

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya

Table of Contents

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya	1
FOREWORD.....	3
PREFACE.....	4
ACKNOWLEDGEMENTS.....	5
ABBREVIATIONS.....	5
1. ACUTE INJURIES AND TRAUMA & SELECTED EMERGENCIES	7
1.1. Anaphylaxis & Cardiac Arrest.....	7
1.2. Abdominal Trauma.....	8
1.3. Bites & Rabies.....	10
1.4. Burns.....	13
1.5. Disaster Plan.....	16
1.6. Head Injury.....	19
1.7. Multiple Injury Patient.....	21
1.8. Pneumothorax & Haemothorax.....	21
1.9. Shock.....	22
1.10. Tracheostomy.....	26
2. AIDS & SEXUALLY TRANSMITTED INFECTIONS	27
2.1. HIV/AIDS in Kenya.....	27
2.2. HIV Transmission & Prevention.....	28
2.3. Stages of Infection & Diagnosis of AIDS.....	30
2.4. HIV Testing & Patient Education.....	36
2.5. Gonorrhoea & Urethral Discharge.....	38
2.6. Genital Discharge in the Female.....	38
2.7. Dysuria in the Female.....	45
2.8. Lower Abdominal Pain in the Female.....	45
2.9. Genital Ulcer Disease.....	46
2.10. Buboec or Swollen Inguinal Glands.....	48
2.11. Genital Warts.....	48
3. CARDIOVASCULAR DISEASES	48
3.1. Congenital Heart Disease.....	48
3.2. Deep Vein Thrombosis.....	51
3.3. Heart Failure.....	52
3.4. Hypertension.....	54
3.5. Pulmonary Oedema.....	58
3.6. Acute Myocardial Infarction.....	59
3.7. Acute Rheumatic Fever (ARF).....	60
3.8. Rheumatic Valvular Heart Disease.....	61
4. CENTRAL NERVOUS SYSTEM	62
4.1. Cerebral Palsy.....	62
4.2. Seizure Disorders.....	63
5. DENTAL AND ORAL CONDITIONS	68
5.1. Abscess, Periapical.....	68
5.2. Acute Necrotizing Ulcerative Gingivitis (ANUG).....	68
5.3. Alveolitis (Dry Socket).....	69
5.4. Cellulitis (Oral).....	69
5.5. Gingivitis.....	70
5.6. Neoplasms, Salivary Gland & Hereditary/Developmental Disorders.....	71
5.7. Pericoronitis.....	71
5.8. Periodontitis.....	72
5.9. Pulpitis.....	72
5.10. Temporomandibular Joint Disorders.....	73
5.11. Trauma.....	74
6. EAR, NOSE AND THROAT CONDITIONS	75
6.1. Acute Otitis Media.....	75
6.2. Otitis Externa.....	76
6.3. Chronic Suppurative Otitis Media (CSOM).....	76
6.4. Epistaxis.....	77
6.5. Foreign Bodies in the Ears.....	78
6.6. Foreign Bodies in the Nose.....	79
6.7. Mastoiditis.....	80

Table of Contents

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya

6.8. Wax in Ear.....	80
6.9. Foreign Body in the Oesophagus.....	81
6.10. Laryngotracheal Trauma.....	81
6.11. Allergic Rhinitis.....	81
6.12. Parotid Masses.....	82
6.13. ENT Manifestations of HIV/AIDS.....	83
6.14. Hearing Impairment.....	83
6.15. Tracheostomy.....	83
7. ENDOCRINE SYSTEM CONDITIONS.....	83
7.1. Diabetes Mellitus.....	83
7.2. Thyroid Diseases.....	89
8. EYE CONDITIONS.....	92
8.1. Common Eye Conditions.....	92
8.2. Eye Injuries.....	92
8.3. Ocular Manifestation of Common Systematic Diseases.....	96
8.4. Orbital Cellulitis.....	97
9. FAMILY PLANNING.....	98
9.1. Hormonal Contraceptives.....	98
9.2. Intrauterine Contraceptive Devices (IUCDS).....	104
9.3. Barrier Methods.....	105
9.4. Surgical Contraception.....	107
9.5. Periodic Abstinence (Natural Family Planning).....	108
10. GASTROINTESTINAL CONDITIONS.....	109
10.1. Amoebiasis.....	109
10.2. Diarrhoeal Diseases.....	110
10.3. Gastritis.....	115
10.4. Gastro–Oesophageal Reflux Disease (GORD).....	116
10.6. Upper Git Bleeding.....	118
10.7. Lower Git Bleeding.....	119
10.8. Worms.....	120
11. IMMUNIZATION.....	123
12. INFECTIONS (SELECTED) & RELATED CONDITIONS.....	126
12.1. Bacterial Infections.....	126
12.2. Malaria.....	127
12.3. MEASLES.....	134
12.4. MENINGITIS.....	136
12.5. PARALYSIS (ACUTE FLACCID).....	138
12.6. SCHISTOSOMIASIS.....	139
12.7. TETANUS.....	142
12.8. TUBERCULOSIS.....	143
12.9. SALMONELLA INFECTIONS.....	148
13. MENTAL DISORDERS.....	150
13.1. ACUTE CONFUSION (Acute Psychosis).....	150
13.2. ALCOHOL WITHDRAWAL (Delirium tremens).....	151
13.3. SUBSTANCE ABUSE RELATED DISORDERS.....	152
13.4. ANXIETY.....	153
13.5. CHILDHOOD PSYCHIATRIC DISORDER.....	154
13.6. CONVERSION SYNDROMES.....	155
13.7. DEPRESSION.....	155
13.8. BIPOLAR MOOD DISORDER (MANIC EPISODE).....	157
13.9. SCHIZOPHRENIA.....	158
13.10. SLEEP DISORDERS.....	159
13.11. SUICIDE ATTEMPTS.....	159
13.12. VALUE OF ELECTRO–CONVULSIVE THERAPY (ECT).....	160
14. MUSCULOSKELETAL CONDITIONS.....	161
14.1. ARTHRALGIA, NON–SPECIFIC.....	161
14.2. GOUT.....	161
14.3. OSTEOARTHRITIS.....	163
14.4. RHEUMATOID ARTHRITIS.....	163

Table of Contents

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya

15. NEONATAL CARE & CONDITIONS.....	165
15.1. NEONATAL ASPHYXIA & RESUSCITATION.....	165
15.2. CARE OF THE NORMAL NEWBORN.....	166
15.3. BIRTH INJURIES.....	167
15.4. BORN BEFORE ARRIVAL (BBA).....	168
15.5. CONGENITAL ANOMALIES.....	169
15.6. INFANTS OF DIABETIC MOTHERS.....	173
15.7. NEONATAL JAUNDICE.....	175
15.8. PRETERM INFANT.....	177
15.9. APNOEIC ATTACKS.....	178
15.10. RESPIRATORY DISTRESS.....	178
16. NEOPLASMS.....	180
16.1. NEOPLASMS IN CHILDHOOD.....	180
16.2. NEOPLASMS IN ADULTS.....	182
16.3. HEAD AND NECK CANCERS.....	183
17. NUTRITIONAL AND HAEMATOLOGIC CONDITIONS.....	183
HAEMATOLOGY.....	184
NUTRITION.....	189
18. OBSTETRIC AND GYNAECOLOGICAL CONDITIONS.....	198
18.1. GYNAECOLOGY.....	198
18.2 OBSTETRICS.....	218
INTRAPARTUM CARE & COMPLICATIONS.....	240
POSTPARTUM CARE & COMPLICATIONS.....	248
19. ORTHOPAEDICS.....	257
ORTHOPAEDICS & FRACTURES.....	257
JOINT AND TENDON INJURIES.....	260
20. POISONING.....	264
21. RESPIRATORY DISEASES.....	265
ACUTE UPPER RESPIRATORY TRACT INFECTIONS.....	265
LOWER RESPIRATORY TRACT INFECTIONS.....	269
22. SIGNS & SYMPTOMS.....	279
22.1. COMA.....	279
22.2. FEVER.....	281
22.3. FEVER OF UNKNOWN ORIGIN.....	282
22.4. HEPATOSPLENOMEGALY.....	284
22.5. JAUNDICE.....	285
22.6. OBSTRUCTIVE JAUNDICE.....	286
22.7. LYMPHADENOPATHY.....	287
23. SKIN DISEASES.....	288
ECZEMA.....	288
BACTERIAL INFECTIONS.....	289
PARASITIC INFESTATIONS.....	291
DERMATOLOGICAL EMERGENCIES.....	293
24. SURGERY.....	295
24.1. CARE OF THE SURGICAL PATIENT.....	295
24.2. ABDOMINAL CONDITIONS.....	300
24.3. ABSCESSSES.....	304
24.4. ANORECTAL CONDITIONS.....	304
24.5. BREAST DISEASES.....	309
24.6. CENTRAL NERVOUS SYSTEM CONDITIONS.....	310
24.7. CHEST.....	312
24.8. FLUID & ELETROLYTE BALANCE.....	314
24.9. GENITOURINARY SYSTEM.....	315
24.10. SKIN ULCERS & TUMOURS OF THE SKIN.....	319
25. Genito–urinary Diseases: Urinary Tract & Renal Conditions.....	321
25.1. Urinary Tract Infections.....	321
25.2. Renal Disease Signs & Symptoms.....	323
25.3. Acute Glomerulonephritis.....	324
25.4. Acute Renal Failure.....	324

Table of Contents

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya

<u>25.5. Chronic Renal Failure</u>	326
<u>25.6. Hypokalaemia</u>	327
<u>25.7. Nephrotic Syndrome</u>	328
<u>25.8. Urinary Fistula</u>	329
<u>Annexes</u>	329
<u>A. Reference Ranges of Common Laboratory Tests</u>	329
<u>B. Paediatric Drug Dosages</u>	330
<u>C. Kenya Essential Drugs List (October, 2002)</u>	336

Clinical Guidelines for Diagnosis and Treatment of Common Conditions in Kenya

Government of Kenya
Ministry of Health



W.H.O.



October, 2002 Nairobi, Kenya

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NOTE ON DRUG DOSAGES

Every effort has been made to ensure that drug dosages and treatment schedules are correct and in accordance with current accepted medical practice. However, no responsibility can be taken for errors or omissions. When using an unfamiliar drug, clinicians are urged to confirm dosages before prescribing or administering the drug.

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FOREWORD

In the early 1980s, the Ministry of Health National Essential Drugs Programme published the Standard Treatment Guidelines for health centres and dispensaries in the form of a wall chart and a handbook for rural health workers. These have been the basis for the rural health drug supply kits and for Continuing Education programmes for health workers at this level.

