td>
</tr>
<tr>
<td>6–12 years</td>
<td>250–500 mg</td>
</tr>
</tbody>
</table>

MALARIA TREATMENT FAILURE

In case of treatment failure i.e. blood smear positive for malaria parasites (trophozoites) after full treatment with Amodiaquine–Artesunate start the patient on Quinine.

Quinine, oral

Adults: 600 mg 8 hourly for 7 days

Children: 10 mg/kg body weight 8 hourly for 7 days

MALARIA IN PREGNANCY

Pregnant women are vulnerable to malaria. This is especially so in women in their first and second pregnancies. To prevent malaria in pregnancy and the effects of malaria on the unborn child, intermittent preventive treatment (IPT) is to be used. In this regimen, the full dose of treatment for malaria using Sulphadoxine–Pyrimethamine (SP) is given by the directly observed therapy (DOT) method.

Cautions:

- Pregnant women who have glucose–6–phosphatase dehydrogenase (G6PD) deficiency or are allergic to sulpha–containing medicines should avoid sulphadoxine–pyrimethamine
- Those who have taken any sulpha–containing medicines within the past one month should not be given sulphadoxine–pyrimethamine. They would have to wait until their next Antenatal Clinic visit
- Sulphadoxine–pyrimethamine should not be taken before quickening or the 16th week of pregnancy or after the 36th week of pregnancy

Note: Pregnant women who fall under the above criteria should sleep under Insecticide Treated Nets (ITNs)

Schedule for IPT with Sulphadoxine–Pyrimethamine
1. When a pregnant woman comes to Antenatal Clinic in the second trimester, AFTER QUICKENING or after 16 weeks gestation, she should be given three tablets of sulphadoxine–pyrimethamine (500 mg/25 mg) as the first dose of IPT.

2. The second dose of three tablets of sulphadoxine–pyrimethamine (500 mg/25 mg) is to be given one month after the first

3. The third and final dose of three tablets of sulphadoxine–pyrimethamine (500 mg/25 mg) should be taken one month after the second dose and before 36 weeks gestation.

<table>
<thead>
<tr>
<th>Dose of SP</th>
<th>When It Should Be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Dose</td>
<td>After Quickening or 16 weeks of pregnancy</td>
</tr>
<tr>
<td>Second Dose</td>
<td>At least one month after first dose</td>
</tr>
<tr>
<td>Third Dose</td>
<td>At least one month after second dose</td>
</tr>
</tbody>
</table>

Malaria Prevention in HIV positive women

Pregnant women who are HIV positive should be given three tablets of sulphadoxine–pyrimethamine (500 mg/25 mg) monthly, beginning at 16 weeks until 36 weeks of pregnancy.

Treatment of Malaria in Pregnancy

When a pregnant woman gets malaria, she should be given a full course of quinine oral, 600 mg 8 hourly for 7 days.

CEREBRAL MALARIA

Cerebral malaria is a life threatening complication of malaria that may affect both children and adults and requires special attention. It is a very serious disease, which may rapidly cause death or permanent brain damage. The diagnosis is made on clinical signs and symptoms. The presence of malaria parasites seen under the microscope confirms the diagnosis; however, its absence does not exclude the diagnosis. Start treatment immediately when there is high clinical suspicion.

SIGNS AND SYMPTOMS

- High fever
- Headache
- Vomiting
- Neurological signs: confusion, irritability, drowsiness, convulsions, coma, focal neurological deficits and psychoses

TREATMENT

Quinine is the drug of choice for the management of severe malaria. It can be given IV or IM until the patient can take it orally, then switch to the oral route to complete a full 7–day course.

Quinine, parenteral:

IV administration of Quinine

**Adults:** Quinine dihydrochloride, IV, 10 mg/kg body weight of salt (max 600 mg), 8 hourly in 5% Dextrose (500 mls) given over 4 hours until patient can tolerate oral quinine.

**Children:** Quinine hydrochloride, IV, 10 mg/kg body weight of salt, 8 hourly in 5–10 ml/kg body weight of 4.3% Dextrose in 0.18% normal saline) given over 4 hours until patient can tolerate oral quinine.

IM administration of Quinine for adults and children
Quinine dihydrochloride, deep IM injection, 10 mg/kg body weight 8 hourly – use 100 mg/ml Quinine which can be obtained by diluting 600mg Quinine (2 ml–vial) in 4 ml water for injection or saline.

Parenteral treatment should be continued until patient can tolerate oral quinine which should then be given to complete the full 7–day course.

NOTE:

- Intramuscular injections of quinine are less hazardous to administer than intravenous quinine.
- IV quinine should be given in 5% dextrose infusion and over a 4 hour period. This should be repeated 8 hourly until the patient can tolerate oral quinine.
- Quinine injection should never be given as a bolus IV injection. If an IV infusion pump is available it should always be used.

Additional measures for the management of severe or complicated malaria are listed on the table below.

### Additional measures for the management of severe or complicated malaria

<table>
<thead>
<tr>
<th>Complication</th>
<th>Recognition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Postural hypotension</td>
<td>Severe dizziness or faintness on standing; marked blood pressure variation in lying and standing positions</td>
<td>Nurse in bed with patient on his/her side. Give Sodium Chloride, IV</td>
</tr>
<tr>
<td>2. Heavy parasitaemia Malaria Parasites ++++</td>
<td>Parasite (ring–form) density exceeding 5% infected red blood cells or 250,000 parasites/ml of blood</td>
<td>Parenteral Quinine until oral treatment possible</td>
</tr>
<tr>
<td>3. Hyperthermia, hyperpyrexia</td>
<td>Patient very hot to touch with a temperature of 40°C and above; dry skin</td>
<td>Fanning, tepid sponging and Paracetamol by mouth.</td>
</tr>
<tr>
<td>4. Severe Anaemia</td>
<td>Marked mucosal pallor, PCV less than 20% and Hb less than 7.0 g/dl. Hypoxia of signs of heart failure</td>
<td>Consider blood transfusion. (See section on anaemia)</td>
</tr>
<tr>
<td>5. Cerebral involvement</td>
<td>Altered consciousness (confusion, delirium, stupor, coma), convulsion, focal neurological abnormalities or psychoses</td>
<td>Maintain airway, give Diazepam IV for convulsions (may be given rectally) Exclude hypoglycaemia</td>
</tr>
<tr>
<td>6. Renal failure</td>
<td>Urine output of less than 30 ml per hour. It may be associated with dark coloured urine, persistent vomiting or diarrhoea</td>
<td>Ensure adequate hydration. If no improvement see section on Acute Renal Failure.</td>
</tr>
<tr>
<td>7. Jaundice</td>
<td>Yellow coloration of sclerae, bilirubin and urobilinogen in urine, the urine may be dark coloured</td>
<td>Evaluate jaundice, do LFTs, Check Hb and G6PD status and transfuse if anaemic. Maintain hydration to avoid renal failure.</td>
</tr>
<tr>
<td>8. Electrolyte/acid–base or fluid imbalance</td>
<td>Weakness, deep sighing respiration, dehydration, poor skin turgor, fast pulse, sunken eyes</td>
<td>Encourage fluid intake or start Sodium Chloride, IV</td>
</tr>
<tr>
<td>9. Hypoglycaemia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sweating, fast pulse, deepening coma, as complication of malaria or Quinine therapy

| 10. Acute pulmonary oedema | Breathlessness; Inability to lie flat; use of accessory muscles of respiration | Glucose, IV, 50 ml of 50% followed by Glucose 5%. Monitor random blood glucose | Nurse propped up; give oxygen; Give Furosemide (Frusemide), IV, 40 mg |

WORM INFESTATION (INTESTINAL)

Infestation with worms is very common. It is caused by poor hygiene or contact of bare skin with soil in which the worm or its eggs live.

COMMON WORM INFESTATIONS

- Hookworm
- Ascariasis
- Strongyloidiasis
- Tape worm
- Thread worm
- Whip worm

SYMPTOMS

- Generalised Itching – when the larvae are in the bloodstream
- Perianal itching – threadworm
- Dry cough and wheeze –when the larvae pass through the lungs
- Abdominal discomfort and sometimes pain
- General weakness and easy fatigability
- Presence of worm(s) in the stool, or vomitus

SIGNS

- Large swollen abdomen in children
- Anaemia
- Wheezing
- Poor physical growth in children
- Signs of malnutrition

TREATMENT

Treatment objectives

- To rid the gut of worms
- To correct effect of infestation e.g: anaemia, malnutrition

Pharmacological Treatment

(Evidence rating: B)

For Hookworm, Ascaris, Whipworm, *Threadworm:

*For threadworm infestations repeat treatment after 3 weeks

Mebendazole, oral,
Adults and children above 2 years; 100 mg twice daily for 3 days
Not recommended in children below 2 years and in pregnant women.

or

Albendazole, oral,

Adults and children above 2 years; 400 mg as a single dose
Children below 2 years; 200 mg as a single dose
Not recommended during pregnancy

For strongyloides

Tiabendazole (Thiabendazole), oral,

Adults: 1.5 g twice a day for 3 days
Children: 25 mg/kg body weight twice a day for 3 days

or

Albendazole, oral,

Adults and children above 2 years; 400 mg twice daily for 3 days. Repeat after 3 weeks if necessary
Children below 2 years; 200 mg once daily for 3 days
Not recommended during pregnancy

For tape worm

Niclosamide, oral,

Adults and children above 6yrs; 2g as a single dose
Children:
2–6 years; 1 g as a single dose
0–2 years; 500 mg as a single dose.

Chew tablets 2 hours before a meal.

or

Praziquantel, oral,

Adults and children: 10–20 mg/kg body weight as a single dose
For treatment of anaemia and malnutrition,(see appropriate Section)

CHAPTER 14: DISORDERS OF THE RESPIRATORY SYSTEM

COMMON COLD

This is a common viral infection of the nasopharyngeal mucosa. It is contagious and is spread by airborne droplets. The symptoms resolve without antibiotic treatment.
SYMPTOMS

Patients may have

- Runny nose
- Blocked nose
- Slight fever
- Cough with the cold
- Muscle aches

In children in addition to the above this may be the first sign of influenza or measles which may also have an associated conjunctivitis. It may also be complicated by an otitis media.

DO NOT GIVE ANTIBIOTIC TREATMENT since it is a viral infection.

TREATMENT

Therapeutic objectives

- To relieve any nasal congestion caused by secretions which may also cause blockage.
- To relieve any fever and soothe the patient.

Non-Pharmacological Treatment

- Rest
- Encourage lots of fluid intake

Pharmacological Treatment

(Evidence rating: A)

- Paracetamol or Asprin (in adults) to relieve the fever and associated muscle aches.

Paracetamol, oral,

Adults: 500 mg–1 g 3 to 4 times daily

Children:

3 months–1 year; 60–120 mg 3 to 4 times daily
1–5 years; 120–250 mg 3 to 4 times daily
6–12 years; 250–500 mg 3 to 4 times daily

Aspirin, oral,

Adults: 300–600mg 4 times daily

DO NOT USE ASPRIN IN CHILDREN UNDER THE AGE OF 16 YEARS

- Sodium Chloride 0.9% drops into each nostril to relieve congestion as required.

If 'cold' lasts longer than a week and there is persistent fever and cough associated with increased phlegm or offensive nasal discharge then consider the following:
• Secondary bacterial infection of the respiratory tract
• Influenza

See appropriate sections for treatment of the above conditions.

PNEUMONIA

Pneumonia is an infection of the lung tissue, caused by various bacterial species, viruses, fungi or parasites. Thus it is not a single disease but a group of specific infections. Identification of the causative organism is the key to correct treatment. However because of the serious nature of the infection antibiotic treatment should be started immediately before laboratory confirmation of the causative agent.

CAUSES

Community acquired pneumonia

In Ghana, it is commonly due to Streptococcus pneumoniae, Streptococcus pyogenes, Mycoplasma pneumoniae and Haemophilus influenza. In children during measles, whooping cough or other viral epidemics Staphylococcus aureus is the most important agent.

Hospital acquired pneumonia

Gram−negative bacteria, Pseudomonas aeruginosa and Staphylococcus aureus are the commonest agents.

SYMPTOMS

• Fever – may be of sudden onset
• Productive or non−productive cough
• Sputum production– yellowish–green, rusty or blood stained (always ask about colour and smell of sputum)
• Chest pain – worse on deep breathing or coughing
• Breathlessness

SIGNS

• Fast breathing (children < 1 year, 50 breaths per minute or more and 1–5 years 40 breaths per minute or more)
• Use of accessory muscles of respiration and flaring of the nasal margins
• Fever
• Fast pulse rate
• Signs of consolidation or effusion in the chest
• Cyanosis

INVESTIGATIONS

• Full blood count
• Chest x−ray
• Sputum culture/acid−fast bacilli
**TREATMENT**

**Non−Pharmacological Treatment**

- Nurse in comfortable position
- Control fever and pain
- Keep well hydrated

**Pharmacological Treatment**

*(Evidence rating: A)*

**ANTIBIOTICS**

**Adults (ambulatory patient):**

Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly for 7 days

If patient is allergic to penicillin give:

Erythromycin, oral, 500 mg 6 hourly for 7 days

**If severe (hospitalised patient) give:**

Benzylpenicillin, IV, 1−2 MU 6 hourly for 2 days, then Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly for 7 days

**Children (ambulatory patient):**

Amoxicillin (Amoxycillin), oral,

- <1 year; 62.5 mg 8 hourly for 7 days
- 1−5 years; 125 mg 8 hourly for 7 days
- 6−12 years; 250 mg 8 hourly for 7 days

**If severe (hospitalised patient) give:**

Benzylpenicillin, IV, 50,000 Units/kg body weight 6 hourly

Assess after 24−48 hours and change to Amoxicillin, oral or continue Benzylpenicillin, IV depending patient’s clinical state.