In 1994, the Ministry of Health published the National Drug Policy (NDP), the Essential Drugs List (EDL) and the Standard Treatment Clinical Guidelines.

The publication of the Second Edition (updated) EDL and the *Clinical Guidelines* is an important milestone in pursuance of the NDP. These *Guidelines* are neither prescriptive nor restrictive. They are facilitative, enabling and set a firm basis towards the attainment of equity in health care, developing rational use of drugs by all prescribers, dispensers and patients.

The *Guidelines* are for the use of Clinicians who have the primary responsibility for diagnosis and management of outpatients and inpatients. This includes doctors, clinical officers, nurses and midwives caring for maternity patients. The *Guidelines* should be useful to medical students, clinical officers, pharmacists and nurses in training and generally to health professionals working in the clinical setting.

This revised manual is the result of considerable collective effort of senior clinicians from the Ministry of Health, the University of Nairobi and the Kenyatta National Hospital. Efforts have been made to include the most recent recommendation of the Ministry of Health specialised disease programmes and the World Health

Organisation.

On behalf of the Ministry of Health many thanks are accorded to all contributors, reviewers and the editors who have worked so hard to make the *Guidelines* a reality.

The regular use of the *Guidelines* by clinicians countrywide will improve and encourage the rational use of available drugs and thus contribute albeit in a modest way towards the realisation of the health sector vision of "creating an enabling environment for the provision of sustainable quality health care that is acceptable, affordable and accessible to all Kenyans".



Dr. Richard O. Muga, MBS
Director of Medical Services

October. 2002

PREFACE

The first edition of the *Clinical Guidelines for the Diagnosis and Treatment of Common Hospital Conditions in Kenya* responded adequately to the felt needs by Kenyan health workers for a concise, easy-to-carry and easy-to-consult pocket manual that gives clear diagnosis and treatment guidelines as well as optimal dosage protocols.

Although it was not possible to meet the big demand for the guidelines by health workers countrywide, most public, mission and private health institutions received copies which have been and continue to be put to good use. The process of preparing the 2nd Edition has been lengthy and involving. A wide cross section of users provided useful feedback on areas needing revision and expansion through two-day Provincial user/reviewers workshops. A writers' workshop brought together teams of clinicians from the MOH, the KNH and the UON to review, revise, update and rewrite additional material as suggested by the users. The Editors have put in many hours to review, correct and edit the material for publication. All reviewers' comments and suggestions have been taken into account.

The sections on malaria, tuberculosis and STI/HIV/AIDS have been revised with specific attention to the current management of the conditions. Users of the *guidelines* are advised to keep updated on the management of these diseases since their treatment is rapidly evolving and changing. New material includes a section on orthopaedics, sickle cell anaemia and disaster management.

The Essential Drugs List (EDL) has been revised, obsolete drugs deleted and new ones added as appropriate. Access to drugs for the treatment of life-long conditions such as diabetes, asthma, hypertension, epilepsy and psychiatric illness has been increased. Some of these drugs have been made available at dispensaries and health centres to facilitate filling of prescriptions at less costs.

While the use of these guidelines will to some extent standardise the approach to rational drug use all health workers are encouraged to be aware and observe the existing national laws, regulations and guidelines that govern the registration, procurement, marketing prescribing and use of pharmaceuticals. Health professionals owe it to Kenyans and the world at large to eliminate the existing practice of making nearly all drugs available (with or without prescription) often on considerations that are non-medical: and unethical. Health professionals must accept, perform and take responsibility for the roles they are qualified, registered and licensed to perform. Drugs are not items of trade and monetary-gain even in our liberalised economy.

With financial support from WHO and the PPB, it has been possible to provide a limited number of the *Guidelines* copies to health institutions countrywide. If demand so dictates printing and distribution of more copies will depend on sales of copies even at subsidised costs.

Finally, the Editors wish to extend their sincere appreciation to all those colleagues who have contributed in any way to the preparation and publishing of this 2nd edition of the *Guidelines*.

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The World Health Organisation (WHO) provided financial and logistical support for the reviewers workshops, the writers workshop, editorial work and printing.

The Pharmacy and Poisons Board (PPB) supported the editing, review and printing of the *Guidelines*.

The cross-section of health workers who used the *Guidelines* and provided useful inputs and suggestions for the revision and update of the *Guidelines*.

The health professionals who provided materials and technical inputs to revise and rewrite the *Guidelines*.

The secretariat team which provided administrative and logistical support at all stages of the preparation of the *Guidelines*.

The Chief Pharmacist and PPB Registrar through whose efforts it was possible to obtain financial support to review edit and print the *Guidelines*.

ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ARV	Anti-Retroviral
AZT	Zidovudine
BP	Blood Pressure
BSA	Body Surface Area
C/S	Caesarian Section
C&S	Culture and Sensitivity
CCF	Congestive Cardiac Failure
CHD	Congenital Heart Disease
CMV	Cytomegalovirus
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
CVP	Central Venous Pressure
CXR	Chest X-ray
DIC	Disseminated Intravascular Coagulopathy/Coagulation

DM	Diabetes Mellitus
DVT	Deep Vein Thrombosis
ECG	Electrocardiogram
EDL	Essential Drugs List
ENT	Ear, Nose & Throat
ESR	Erythrocyte Sedimentation Rate
FB	Foreign Body
GA	General Anaesthesia
GIT	Gastrointestinal Tract
GUD	Genital Ulcer Disease
Hb	Haemoglobin
HIV	Human Immunodeficiency Virus
IM	Intramuscular
IU	International Units
IUCD	Intra-uterine Contraceptive Device
IV	Intra-venous
KOH	Potassium Hydroxide
LA	Local Anaesthesia
LGI	Lymphogranuloma Inguinale
LGV	Lymphogranuloma Venereum
mmHg	Millimetres of Mercury
MPs	Malaria Parasites
NaHCO ₃	Sodium Bicarbonate
NASCOP	National AIDS & STD Control Programme
NGU	Non-gonococcal Urethritis
ORS	Oral Rehydration Solution
PCP	Pneumocystis Carinii Pneumonia
PCR	Polymerase Chain Reaction
PCV	Packed Cell Volume
PDA	Patent Ductus Arteriosus
PID	Pelvic Inflammatory Disease
PO	Per Oral
POC	Products of Contraception
PTI	Prothrombin Time Index
RBCs	Red Blood Cells
RPR	Rapid Plasminogen Reaction

SC	Subcutaneous
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
VDRL	Venereal Diseases Research Laboratory test for syphilis
VSC	Voluntary Surgical Contraception
VSD	Ventricular Septal Defect
WHO	World Health Organisation Micrograms

1. ACUTE INJURIES AND TRAUMA & SELECTED EMERGENCIES

1.1. Anaphylaxis & Cardiac Arrest

ANAPHYLAXIS

Allergic reaction due to mediators in a sensitised individual. It may be due to drugs, food, sera, stings and intravascular contrast media.

Clinical Features

Pruritus, Urticaria. Respiratory distress (due to laryngeal edema, bronchospasm). Hypotension.

Management

- Avoid offending agents
- Adrenaline 0.5–1 ml (children: 0.01 ml/kg) IM repeated every 10 minutes for 3 doses
- Antihistamine:
 - chlorpheniramine 10 mg IV slowly. IM/SC then continued 10 mg 8 hourly for 24–48 hours (children 0.1 mg/kg)
 - hydrocortisone 100 mg IV is of secondary value but useful to prevent delayed recurrences
- Aminophylline 6 mg/kg IV over 20 minutes if there is wheezing
- Nebulised oxygen OR bronchodilators e.g. salbutamol
- Patients with mild to moderate reaction e.g. urticaria or mild bronchospasm should be observed for at least 6 hours because attacks may recur after full recovery.

Admit For

- Severe reactions e.g. hypotension, severe bronchospasm (especially with orally ingested antigens). Severe reactions require intravenous fluid replacement with normal saline and close monitoring especially BP and urinary output.

Avoid offending agents

CARDIAC ARREST

Due to asystole, ventricular fibrillation, and cardiovascular collapse in extreme arterial hypotension. There is absence of heart sounds and of carotid and femoral pulses. There may be associated apnoea and cyanosis.

Cessation of circulation requires immediate treatment

Management – General

AIRWAY Clear airway immediately. Vomitus and secretions should be aspirated or removed with fingers or handkerchief.

VENTILATION Inflate lungs with air or oxygen by mouth-to-mouth **OR** mouth-to-nose insufflation **OR** by bag and mask devices, (ensure thoracoabdominal motion).

CIRCULATION Carry out external cardiac massage (compressions) by applying appropriate pressure over the sternum. One breath should be interposed between every 4 to 5 cardiac compressions.

- For newborn or small infants effective cardiac output can be produced by applying maximum pressure with the tip of 2 fingers over middle third of the sternum. For larger infants and small children use the heel of one hand over the sternum opposite the 4th interspace
- For big children the heel of the right hand is placed over the heel of the left hand to provide the strength of both arms and shoulders
- When ventilation and massage are effective carotid and femoral pulses become palpable, pupils constrict and the colour of mucous membranes improves.

Management – Pharmacologic

- **Adrenaline** (1:1000) 0.5–1 ml IV/IM (children 0.01 ml/Kg) which increases myocardial contractile force
- **Sodium bicarbonate** IV to correct severe metabolic acidosis which develops rapidly after cessation of circulation (1.0 mEq/kg). 1 ml of 8.4% NaHCO₃ contains 1 mEq.
- Drug therapy of cardiac arrest remains controversial.

Management – Post Resuscitation Care

- Treat cause of collapse
- Monitor and regulate arterial pressure.

Always have a resuscitation tray ready

1.2. Abdominal Trauma

Abdominal injuries(to spleen, liver, bladder, gut) can follow fairly minor trauma. If a patient has multiple injuries assume abdomen is involved until this is ruled out. The evolution of the injury could be slow leading to symptoms and signs developing late. Signs and symptoms of blunt injuries can be masked by injuries elsewhere e.g. fractured limbs, fractured ribs and spinal cord or head injuries. Organomegaly makes the involved organs vulnerable to abdominal trauma.

Unexplained shock in trauma patient should point towards an intra-abdominal bleed

Clinical Features

Of important value are the vital signs (Pulse rate, blood pressure, respiratory rate and temperature). There may be obvious bruises or abdominal wall wounds. Pain, localised tenderness or rigidity of the abdominal wall indicate the most likely site of injury. Abdominal distension – could either be due to gas leaking from a ruptured viscus or from blood from injured solid organ(s) or torn blood vessels: this is a serious sign. Absent bowel sounds and sustained shock despite resuscitation mandate urgent surgical intervention. Haematuria occurs in bladder injuries and haematochezia in rectal injuries.

Investigations

- Plain abdominal and chest X-rays may show existing fractures, foreign bodies, gas under the diaphragm or bowel loops in the chest.
- Total blood count is useful for serial comparisons
- Group and cross-match, if intra-abdominal bleeding is suspected
- Bloody nasogastric aspirates may indicate upper gastrointestinal injuries.

Management

- Start large bore IV line
- Give tetanus toxoid IM
- Manage shock if present
- Penetrating wounds are to be explored urgently
- Clean, stitch and dress small open wounds (not penetrating the anterior abdominal wall). If not sure, explore the wound directly under local anaesthesia:
- Closely monitor BP, pulse rate, respiratory rate and temperature
- Repeat clinical examination
- In blunt trauma, manage according to clinical findings and how they evolve. Mild symptoms are managed conservatively while deterioration is managed by exploration
- Indications for laparotomy include:
 - persistent abdominal tenderness and guarding.
 - persistent unexplained shock
 - paralytic ileus
 - positive x-ray findings: pneumoperitoneum, multiple air-fluid levels
 - positive peritoneal lavage
- Specific organ injuries are managed specifically at laparotomy.

DO NOT TAP THE ABDOMEN

Admit

- if abdominal injury is suspected.

1.3. Bites & Rabies

ANIMAL BITES

These include human, dog and other domestic animals as well as wild animal bites (hippo. crocodile, etc).

Management

Will depend on the extent of tissue loss and site of injury. Most bites are cuts and simple lacerations. Other animals (hippos and crocodiles) inflict major tissue destruction (lacerations, avulsions and amputation).

- **Immediate care** Stop all bleeders by pressure and ligature while preparing for thorough toileting. Administer a pain reliever e.g. pethidine 100 mg IM for an adult
- **Local** Clean all simple cuts and lacerations thoroughly with cetrimide + chlorhexidine or hydrogen peroxide or detergent and dress. A **delayed suture** is advised 4–7 days after a bite
- Update tetanus immunisation
- Amoxycillin 500 mg TDS (25–50 mg/kg)
- Rabies vaccine should be given in appropriate cases
- Large bites require surgical toileting under anaesthesia. DAILY dressing is advised and later either skin grafting or flap repair is done: open chest injuries will require closure and under water–seal drainage; open abdominal wounds will necessitate an exploratory laparotomy
- Amputated extremities will need toileting and stump refashioning where necessary
- If in shock treat aggressively with saline infusions, blood transfusion and vasopressor agents
- In major tissue destruction administer antibiotic e.g. crystalline penicillin, gentamicin and metronidazole for 7 days; piperacillin 2 gms TDS is an alternative. This will cover for clostridium, gram negative and anaerobic bacteria which colonise the mouths of most animals.

Admit If

- Major tissue destruction.

Refer If

- Patient requires major operation after resuscitation.

SNAKE BITES

Remember 70% of snakes are **not** poisonous. The venom produced by poisonous snakes will have neurotoxic, haemolytic, cytotoxic, haemorrhagic and anticoagulant effects. Most snake venoms have more than one toxic effect.

Classification of poisonous snakes

Elapidae (e.g. cobras) Predominantly neurotoxic venom. **Viperidae** (e.g. puff adders, vipers) Predominantly cytotoxic and haemolytic venom. **Colubridae** (e.g. rattle snakes) Predominantly haemorrhagic venom. Know the local snakes (snake Parks are a great help).

Clinical Features

Poisonous bites are characterised by EXCRUCIATING PAIN. ONE or TWO FANG MARKS (compared to a row of punctures in non-poisonous snakes). Pain, swelling, tenderness and ecchymosis occur within minutes of a poisonous bite; swelling increases for 24 hrs, later formation of haemorrhagic vesiculation. Neurotoxic features: muscle cramping, fasciculation and weakness and eventually respiratory paralysis which may occur within 10 minutes; these may be accompanied by sweating and chills, nausea and vomiting. Haemolysis with jaundice may predominate.

Management – General

- Clean the site well with cetrimide + chlorhexidine or hydrogen peroxide or detergent and remove the fangs if any
- Update tetanus immunization
- Do **not** use a tourniquet
- Apply adequate local pressure on the bite (thumb or index finger)
- Incision and suction (using an appropriate suction cap not your mouth) is useful in the **first 30 minutes**
- Immobilize the affected extremity with a splint
- Single excision **within one hour** through the tang punctures can remove most of the venom
- If in shock treat aggressively with saline infusions, blood transfusion and vasopressor agents.

Management – Pharmacologic

- No need for anti-snake venom if:
 - there is minimal swelling and pain
 - there are no constitutional symptoms and signs
 - a known non-poisonous snake
- Assess those who require anti-venom:
 - start on intravenous drip
 - keep bitten part level with the heart
 - infuse polyvalent anti-venom in all patients with **systemic symptoms** and **spreading local damage** such as marked swelling
 - anti-venom is given as an intravenous infusion in normal saline. The infusion should be given slowly for the first 15 minutes (most reaction will occur within this period). Thereafter the rate can be gradually increased until the whole infusion is completed within 1 hr;

<p>Minimal symptoms.....1–4 vials Moderate symptoms.....5–9 vials Severe symptoms.....10–15 vials</p>

NB You need resuscitation tray for anaphylaxis ready. Most patients will have some form of anaphylactic reaction.

Admit For

- All snake bite patients for at least 24 hrs.

Refer If

- Patients are systemically symptomatic after anti-venom
- Severe local symptoms (e.g. for debridement, skin grafting, etc)
- You are not sure of toxicity and sequelae of patients.

BEE STING

Bee sting causes sharp pain followed by intense itching. Signs subside within a few hours. In hypersensitive individuals, anaphylaxis may occur [see 1.1. **anaphylaxis**]. Other patients may experience delayed reactions usually after 0–14 days.

RABIES

Any mammalian animal may carry rabies. Saliva from a rabid animal contain large numbers of the rabies virus and is inoculated through a bite, any laceration or a break in the skin.

Management

• Immediate local care:

- thorough irrigation with copious amounts of saline solution
- cleansing with a soap solution
- debridement
- administration of antibiotic
- administration of tetanus toxoid
- delayed suture or skin grafting
- infiltrate the wound with rabies immunoglobulin

• Indication for rabies vaccine:

- bites from wild animals
- bites from UNPROVOKED domestic animal
- bites from a sick looking domestic animal, whether immunized or not
- severe injury (multiple or deep puncture wounds), or any bites on the head, face, neck, hands or fingers
- laboratory findings of Negri bodies in the brain of the involved animal
- persons at high risk of exposure.

Immunization

Pre-exposure prophylaxis should be offered to persons at high risk of exposure such as laboratory staff working with rabies virus, animal handlers and wildlife officers.

Three full intramuscular doses of 1 ml on days 0, 7 and 28 in the deltoid area.

Post exposure prophylaxis of previously vaccinated persons Local treatment should always be given. Post exposure prophylaxis should consist of 2 booster doses either intradermally or intramuscularly on days 0 and 3 if they have received vaccination within the last 3 years.

Otherwise full course of rabies vaccine.

Post exposure prophylaxis

- Passive immunization: Human rabies immunoglobulin is given as a dose of 20 IU per kg of body weight infiltrated around the wound and 20 IU per kg given IM in gluteal region followed by a course of rabies vaccine
- Intradermal schedule: 1 dose (0.1 ml) should be given at each of two sites, either the forearm or the upper arm, on days 0, 3, 7 and one dose at one site on days 30 and 90
- Intramuscular schedule: 1 dose (1 ml) should be administered on days 0, 3, 7, 14 and 28. All IM injections should be given into the deltoid region or in small children into the anterolateral area of the thigh muscle.

1.4. Burns

The majority of burns are caused by heat, which may be open flame, contact heat, and hot liquids (scalds). Others are chemical, electric, friction, sunburns and irradiation. Extreme cold can cause tissue injuries (i.e frost bite).

Management at Site

- Remove victim from scene of injury
- Roll the victim to extinguish flames and use cold water.
- Do not remove charred clothing
- Cover burnt areas with clean material.

Management at the Health Facility

First aid measures.

- AIRWAY: Ensure patient has a clear air way e.g. suction, oral airway, endotracheal intubation, tracheostomy.
- BREATHING: Ensure patient is breathing, oxygen by mask
- CIRCULATION: Adequate intravenous access, intravenous crystalloids, group and cross-match blood, tetanus toxoid and analgesics.

Quick assessment of the extent of burns

- Burnt surface area
- Site of injury (note facial, perineal, hands and feet)
- Degree of burns
- Other injuries (e.g. fractures, Head injuries, chest injuries, abdomen etc).
- The Wallace Rule of Nines (**see box next page**) is used to estimate the extent of burns.

CRITERIA FOR ADMISSION

- Extent of Burns: > 10%
> 25% transfer to Burns Unit

- Pay special attention to the following:

- hands and feet
- face and neck
- perineum
- joints
- Other associated injuries

Inhalational Burns

Chemical and Electric Burns

Other blown pre-existing Diseases e.g. Diabetes mellitus.