**REFER**

Refer to the nearest hospital if no improvement i.e. fever remains high or patient is still (or more) breathless. If patient is already in hospital then intravenous antibiotics should be considered and further investigations done.

**ASTHMA**

Asthma is a very common disease of the bronchial airways characterised by increased sensitivity to many external agents. Asthma is episodic and may be associated with seasons like the rainy season or harmattan.
Bronchial asthma occurs at all ages but peaks in childhood. It is classified as an allergic disease, which may be due to an external or intrinsic agent. The disease is associated with a personal or family history of hay fever, eczema or urticaria.

**CAUSES**

Factors that provoke asthma are:

- Allergens – house dust, animal hairs, strong scents, etc.
- Drugs e.g. beta-blockers (e.g. Propranolol), Prostaglandin F2α and Aspirin
- Environmental e.g. air pollution and climatic changes
- Occupational exposure to industrial chemicals, dust and drugs.
- Infections – viral or bacterial

**SYMPTOMS**

- Episodic breathlessness
- Cough
- Wheeze

**SIGNS**

- Tachypnoea (fast breathing)
- Rhonchi
- Use of accessory muscles of respiration
  Features of a life threatening attack are:
  - Inability of patient to speak full sentences in one breath
  - Rapid pulse > 140/min
  - Rapid respiration > 40/min
  - Cyanosis
  - Silent chest on auscultation
  - Drowsiness or confusion

**INVESTIGATIONS**

- FBC
- Chest X-ray

**TREATMENT**

*(Evidence rating: A)*

**MANAGEMENT OF ACUTE SEVERE ASTHMA**

- Give Oxygen, intranasal or by mask, in high concentration
- Nebulised Salbutamol 2–5 mg, repeat every 30 minutes until relief

plus
Adults:

- Hydrocortisone, IV, 200 mg or Prednisolone, oral, 20–40 mg daily.

Children:

- Hydrocortisone, IV,

<1 year; 25 mg 8 hourly
1–5 years; 50 mg 8 hourly
6–2 years; 100 mg 8 hourly

or

- Prednisolone, oral, 1–2 mg/kg body weight daily.
- If there is no improvement, add
  - Aminophylline, IV,

Adults: 250 mg over 20 minutes and repeat after 30 minutes if necessary
Children: 3–5 mg/kg body weight 6–8 hourly over 20 minutes as a slow bolus injection

DO NOT give any form of sedation.

- If patient is IMPROVING
  - Continue with Oxygen
  - Prednisolone, oral, 20–40 mg daily or Hydrocortisone, IV, 100 mg 8 hourly.
  - Nebulised Salbutamol 2–5mg 2–4 hourly or
  - Aminophylline, IV,

Adults: 250 mg 6 hourly
Children: 3–5 mg/kg body weight 6–8 hourly over 20 minutes as a slow bolus injection

- If patient is NOT IMPROVING
  - Continue Oxygen
  - Give nebulised Salbutamol, 2–5 mg more frequently every 15–30 minutes

plus

Adults:

- Aminophylline, IV infusion 250 mg in 500 ml of 5% Dextrose or 0.9% Sodium Chloride, 6 hourly
- Hydrocortisone, IV, 200 mg 6 hourly or Prednisolone, oral, 30–60 mg daily.

Children:

- Hydrocortisone, IV,
<1 years; 25 mg 8 hourly
1−5 years; 50 mg 8 hourly
6−12 years; 100 mg 8 hourly
or

- Prednisolone, oral, 1−2 mg/kg body weight daily

plus

- Aminophylline, IV, 3−5 mg/kg body weight 6−8 hourly over 20 minutes as a slow bolus injection
- Once patient is improving
  - Change to oral steroids
  - Wean off aminophylline and stop in 12−24 hours.
  - Reduce nebulised Salbutamol. Substitute with inhaled or oral Salbutamol after 24 hours.
  - Give written and oral instructions on how to tail off oral steroids. In children, give Prednisolone 1−2 mg/kg body weight for 3 days

REFER

- Rapidly deteriorating patients
- Poor response to acute managment
- Follow up in one week and refer patient to specialist for continued care.

MANAGEMENT OF CHRONIC ASTHMA IN ADULTS AND CHILDREN OF SCHOOL GOING AGE

First steps should be:

- Avoidance of provoking factors where possible
- Patients involvement and education in management
- Selection of the best treatment available
- Step up treatment as needed for good control
- Refer early for specialist care after STEP 2

AIMS OF MANAGEMENT

- Least possible symptoms
- Least possible limitation of lifestyle
- Least possible need for relief treatment or hospitalisation
- Least adverse effects from medications

(Evidence rating: A)

STEP 1

- Occasional use of bronchodilators for relief.
- If inhaled beta agonists or oral bronchodilators are needed more than once daily then move to Step 2 where a doctor should be involved.

STEP 2
• Regular twice daily use of inhaled Beclometasone (Beclomethasone) 200–400 microgram
  plus inhaled

• Salbutamol 100–200 microgram (1–2 puffs) 3–4 times daily.

STEP 3

• Regular, twice daily, use of inhaled Beclometasone (Beclomethasone) 400–2000 micrograms.

STEP 4

• High dose inhaled steroid as in Step 3 plus inhaled Salbutamol
• Modified-release Theophylline

STEP 5

• Addition of regular once daily Prednisolone, oral, 20–60 mg
• Regular oral Prednisolone in a single daily dose reducing to lowest dose possible or alternate daily dosage without provoking attacks.

STEPPING DOWN

Review treatment every 3–6 months. If control is good a stepwise reduction in treatment may be possible. When inhaled steroids are not available for Steps 2, 3 and 4, short courses of oral prednisolone can be used to control the attacks.

In adults, Prednisolone, oral 30 mg can be started and tailed off by 5 mg every third day as follows:

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose (mg)</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
|      |     |     |     |     | plus Salbutamol 4 mg 3 times a day

REFER

When patients need more than one course of Prednisolone in 3 months refer for specialist care.

ACUTE BRONCHITIS

This refers to an acute infection of the bronchial mucosa. It is often found in association with Upper Respiratory Tract infection.

SYMPTOMS

• Initial dry cough, later productive
• Anterior chest pain aggravated by coughing
• Low grade fever

SIGNS

• Rhinorrhea
• Normal respiration initially then crepitations and rhonchi

TREATMENT

Therapeutic objectives

• To relieve symptoms
• Antibiotic therapy for suspected bacterial infection

Non−Pharmacological Treatment

• Bed rest
• Keep well hydrated
• Give humidified air if possible

Pharmacological Treatment

(Evidence rating: C)

• Treat fever with Paracetamol, oral,

<table>
<thead>
<tr>
<th>Adults:</th>
<th>500 mg−1 g 3 to 4 times daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children:</td>
<td></td>
</tr>
<tr>
<td>3 months–1 year;</td>
<td>60–120 mg 3 to 4 times daily</td>
</tr>
<tr>
<td>1–5 years;</td>
<td>120–250 mg 3 to 4 times daily</td>
</tr>
<tr>
<td>6–12 years;</td>
<td>250–500 mg 3 to 4 times daily</td>
</tr>
</tbody>
</table>

• Most of the cases are viral so antibiotics are not required
• Antibiotics should however be prescribed if:

  • The patient is very ill
  • The patient is breathless
  • There is an underlying illness like malnutrition, measles, rickets, anaemia, diabetes mellitus, chronic bronchitis

CHRONIC BRONCHITIS

This is chronic inflammation of the bronchial mucosa of irritant (tobacco) or allergic (asthma) origin, progressing towards chronic respiratory failure. It is part of the syndrome of chronic obstructive airways disease (COAD).

SYMPTOMS AND SIGNS

• Morning cough with production of clear sputum
• Fever associated with secondary bacterial infection
• Production of thick offensive sputum
TREATMENT

Non-pharmacological Treatment

- It is important to always exclude tuberculosis by testing for acid-fast bacilli on the sputum produced
- Discourage smoking (cigarette, cigars, etc.)
- No antibiotics are needed unless there is secondary infection

Pharmacological Treatment

Amoxicillin (Amoxycillin), oral,

**Adults:** 500 mg 8 hourly for 7 days

**Children:**

- <1 year: 62.5 mg 8 hourly for 7 days
- 1−5 years: 125 mg 8 hourly for 7 days
- 6−12 years: 250 mg 8 hourly for 7 days

BRONCHIOLITIS

This is an acute viral infection of the bronchioles occurring in infants under 10 months of age which can lead to fatal acute respiratory failure. It tends to occur in epidemics during the cold seasons.

SYMPTOMS

- Onset often follows a cold
- Low grade fever
- Cough
- Breathlessness
- Wheezing

SIGNS

- Fast breathing
- Distention of nasal margins (alar flare)
- Chest wall between the ribs moves inwards a lot during breathing (intercostal recession)
- On auscultation there are rhonchi and crepitations
- Cyanosis (blue discolouration of lips, tongues and finger tips) if severe

TREATMENT

Therapeutic objectives

- To avoid worsening of obstruction by thick secretions
- To prevent hypoxia
- To prevent and ensure prompt treatment of respiratory failure

Non–Pharmacological Treatment

Bronchiolitis has a high mortality rate so it should ideally be treated in hospital
• Child should be propped up or held by the mother in a sitting position
• Keep well hydrated but avoid fluid overload

Pharmacological Treatment

(Evidence rating: C)

Antibiotics are given to very sick infants with suspected secondary bacterial infection.

Amoxicillin (Amoxycillin), oral,

<1 year; 62.5mg 8 hourly for 7 days.
1–5 years; 125mg 8 hourly for 7 days
6–12 years; 250mg 8 hourly for 7 days

Close monitoring and possible intubation and ventilation may be required. Bronchodilators and corticosteroids are NOT effective and should not be given.

BRONCHIECTASIS

In bronchiectasis, the medium and smaller sized bronchi usually in the lower lobes become diseased and dilate. Their ciliated epithelium is then replaced by squamous cells. The mucus in them becomes seats of chronic infection with the formation of large amounts of purulent and often offensive sputum.

SYMPTOMS

• Fits of coughing
• Copious offensive sputum (especially in the morning)
• Chest pain

SIGNS

• Weight loss
• Fever
• Crepitations

INVESTIGATIONS

• FBC
• Sputum culture
• Chest X–ray

TREATMENT

Non–Pharmacological Treatment

• Postural drainage

Pharmacological Treatment

Start Amoxicillin (Amoxycillin), oral, prior to referral

Adults: 500 mg 8 hourly for 7 days
Children:

<1 year; 62.5 mg 8 hourly for 7 days.

1–5 years; 125 mg 8 hourly for 7 days

6–12 years; 250 mg 8 hourly for 7 days

REFER

Refer all suspected cases to hospital for confirmation, sputum culture and sensitivity tests and specialist management.

LUNG ABSCESS

A lung abscess is a cavity within the substance of the lung filled with necrotic tissue, which occurs as a result of infection.

CAUSES

- The aspiration of infected mucus or tissue from the nose, mouth or pharynx especially in alcoholics, epileptics, unconscious or anaesthetised patients and following dental procedures.
- Persistent infection from any bacterial pneumonia
- Presence of a foreign body within the lung either by inhalation or penetrative lung injury
- Obstruction of an airway by tumour
- Septic embol from other infected areas of the body e.g. from septicaemia and endocarditis
- Tuberculosis
- Staphylococcus aureus – usually presenting as multiple abscesses, especially in children

SYMPTOMS

- High swinging fever
- Breathlessness
- Cough, productive of copious amounts of foul smelling sputum.
- Haemoptysis – in over a third of cases.

SIGNS

- Fever
- Tachycardia
- Tachypnoea
- Chest wall tenderness
- Dull percussion note
- Poor air entry

INVESTIGATIONS

- FBC
- Chest X-ray
- Sputum culture
- Blood culture
TREATMENT

Non−Pharmacological

• Postural drainage

Pharmacological Treatment

Antibiotic management should include the following, until confirmation of organism by sputum culture:

Adults:
Flucloxacillin, IV, 500 mg 6 hourly for 14 days plus
Gentamicin, IV 40−80 mg 8 hourly for 14 days plus
Metronidazole, IV, 500 mg 8 hourly for 14 days

Children:
Flucloxacillin, IV,

<1 year; 62.5 mg 6 hourly for 14 days
1−5 years; 125 mg 6 hourly for 14 days
5−12 years; 250 mg 6 hourly for 14 days

plus

Gentamicin, IV,

> 1 year; 2.5 mg/kg BW 12 hourly for 14 days
1−12 years; 2.5 mg/kg BW 8 hourly for 14 days

plus

Metronidazole, IV, 7.5 mg/kg BW 8 hourly for 14 days

REFER

Refer to a Physician or a higher level medical facility.

CHAPTER 15: EAR, NOSE AND THROAT DISORDERS

EAR NOSE AND THROAT DISORDERS

STRIDOR

Stridor is a characteristic noise in the inspiratory phase of breathing when there is an obstruction of the upper airway from the nasopharynx down to the trachea and main bronchi.