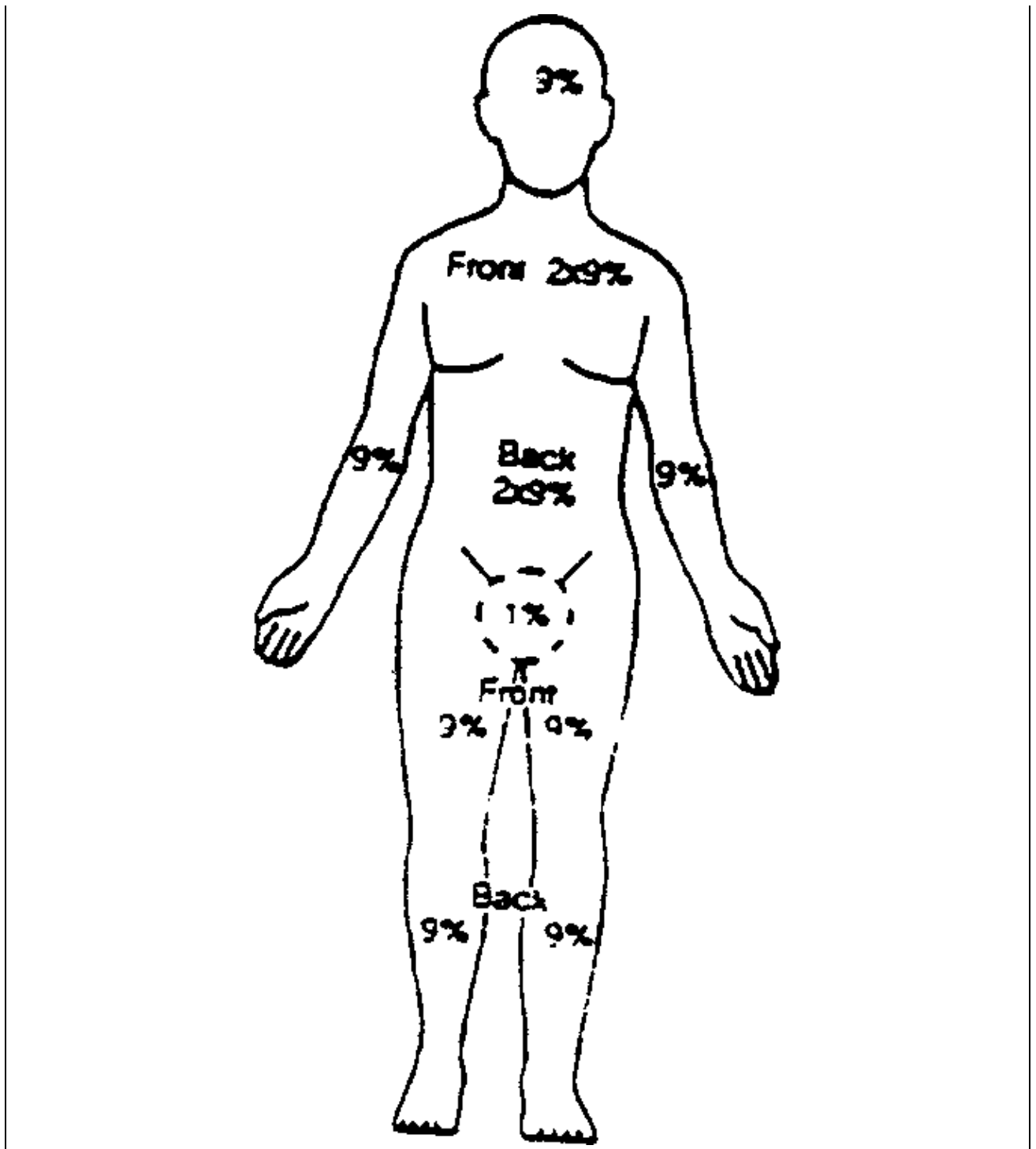
FLUID THERAPY

Fluid administration is the mainstay of treatment and is life saving. Quick vascular access is mandatory. Do not waste time on collapsed peripheral veins, urgently perform a cutdown.

Surface area assessment

Wallace Rule of Nines

"Rule of nine" for estimating the extent of a burn. By adding the affected areas together the percentage of the total body surface burnt can be calculated quickly. It should be remembered that this rule does not apply strictly to infants and children. Infants have a greater percentage of head and neck surface area (18%) and a smaller leg surface area (9%) than adults. Children, compared to adults, incur greater fluid losses as they have a higher ratio of surface to body area.



It is safer to overestimate than under estimate.

Amount of fluids

Parkland's formula:

$4 \times \text{TBSA} \times \text{Weight in Kgs} = (\text{mls})$ administered in the first 24 hours of the burns.

First 8 hrs from time of burns = $\frac{1}{2}$ total calculated fluid

Next 8 hrs = $\frac{1}{4}$ total calculated fluid

Next 8 hrs = $\frac{1}{4}$ total calculated fluid

e.g. 80 kg patient with 20% burns, total fluid ($80 \text{ kgs} \times 20\% \times 4$) mls = 6400 mls, administer as follows:

3200 mls within first 8 hours

1600 mls next 8 hours

1600 mls next 8 hours.

Type of fluids

Crystalloids

- Normal saline
- Ringer's lactate solution
- Hartmann's solution.

Monitor

- Urine output (1 –2 mls/Kg/hr)
- Urea and Electrolytes
- Vital signs
- PCV.

Care of the Burnt Surface

- Clean with antiseptics or normal saline OR even "clean water"
- Dressing; cover with antiseptic cream like silver sulphadiazine. Nurse exposed but use cradle
- Hands, feet use moist plastic bags – as after antiseptic cream.

Special Burns

- Circumferential burns; if this leads to compartment syndrome, escharotomy must be done
- Inhalational burns; should be suspected if there are burned lips, burned nostrils especially in cases of open fires and smoke, give humidified air and oxygen, bronchodilators and appropriate antibiotics, intubation may be necessary.
- Electrical burns; are deep burns, and will require specialised care
- Chemical burns; clean with plenty of water and soap.

The rest of management will follow like other burns.

Skin grafting shortens the duration of hospital stay and should be done early when necessary.

Start physiotherapy and occupational therapy early.

1.5. Disaster Plan

A major disaster is a situation where the number, type and severity of casualties require extraordinary arrangement by the hospital to cope with. These include road accidents, train accidents, airline, boat, terry accidents, factory fires and bomb blasts.

Requirements

- Disaster team headed by a Team Leader

- Emergency equipment and drugs
- Transport
- Communication equipment.

Pre–Hospital Organisation

Important activities:

- Crowd control
- Security and safety for the team and victims
- Primary assessment of the casualties – Triage starts here.
- Transport to various medical facilities depends on the number of casualties and availability of facilities.
- The triage sieve (**see the triage sieve chart in the next page**).

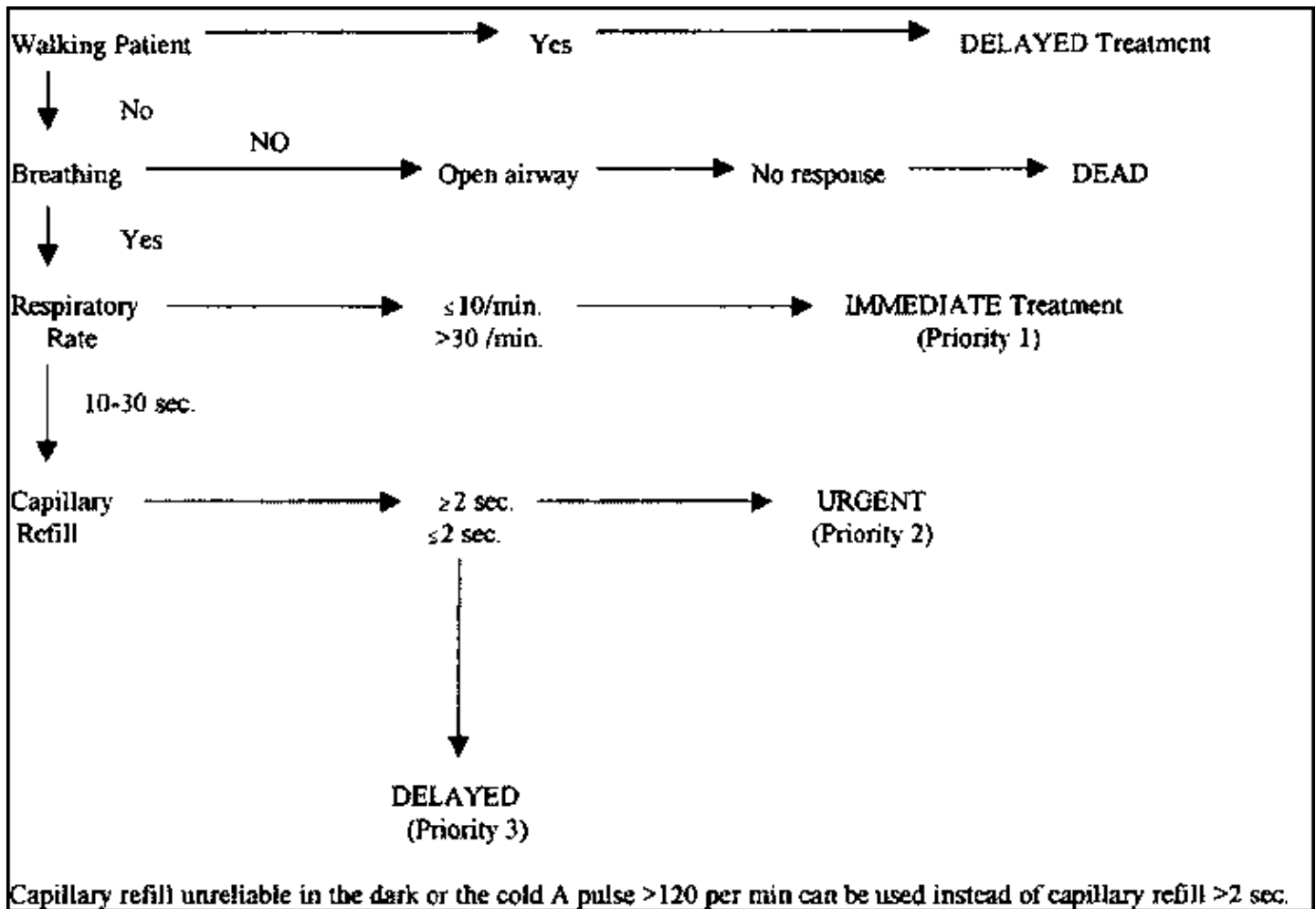
Hospital Organisation

The key to success of management of major disaster is command and control.

Establish an effective control centre staffed by Senior Medical, Nursing and administrative coordinators with appropriate support staff.

THE TRIAGE SIEVE

Is a flow chart that will assist you to identify the priority patients and respond appropriately in a disaster situation.



Triage Sieve

Transport to various medical facilities depends on the number of casualties and availability of facilities.

ACTIONS ON RECEIVING "MAJOR DISASTER STANDBY"

When choosing the transport consider:

- Capacity (a bus may be suitable for large numbers of "delayed" priority casualties).
- Availability (save the emergency ambulances for the seriously injured)
- Suitability (do you need a wheeled or a tracked vehicle? Is a helicopter more suitable?)

When you have loaded a patient:

- Move to the appropriate hospital (are you going straight to a specialist centre?)
- Observe in transit (what equipment do you need?)
- Verify the treatment before departure (do you have enough oxygen, fluids, or analgesics)
- Escort if necessary (doctor, nurse or paramedic?)