COMMON CAUSES
• Inflammatory obstruction due to
• Virus and bacteria (infectious croup)
  • Inhalation of hot fumes as in fire outbreaks
  • Angioneurotic oedema
  • Retropharyngeal abscess
  • Inhalation of foreign body
  • Congenital malformation of the larynx e.g. laryngomalacia

INFECTIOUS CROUP

A very common illness in the infant and preschool child (3 months–5 years)

Two main types;

1. Subglottitis (viral croup, laryngotracheobronchitis (LTB))

2. Acute epiglottitis

1. SUBGLOTTITIS

The obstruction is usually in the subglottic area but may involve the trachea and the bronchi. This is a viral illness and the preceding illness is like common cold. Measles may be complicated by LTB.

SYMPTOMS

• Low grade fever
• Hoarse voice
• Barking cough
• Breathing difficulty
• Restlessness

SIGNS

• Low grade fever

• Restless apprehensive child when obstruction is severe

• Hoarse voice with troublesome barking cough

• Rapid laboured breathing with stridor absent in mild cases except when disturbed

• Retraction of suprasternal notch, supraclavicular and substernal regions as well as intercostals retractions as well as tachypnoea

• In severe obstruction child is cyanosed and may be in shock–like state as death approaches

• Auscultation reveals reduced air entry and stridor

• Reddened throat

INVESTIGATIONS

• Confirm organism by sputum culture

TREATMENT
Therapeutic objectives

• To avoid aggravation of the obstruction with thick or crusted secretions by ensuring good hydration
• To ensure early and timely relief of obstruction

Non-Pharmacological Treatment

• Admit all but the mildest cases for close monitoring of respiratory rate, pulse and temperature
• Nurse in humidified environment
• Offer oral fluids liberally
• Fluids must be given parenterally to very sick children in hospital who cannot drink
• Restless and distressed children must be given humidified oxygen
• Reduce procedures to the essential minimum to ensure maximum rest for the child
• In severe obstruction as indicated by severe tachypnoea, cyanosis, restlessness or unresponsiveness, ask for help to establish the airway by intubation or tracheostomy

Pharmacological Treatment

(Evidence rating: C)

• Antibiotics are not indicated except for suspected secondary bacterial infection
• Cough syrups containing opiates and atropine are contraindicated
• In severe obstruction Hydrocortisone, IV, 50–100 mg 6 hourly for 2–3 days would help reduce the inflammatory obstruction

Antibiotic management

Treatment should include the following medications,

Children:

Flucloxacillin, IV,

<1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
5–12 years; 250 mg 6 hourly for 7 days

plus

Gentamicin, IV,

> 1 year; 2.5 mg/kg BW 12 hourly for 7 days
1–12 years; 2.5 mg/kg BW 8 hourly for 7 days

plus

Metronidazole, IV, 7.5 mg/kg BW 8 hourly for 7 days

REFER

Refer to a Physician or a higher level medical facility.
2. ACUTE EPIGLOTTITIS

This is an acute and life threatening infection in which the epiglottis and surrounding tissue become acutely inflamed and oedematous causing severe obstruction of the upper airways. The causative agent is *Haemophilus influenzae* Type B. The majority of children affected are aged between 3 and 7 years.

The disease tends to have an extremely rapid course (4–6 hours) to respiratory failure and death.

**SYMPTOMS**

- Sudden onset of high fever
- No preceding common cold
- Drooling of saliva due to severe sore throat and dysphagia
- Breathing difficulty

**SIGNS**

- An extremely ill and toxic febrile child
- Head is held forward to extend the neck
- Breathing difficulty with suprasternal, supraclavicular, substernal retractions
- Voice is weak but not hoarse (contrast hoarse voice in subglottitis)
- Auscultation reveals reduced air entry and stridor
- Examination of the throat (must be done only in the presence of a doctor capable and ready to intubate) would show markedly swollen and reddened epiglottis
- Cyanosis in very sick children

**INVESTIGATIONS**

- Blood culture
- Throat swab
- Full blood count
- Lateral x−ray of the nasopharynx and upper airway

**TREATMENT**

**Therapeutic objectives**

- To treat bacteraemia
- To relieve obstruction

**Non−Pharmacological Treatment**

- Admit all children with suspected acute epiglottitis to hospital for close observation
- Alert anaesthetist/ENT specialist to assist with the establishment of airway

**Pharmacological Treatment**

*(Evidence rating: C)*

Start Chlorampenicol, IV, 25 mg/kg body weight 6 hourly while awaiting results of bacteriology
Alternatively,
Cefotaxime, IV, 50 mg/kg body weight 8 hourly
Treatment should be changed to oral antibiotics when appropriate and continued for a total of seven days as follows:
Chloramphenicol, oral,
<1year; 6.25 mg/kg body weight 6 hourly
Older children; 12.5–25 mg/kg body weight 6 hourly
or
Cefuroxime axetil, oral, 125 mg 12 hourly

REFER
All patients immediately if there is no expertise available for intubation or tracheostomy

RETROPHARYNGEAL ABSCESS
Collection of pus in the retropharyngeal space.

COMMON CAUSES
1. Suppuration of retropharyngeal lymph nodes following severe bacterial infection of nasopharynx
2. Rarely osteomyelitis of cervical vertebrae

Group A –haemolytic Streptococcus and Staphylococcus aureus are the common pathogens.

SYMPTOMS
• High fever
• Sore throat
• Difficulty in swallowing
• Hyperextension of neck
• Laboured and noisy breathing

SIGNS
• Hyperpyrexia
• Laboured respiration with intercostal retractions
• Stridor
• Bulge in the posterior pharyngeal wall
• Reddened throat, large and inflamed tonsils

INVESTIGATIONS
• Lateral x–ray of nasopharynx

TREATMENT
Treatment objectives
To treat infection
To relieve the obstruction by draining the abscess
To relieve pain

Pharmacological Treatment

(Evidence rating: C)

Paracetamol, oral

**Adults:** 500 mg−1 g 3−4 times daily

**Children:**
- 3 months−1 year; 60−120 mg 3−4 times daily
- 1−5 years; 120−250 mg 3−4 times daily
- 6−12 years; 250−500 mg 3−4 times daily

Flucloxacillin

**Adults:** 
a) IV, 500 mg 6 hourly for 48 hours followed by
   b) Oral, 500 mg 6 hourly for 10 days if patient is able to swallow

**Children:** 
a) IV, 50−100 mg/kg BW 6 hourly for 48 hours followed by
   b) Oral, 50 mg/kg BW 6 hourly for 10 days if patient is able to swallow

REFER

Refer to ENT specialist for incision and drainage

PHARYNGITIS AND TONSILLITIS

This is an infection of the throat and tonsils. Most sore throats are due to viral infections and should NOT be treated with antibiotics as they subside within 3−5 days. However, it is important to diagnose streptococcal pharyngitis since it may give rise to abscesses in the throat (retropharyngeal and peritonsillar abscess) as well as complications that involve organs like the kidneys and the heart. Streptococcal throat infections require treatment with antibiotics in order to reduce the complications noted above.

SYMPTOMS

- Fever
- Difficulty in swallowing
- Sore throat
- Running nose or cough

SIGNS

- Reddened throat
- Enlarged and reddened tonsils
- Palpable tonsillar lymph glands (at the angle of the mandible)

Signs of streptococcal pharyngitis are:
• Painful enlarged tonsillar lymph glands
• Absence of signs suggesting viral nasopharyngitis (running nose, cough, red eyes)
• Whitish exudate at the back of the throat as well as whitish tonsillar exudate
• Sustained high grade fever
• Occasionally there is a rash of scarlet fever

TREATMENT

Treatment objectives

• To relieve symptoms
• To recognise streptococcal throat infection and treat accordingly
• To relieve pain

Pharmacological Treatment

(Evidence rating: A)

For sore throats without signs of streptococcal pharyngitis,

• No antibiotics should be given. Use warm, salty water gargles
• For pain or fever give

Paracetamol, oral,

**Adults:** 500 mg−1 g 3−4 times a day.

**Children:**
3 months−1 year: 60−120 mg 3−4 times daily
1−5 years: 120−250 mg 3−4 times daily
6−12 years: 250−500 mg 3−4 times daily

or

Ibuprofen, oral,

**Adults:** 200−400 mg 3 times daily

**Children:** 100−200 mg 3 times daily

In patients with streptococcal pharyngitis and tonsillitis, give

Amoxicillin (Amoxycillin), oral

**Adults:** 500 mg 6 hourly for 10 days

**Children:**
<1 year; 62.5 mg 6 hourly for 10 days.
1−5 years; 125 mg 6 hourly for 10 days
6−12 years; 250 mg 6 hourly for 10 days

plus
Benzathine Penicillin, IM,

Adults and children above 10 years; 1.2 MU stat
Children weighing > 30kg; 0.9 MU stat
Children weighing < 30kg; 0.6 MU stat

**Do not give Co-trimoxazole for acute streptococcal**

If patient is allergic to penicillin, use Erythromycin, oral,

**Adults:** 500 mg 6 hourly for 10 days

**Children:**
- 0–2 years; 125 mg 6 hourly for 10 days
- 2–8 years; 250 mg 6 hourly for 10 days

**REFER**

Refer patients with recurrent tonsillitis, retropharyngeal and peritonsillar abscess to an ENT specialist.

**ACUTE SINUSITIS**

This is an infection of the air spaces in the bones of the head which are connected to the nose, so that infections in the nose e.g. colds, catarrh can spread to these spaces. This infection does not occur in children less than 6 years because their air spaces are not well developed.

**SIGNS AND SYMPTOMS**

- Persistent fever
- Persistent thick nasal discharge, which may be foul smelling
- Pain above and below the eyes, when patient bends over or when these areas are tapped lightly.

**TREATMENT**

**Therapeutic objectives**

- To reduce symptoms of pain and fever
- To treat infection

**Non–Pharmacological Treatment**

- Steam inhalation may be effective in promoting drainage of the blocked sinus
- If dental focus of infection is present, extract tooth under antibiotic cover.

**Pharmacological Treatment**

**(Evidence rating: B)**

Amoxicillin (Amoxycillin), oral,

**Adults:** 500 mg 8 hourly for 10 days

**Children:**
<1 year; 62.5 mg 8 hourly for 10 days.
1–5 years; 125 mg 8 hourly for 10 days
6–12 years; 250 mg 8 hourly for 10 days
For those with penicillin allergy, give Erythromycin, oral,

**Adults:** 500 mg 6 hourly for 10 days

**Children:** 20–50 mg/kg BW 6 hourly for 10 days.

*or*

**Adults:** Doxycycline, oral, 100 mg 12 hourly for 10 days may be given.

Give Paracetamol, oral, to relieve pain if present.

**Adults:** 500 mg−1 g 3–4 times daily

**Children:**

3 months–1 year; 60–120 mg 3–4 times daily
1–5 years; 120–250 mg 3–4 times daily
6–12 years; 250–500 mg 3–4 times daily

**ACUTE OTITIS MEDIA**

This is an infection of the middle ear, which communicates with the throat. Therefore it may, especially in children, follow a common cold or a sore-throat or measles infection. It is important in a febrile child to look for it and treat it. Untreated or poorly managed cases may lead to complications such as mastoiditis, chronic otitis media, deafness, meningitis and brain abscess.

**SYMPTOMS**

**Adults:**

- Impaired hearing
- Sudden and persistent ear ache
- Fever
- Pus discharge from the ear for less than 2 weeks

**Children:**

- Fever
- Vomiting
- Diarrhoea
- Crying and agitation
- Severe pain – may try to rub ears with hands
- The eardrum may perforate, discharging pus

**SIGNS**

- Red eardrum
- Discharging ear
Pain on touching the ear
- Occasionally inflamed throat

**TREATMENT**

**Treatment objectives**

- To relieve symptoms
- To ensure prompt and adequate antibiotic therapy to avoid chronicity and other complications

**Non−Pharmacological Treatment**

- Drink lots of fluid
- Continue to feed the child

**Pharmacological Treatment**

*(Evidence rating: B)*

Treat for fever and pain

Paracetamol, oral,

- **Adults:** 500 mg–1 g 3–4 times daily
- **Children**
  - 3 months–1 year; 60–120 mg 3–4 times daily
  - 1–5 years; 120–250 mg 3–4 times daily
  - 6–12 years; 250–500 mg 3–4 times daily

Antibiotics

- **Amoxicillin (Amoxycillin), oral,**
  - **Adults:** 500 mg 8 hourly for 10 days
  - **Children**
    - <1 year; 62.5 mg 8hourly for 10 days
    - 1–5 years; 125 mg 8 hourly for 10 days
    - 6–12 years; 250 mg 8 hourly for 10 days
  - or

- **If allergic to Penicillin, Erythromycin, oral,**
  - **Adults:** 250 mg 6 hourly for 10 days
  - **Children**
    - Up to 2 years;
125 mg 6 hourly for 10 days
2–8 years; 250 mg 6 hourly for 10 days

or

Co–trimoxazole, oral,

**Adults:** 960 mg 12 hourly for 7 days

**Children:**
- 6 weeks–5 months: 120 mg 12 hourly for 7 days
- 6 months–5 years: 240 mg 12 hourly for 7 days
- 6–12 years: 480 mg 12 hourly for 7 days

Re–assess after 5 days. If pain is still severe or pus discharge still present, repeat otoscopy, send swab of discharge for bacteriological examination and change antibiotic to Cefuroxime, oral,

**Adults:** 250 mg 12 hourly for 5 days

**Children:** 125 mg 12 hourly for 5 days

or

Azithromycin, oral

**Adults:** 500 mg once daily for 3 days

**Children:** 10 mg/kg BW once daily for 3 days

REFER

Seek ENT consultation if there is no response after 10 days of treatment.

**CHRONIC OTITIS MEDIA**

This is a chronic infection of the middle ear with perforation of the tympanic membrane and pus discharging from the ear for more than 2 weeks. Acute re–infection, usually related to an obstruction to drainage through the perforated drum with secondary infection by streptococci, pneumococci or gram negative organisms, will result in fever and pain which is otherwise not a common symptom of this condition.

**SYMPTOMS**

- Chronic discharge (otorrhoea)
- Hearing loss

**TREATMENT**

**Therapeutic objectives**

- To keep the ear dry with frequent wicking
- To treat acute exacerbations with antibiotics
DO NOT prescribe antibiotics if the eardrum has been ruptured for more than 2 weeks as secondary infection with multiple organisms, usually occurs. This makes oral antibiotic therapy much less effective.

Non-Pharmacological Treatment

A chronically draining ear can only heal if it is dry. Drying the ear is time-consuming for both the health worker and the mother but it is the only effective measure. This should be demonstrated to the mother if the patient is a child.

- Roll a piece of clean absorbent gauze into a wick and insert carefully into the child’s ear. Leave for one minute then remove and replace with a clean wick.
- Watch the mother repeat this until the wick is dry when removed. The mother should dry the ear by wicking at home at least four times daily until the wick stays dry. If bleeding occurs, drying the ear should be stopped temporarily.
- Nothing should be left in the ear between wicking. The child should avoid swimming or getting the inside of the ear wet.
- Re-assess weekly to ensure that the mother is drying the ear correctly and check for mastoiditis.

Pharmacological Treatment

(Evidence rating: C)

- If acute re-infection occurs give Co-trimoxazole or Amoxicillin (Amoxycillin)

Co-trimoxazole, oral,

- Adults: 960 mg 12 hourly for 10 days
- Children:
  - 6 weeks–5 months; 120 mg 12 hourly for 10 days
  - 6 months–5 years; 240 mg 12 hourly for 10 days
  - >5 years; 480 mg 12 hourly for 10 days

or

Amoxicillin (Amoxycillin), oral,

- Adults: 500 mg 8 hourly for 10 days
- Children:
  - <1 year; 62.5 mg 8 hourly for 10 days
  - 1–5 years; 125 mg 8 hourly for 10 days
  - 6–12 years; 250 mg 8 hourly for 10 days

REFER

Refer all chronically discharging ears to the ENT Specialist
EPISTAXIS

This refers to bleeding from the nose.

CAUSES

The commonest cause is picking of the nose, especially when there is an upper respiratory tract infection. It may also occur as part of generalized bleeding disorders mentioned under Haemostatic and bleeding disorders. Other causes are trauma, nasopharyngeal neoplasms and hypertension.

INVESTIGATIONS

If the epistaxis is due to nose-picking or nasal infection then investigations are not necessary.

TREATMENT

Therapeutic objective

• To stop epistaxis and prevent recurrence.

Non-Pharmacological Treatment

• Sit patient up and flex head to prevent blood running down throat
• Pinch soft side of nose for 10 minutes (patient must breathe through mouth)
• Apply ice-pack to nose

The above measures will usually arrest bleeding but if they fail, pharmacological treatment may be helpful.

Pharmacological Treatment

(Evidence rating: C)

• Topical application of 1:1000 solution of adrenaline on cotton wool
• If bleeding persists, the anterior nares should be packed with ribbon gauze saturated in sterile liquid paraffin

REFER

Patients with:

• Recurrent or severe epistaxis.
• Epistaxis which cannot be arrested.
• Epistaxis suspected to be due to causes other than nose picking or nasal infection.

EYE DISORDERS

OPHTHALMIA NEONATORUM

Any inflammation of the conjunctiva of the newborn is considered as ophthalmia neonatorum.

CAUSES

• Bacterial – Neisseria gonorrhoea, Staphylococci, Streptococci
• Chlamydial
• Viral
• Chemical e.g. silver nitrate

SYMPTOMS

• Discharge of pus from the eye with swelling of the eyelids

SIGNS

• Inflamed conjunctiva
• Purulent or mucopurulent eye discharge

INVESTIGATIONS

Eye swab for culture and sensitivity if possible

TREATMENT

Therapeutic objective

• To treat the infection and to prevent blindness

Non–Pharmacological Treatment

• Frequent (2 hourly) saline irrigation of eyes to get rid of discharge

Pharmacological Treatment

(Evidence rating: C)

• Ceftriaxone, IM, 50 mg/kg body weight stat

plus

• Erythromycin, oral, 12.5 mg/kg body weight 6 hourly for 14 days

• 0.5% Chloramphenicol eye drops, applied to each eye after cleaning away discharge (saline irrigation) every 2 hours for 48 hours then apply 0.5% Chloramphenicol eye drops or 1% Chloramphenicol eye ointment 6 hourly.

REFER

If no response, refer to the eye specialist.

XEROPHTHALMIA

This condition is common in children. It is associated with inadequate intake of foods that contain Vitamin A. It occurs in conditions such as protein calorie malnutrition, measles and malabsorption states. It is a common cause of blindness in children.

SYMPTOMS AND SIGNS

• In the early stages, the child cannot see in the dark.
• As the disease progresses, the child develops dry eyes. The white of the eye loses its sheen and begins to wrinkle.

• In severe cases, the sclera becomes more grey and conjunctiva more folded. The cornea becomes cloudy, soft and ulcerates easily. This is keratomalacia.

**TREATMENT**

**Therapeutic objectives**

• To replace deficient vitamin A
• To prevent blindness in patients with measles and malnutrition

**Non−Pharmacological Treatment**

• Discourage mothers from putting any drugs in the eye unless prescribed by a clinician

**Prevention**

• Examine the eyes of all sick, underweight children
• Feed child with foods that contain Vitamin A. (dark green leafy vegetables e.g. nkontomire, yellow fruits and vegetables, palm oil, milk, eggs)
• Advise on continued breast−feeding till 18 months to 2 years
• Promote measles immunization

**Pharmacological Treatment**

*(Evidence rating: C)*

Give Vitamin A to children as soon as the illness is diagnosed and also in patients with measles and malnutrition.

<table>
<thead>
<tr>
<th>Time</th>
<th>Vitamin A Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (6–11 months)</td>
<td>Children (1–6 years)</td>
</tr>
<tr>
<td>Immediately</td>
<td>100,000 IUnits</td>
</tr>
<tr>
<td>Following day</td>
<td>100,000 IUnits</td>
</tr>
<tr>
<td>One week later</td>
<td>100,000 IUnits</td>
</tr>
</tbody>
</table>

**REFER**

Refer to an eye specialist if the condition is severe with an uneven or bulging cornea.

**FOREIGN BODY IN THE EYE**

Foreign bodies refer to specks of dust, small insects or other tiny objects that get into the eyes. The foreign body may be either in the conjunctival sac, on the cornea or inside the eyeball (intraocular).

**SYMPTOMS**

A history of the likely nature of the foreign body aids in its detection and removal.
The patient may complain of:

• Feeling of something in the eye which may be irritating
• Discomfort or severe pain
• Watering of the eye
• Red eye(s)
• Photophobia i.e. intolerance to light
• Inability to open the eye

SIGNS

• The foreign body may be seen by careful inspection of the cornea or conjunctival sac. Good light is needed and a magnifying glass may be required to detect corneal foreign bodies.

TREATMENT

Therapeutic objectives

• To remove the foreign body
• To treat associated injury
• To prevent complications

Non–Pharmacological Treatment

• Look on the eyeball and under the eyelids to find the foreign body and carefully remove it using a cotton bud or saline irrigation with a syringe. (Do not attach needle to syringe)

• If the foreign body is under the upper eyelid, evert the eyelid and remove the foreign body.

• If the foreign body cannot be removed, apply topical antibiotic, pad the eye and REFER to an eye specialist clinic.

• DO NOT attempt to remove intraocular foreign bodies. REFER

Pharmacological Treatment

(Evidence rating: C)

• After removal of foreign body apply 1% Chloramphenicol eye ointment.

Give Paracetamol, oral, if there is pain

**Adults:**

500 mg–1 g 3 to 4 times daily

**Children:**

3 months–1 year; 60–120 mg 3 to 4 times daily

1–5 years; 120–250 mg 3 to 4 times daily

6–12 years; 250–500 mg 3 to 4 times daily

REFER
Refer patients with

- Corneal foreign bodies
- Intraocular foreign bodies
- Persistent pain and redness of the eye

RED EYE

Infections, allergies and injuries inflame the eye and cause a red eye.

Common causes

- Conjunctivitis
- Corneal ulcer or keratitis
- Acute iritis
- Acute glaucoma

Acute red eye may have a history of injury to the eye or there may be no history of injury.

History of injury is straightforward. There may be a foreign body on the cornea or on the conjunctiva, under the eyelid. A blunt injury may cause a subconjunctival haemorrhage or bleeding into the anterior chamber (hyphaema).

Acute red eye with no history of injury

<table>
<thead>
<tr>
<th></th>
<th>Acute Conjunctivitis</th>
<th>Corneal Ulcer</th>
<th>Acute Iritis</th>
<th>Acute Glaucoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Sudden</td>
<td>Sudden</td>
<td>Sudden</td>
<td>Sudden</td>
</tr>
<tr>
<td>Pain</td>
<td>Discomfort</td>
<td>Painful lids</td>
<td>Painful</td>
<td>Severe pain</td>
</tr>
<tr>
<td>Discharge</td>
<td>Purulent or Muco−purulent</td>
<td>Watery</td>
<td>Watery</td>
<td>Watery</td>
</tr>
<tr>
<td>Vision</td>
<td>Normal</td>
<td>May be reduced</td>
<td>Reduced</td>
<td>Grossly reduced</td>
</tr>
<tr>
<td>Eyelids</td>
<td>Swollen or sticky</td>
<td>Swollen</td>
<td>Usually normal</td>
<td>Severely Swollen</td>
</tr>
<tr>
<td>Redness</td>
<td>Red away from cornea</td>
<td>Red around the cornea</td>
<td>Bright red around cornea</td>
<td>Dull red all over</td>
</tr>
<tr>
<td>Cornea</td>
<td>Clear</td>
<td>Grey or grey−white patch</td>
<td>Hazy</td>
<td>Cloudy</td>
</tr>
</tbody>
</table>

TREATMENT

Therapeutic objectives

- To treat the infection and prevent blindness, in the case of acute conjunctivitis and corneal ulcer
- To relieve pain and redness and refer immediately to the specialist for urgent management to prevent blindness, in the case of acute iritis and acute glaucoma

Non−Pharmacological Treatment

Acute conjunctivitis
• Take a conjunctival swab for culture and sensitivity.
• Frequent, (2 hourly), washing of face and eyes to get rid of discharge.

Pharmacological Treatment

(Evidence rating: C)

Acute conjunctivitis

• 1% Tetracycline ointment applied every 8 hours for 72 hours. If no improvement, refer. or
• 0.5% Chloramphenicol eye drops, 2 hourly for 48 hours. If no improvement, refer. If improving, reduce chloramphenicol eye drops to 6 hourly for 7 days.

Corneal ulcer

• Apply 1% Tetracycline eye ointment and refer to the specialist immediately.

REFER

Refer corneal ulcer, acute iritis and acute glaucoma immediately to the eye specialist.

CHAPTER 16: ORAL AND DENTAL CONDITIONS

GINGIVITIS AND STOMATITIS

Common oral and dental conditions are gingivitis and stomatitis, dental caries and dental abscess.

SYMPTOMS

• Sore mouth
• Bleeding gums especially after brushing
• Pain while swallowing
• Cracks at the corners of the mouth
• Poor appetite
• Nausea

SIGNS

• Hyperaemic buccal mucosa and gums
• There may be ulcers present

TREATMENT

Non–Pharmacological Treatment

• Clean the mouth with gauze soaked in saline
• Frequent mouth rinse with saline especially after each meal
• Advise the patient or the mother of the child on a good diet, keep good oral hygiene by brushing teeth at least twice daily. If calculus already present, refer to a dental hygienist for scaling and polishing of the teeth.

Pharmacological Treatment
If the ulcers look infected, give Amoxicillin (Amoxycillin) combined with Metronidazole.

**Amoxicillin (Amoxycillin), oral,**

- **Adults:** 500 mg 8 hourly for 5 days;
- **Children:**
  - <1 year: 62.5 mg 8 hourly for 5 days
  - 1–5 years: 125 mg 8 hourly for 5 days
  - 6–12 years: 250 mg 8 hourly for 5 days

**Metronidazole, oral,**

- **Adults:** 400 mg 8 hourly for 5 days
- **Children:**
  - 1–3 years: 50 mg 8 hourly for 5 days
  - 3–7 years: 100 mg 8 hourly for 5 days
  - 7–10 years: 200 mg 8 hourly for 5 days

**DENTAL CARIES**

Holes can occur in any tooth.