Call all **off duty** staff

TRIAGE SORT

Actions on receiving "Major incident declared – activate plan"

- Coordinators meet and establish the control centre, if no prior warning. They then:
- Dispatch the medical–incident officer to the scene
- Establish whether mobile medical teams are required; collect the teams, ensure the members are properly clothed and equipped, and dispatch them to the scene
- Establish a triage point
- Clear the accident and emergency department of existing casualties and prepare for the reception of casualties
- Inform theatres and outpatients that normal activities must be suspended: ask the intensive care unit to clear beds if possible
- Designate a ward for the reception of admitted casualties and start emptying it of existing patients
- Organize staff as they arrive
- Arrange facilities for the police, relatives, and the media

TRIAGE ACTIVITIES

Medical, nursing and administrative coordinators meet and establish the control centre. They then:

- Liaise with the ambulance service about the details and status of the incident
- Nominate the medical incident officer and dispatch him or her to the scene, if appropriate
- Start to prepare the accident and emergency department for the reception of casualties
- Warn theatres, the intensive care unit, pharmacy, laboratory, x–ray, and outpatients about the possible disruption of activities.
- Establish an accurate bed state.

The most surgically experienced person should triage (grade) the casualties.

- TRIAGE I: Patients who have life threatening injuries such as penetrating chest or abdominal wounds, head injuries or hypovolaemic shock. These are patients that can be saved by way of urgent surgery.
- TRIAGE II: Patients who have such severe injuries that they are likely to die anyway.
- TRIAGE III: Patients who have only minor injuries and will probably recover even if treatment is delayed. Operate this group last.

The decision as to what to do with each patient is made by the triage officer. This is a continuing process and patients are reassessed regularly.

1.6. Head Injury

- **Admit** for hourly neurological observations if:
 - Depressed conscious level
 - Skull fracture
 - Focal neurological signs

• **Hourly neurological observations** should be recorded and should include:

- Glasgow Coma Scale
- blood pressure, pulse, and respiratory rate
- pupil size and reaction
- limb movements (normal mild weakness, severe weakness, spastic flexion, extension, no response)
- peripheral deep tendon reflexes

• If there are signs of an intracranial haematoma developing (declining conscious level, pupil signs), cross-match and arrange for Burr holes to be done as an emergency

• **Compound skull fracture** Do thorough wound toilet and haemostasis as an emergency. Crystalline penicillin 2 mega units IV QDS and chloramphenicol 500 mg IV QDS for one week then oral for 7 days

• **Depressed skull fractures** More than one table thick require elevation

• **Basal skull fracture** Blood/CSF coming from the ear or nose is a basal skull fracture unless external source of bleeding seen – give antibiotics (IV penicillin and chloramphenicol)

• **Do not** give narcotic analgesics. Use paracetamol

• **Convulsions** must be rigorously controlled. Give diazepam 10–20 mg IV and phenobarbitone 5 mg/kg IM daily.

Neuro observations done less often than hourly are of no use

Glasgow Coma Score

Eye Opening (E)		Best Motor Response (M)	
• Spontaneous	4	• Obeys	6
• To voice	3	• Localizes pain	5
• To pain	2	• Flexion withdrawal	4
• Nil	1	• Flexion abnormal	3
		• Extension	2
		• Nil	1
Best Verbal Response (V)			
• Oriented, converses	5		
• Converses, but confused	4		
• Inappropriate words	3		
• Incomprehensible sounds	2		
• Nil	1		

Score = E+M+V(**the higher the score the better the prognosis**)

Note: Trend is more important than present level of consciousness

Fork jembe injuries are almost always penetrating, no matter how small the skin wound seems: Always explore

1.7. Multiple Injury Patient

This is a situation where the patient is injured in more than two systems of the body. This occurs in road traffic accidents, falls from a height, in blast injuries etc.

The approach to a patient with multiple injuries has to be systematic in order to identify all the injuries and prioritise on their attention.

Resuscitation takes priority and in this order

A – Airway Position the head and with linger or suction, clear blood, mucus and foreign bodies

B – Breathing Respirator.' rate, air entry into the chest should be checked

C – Circulation Stop active bleeding. Monitor pulse rate, blood pressure and fix a large intravenous cannula preferably in the antecubital area. Do a cutdown if need be

D – Dysfunction of CNS: Assess neurological status, consciousness level, spinal cord status, etc

D – Drags to correct acid base and volume imbalance

E – Exposure Disrobe the entire patient and carry out a complete physical examination.

- Chest injuries: e.g. haemopneumothorax from whatever cause takes priority
- Head injuries: Require setting of baseline observations
- A patient in shock from non-obvious causes point towards the abdomen: visceral injuries can be very unapparent but could be fatal
- Peripheral bone fracture; may need stabilization initially and proper attention later
- After resuscitation and stabilization; patient will require frequent and more thorough examinations
- Attention should be paid towards: Continued bleeding – stopping it and transfusion: haemopneumothorax may need tube thoracostomy drainage (under water seal drainage); persistent shock from unexplained source may necessitate an exploratory laparotomy; limb fractures may need Plaster of Paris fixation; spine fractures – bed rest with fracture boards; X-rays of the patient with multiple injuries should be taken after adequate resuscitation. Exceptions are in the chest and cervical spine which should be taken after initial resuscitation. Acute gastric distension – managed by nasogastric tube and suction of the same; The patient will require feeding to counter the catabolism associated with multiple injuries; some of the injuries may require referral for more specialised care. This is done after adequate resuscitation.

1.8. Pneumothorax & Haemothorax

PNEUMOTHORAX

Air in the plural space causing lung collapse on the affected side. Causes include:

Spontaneous in children following staphylococcal pneumonia and in older patients with chronic obstructive pulmonary disease. **Trauma** blunt trauma with rib fractures and or lung contusion, penetrating injuries; stab wounds and missiles.

Clinical Features

Shortness of breath. Tightness of the affected chest. Tachypnoea and tachycardia. Reduced excursion of the chest with reduced air entry. Hyper-resonant chest. Cyanosis. Sweating.

Investigations

- Chest X-ray: Shows various degrees of lung collapse.

Management

- If more than 5% pneumothorax institute tube thoracostomy drainage (under-water seal drainage), maintain absolute sterility
- Tube comes out when the lung remains expanded after clamping the chest tube for a number of hours
- Tension pneumothorax needs more rapid management with a wide bore cannula drainage or underwater seal drainage under LA.
- The frail chest leads to paradoxical breathing and requires assisted ventilation (i.e. intermittent positive pressure ventilation)

HAEMOTHORAX

Blood in the pleural space. This varies in amount from small to massive. Causes **Trauma**: Blunt penetrating, following chest surgery. Tumours of the chest cavity and chest wall.

Clinical Features

Depend on the magnitude of the problem, could cause hypovolaemic shock if massive. otherwise the same symptoms as in pneumothorax. Dull percussion note. Haemopneumothorax a common presentation.

Investigations

- Chest X-ray:
 - do erect PA view and lateral
 - look for fractured ribs, collapsed lung(s). air-fluid level
- Haemogram.

Management

- Small haemothorax will resolve spontaneously
- Large haemothorax will require intercostal underwater seal drainage
- Large clotted haemothorax may require thoracostomy and drainage to untether the lung that remains collapsed
- Fracture of rib – inject 2% lidocaine about 2–5 mls at fracture site.

1.9. Shock

Hypovolaemic shock

This is due to loss of intravascular volume.

Causes:

- Haemorrhage
- Severe burns:
 - (rapid plasma loss from damaged tissues) when over 25% BSA is burnt.
 - Endotoxaemia makes matters worse
- Dehydration
- Vomiting and Diarrhoea (cholera and enterocolitis)
- Intestinal obstruction (mechanical or paralytic ileus) until 10–15% of blood volume is lost the cardiac output is maintained by tachycardia and vasoconstriction.

Clinical Features

The patient becomes cold, clammy, drowsy and tachypnoeic. There is cold sweat, restlessness and blood pressure may even become unrecordable. The skin is pale and cold with collapsed peripheral veins, with a tachycardia. The urinary output is an indicator of renal blood flow, and will significantly fall. Temperature is subnormal (less than 35°C).

Investigations

- Hb and PCV
- Urea and Electrolytes
- Blood sugar
- Group and Xmatch Blood
- Blood gas analysis if possible.

Management

- Once shock is suspected, the medical staff on the patient should swing into co-ordinated action and treatment to the patient intensified
- Treat the primary problem e.g control haemorrhage, endotoxaemia etc.
- Secure a large intravenous line, if there is no accessible peripheral line do a cutdown
- Central venous pressure line is preferable if available
- Start infusion of isotonic saline, or Run 2 litres fast in adult
- In children calculate against Body weight 200 mls/Kg/24 hr, give first half in 4 hours
- Group and Xmatch Blood before you give Plasma expanders (Dextran 70, etc.):
 - Transfuse in cases of blood loss, burns shock
 - If shock is due to vomiting or diarrhoea replace continuing loss**Adults:** 1 litre 6 hourly Hartmann's solution; children 30 mls/Kg 6 hrly – half strength Darrows. **Continue with IV fluids** till shock reversed and cause treated
- Maintenance continues till shock is reversed and the cause is reversed
- Surgical intervention is undertaken as soon as patient is stable i.e. Laparotomy for intestinal obstruction etc., Broad spectrum antibiotics for sepsis and burns.

Clinical Features and Treatment of Common Poisonings

SUBSTANCE	CLINICAL FEATURES	TREATMENT
Mineral acids e.g. HCl, H ₂ SO ₄	Excruciating pain orally, pharyngeally, substantially, epigastric, dysphagia, vomiting, haematemesis Later Laryngeal oedema; obstruction, oesophageal perforation Long term: Stenosis of oesophagus	Lethal dose if concentrated– 20 mls • Liberal water or milk orally • Analgesic injection to relieve pain • DO NOT GIVE ALKALIS OR INDUCE VOMITING/LAVAGE
Alkalis e.g. Sodium hydroxide	As above	As above. DO NOT GIVE ACIDS
Organochlorine e.g. DDT, Aldrin, Dieldrin	Excitement, tremors, convulsions with respiratory failure due to convulsions	• IV diazepam for convulsions • Gastric lavage • Survivors beyond 48 hours almost invariably recover
Organophosphates e.g. Diazinon	Headaches, weakness, vomiting, colicky abdominal pain, profuse cold sweating, hypersalivation, muscular twitching, fasciculations, diarrhoea, tenesmus, convulsions, dyspnoea with bronchoconstriction, meiosis, bilateral crepitations	• Decontaminate (see above) • Gastric lavage • IV atropine 2 mg STAT, repeat after 10–20 min. until full atropinization (pulse 100–120, dilated pupils) and maintain on SC atropine 4–6 hours x 24–48 hours • Pralidoxime (PAM) 1 gm (children 30 mg/kg) STAT, repeat 4 hourly, 12–24 hours depending on response
Bipyridilium herbicides e.g. (paraquat, grammosine)	Oral/pharyngeal inflammation, later multi–organ failure within hours or days depending on dose. Later interstitial pulmonary oedema and fibrosis Multi–organ failure or pulmonary oedema invariably leads to death!	• Lethal dose as low as 10 mls • Gastric lavage with 50–100 gm activated charcoal 4 hourly until patient improves.
Rodenticide (majority are oral anticoagulant based)	Generalised bleeding, with intracranial haemorrhage being most serious	• Vit. K 10 mg IV STAT • Fresh blood if anaemic
Chloroquine (mistaken for abortifacient)	Convulsions, cardiac arrhythmia, cardiac arrest	• Gastric lavage • IV diazepam for convulsions • Refer if in coma
Methyl Alcohol (methanol)	Intoxication, drowsiness, muscle weakness, blurred vision, photophobia, papilloedema blindness, coma, cerebral oedema, cardio–respiratory depression, seizures, DEATH	• IV sodium bicarbonate • 10% Ethanol/50% Dextrose/5% Dextrose • loading dose 0.7 g/kg over 1 hr. Maintain at 0.1–0.2 g/kg/hr up to ethanol level of 100 mg/d L • Haemodialysis
Carbon Monoxide Automobile exhaust/charcoal jiko Acetylene gas	Vary with percentage of carboxyhaemoglobin • Headache, vertigo, confusion, dilated pupils, convulsions, coma	• 100% oxygen • Hyperbaric oxygen • Respiratory support
Digoxin	Arrhythmias, ventricular fibrillation, anorexia, nausea, vomiting, confusion, ambylopia	• Discontinue drug, potassium administration • Treat arrhythmias with lidocaine OR phenytoin

		• Antidigoxin FAB fragments
Heparin	Bleeding tendencies, gums, petechial haemorrhages, GIT bleeding	Protamine sulphate
Iron ferric salts, FeSO ₄ , Vitamins with iron	Vomiting, abdominal pain, pallor, cyanosis, diarrhoea, shock	• Emesis • Gastric lavage • Deferoxamine 1 gm IV • Exchange transfusion
Isoniazid	CNS stimulation, seizures, coma	• Emesis, gastric lavage • Diazepam • Pyridoxine (1 mg for 1 mg ingested up to 200 mg) • Sodium bicarbonate for acidosis
Lead: lead salts, solder, paints and painted surfaces	Acute ingestion: thirst, abdominal pain, vomiting, diarrhoea, lead encephalopathy	Chelation (after source of Lead elimination) Dimercapol (BAL) • Calcium sodium ediate
Mercury: All mercury compounds, diuretics, mercuric chloride	Acute: gastroenteritis, vomiting, nephritis, anuria Chronic: gingivitis, mental disturbances, neuro deficits, pneumonitis	• Gastric lavage • Activated charcoal • Penicillamine • Haemodialysis for renal failure • Look out for GIT perforation. Lungs: supportive care
Opiates/narcotics	Drowsiness, pin-point pupils, shallow respiration, spasticity, respiratory failure	• Do not give emetics • Gastric lavage, • Activated charcoal • Naloxone 5 ?g/kg IV to awaken and improve respiration • IV fluids to support circulation
Warfarin sodium	Bleeding tendencies	Vitamin K 10 mg IV STAT + OD for 5 days

Clinical Monitoring

- Blood pressure measurement
- Urine output (1–2 mls/kg/hr) catheterise
- Nasogastric suction in abdominal conditions
- Blood glucose levels
- Hb or PCV daily and correct appropriately

Treat renal complications appropriately, and more importantly treat the cause of the hypovolaemia to pre empt these complications. Remember to consult in this very dire emergency.

SEPTIC SHOCK

Clinical Features

Due to systemic sepsis. Initially "warm shock": increased heart rate; diaphoresis; warm skin. Later "cold shock": decreased cardiac output; cool vasoconstricted skin.

Complications

- Pulmonary oedema

- Renal Failure
- Disseminated Intravascular Coagulation (DIC), bleeding.

Investigations

- Hb, Wbc, Platelets
- Urea & electrolytes, creatinine
- Blood sugar
- C&S (blood and body fluids).

Management – General

- Resuscitate with normal saline or dextran 70 – large volumes may be required but watch for heart failure. A CVP line is useful
- Hourly pulse and BP
- Catheterise and monitor urine output hourly – if less than 20 ml/hr after adequate fluid replacement then give frusemide 80 mg IV STAT
- Oxygen via face mask
- Definitive treatment of cause.

Management – Pharmacologic

- Start empirically on:

Crystalline penicillin 4 mega units IV QDS
 + gentamicin 80 mg IV 8 hrly
 + metronidazole 500 mg IV 8 hrly or 1 gm suppositories or tablets rectally 8 hrly. Oral metronidazole can be started as soon as patient is able to swallow

- Specific antibiotics depend on source of infection and C&S results.

Resuscitation measures should be commenced immediately the patient is seen.

Refer If

- Complicated.

1.10. Tracheostomy

An artificial opening into the trachea through the neck in order to by pass an obstruction of the airway and/or to provide access to the lower airway facilitating ventilatory support.

Indications

Emergency Tracheostomy: Foreign bodies (in the upper airway), maxillofacial trauma (patient cannot breath and endotracheal intubation impossible), inflammatory conditions such as; epiglottitis, Ludwig's angina,

retropharyngeal and other oropharyngeal abscesses with respirator,' obstruction, tumours of head and neck with acute obstruction to airway (due to oedema, bleeding, infection, etc). **Elective tracheostomy** (ventilation likely to continue for more than two weeks); surgery for tumours of head and neck, major reconstructive facial surgery, prolonged ventilatory support surgery e.g. in: Flail chest, acute respirator,' distress syndrome, pneumonia. Guillain–Barre syndrome.

Management

- **In case of complete acute upper respiratory tract obstruction** give oxygen through a big bore needle or a canula inserted through cricothyroid membrane (Cricothyrotomy). Quickly extend the neck over a rolled up towel or pillow. Feel for the cricoid prominence (Adam's apple) and the depression just distal to its membrane. Insert a big bore needle or canula to the trachea (with or without local anaesthetic depending on circumstances).

Tracheostomy Technique

- Ideally done in theatre, properly cleaned and draped. Position patient supine **with** neck extended over a pillow and head stabilised in tracheostomy position.

Anaesthesia General Anaesthesia through a tracheal tube if possible. Local anaesthesia. No anaesthetic in extreme circumstances.

Incision Transverse incision, 2 cm below the lower angle of cricoid cartilage. Incision made through the skin, subcutaneous fat and deep cervical fascia. Blunt dissection then expose the anterior jugular vein, infrahyoid muscles and occasionally thyroid isthmus (which should be ligated and divided). A cruciate incision or a circular window is then made through the third and fourth tracheal rings. A tracheostomy, endotracheal or other tube is then inserted. The skin incision is closed loosely around the tube. Fix the tube securely with well tied tapes.

NB Use as short a time as possible through this simple procedure. Humidification of the gases/air and frequent suction through the tube must be done. When a clear passageway has been established and ventilation restored then refer the patient. For continued care of the tracheostomy, decannulation, etc. Refer to a relevant textbook for detail.

2. AIDS & SEXUALLY TRANSMITTED INFECTIONS

2.1. HIV/AIDS in Kenya

Since the index case of AIDS in Kenya was recorded in 1984, HIV infection has spread very rapidly in the country and the magnitude and impact of HIV/AIDS is a major public health and development challenge.

To date it is estimated that MORE than 2.2 million Kenyans are infected with HIV and that over 1.5 million Kenyans have died of AIDS and AIDS related illnesses.

17–18% of urban dwellers in Kenya and 13% of rural Kenyans are HIV positive. Since 80% of Kenyans live in rural areas more HIV infected people live in rural Kenya. About 50%–70% of the medical ward beds are occupied by AIDS patients.

Due to the seriousness and magnitude of the HIV/AIDS problem, Kenya declared HIV/AIDS a national disaster in 1999 and set up a National AIDS Control Council under the Office of the President to provide a frame–work for multisectoral co–ordination. resource mobilisation and allocation towards combating HIV spread.

The National HIV/AIDS and STD Control Programme (NAS COP) 5–year strategic plan (1999–2004) has identified the following priority' areas of intervention:

- Advocacy and promotion of behaviour change
- Prevention of blood borne infection
- Reduction of STD prevalence
- Prevention of mother to child transmission of HIV
- Strengthening epidemiological and research activities
- Prevention of AIDS including care and support to the affected and infected
- Mitigation of socio–economic impact of AIDS.

2.2. HIV Transmission & Prevention

HIV infection is caused by one of two related retroviruses, HIV–1 and HIV–2 resulting in a wide range of clinical manifestations. These vary from asymptomatic carrier states to severe debilitating and fatal disorders related to defective cell–mediated immunity.

HIV–1 is found worldwide, is the predominant cause of AIDS in Kenya and it is associated with more severe and rapidly progressive disease than HIV–2.

AIDS (Acquired Immune Deficiency Syndrome) is that stage of HIV infection when there is severe immunosuppression as manifested by the occurrence of life threatening opportunistic infections and malignancies. AIDS is a fatal disease that has no cure and no vaccine to prevent. Prevention is the most effective tool to its control.

Transmission requires contact with body fluids containing infected cells or plasma. HIV is present in blood, semen, vaginal secretions, breast milk, saliva, CSF and wound exudates.

HIV is not transmitted by casual contact or even by the close nonsexual body contact that occurs at work, school or at home.

Modes of Transmission & Preventive Measures for HIV Infection

Mode of Transmission	Preventive Measures
Sexual relations: vaginal intercourse (majority of cases), anal or oral sex	<ul style="list-style-type: none"> • Abstinence (most ideal) • Avoiding risky sex practices like casual and multiple sex partners • Use of condoms • Prompt and effective treatment of STIs (STIs increase risk of HIV transmission)
Mother–to–baby: during childbirth, breast feeding (30–40% transmission rate) or in utero	<ul style="list-style-type: none"> • Counselling during antenatal period on infant feeding options, infant feeding & family planning for HIV–positive women is necessary • Avoid pooling and sharing of breast milk in nurseries; however, encourage exclusive breastfeeding and avoid mixed feeding • ARV (Nevirapine) to both mother and a child
Blood transfusion: if blood not properly screened	<ul style="list-style-type: none"> • Select and defer donors with risky sexual behaviour or belonging to risky groups • Avoid unnecessary transfusions • Ensure that all blood is screened • Arrange autologous transfusions where possible

Blood-contaminated instruments: needles & skin piercing instruments

- Ensure that sterile needles are used at all times
- Ensure that tools for ear-piercing, circumcision, tattooing are sterile

Prevention of Mother-to-Child transmission of HIV

HIV can be passed on from an infected mother to her child before birth, during delivery or while breastfeeding. Studies show that between 23% and 42% of babies born in developing countries are infected.