**SYMPTOMS**

- Pain with hot, cold or sweet foods or drinks
- Pain may be intermittent or severe, sharp and constant

**SIGNS**

- A hole or black spot may be visible on any surface of a tooth.

**TREATMENT**

**Therapeutic objectives**

- To relieve pain
- To fill cavities
- To educate on good dental hygiene

**Non–pharmacological Treatment**

- Regular dental reviews

**Pharmacological Treatment**

(Evidence rating: C)

- Analgesics may help to relieve the pain:
Paracetamol, oral

**Adults:**
500 mg–1 g 3–4 times daily

**Children**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Dose</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months–1 year;</td>
<td>60–120 mg</td>
<td>3–4 times</td>
</tr>
<tr>
<td></td>
<td>daily</td>
<td>daily</td>
</tr>
<tr>
<td>1–5 years;</td>
<td>120–250 mg</td>
<td>3–4 times</td>
</tr>
<tr>
<td></td>
<td>daily</td>
<td>daily</td>
</tr>
<tr>
<td>6–12 years;</td>
<td>250–500 mg</td>
<td>3–4 times</td>
</tr>
<tr>
<td></td>
<td>daily</td>
<td>daily</td>
</tr>
</tbody>
</table>

- Then **REFER** to a Dentist for treatment.

**DENTAL ABSCESS**

In this condition there is a collection of pus around the affected tooth, which may spread into the surrounding tissue.

**SYMPTOMS**

- Fever
- Feeling unwell
- A constant throbbing pain in the affected tooth

**SIGNS**

- Fever
- A swelling of the gum around the affected tooth leading to facial swelling
- Pus may be seen discharging from the gum around the affected tooth

**TREATMENT**

**Therapeutic objectives**

- To relieve pain
- To treat infection

**Pharmacological Treatment**

*(Evidence rating: C)*

Relieve pain

Paracetamol, oral,

**Adults:**
500 mg–1 g 3–4 times daily

**Children**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Dose</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months–1 year;</td>
<td>250</td>
<td>daily</td>
</tr>
</tbody>
</table>
60–120 mg 3–4 times daily

1–5 years; 120–250 mg 3–4 times daily

6–12 years; 250–500 mg 3–4 times daily

or

Ibuprofen, oral,

Adults: 200–400 mg 3 times daily

Children: 100–200 mg 3 times daily

Start antibiotic treatment with Amoxicillin (Amoxycillin) and Metronidazole

**Antibiotics**

Amoxicillin (Amoxycillin), oral,

Adults: 500 mg 8 hourly for 7 days

Children:

<1 year; 62.5 mg 8 hourly for 7 days.

1–5 years; 125 mg 8 hourly for 7 days

6–12 years; 250 mg 8 hourly for 7 days

Metronidazole, oral,

Adults: 400 mg 8 hourly for 7 days

Children: 100–200 mg 8 hourly for 7 days.

**REFER** to a dental surgeon.

**ORAL THRUSH (CANDIDIASIS)**

This is a fungal infection of the buccal mucosa caused by *Candida albicans*. It mainly affects the very young, the very old or those whose immunity is impaired. It occurs more frequently in HIV/AIDS patients, the malnourished, diabetics, patients on long term antibiotics and corticosteroids.

**SYMPTOMS/SIGNS**

- White patches on the tongue, cheeks or roof of the mouth which can be wiped off leaving a raw surface
- Difficulties in eating, breast fed babies may refuse to suck.
- Burning sensation in the mouth

**TREATMENT**

- Treatment objectives
  - To eradicate infection
  - To identify and treat any underlying condition
Pharmacological Treatment

(Evidence rating: B)

Adults: Instruct the patient to suck Nystatin, oral, 100,000 units 4 times daily after food for 14 days.

Children: Give Nystatin oral suspension, 2 drops (100,000 units) in the mouth 4 times daily after each feed for at least 10 days. Make sure it is spread well in the mouth. Alternatively use Miconazole oral gel 2.5 ml smeared on the oral mucosa using the finger.

CHAPTER 17: DISORDERS OF THE MUSCULOSKELETAL SYSTEM

LOW BACK PAIN

Low back pain is a common presenting complaint especially among the elderly. It may be a mild, transient symptom or chronic and disabling complaint.

There are many causes of low back pain but a cause can usually be found from a good clinical history and physical examination. In some patients however, no cause will be found and these people are described as having non−specific back pain. Acute ligamentous (sprain) lesions and muscular strain are usually self−limiting,

CAUSES

- Acute ligamentous (sprain) lesions
- Muscular strain
- Chronic osteoarthritis

Other causes include:

- Back strain due to poor posture worsened by mechanical factors like overuse, obesity and pregnancy.
- A protruding or ruptured intervertebral disk
- Traumatic ligament rupture or muscle tear
- Fracture
- Infection (e.g. tuberculosis or septic discitis)
- Malignancy e.g. metastases, multiple myeloma or spinal tumour, prostatic carcinoma
- Congenital abnormalities e.g. abnormal intervertebral facets, sacralization of L−5 transverse process
- Spondylolisthesis – i.e. Slipping forward of a vertebra upon the one below
- Narrowed spinal canal from spinal stenosis
- Psychogenic pain: The back is a common site of psychogenic pain. Inconsistent historical and physical findings on sequential examination may make one suspicious of this diagnosis
- Fibromyalgia, connective tissue diseases
Points of Distinction Between Inflammatory And Mechanical Back Pain

<table>
<thead>
<tr>
<th></th>
<th>Inflammatory</th>
<th>Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONSET</strong></td>
<td>Gradual</td>
<td>Sudden</td>
</tr>
<tr>
<td><strong>WORST PAIN</strong></td>
<td>In the morning</td>
<td>In the evening</td>
</tr>
<tr>
<td><strong>MORNING STIFFNESS</strong></td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td><strong>EFFECT OF EXERCISE</strong></td>
<td>Relieves pain</td>
<td>Aggravates pain</td>
</tr>
</tbody>
</table>

Features that suggest that back pain may be serious

- Recent onset
- Weight loss
- Symptoms elsewhere e.g. chronic cough
- Localized pain in the dorsal spine
- Fever
- Raised ESR

**TREATMENT**

(Evidence rating: B)

**Acute low back pain**: Acute pain following unusual strain or activity is the most common form.

**Non–pharmacological Treatment**

Treat by relieving muscle spasm with bed rest in a comfortable position with hips and knees flexed; local heat and massage.

**Pharmacological Treatment**

Analgesics

- **For mild pain**
  - Ibuprofen, oral, 400 mg 3 times daily

- **Severe pain**
  - Diclofenac, IM, 75 mg. 12 hourly by deep IM injection

  or

  - Diclofenac, rectal, 50 mg 8 hourly

- **Chronic low back pain**

**Non–pharmacological Treatment**

- Treat the cause, e.g. weight reduction in the obese, improving muscle tone and strength through physiotherapy, improving posture.

- Depending on the cause, surgical procedures may be necessary, e.g. in disc disease or spinal stenosis.
Pharmacological treatment

Analgesics are given for pain as above. AVOID narcotic analgesics.

Psychogenic pain:

- Reassurance is needed
- Explore causes
- Treat depression if appropriate
- Give analgesics but AVOID addictive medications, e.g. narcotic analgesics
- Physical therapy may be helpful

GOUT

This condition is associated with high levels of uric acid in the blood. This results in deposition of microcrystals of the uric acid in the joints and periarticular tissues. Phagocytosis of urate crystals leads to the pain and inflammation that characterises this disorder. Acute symptoms are often precipitated by alcohol intake and binge eating as well as dehydration, fasting and surgery.

CAUSES

Primary Gout

- Inherited metabolic disorder leading to hyperuricaemia
- Tophi (urate crystal deposits) in subcutaneous tissues, joints and kidneys

Secondary Gout

- Complications of other diseases e.g. haematological malignancies, chronic renal diseases or drugs e.g. thiazide and loop diuretics, cytotoxic drugs, pyrazinamide

SYMPTOMS

- Excruciating pain and swelling usually of a joint e.g. big toe, knee or ankle
- Asymptomatic – high uric acid found on laboratory test

SIGNS

Affected joint is inflamed, swollen and tender

INVESTIGATIONS

- Serum uric acid
- FBC, ESR
- BUE, creatinine
- Liver Function Tests

TREATMENT

Therapeutic objectives

- To relieve pain immediately
- To reduce joint inflammation
- To prevent recurrent attacks and joint damage
Non-Pharmacological Treatment

• Rest affected joint
• Encourage copious fluid intake
• Identify and manage underlying or predisposing factors
• Weight reduction in obese or over weight individuals
• Dietary modification (refer to dietician)

Pharmacological Treatment

(Evidence rating: C)

• Diclofenac, oral, 50 mg 3 times daily; start with high oral dose and then gradually reduce the dose.

Do not give Allopurinol in the acute phase. Start only when pain is under control i.e. after approximately 2 weeks

INTERVAL-PHASE GOUT

This describes the situation where there is:

• Frequent attacks of acute gout
• Consistently elevated serum uric levels
• Renal impairment with high uric acid levels.

TREATMENT

(Evidence rating: C)

• Allopurinol, oral, 100–300 mg once daily. Reduce dose in renal or hepatic impairment

(Note: NSAIDs are not to be given for maintenance or prophylaxis).

REFER

Refer patients to a dietician for dietary modification and a weight reducing diet in the obese and over weight.

OSTEOARTHRITIS

This is a degenerative joint disease. Damage to articular cartilage leads to reactive new bone formation. Weight bearing joints e.g. hips, knees, cervical and lumbar spine, but also distal inter phalangeal and metacarpophalangeal joints of hands are affected.

CAUSES

• Main cause unknown. It is commonest in the elderly and in obese and over weight individuals. Both sexes are equally affected.

SYMPTOMS

• Pain at initiation of exercise (walking)
• Morning stiffness which improves with exercise
• Diminution of joint movement
SIGNS

• Crepitus in affected joint(s)
• Heberden's nodes
• Joint swelling and deformities
• Osteoarthritis of cervical and lumbar spine may lead to myelopathy

INVESTIGATIONS

• ESR
• X-ray of affected joints

TREATMENT

Therapeutic objectives

• To relieve pain
• To prevent deformities
• To educate patient

Non-Pharmacological Treatment

• Encourage weight reduction if obese or overweight
• Increase physical activity (exercise)
• Weight supports (crutches, walking sticks or frames)

Pharmacological Treatment

(Evidence rating: C)

• Ibuprofen, oral, 200–400 mg 3 times daily or
• Diclofenac, oral, 25–50 mg 3 times daily.

REFER

• Long term management of severe cases are referred to orthopaedic surgical specialists.
• Other complications e.g. lumbar spinal stenosis, cervical spondylosis and nerve compression require specialist management.

RHEUMATOID ARTHRITIS

This is a chronic autoimmune inflammatory disease of joints characterised by symmetrical inflammation of synovial tissue. It is commonest in young women. The symptoms fluctuate widely with periods of remission and exacerbation.

SYMPTOMS

• Pain, swelling in small joints of hands and wrists for several weeks
• Morning joint stiffness
• Weight loss, lethargy, depression
• Polymyalgia – systemic illness with muscle pain, minimal joint involvement, and explosive overnight joint pain
**SIGNS**

- Spindle-shaped fingers, symmetrical
- Limitation of small joint movement
- Progression leads to joint deformities
- Carpal tunnel syndrome
- Anaemia
- Rheumatoid nodules
- Muscle wasting
- Dry eyes
- Peripheral sensory neuropathy
- Depression

**INVESTIGATIONS**

- Rheumatoid Factor
- FBC, ESR
- Antinuclear antibodies (ANA)
- X-ray of affected joints

**TREATMENT**

**Therapeutic objectives**

- Reduction of pain, swelling and stiffness.
- Prevention of deformities.

**Non−Pharmacological Treatment**

- Rest and exercise

**Pharmacological Treatment**

*(Evidence Level: B)*

- Diclofenac, oral, 50 mg 3 times daily

**REFER**

Refer all suspected cases to specialist physicians

**JUVENILE RHEUMATOID ARTHRITIS**

Rheumatoid arthritis in children may present in one of three forms:

1. Systemic onset arthritis (Still’s disease)
2. Polyarticular onset arthritis
   - Rheumatoid factor negative
   - Rheumatoid factor positive
3. Pauci–articular onset arthritis
1. SYSTEMIC ONSET ARTHRITIS

This may occur at any age (mostly at 2–4 years old). It may also occur in young adults (early 20s).

SYMPTOMS & SIGNS

- Swinging fever
- Rash – maculo–papular, especially on the torso
- Lymphadenopathy common
- Hepato–splenomegaly may be striking but is less common
- Arthralgia
- Arthritis, multiple joints

2. POLYARTICULAR ONSET ARTHRITIS

This typically involves five or more joints; usually the small joints. Rheumatoid factor is positive in older girls in whom the disease course is similar to adult type.

3. PAUCI–ARTICULAR ONSET ARTHRITIS

Commonest type of juvenile rheumatoid arthritis (50 %)

SYMPTOMS AND SIGNS

- Less than five joints affected

  - Usually asymmetrical; large joints of lower extremities. Occasionally single joint (proximal interphalangeal joint) and swollen knee may be the only joints affected

  - In girls, younger age of onset (around 2 years); Anti nuclear antibodies likely to be positive. There is a high tendency to develop uveitis – slit lamp examination to be done every six months.

INVESTIGATIONS

- FBC, differential, ESR
- Rheumatoid factor
- X–ray of affected joints
- Anti Nuclear Antibodies (ANA)

TREATMENT

Therapeutic objectives

- To control inflammation
- To prevent deformities and growth retardation
- To control extra articular complications

Pharmacological Treatment

(Evidence rating: A)

- Ibuprofen, oral,
Child over 7kg: 30–40 mg/kg BW daily in 3–4 divided doses

REFER

All suspected cases should be referred to a Paediatrician.

SYSTEMIC LUPUS ERYTHEMATOSIS

This is a multisystem autoimmune disease of unknown aetiology. It is commoner in women and occurs at a peak age of 15–25 years.

SYMPTOMS & SIGNS

- Arthralgia
- Photosensitive skin eruptions (butterfly rash on the nose bridge and cheeks)
- Malaise, weight loss, fever, anaemia
- Hair loss (alopecia)
- Psychiatric manifestations

INVESTIGATIONS

- ESR
- LE cells/Anti DNA
- ANA
- BUE, Creatinine
- Urinalysis

TREATMENT

Therapeutic objective

- To suppress manifestations

Non–Pharmacological Treatment

- Adequate rest and avoidance of fatigue
- Avoidance of exposure to sun in photosensitive patients

Pharmacological Treatment

(Evidence rating: C)

- Ibuprofen, oral, 400 mg 3 times daily

REFER

All patients for specialist care.

ACUTE SEPTIC ARTHRITIS

This is acute inflammation of joints, usually big joints, following bacterial infection. Good prognosis depends on early initiation of antibiotic treatment.
TYPES
1. Non−Gonococcal – majority
2. Gonococcal

NON−GONOCOCCAL ARTHRITIS

Causes:
• Staphylococcus aureus in majority of cases
• Streptococcus pyogenes and Pneumococi
• Haemophilus influenzae in infants
• Salmonella in sickle cell disease

SYMPTOMS
• Sudden onset. Large joints usually affected
• Pain
• Fever
• Restriction of movement of limbs

SIGNS
• Affected joint is hot, tender and swollen with effusion

INVESTIGATIONS
• Aspiration of joint effusion (fluid is turbid with polymorphs) for Gram stain and culture
• Blood culture
• Full blood count
• Sickling/Hb Electrophoresis

TREATMENT

Therapeutic objectives
• To relieve pain
• To treat infection
• To prevent joint damage

Non−Pharmacological Treatment
• Rest affected joint. Try splinting during acute phase (apply traction in hip infection)

Pharmacological Treatment
(Evidence rating: C)
Antibiotics are started soon after diagnostic joint aspiration and blood culture. Continue treatment for two weeks after joint swelling has subsided.

Adults:
Flucloxacillin, IV, 500 mg 6 hourly for 72 hours, thereafter
Flucloxacillin, oral, 500 mg 6 hourly.

Children:

Flucloxacillin, IV,

>1 year; 62.5 mg 6 hourly for 72 hours
1−5 years; 125 mg 6 hourly for 72 hours
5−12 years; 250 mg 6 hourly for 72 hours, thereafter

Flucloxacillin, oral,

>1 year; 62.5 mg 6 hourly
1−5 years; 125 mg 6 hourly
5−12 years; 250 mg 6 hourly

In children with sickle cell disease and suspected Salmonella infection, additionally give

Ciprofloxacin, oral, 10 mg/kg body weight 12 hourly

Pain relief with:

Paracetamol, oral, 500 mg−1g 3−4 times daily or
Ibuprofen, oral, 400 mg 3 times daily

REFER

Refer patients with large or loculated effusions to specialist for joint aspiration.

GONOCOCCAL ARTHRITIS

This is not common and the main organism responsible is *Neisseria gonorrhoeae*. Joint involvement may be asymmetrical and polyarticular.

Other features:

• Rash (macular, vesicular, or pustular)
• Tenosynovitis
• Urethral discharge

INVESTIGATIONS

Culture of urethral discharge, skin or genital lesions

TREATMENT

(Evidence rating: C)

Ciprofloxacin, oral, 500 mg 12 hourly for 14−21 days

Treat suspected Chlamydia infection with:

Doxycycline, oral, 100 mg 12 hourly for 14 days.
OSTEOMYELITIS

This is infection of bone. It is a blood-borne infection, usually in children, from a septic focus or following trauma but direct infection of the bone may also occur in fractured bones that communicate with the exterior (i.e. compound fractures). It may be acute or chronic. It is common in patients with sickle cell disease.

CAUSES

*Staphylococcus aureus* is the commonest organism. Less common organisms include Streptococci, *E. coli*, Proteus and Pseudomonas and *Haemophilus influenzae* in children. In sickle cell disease Streptococcus and Salmonella are common causes.

SYMPTOMS

In acute osteomyelitis the patient, usually a child

- has a high fever, 38°C or more
- has pain of the affected part
- is unwilling to move the affected part

SIGNS

- Limited voluntary movement of affected part
- Local swelling, warmth and tenderness
- A definite fluctuant abscess may develop
- Anaemia is severe in patients with sickle cell disease

INVESTIGATIONS

- Full blood count, ESR
- X-ray of the affected bone may be normal initially but new bone formation in the line of the elevated periosteum is seen after 10 to 14 days
- Blood culture or pus for culture if possible

TREATMENT

Therapeutic objectives

- To relieve pain
- To control infection
- To lower body temperature
- To prevent complications e.g. pathological fractures, chronic osteomyelitis

Non-Pharmacological Treatment

- Splintage of affected limb in Plaster of Paris (POP) back slab or other suitable splint
- Tepid sponging

Pharmacological Treatment

(Evidence rating: C)

- IV fluids and blood transfusion if indicated
- Antipyretics/Analgesics e.g. Paracetamol, oral,
Adults: 500 mg–1 g 3–4 times a day.

Children:

3 months–1 year; 60–120 mg 3–4 times daily
1–5 years; 120–250 mg 3–4 times daily
6–12 years; 250–500 mg 3–4 times daily

• Antibiotics

Adults: Flucloxacillin, IV, 250–500 mg 6 hourly until the organism and its sensitivities are known. Give parenteral treatment for 2 weeks and then continue with Flucloxacillin oral for 4 weeks.

Children:

<1 year; 62.5 mg six hourly
1–5 years; 125–250 mg six hourly
6–12 years; 250–500 mg six hourly

Alternative treatment is Clindamycin, oral, IM or IV,

Adults: 150–300 mg 6 hourly
Children: 3–6 mg/kg BW 6 hourly

Use parenteral route for 2 weeks and then continue with oral for 4 weeks.

In sickle cell disease patients:

Ciprofloxacin, oral, 500–750 mg 12 hourly or IV 200–400 mg 12 hourly should be added to flucloxacillin.

REFER

Refer patients with the following problems to an orthopaedic surgeon;

• Patients not responding to treatment (persistent fever and pain after 2 days)
• Fluctuant abscess will require drainage
• Complications e.g. pathological fracture, chronic osteomyelitis

CHAPTER 18: TRAUMA AND INJURIES

WOUNDS

A wound is a break in the skin, usually caused by injury. It may bleed, may be contaminated with dirt and other foreign matter and may be associated with broken bones. It may be small or large and may be deep or
superficial. It may become infected and infection may spread.

CAUSES

• Mechanical agents e.g. cuts from cutlass or knife, gunshot, accidents, burns
• Chemical agents e.g. strong acids or alkalis, other corrosive chemicals
• Wounds may follow snake or insect bites, animal or human bites

SYMPTOMS

• Local pain
• Bleeding
• Discharge of pus if infected. Pus may be offensive

SIGNS

• Local swelling and tenderness
• Look for other injuries e.g., head, chest, abdomen, bone, nerves
• Determine the physical characteristics of the wound e.g. site, size, shape & depth

INVESTIGATIONS

• Check Hb if patient has bled
• Group and cross–match if indicated
• X–ray of injured part may be required
• Wound swab for culture and sensitivity if wound is infected

TREATMENT

• Therapeutic objectives
  • To control bleeding
  • To prevent infection
  • To protect against tetanus
  • To relieve pain
  • To achieve early closure of wound

Non–Pharmacological Treatment

• Apply sterile pressure dressing to bleeding site and raise the injured part to control bleeding. A tourniquet may be applied if bleeding is profuse and cannot be controlled by pressure. If a bleeding vessel can be identified, it should be ligated.

• Bleeding from a tooth socket – put a small piece of sterile gauze in the socket and ask the patient to bite on it.

Pharmacological Treatment

(Evidence rating: C)

• For all potentially contaminated wounds, give tetanus prophylaxis and give booster doses of the toxoid as appropriate: refer to section under immunization.

• For pain: Give Paracetamol, oral,
**Adults:** 500mg–1g 3–4 times daily

**Children:**
- 3 months–1 year; 60–120 mg 3–4 times daily
- 1–5 years; 120–250 mg 3–4 times daily
- 6–12 years; 250–500 mg 3–4 times daily

• IV fluids and blood transfusion may be required.

**WOUND MANAGEMENT**

• Immediate closure of wounds is good, but this is not advisable if the wound is dirty or likely to become infected e.g. gunshot wounds, animal and human bites and wounds over 24 hours old. They should NOT be sewn up.

• Wash hands well and wear sterile gloves. Clean the wound with antiseptic solution. Scrub dirty wounds with antiseptic solution and irrigate with dilute hydrogen peroxide and saline.

• If there are bits of gravel, glass or dirt in the wound, remove them gently. Lift up all flaps of skin, clean under them, excise all dead tissue and cover the wound with sterile gauze. Anaesthesia may be required.

*Do not use Eusol, which is both irritant and exposes patient to unnecessary borate levels*

• Dress infected wound AS OFTEN AS NEEDED with normal saline or povidone iodine lotion.

• Take wound swab for culture and sensitivity test if possible and start Amoxicillin (Amoxycillin) while waiting for results of wound culture

  Amoxicillin (Amoxicillin), oral, 500 mg 8 hourly for 5 days

**Adults:** 500 mg 8 hourly for 5 days

**Children**
- 1 year; 62.5 mg 8 hourly for 5 days
- 1–5 years; 125 mg 8 hourly for 5 days
- 6–12 years; 250 mg 8 hourly for 5 days

**REFER**

Complicated wounds (eg. wounds associated with fractures, division of tendons, blood vessels and nerves).

**BITES AND STINGS**

**Principles:**

Leave them open; punctured wounds are especially likely to be infected. Usually the marks of the stings or bite are obvious.
SNAKE BITE

Vipers are the cause of most snake bites in tropical Africa. Others are the puff adders and mambas. Poisonous snake bites are indicated by one or two fang marks on the skin, whereas multiple teeth mark suggests that the snake is not poisonous.

SYMPTOMS

• Most bites occur on the feet
• Local pain and swelling if venom is injected
• Bleeding from the gums, nose and also internally
• Difficulty in breathing and swallowing due to muscle paralysis may also occur
• The patient may be confused and restless
• Respiratory failure or heart failure may occur

SIGNS

• Fang marks
• Local swelling, blisters, bleeding and necrosis of tissue

TREATMENT

• Therapeutic objectives
  • To reduce the chance of spread of poison
  • To relieve pain and control infection
  • To support the respiration or circulation if indicated
  • To counteract the snake poison

Non−Pharmacological Treatment

First Aid

• Do not move the limb that has been bitten – the more it is moved, the faster the poison spreads. Carry the person on a stretcher and tie the limb to a straight piece of wood. Tie a piece of cloth firmly, but not too tight, above the bite and loosen it for a few seconds every half−hour. If ice is available, wrap pieces in cloth and place it around the bite. If the snake is identified as non−poisonous or there is absence of swelling or systemic signs, clean the wound and re−assure the patient.

For probable venomous bites:

• Clean site of bite with antiseptic lotion or soap and water
• DO NOT make any incisions at the site of the bite

Pharmacological Treatment

(Evidence rating: C)

At the hospital:

• IV fluids to maintain circulation and blood transfusion if the patient is bleeding or having severe intravascular haemolysis (dark urine, jaundice)
• Support respiration if indicated
• Paracetamol, oral, for pain
Adults: 500mg−1 g 3−4 times daily

Children:
3 months−1 year; 60−120 mg 3−4 times daily
1−5 years; 120−250 mg 3−4 times daily
6−12 years; 250−500 mg 3−4 times daily

• Tetanol, IM, 0.5 ml stat, repeat after 4 weeks
• Inject polyvalent anti−snake venom according to the instructions on the information leaflet if the snake bite is suspected to be poisonous.
• Give Adrenaline, SC, 0.25 ml of 1:1000 before injection of antivenom to prevent severe acute reactions.
• Give Procaine Benzylpenicillin (Procaine Penicillin), IM, 3 MU daily for 5 days.

REFER
Those with respiratory failure, heart failure, renal failure, muscle paralysis, muscle necrosis, bleeding or intravascular haemolysis.

SNAKE SPIT IN THE EYES
The black−necked cobra or the spitting cobra sprays its venom into the eyes of its victim. It causes irritation of the eyes and may cause conjunctivitis and even blindness if not washed away immediately.

TREATMENT
• Irrigate the eye with any liquid available (water, milk, saline etc).
• Instil diluted antivenom (one part to five parts of Sodium Chloride 0.9%).
• Treat as corneal abrasion with topical antibiotics(see section on eye injuries)

SCORPION STING
They leave a single mark, and the stings are extremely painful. Children may have the following symptoms: vomiting, abdominal pain, excessive salivation, sweating and rapid respiration.