Prevention of the transmission can be further reduced through the use of antiretroviral drugs.

Breastfeeding Status	Drug	ANC	Labour	Baby	% Reduction of MTCT
Breast feeding	NEVIRAPINE	No	200 mg single dose at the onset of labour	2 mg/kg single dose in the first 72 hours	47% (infection status at 6 weeks age)
Non breast feeding	ZIDOVUDINE	100 mg PO 5 times daily from 14.34 wk gest.	IV 2 mg/kg stat, then 1 mg/kg/hr	2 mg/kg PO 6 hrly x 6 wks	68% (infection status at 18 months)
Non breast feeding	ZIDOVUDINE	300 mg PO OD from 36-40 week gest.	300 mg PO, 3 hrly	No	50% (infection status at 6 months age)

Prevention of HIV Transmission in Health Facilities

The HIV virus does not spread through casual contact, hence patients with HIV infection may be nursed in open wards. Eating utensils need not be handled in a special way. However, health workers who handle HIV-contaminated blood or certain body fluids are at risk. Precautions include:

- Decontaminating surfaces which have been soiled by blood or other body fluids with sodium hypochlorite 0.25% (e.g. Jik)
- Soaking instruments in glutaraldehyde solution
- Washing of hands and other contaminated parts of the body with soap and water
- Using gloves for all direct contact with blood and other body fluids
- Soaking in bleach (e.g. Jik), for 30 minutes, all soiled bed linen and clothing before general washing
- Wearing of gloves and taking care in all situations involving direct exposure to blood and body fluids e.g. wound dressings, surgery and other invasive procedures, vaginal deliveries, collection of laboratory specimens
- **Accidental needle stick injury:**
 - Immediate measures;
 - skin;
 - decontaminated skin wash thoroughly with soap
 - squeeze out of wound and let blood flow freely
 - apply iodine, methylated spirit, betadine or other virucidal agents
 - eye;

- rinse thoroughly with sterile saline, eye irrigant and clean water splash
- mouth/nose;
 - clean water rinse flush
 - oral disinfectants
- post exposure care;
 - allay anxiety
 - discuss safer sex/third party risks
 - HIV pre– and post–test counselling
- **testing;**
 - baseline HIV screening at injury
 - repeat 6 weeks, 3 months and 6 months
 - post HIV exposure prophylaxis.

2.3. Stages of Infection & Diagnosis of AIDS

AIDS is the end stage of the spectrum of disease. Characterised by life threatening opportunistic infections and neoplasms. Some of the conditions include: Pneumocystis Carinii Pneumonia, disseminated Kaposi's sarcoma, CNS infections (toxoplasmosis, cryptococcus, CMV, herpes), stroke, disseminated fungal infections.

Individual patients progress at different rates determined partly by: Route of infection, age, sex, nutrition, other concurrent infections, availability and utilisation of health services. Patients life style (e.g. alcohol or heavy smoking), presence of another STD, and pregnancy can also hasten disease progression.

Clinical Features

AIDS is the end stage of the spectrum of disease. The diagnostic criteria for this stage are as shown below.

WHO CLASSIFICATION – ADULTS + ADOLESCENTS	CHILDREN
<p>Clinical stage I – Asymptomatic – Persistent generalised lymphadenopathy</p> <p>Clinical stage II – Early (mild) Disease – Weight loss <10% body weight Minor skin infections Herpes Zoster Recurrent upper respiratory infections</p> <p>Clinical stage III – Intermediate (Moderate)– – Weight loss > 10% body weight, chronic diarrhoea, fever, oral Candida, TB, severe bacterial infections</p> <p>Clinical stage IV – Late (Severe Disease) – HIV wasting syndrome, CMV, pneumocystis carinii pneumonia, toxoplasmosis, Kaposi's sarcoma, HIV encephalopathy</p>	<p>Major signs Weight loss or abnormally slow growth; Chronic diarrhoea – 1 month; Fever – 1 month</p> <p>Minor signs Generalised lymphadenopathy Oropharyngeal candidiasis Repeated common infections e.g. otitis media Persistent cough Generalised dermatitis Confirmed maternal HIV infection</p> <p>AIDS Diagnosis: 2 Major signs + 1 minor sign in the absence of other immunodeficiency</p>

NB: Where there are no facilities for CD4 counts and viral load assays, total lymphocyte count may be used. (If total lymphocyte count <1200, treat.)

HTV/AIDS Related Manifestations; Opportunistic Infections, Neoplasms and other common HIV Manifestations

The manifestations of HIV infection are many and present in all disciplines of medicine.

Skin

Dermatologic manifestations of HIV infection are probably the commonest. The diseases could be infective (bacterial, fungal, viral), reactive (eczema, hypersensitivities) or neoplastic (Kaposi's sarcoma).

Herpes zoster (shingles) This presents as vesicles and bullae distributed along a dermatome. 80% of young adults who develop HZ are HIV positive.

HZ occurs very early in the course of HIV infection and intensive counselling should be offered to such people with early disease. The lesions usually heal and may leave a scar.

Post herpetic neuralgia is a common complication.

Seborrhoeic dermatitis This is an eczematous skin condition usually affecting the scalp, central face (especially the naso-labial fold, eyebrows) and flexures of limbs. The affected areas are erythematous and have greasy scales. Treatment is by the use of steroids and tar preparations.

Molluscum contagiosum These present as umbilicated papules usually around the genitals. They exude some whitish materials (molluscum bodies) when pressed or cut.

Kaposi's sarcoma This is a neoplasm of the vascular-forming cells. It presents as bluish black nodules or plaques on the skin or mucous membranes. It may also involve the lymphatics and other organs including the GIT and lungs. Involvement of the hard palate is a poor prognostic sign.

Management: [Refer to the next level of clinical management]

HIV-associated pruritis Itchy papular dermatitis, usually on extensor of limbs and trunk. Topical steroids and soothing agents (e.g. calamine lotion) are helpful.

Chronic herpes simplex or HSV ulcers caused by HSV I and II in HIV patients. Recurrent HSV infections lead to progressively enlarging ulcers on the genitalia, buttocks and perineum.

Management

- Antiseptic soaps or saline baths
- Topical acyclovir cream or systemic acyclovir tabs;
 - 200–400 mg PO TID/QID for 10 days
- Antibiotics for secondary bacterial infections.

Psoriasis Multiple inheritance disease. A chronic recurrent disease characterised by well-circumscribed silvery scaling papules and plaques of varying sizes. Condition exacerbated by HIV infection, obesity, stress, sunlight and drugs (systemic steroids, alcohol, chloroquine).

Management

- Avoid offending drugs
- Use topical steroid with keratolytic agent e.g. salicylic acid
- 0.05–0.4% dithranol ointment
- Avoid exposure to ultra-violet light.

Gastrointestinal Tract

Candidiasis

Caused by yeast or fungus. *Candida albicans* is the commonest agent. Usually a normal inhabitant of mucosal surfaces but overgrows with increasing immune deficiency.

Presentation: Appear as white, milk-like, removable plaques on the oral mucosa.

Oral thrush – white coating on hard or soft palate and tongue, causes dysphagia if oesophagus involved, occurs in late disease.

Management

- Nystatin 100,00 units 4 times daily after food for 7 days
- Ketoconazole 200 mg or 400 mg OD for 7 days.

Diarrhoea of more than 1 months duration, often caused by shigella, salmonella, amoeba; can also be caused by the virus itself (slim or wasting disease).

Respiratory

Cough of more than 1 months duration, with or without shortness of breath caused by infection with lower tract organisms.

The cases of Pulmonary tuberculosis (PTB) have of late been on the increase. The risk of reactions to anti-TB therapy is higher in HIV positive patients. Thiacetazone (in Thiazina) is to be avoided [see 12.8. TB]. *Pneumocystis carinii* pneumonia is less frequent than in the western world.

Neurological

Headaches (progressively worsening). Mental deterioration. Fits, seizures. Meningitis including cryptococcal meningitis. CMV encephalitis. Sensory loss.

Gynaecological

Acute and chronic PID; bad obstetric history and amenorrhoea

Ophthalmic e.g. cytomegalovirus retinitis, toxoplasmosis herpes zoster affecting the ophthalmic nerve, Kaposi's sarcoma involving the conjunctiva, etc.

General

Fever, constant or recurrent. Unexplained weight loss of > 10% of body weight. Chronic malaise or fatigue. Enlarged lymph nodes at 2 or more extra-inguinal sites for more than 3 months.

MOST OPPORTUNISTIC INFECTIONS IN HIV/AIDS ARE TREATABLE. PATIENTS RESPOND WELL AND ARE ABLE TO RESUME WORK

Investigations

- **Specific to HIV/AIDS** Rapid Tests – 2 parallel tests with 2 different kits. A third kit can be used as tie breaker. Alternatively use a double ELISA
- **Test viral load** Quantitative PCR test for viral load in plasma
- **Test to assess Immuno-competence** CD4/CD8 T-lymphocyte count, total lymphocyte count

• **Indication for HIV testing** Routine screening for HIV is unwarranted. Testing is done if there is strong clinical indication for HIV infection or AIDS; the client/patient is a blood/organ donor, an individual requires to know his/her sero-status for purposes of travel, insurance, marriage, etc. These individuals should also be counselled and informed consent obtained

• **Not specific to HIV/AIDS** These depend on the presentation of the individual case e.g;

- diarrhoea: stool ova and cysts. C&S
- cough: chest X-ray, sputum for AFB microscopy, culture and sensitivity.
KOH
- fever: malaria parasites, blood cultures, septic screen.

Investigations should be ordered as clinical features indicate as most HIV related diseases are treatable

Management – General of HIV/AIDS

- A well balanced diet, good rest and exercises help to maintain health. Discourage excessive alcohol drinking and smoking
- Prompt attention for any health problem
- **Social** Through counselling patients/clients should be helped to cope with the condition. With the patient's consent other family members can be involved. The social support systems should be utilised. Home based care stems from the understanding between the patient, his relatives and the health workers
- **Immunization** All the EPI vaccines have been shown to be safe in HIV/AIDS patients
- **Breastfeeding** Infants who escape HIV infection during pregnancy and delivery may still become infected by breastfeeding from an infected mother. Studies show that the infection due to breastfeeding ranges from 14–29%

Breastfeeding provides optimal nutrition, protects from many life-threatening diseases for all children. However, a woman known to have HIV infection should be informed about the risk of HIV infection transmission through breastfeeding and about other possible feeding options so that she can make her own decision about whether or not to breastfeed.