TREATMENT

Treatment objectives
• To relieve pain
• To maintain hydration
• To reassure patient

Non−Pharmacological Treatment
• Put ice compresses on the area. Detain for observation
• Give the patient plenty of fluids to drink
Pharmacological Treatment

(Evidence rating: C)

• Paracetamol, Aspirin, Ibuprofen or Diclofenac, oral
• Local infiltration with 2–5 ml of 1% Lidocaine (Lignocaine) for pain relief

BEE AND WASP STINGS

 Majority of stings only produce a painful local reaction. These may cause allergic reactions and occasionally may lead to anaphylaxis with local pain generalized urticaria, hypotension, and difficulty in breathing as a result of bronchospasm and oedema of the glottis. Death may occur.

TREATMENT

Pharmacological Treatment

(Evidence rating: C)

Under such conditions, give:

• Adrenaline, SC (1:1000): 0.5–1 ml stat
• Promethazine, IM: Adults: 50 mg stat Children: 12.5–25 mg stat
• Hydrocortisone, IV: 100–200 mg repeated 6 hours later if necessary
• Apply ice
• Give IV fluids for shock
• Paracetamol for pain

In the case of bee sting remove stinger from skin by scraping. Do not pull it out.

HUMAN BITES

Human bites (which usually occur during fights) lead to infections which, if neglected, almost invariably produce a highly destructive, necrotizing lesion contaminated by a mixture of aerobic and anaerobic organisms. A deliberately inflicted bite on the hand or elsewhere should be considered as contaminated.

TREATMENT

Non−pharmacological Treatment

• Clean thoroughly; do not suture

Pharmacological Treatment

(Evidence rating: C)

• Tetanus prophylaxis (See section on tetanus prophylaxis)
• Antibiotic

Adults:

Flucloxacillin, oral, 500 mg 6 hourly for 7 days plus

Amoxicillin (Amoxycillin), oral, 500 mg 8 hourly for 7 days

Children:

Flucloxacillin, oral
>1 year; 62.5 mg 6 hourly for 7 days
1–5 years; 125 mg 6 hourly for 7 days
5–12 years; 250 mg 6 hourly for 7 days

**plus**

Amoxicillin, oral

<1 year; 62.5 mg 8 hourly for 7 days.
1–5 years; 125 mg 8 hourly for 7 days
6–12 years; 250 mg 8 hourly for 7 days

• Analgesia – Paracetamol, oral,

**Adults:** 500 mg–1 g 3 to 4 times daily

**Children:**

3 months–1 year; 60–120 mg 3–4 times daily
1–5 years; 120–250 mg 3–4 times daily
6–12 years; 250–500 mg 3–4 times daily

**DOG AND OTHER ANIMAL BITES**

Any mammalian animal, including dogs may carry the rabies virus. Saliva from the infected animal contains large numbers of the rabies virus and is inoculated through a bite, laceration, or a break in the skin.

**TREATMENT**

**Therapeutic objectives**

• To treat laceration
• To prevent rabies infection
• To prevent other infections

**Non–pharmacological Treatment**

Immediate local care:

• Wash site with soap and water
• All injuries – abraded skin, minor bites and scratches, major bites and scratches are treated in the same way by thorough irrigation with copious amounts of saline solution or cleansing with cetrimide plus chlorhexidine solution

• Update tetanus immunisation – 0.5ml adsorbed tetanus vaccine, by IM injection.

Pharmacological Treatment

(Evidence rating: A)

Indication for use of Rabies Immunoglobulin and Rabies vaccine

It should be remembered that not every animal carries rabies, although the possibility should be borne in mind for every animal bite. The treatment provided is dependent on both the certainty of the presence of the rabies virus in the animal and the immunisation state of the patient.

<table>
<thead>
<tr>
<th>Condition of Animal</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>At time of attack</td>
<td>During Observation</td>
</tr>
<tr>
<td>Normal</td>
<td>No change after 10 days</td>
</tr>
<tr>
<td>Normal</td>
<td>Confirmed signs of rabies after 10 days</td>
</tr>
<tr>
<td>Strong suspicion of rabies</td>
<td>Unconfirmed sign, animal</td>
</tr>
<tr>
<td>Rabies</td>
<td>Rabies confirmed</td>
</tr>
<tr>
<td>Rabies</td>
<td>Immediate vaccination</td>
</tr>
</tbody>
</table>

Patients vaccinated within last three years:

Day 0

1. Infiltrate wound and around wound with rabies immunoglobulin (10 IU/kg body weight); and
2. Give Rabies Immunoglobulin (10 IU/kg body weight) by IM injection;
3. 1 ml Rabies vaccine by IM injection*

Day 3 (or any day up to day 7)

1. 1 ml Rabies vaccine by IM injection*

Patients with no vaccination or more than 3 years since vaccination:

Day 0

1. Infiltrate wound and around wound with rabies immunoglobulin (10IU/kg body weight);
   and
2. Give Rabies Immunoglobulin (10 IU/kg body weight) by IM injection;
3. 1 ml Rabies vaccine by IM injection*
Days 3, 7, 14, 30

1. 1 ml Rabies vaccine by IM injection*

*NOTE: Evidence shows that when this vaccine is injected into the gluteal region there is a poor response. Always use the deltoid muscle, or in small children the anterolateral thigh, to give the IM injection of rabies vaccine.

Chloroquine may diminish antibody response, so discontinuation of any chloroquine concomitant treatment should be considered.

Always

Complete the rabies vaccine monitoring form
Check availability of treatment for the next patient

NOTE:

These guidelines are prepared with respect to the use of Rabies Immunoglobulin of human origin and human diploid cell rabies vaccine.

For the use of other products seek advice and guidance from the Pharmacist or SMO Public Health at either Regional or District level.

RABIES IMMUNISATION

Prophylactic immunisation should be offered to those at high risk (eg. laboratory staff working with rabies virus, animal handlers, veterinary surgeons, and wildlife officers likely to be exposed to bites of possibly infected wild animals). Give rabies vaccine 1 ml by IM injection on each of days 0, 7 and 28. Booster doses should be given every 2–3 years.

BURNS

A burn is a destruction of the skin and sometimes deeper tissue. The burn may be superficial or deep.

CAUSE

• Fire
• Hot liquids e.g. water, steam, soup
• Hot metallic objects
• Caustic chemical e.g. acid or alkali
• Electricity

SYMPTOMS

• Pain, which may be severe
• Patient may have difficulty in breathing if he has inhaled hot fumes or hot air
• Vomiting may occur
• The patient may be unconscious

SIGNS

• Shock – cold clammy skin, weak rapid pulse, low blood pressure
• Presence of a burn
• Pain on sterile pin prick of burn area means burn is superficial and will heal well if infection is prevented

• No pain on pin prick means a deep burn

TREATMENT

• Therapeutic objectives
  • To relieve pain
  • To replace fluid lost
  • To prevent infection of burn wound
  • To aid healing of the burn wound
  • To avoid complications

Non–Pharmacological Treatment

• All burns due to hot liquids or steam should be put under the tap or into cool clean water immediately they happen and left in or under water for 10–15 minutes.

• Do not break blisters

• Do not smear oily things on burns

Pharmacological Treatment

(Evidence rating: C)

• If the blisters are already broken, wash gently with soap and cool clean water (boiled and cooled) till clean, then put gentian violet or mercurochrome or silver sulfadiazine on the exposed area and leave open

• If it is necessary to cover the wound then use Vaseline gauze (deep burns, circumferential burns, infected burns)

• Give IV fluids and blood transfusion where indicated otherwise encourage the patient to drink lots of fluids

• Give 100% oxygen where inhalation of smoke has occurred

• Relieve pain with Paracetamol

Adults: 1 g 3 times a day

Children: 250–500 mg 3 times a day

• If burn is severe give Morphine, IV, 10 mg or Pethidine, IV, 100 mg made up to 10 mls with Sodium Chloride 0.9% administered slowly. STOP when pain has improved

• Inject Tetanol 0.5 ml immediately, repeat after 4 weeks

• Injection Procaine benzylpenicillin (Procaine Penicillin)

Adults: 3 MU immediately, for extensive burns.
Children: 1.5 MU stat.
Further antibiotic treatment is indicated if suprainfection occurs.

REFER

• Extensive burns and deep burns
• Burns of the head, neck, axillae, hand and perineum.

HEAD INJURIES

Head injuries are injuries in which the brain, the skull or the blood vessels within the brain and skull may be affected separately or together. They may be open or closed injuries.

CAUSES

• Road traffic accidents
• Falls from heights
• Blows to the head
• Gunshot wounds

SYMPTOMS

The symptoms will depend on the severity of the head injury

• There may or may not have been loss of consciousness
• The patient may complain of headaches, drowsiness or intolerance to light
• They may have gaps in memory about past events

SIGNS

• The level of consciousness immediately after and since the injury enables the determination of any deterioration or improvement that may have occurred
• Examine the skull closely for any evidence of external injuries such as abrasions, contusions, lacerations or fractures
• Check for CSF or blood leakage from the ears or nostrils
• Examine the pupils to see if they are unequal in size
• Look for signs of rising intracranial pressure (ICP) such as deepening coma or a lucid interval followed by relapse, a rising blood pressure and slowing of the pulse and respiration
• Examine the conjunctivae for pallor suggestive of bleeding
• Smell the breath for alcohol
• Search for other injuries
• If conscious, parts of the body may be weak or paralysed
• If comatose, assess level of coma on the Glasgow coma scale

INVESTIGATIONS
• Do a skull X-ray (postero-anterior and lateral views) to look for fractures (After patient has been stabilised)

• DO NOT perform a lumbar puncture

TREATMENT

Therapeutic objectives

• Maintenance of a clear airway and assist ventilation if necessary
• Attention to posture, bladder function and feeding
• Continuous observation to detect the onset of improvement, deterioration or complications.
• Treatment of skull fractures and its complications

Non-Pharmacological Treatment

If patient is not severely injured, sit him up when headache allows (If headache severe suspect a complication).

In the unconscious patient:

• Ensure a clear airway, suck out any secretions
• Ventilate if necessary
• Nurse patient on the side or semi-prone position
• Turn patient every 2 hours
• Catheterize patient
• Pass nasogastric tube for feeding if patient is unconscious
• Continuous observation of pulse, BP, level of consciousness, pupils

Pharmacological Treatment

(Evidence rating: C)

• Dexamethasone, IV, 10 mg stat then 4mg 6 hourly for 48 hours for raised ICP.
• Mannitol infusion 0.25 g/kg body weight may be given over 30 to 60 minutes to lower ICP if Dexamethasone is not available
• Give Aspirin or Paracetamol for pain and headaches

Aspirin, oral,

Adults: 300–900 mg every 4–6 hours
Children: Not recommended

Paracetamol, oral,

Adults: 500 mg–1g 3–4 times daily

Children:
3 months–1 year; 60–120 mg 3–4 times daily
1–5 years; 120–250 mg 3–4 times daily
6–12 years; 250–500 mg 3–4 times daily

• For fracture base of skull give Benzylpenicillin, IV,

Adults: 4.8–9.6g daily in 4 divided doses
Children: 200mg/kg BW daily in 4 divided doses

• For open skull fractures give Ampicillin, IV,

Adults: 500 mg 6 hourly
Children: 100 mg/kg BW in 4 divided doses

DO NOT GIVE SEDATIVES

Indications for admission:

• Children
• No recall of the blow or the event
• Vomiting
• Confusion
• Loss of consciousness
• Fracture of skull
• Severe headache
• CNS signs

REFER

Patient with:

• Disturbance of consciousness
• Fractured skull, CSF rhinorrhoea or otorrhoea
• Dilated pupil or pupils
• Lateralising signs
• When CT scan is required

ACUTE ABDOMEN

Acute abdomen is sudden onset of severe abdominal pain which may require surgical operation. Some medical conditions may present as acute abdominal pain.

CAUSES

Possible causes are:

• Inflammatory conditions e.g Appendicitis, salpingitis, cholecystitis
• Perforations e.g typhoid perforation, traumatic perforation
• Intestinal obstruction e.g. strangulated hernia, adhesions, volvulus
• Haemorrhage e.g ruptured ectopic pregnancy, ruptured spleen
• Acute pancreatitis
• Colics e.g ureteric colic, biliary or intestinal colic
• Medical conditions e.g. diabetes mellitus, gastro-enteritis, gastritis, malaria, pneumonia,
UTI, sickle cell crises, adrenocortical crises, porphyria, nephrotic syndrome

SYMPTOMS

• Pain
• Gradually increasing abdominal pain suggests inflammation
• It is sudden in perforations and colics
• Colicky abdominal pain and absolute constipation suggest intestinal obstruction
• Anorexia, nausea and vomiting may occur
• A history of dyspepsia may point to perforated peptic ulcer
• Fever, headaches, joint pains and sudden onset of abdominal pain may suggest typhoid perforation
• Dizziness or faintness or collapse may be due to bleeding from ruptured ectopic, ruptured spleen or liver
• Vaginal discharge may suggest pelvic infection
• Frequency and dysuria may suggest urinary tract infection
• A past history of alcohol ingestion may suggest gastritis or acute pancreatitis
• Watery mucoid blood–stained stools with abdominal colic points to dysentery

SIGNS

• Signs of dehydration e.g. dry tongue, sunken eyes, loss of skin turgor
• High temperature in acute inflammations
• Hypotension with low blood pressure and rapid pulse if shock is present or adrenocortical crises
• Abdominal distension with fluid or gas may suggest peritonitis, haemorrhage, acute pancreatitis or intestinal obstruction
• Abdominal surgical scars may suggest intestinal obstruction due to adhesions
• Examine the hernia orifices for a strangulated hernia, especially for femoral hernia
• Tenderness, rebound tenderness and guarding suggest peritonitis due to inflammatory conditions or perforations
• Absence of bowel sounds points to peritonitis and increased bowel sounds intestinal obstruction
• Rectal and vaginal examinations will reveal tenderness in the rectovesical or recto–uterine pouch
• Examine the chest for basal pneumonia or myocardial infarction.
• Pallor, gnathopathy, frontal bossing in sickle cell disease
INVESTIGATIONS

- Full blood count, blood film for malaria parasites, sickling test
- Chest X-ray to look for gas under the diaphragm in perforations and for signs of pneumonia
- Plain abdominal x-ray (erect & supine) for fluid level and distended bowel due to intestinal obstruction. Gallstones or kidney stones may be seen
- 4–quadrant abdominal tap may yield pus, bile stained fluids from perforations or blood from bleeding ectopic or ruptured spleen or liver
- Random blood glucose
- Urine examination for RBCs, WBCs
- Blood urea, electrolytes and creatinine

TREATMENT

Therapeutic objectives

- To resuscitate patient
- To relieve pain
- To control infection if present
- To treat the underlying causes.

Non–Pharmacological Treatment

- Pass nasogastric tube and aspirate the stomach
- Monitor pulse, blood pressure and urine output. Aim at urine output of 30–50 ml per hour
- Re–examine patient frequently if the diagnosis is uncertain

Pharmacological Treatment

(Evidence rating: C)

- Resuscitation with IV fluids or blood transfusion
- Relieve pain as soon as diagnosis is made Pethidine, IM

Adults: 50–100 mg every 3–4 hours.
(Maximum 400 mg/day)

Children: 0.5–2 mg/kg BW repeated after 4 hours.

- Antibiotics may be indicated for infectious conditions. The following regime may be used for gut related infections

  Gentamicin, IV or IM

Adults and Children:

2–5 mg/kg BW daily in 3 divided doses. Do not give if urine output is less than 30ml/hour.

Metronidazole, IV
Adults: 500 mg infusion 8 hourly

Children: 7.5 mg/kg BW infusion 8 hourly

Ciprofloxacin, IV,

Adults: 200–400 mg 12 hourly infused over 30–60 minutes may be added for typhoid perforation.

Children: Not recommended but where benefit outweighs the risk, it can be given. Ciprofloxacin IV, 10 mg/kg body weight 12 hourly.

Further treatment will depend on the diagnosis.

REFER

• If diagnosis cannot be made
• If surgical expertise is not available at the facility

CHAPTER 19: EMERGENCIES

ACUTE ALLERGIC REACTION (ANAPHYLAXIS)

An acute allergic reaction or anaphylaxis is a life threatening but rapidly reversible condition if TREATED PROMPTLY

CAUSES

Anaphylaxis can develop within minutes of injection or ingestion of medicines or contact with trigger factors. These include:

• Bee or insect bites
• Penicillins, Sulphonamides
• Antisera snake serum, Antitetanus serum
• Intravenous X ray contrast media
• Vaccines or antigens
• Foods like seafoods, nuts etc.

SYMPTOMS

• Acute difficulty in breathing with laryngeal oedema and obstruction
• Bronchospasm with wheezing
• Shock with hypotension
• Facial oedema and urticarial rash
• Severe itching

TREATMENT

(Evidence rating: C)

• Give Adrenaline, IM or SC, 0.5–1.0 ml of 1:1000 solution repeated if necessary every 10 minutes according to blood pressure and pulse
• Promethazine, IM, 25 mg 8−12 hourly

• If asthma develops give nebulised Salbutamol or Aminophylline, IV, whichever is available (see section on asthma)

• Give 500ml–1 litre of Sodium Chloride 0.9% 4 hourly

• Hydrocortisone, IV, 200 mg 12 hourly, to control any late allergic reaction that may occur.

Ensure that the name of the drug or substance that caused the reaction is written prominently on the patient’s folder and educate the patient and relatives on future avoidance.

SHOCK

Shock is a state of circulatory collapse leading to reduction in delivery of oxygen and other nutrients to vital organs which if prolonged leads to irreversible multiple organ failure.

CAUSES

• Excessive haemorrhage – trauma, peptic ulcer
• Excessive fluid loss – diarrhoea, vomiting, burns
• Acute myocardial infarction

SYMPTOMS

• Feeling faint
• Palpitations
• Sweating
• Restlessness
• Clouding of consciousness

SIGNS

• Pallor
• Cold extremities
• Tachycardia
• Hypotension Systolic BP <90 mmHg

TREATMENT

(Evidence rating: C)

Hypovolaemic shock

• Insert the largest bore cannula in the largest vein visible. You may insert 2 cannulae at separate sites for rapid IV infusion

• Raise drip stand or squeeze bag to increase infusion rate

• Give colloids (e.g. Dextran 70)

• If not available give crystalloids e.g. Sodium Chloride 0.9%. Aim to give in Adults: 70 ml/kg body weight; Children: 30 ml/kg body weight.(see section on management of severe dehydration)
• In haemorrhagic states cross-matched blood is preferred but time-consuming so resuscitate with above

• Fluid should be given quickly and slowed only when BP rises and urine flow is adequate.

• Catheterise the bladder

• GIVE OXYGEN 6 L/min via nasal or facial masks

• Continue to monitor BP, pulse and urine output

REFER

• CARDIOGENIC SHOCK Refer to a higher level health facility
• ANAPHYLACTIC SHOCK See section on Anaphylactic shock

CHAPTER 20: ANTIBIOTIC PROPHYLAXIS IN SURGERY

The main cause of morbidity and mortality in surgery is infectious complications. Antibiotic prophylaxis in surgery is the administration of antibiotics in the perioperative period in order to reduce septic complications.

OBJECTIVES

Antibiotic prophylaxis is indicated in cases where a high level of septic complications is to be expected or where a possible infection could have disastrous local or generalized effects. The aim therefore is to prevent:

• Frequent infections e.g. in appendicectomy, resection of colon

• Major local consequences of infections e.g. in brain surgery, in surgery where implants are used as in joint and vascular prostheses.

• Major generalized consequences of infections e.g. surgery in diabetics, in patients with obstructive jaundice, the aged, multiple trauma.

• Lethal infections e.g. in heart valve replacement surgery.

Indications for antibiotic prophylaxis in surgery:

Proven indications

• Acute appendicitis and intestinal obstruction
• Surgery on the colon and rectum
• Surgery on the biliary tract
• Gastro-oesophageal and oro-pharyngeal surgery for carcinoma
• Hysterectomy
• Surgery in the presence of pus
• Patients with rheumatic heart disease
• Patients with congenital heart disease

Accepted indications

• Implantation surgery where prothesis and other implants are used
• Cardiovascular surgery
• Caesarian section

Possible indications

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Choice of antibiotic for prophylaxis

It should:

- Have antibacterial activity against the anticipated pathogens
- Not easily induce antimicrobial resistance
- Be easy to administer and absorb with high concentration at the site of infection
- Be easy to metabolize and excrete
- Have few toxic or adverse reactions
- Be cheap.

Regimens

Short-course (three-dose) antibiotic prophylaxis and single-dose regimens have been described. Single-dose prophylaxis is preferred, as antimicrobial resistance has not been noted.

<table>
<thead>
<tr>
<th>SURGICAL PROCEDURE</th>
<th>REGIMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendicectomy/Uncomplicated appendicitis</td>
<td>Metronidazole, IV,</td>
</tr>
<tr>
<td></td>
<td><strong>Adults</strong>: 500 mg single dose at induction of Anaesthesia.</td>
</tr>
<tr>
<td></td>
<td><strong>Children</strong>: 7.5 mg/kg body weight single dose at induction of anaesthesia <strong>or</strong></td>
</tr>
<tr>
<td></td>
<td>Metronidazole, rectally,</td>
</tr>
<tr>
<td></td>
<td><strong>Adults</strong>: 1 g one hour before surgery</td>
</tr>
<tr>
<td></td>
<td><strong>Children</strong>: 125–250 mg one hour before surgery</td>
</tr>
<tr>
<td>Resection of the colon or rectum or obstructed bowel</td>
<td>Gentamicin®, IV, <strong>plus</strong></td>
</tr>
<tr>
<td></td>
<td>Metronidazole®, IV,</td>
</tr>
<tr>
<td></td>
<td><strong>Adults</strong>: 500mg</td>
</tr>
<tr>
<td></td>
<td><strong>Children</strong>: 7.5mg/kg body weight</td>
</tr>
<tr>
<td></td>
<td><strong>or</strong></td>
</tr>
<tr>
<td></td>
<td>Metronidazole®, IV,</td>
</tr>
<tr>
<td></td>
<td>(doses same as above)</td>
</tr>
<tr>
<td></td>
<td><strong>plus</strong></td>
</tr>
<tr>
<td></td>
<td>Cefuroxime®, IV,</td>
</tr>
<tr>
<td></td>
<td><strong>Adults</strong>: 1.5 g</td>
</tr>
<tr>
<td></td>
<td><strong>Children</strong>: 60 mg/kg body weight as a single dose.</td>
</tr>
<tr>
<td>Biliary tract surgery</td>
<td>Single dose of Gentamicin® <strong>or</strong> Cefuroxime® (same as above)</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>Single dose of Metronidazole®, IV, 500mg</td>
</tr>
<tr>
<td>Dental procedures for patients with heart valve prostheses, rheumatic heart disease, septal defect and patent ductus.</td>
<td>A) Under Local Anaesthesia:</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin(Amoxycillin), oral,</td>
</tr>
<tr>
<td>Adults:</td>
<td>3 g one hour before procedure.</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td><strong>Children:</strong></td>
<td></td>
</tr>
<tr>
<td>5 years;</td>
<td>750 mg.</td>
</tr>
<tr>
<td>5−10 years;</td>
<td>1.5 g</td>
</tr>
</tbody>
</table>

Patients With Penicillin Allergy Or Who Have Received More Than One Dose Penicillin in The Previous Month; Clindamycin, oral,

<table>
<thead>
<tr>
<th>Adults:</th>
<th>600 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children:</td>
<td>&lt; 5 years; 150 mg, 5−10 years; 300 mg</td>
</tr>
</tbody>
</table>

Patients Who Have Had Previous Endocarditis

| Adults: Amoxicillin, IV, 1 g **plus** Gentamicin, IV, 120 mg at induction then,  |
|--------|------------------------------------------------|
| Children: Amoxicillin, oral, 500 mg 6 hours later. Amoxicillin, oral, < 5 years; ¼ of adult dose, 5−10 years; ½ of adult dose **plus** Gentamicin, IV, 2mg/kg body weight. |

**B) Under General Anaesthesia:**

Amoxicillin, IV,

<table>
<thead>
<tr>
<th>Adults:</th>
<th>1 g at induction then Amoxicillin,</th>
</tr>
</thead>
</table>
oral, 500 mg 6 hours later.  
Children: < 5 years; ¼ of adult dose, 5–10 years; ½ of adult dose.

If Patient Has A Prosthetic Valve Or Previously Had Endocarditis, Ampicillin, IV and Gentamicin, IV.

Patients who are allergic to penicillin or who have had more than a single dose of Penicillin In Previous Month Clindamycin, IV,

Adults: 300 mg over at least 10 minutes at induction or 15 minutes before procedure, then Clindamycin, oral or IV, 150mg 6 hours later.  
Children: 5–10 years; ½ adult dose. IlIn, oral, 500 mg 6 hours later.  
Children: Amoxicillin, oral, < 5 years; ¼ of adult dose, 5–10 years; ½ of adult dose.

§ = Doses to be administered at induction of anaesthesia.

OTHER PUBLICATIONS

• National Drugs Policy (2004)

• Code of Ethics and Standards of Practice for Traditional Medicines Practitioners in Ghana (2004)
ABOUT THIS BOOK

The purpose of this document is to improve the quality of care patients receive at all health facilities, public or private. This edition of the Standard Treatment Guidelines follows the same principles applied to the 2000 Edition. The scope of health problems was reviewed and added on to by a panel of experts comprising clinicians and pharmacists.

In a bid to ensure transparency and adherence to the evidence–based approach adopted, each member of the panel of experts signed a confidentiality and conflict of interest document before starting work.

The draft guidelines were subjected to extensive review by various stakeholders including professional associations, programme managers and other health care professionals. An editorial group comprising clinicians and pharmacists edited the draft document prior to final approval by the panel of experts. The medications identified for the treatment of the health problems automatically migrated to the Essential Medicines Lists to ensure harmony in treatment, procurement and reimbursements.

Every effort has been made to ensure accuracy of the information provided. The guidelines in this book are directed at all health prescribers and has built–in triggers for referral to higher health care levels. The information provided has been checked to ensure that there is no conflict with guidelines of public health programmes.

"The Standard Treatment Guidelines (STG) ......... brings together essential and current knowledge necessary for prescribers to provide the best of care to patients"

Dr. Kwaku Afriyie
Hon. Minister of Health

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MINISTRY OF HEALTH

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