Mother should be discouraged from breastfeeding.

If a mother chooses not to breastfeed:

- ensure that there is enough breast milk replacement
- ensure that is an appropriate replacement
- ensure that the milk is prepared correctly and hygienically
- use a cup and demonstrate to the mother how to feed
- ensure that the mother understands that the prepared feeds have to be finished within 6 hrs or be discarded thereafter
- ensure proper storage of the prepared feeds.

If a mother chooses to breastfeed;

- exclusive breastfeeding for limited period of 6 months
- sudden weaning
- express breast milk and heat 60°C (near boiling point) before giving to baby.

Management – Pharmacologic

Triple Therapy – using antiretroviral drugs:

The main aim of treatment is to suppress the viral load, achieve reconstruction of the immune system and hence improve quality of life.

• Principles of Treatment

- ensure patient compliance through counselling and follow up
- use combination therapy of 3–4 drugs
- nutritional support is an important component of management

• Antiretroviral treatment – so far no drug or herb has been shown to eliminate the virus from the body. Some drugs have been shown to slow the multiplication of the virus. and thus improve quality of life and delay the progression of the disease. They include:

- nucleoside analogues(reverse transcriptase inhibitors) e.g. zidovidine
- non–nucleoside reverse transcriptase inhibitors e.g. niverapine
- protease inhibitors e.g. indinavir

• Refer for antiviral treatment where **affordable/available**

• Triple therapy – using antiviral drugs.

WHO GOES ON THE ARV THERAPY?

CLINICAL CATEGORY	CD4 CELL COUNT	PLASMA HIV RNA	RECOMMENDATION
Asymptomatic	>200/mm ³ <350/mm ³	<30,000	Limited Priority
Asymptomatic	<200/mm ³	Any value	Treat
Asymptomatic		>55,000 (RT–PCR)	Treatment recommended by some in 3 years because >30% develop AIDS. If viral load is low in 3 years, some refer
Symptomatic	Any value	Any value	Treat

ARV STANDARDISED REGIMES IN KENYA

Adults and adolescents

1st line: D4T + 3TC + EFV
For pregnant women and those likely to get pregnant give;
D4T + 3TC + NVP

2nd line: AZT + ddl + lopinavir with ritonavir (needs refrigeration),
alternatively – nelfinavir

Children below 13 years

1st line: AZT + 3TC + nevirapine

2nd line: D4T + ddl and lopinavir with

ritonavir

Tuberculosis Patients

- Avoid ARVs in intensive phase: D4T + 3TC and EFV (800 mg per day) NB: Protease inhibitors are contraindicated when rifampicin is used.

Prevention of Mother to Child Transmission

1st line: Nevirapine
In symptomatic disease; D4T + 3TC + NVP

Post Exposure Prophylaxis

Low risk: AZT/3TC

High risk: AZT/3TC/indinavir

LABORATORY MONITORING

- Haemogram
- Liver function tests
- Serum Amylase
- Renal Function tests
- Blood and urine sugar
- Lipid profile
- CD4 lymphocyte
- Viral load.

WHEN SHOULD CHANGE OF DRUGS OCCUR?

- Treatment failure
- Unacceptable toxicity
- intolerance
- Non adherence
- Sub optimal treatment regime.
- **Opportunistic infections and other manifestations** Opportunistic infections respond to conventional treatments though they may require a longer course or higher dose of treatment than in HIV negative patients. Management of the specific infections is covered in the relevant chapter, however a few are mentioned below:
 - **Pneumonia** Most are due to streptococcus. Use crystalline penicillin (or ampicillin) **OR** combination of cotrimoxazole and gentamicin in unresponsive cases
 - **Diarrhoea** Correct dehydration. Specific therapy depends on causative organism. Combination of cotrimoxazole and metronidazole is often helpful **OR** chloramphenicol with metronidazole may be used

- **Oropharyngeal candidiasis** 1% gentian violet paint TDS **OR** nystatin oral drops or cream **OR** miconazole oral gel BD **OR** tabs ketoconazole 3–6 mg/kg/day in 2 doses for 7 days **OR** fluconazole 200 mg STAT then 100 mg OD for 2 weeks
- **Tuberculosis** [see 12.8. TB].
- **Boils/furuncles** cloxacillin 500 mg QID for 14 days OR erythromycin 500 mg QID for 14 days + topical bactroban
- **Cryptococcal meningitis** amphotericin B 0.7–1 mg/kg daily OR fluconazole 400 mg daily for 6–10 weeks then 200 mg OD for life
- **Pneumocystis Carinii Pneumonia (PCP)** tabs prednisone 60 mg daily taper off over 3 weeks + cotrimoxazole (TMP SMX) IV 15 mg TMP/kg/day IV 6 or 8 hourly for 21 days OR double strength cotrimoxazole 2 tablets 8 hrly for 21 days +oral dapsone 100 mg OD daily for 21 days
- **Toxoplasmosis** pyremthamine 50–100 mg PO OD+ folinic acid 10–20 mg QID + clindamycine 600–1200 mg 8 hrly OR dapsone 100 mg OD for 3–6 weeks.

Admit For

- Investigations, if diagnosis is uncertain and outpatient testing not possible
- Opportunistic infections which cannot be treated on outpatient basis
- Whenever possible home and community based care is preferred for terminally ill AIDS patients for whom the hospital offers little benefit; efforts should be made to support the family in caring for terminally ill patients.

2.4. HIV Testing & Patient Education

- **Pre-test counselling** Before an individual is screened for HIV he/she should be counselled and consent sought. It becomes easier to communicate the results and the patient/client is able to contain the news. Results should be treated in confidence.
- **Post test counselling** Both positive and negative results must be communicated in person by a health care provider. Counselling should be done
- **HIV positive patients** need to know:
 - they can transmit the infection to their sexual partner(s), baby in utero (if the patient is/or becomes pregnant)
 - their health can deteriorate faster if they acquire other infections including STIs
 - their health can deteriorate faster if they have some life-styles like excessive intake of alcohol, smoking, poor nutrition, multiplicity of sexual partners
 - condoms, as generally used, are roughly 70–80% effective in preventing acquisition and transmission of HIV and other STIs. Proper education on condom use can increase the effectiveness of the condom to 90%
 - Pregnancy hastens the progression of disease and up to 40% of the babies born to HIV infected mothers will acquire the infection. Contraceptive advice

should be given. IUCD (Coil) are known to predispose to PIDs and hence are discouraged.

HIV test should not be done without first counselling the patient

All the contraceptives (except condom) do not prevent the transmission or acquisition of HIV and STIs. Two methods of contraception (one of which must be a condom) are essential.

- **HIV negative patients/clients** need to know:
 - That one can be in the window period (i.e. time between infection with HIV and development of detectable antibodies)
 - That a negative result does not mean that he/she cannot acquire HIV if exposed.

- **Everyone** should know:
 - How HIV is transmitted [**see 2.2. transmission modes**]
 - How one can avoid getting infected [**see 2.2. preventive measures**]
 - That HIV CANNOT be transmitted by shaking hands or touching people with AIDS; sneezing or coughing; food, drinking water, or sharing utensils; insect bites; or toilets and latrines.

SEXUALLY TRANSMITTED INFECTIONS (STIs)

Sexually transmitted infections (STIs) are communicable diseases transmitted through sexual contact between man and woman (heterosexual), man and man (homosexual) and woman and woman (lesbian). These diseases can be transmitted from mother to child (vertical transmission), i.e. in utero, during birth or soon after birth. Some can also be transmitted through blood transfusion, contaminated needles, syringes, specula, gloves, skin piercing and cutting instruments.

Accurate diagnosis and effective treatment of STI is an essential and cost-effective HIV/AIDS prevention strategy

Management

- Full course of appropriate drug therapy – see following table
- Treatment of complications, if any
- Follow up of the patient
- Provision of health education and counselling
- Management of the sexual contacts, including contact tracing, diagnosis, treatment, health education and counselling.

Patient Education

- Avoid multiple or anonymous partners, prostitutes or any other person with multiple sex partners
- Use condoms correctly e.g. avoid oil-based lubricants
- Avoid alcohol or drug abuse which may lead to irresponsible sexual behaviour.

THE 4 C's OF STI MANAGEMENT

Each and every treatment of STI must include the 4 C's:

Compliance to the full drug course & follow-up
Counselling: On safer sexual behaviour
Condom: Ensure proper use
Contact tracing, partner treatment and notification

Clinical Features and Treatment Summary

For more detailed description see clinical features following the treatment summary' table.

2.5. Gonorrhoea & Urethral Discharge

Clinical Features

Discharge in anterior urethra with dysuria or urethra) discomfort.

Types are **gonococcal** (90%) and **non-gonococcal urethritis** (NGU–10%). Causes NGU include *Chlantlydia trachomatis* and rarely *Trichomonas*, or *Herpes simplex*. Gonorrhoea and NGU co-exist in 5–10% of cases. In addition, Infection of glans (balanitis) or prepuce (posthitis) by *Candida albicans* can lead to discharge.

Gonorrhoea: Abundant pus-like discharge, incubation period 3–10 days.

NGU: Muroid or serous discharge, scanty, usually seen in morning, incubation 10–14 days.

Investigations

- Diagnosis in male is usually clinical but if confirmation is required a urethral smear is done
- Gram stain showing pus cells & intracellular Gram negative diplococci is 95% accurate.

Management – see table.

2.6. Genital Discharge in the Female

Causes of vaginal discharge include *Candida vulvovaginitis* (monilia or thrush), *trichomonas vaginitis*, and bacterial vaginosis. **Endocervical discharge** can be caused by–gonorrhoea, *chlamydia trachomatis* and *mycoplasma hominis*.

CANDIDA VULVOVAGINITIS (Monilia or Thrush)

Common infection of the vulva and vagina caused by a fungus called *Candida albicans*.

It is not always transmitted by sexual intercourse. Predisposing factors are diabetes mellitus, systemic antibiotics, pregnancy, hormonal oral or injectable contraceptives and decreased host immunity.

Clinical Features

Vaginal discharge is creamy and thick (curd like). Associated with itching, burning and soreness during micturition and sexual intercourse. There is erythema, excoriation and fissures. Diagnosis is mainly clinical.

Investigations

- Wet mount is prepared by putting a drop of the discharge onto a glass slide and adding a drop of saline or 10% potassium hydroxide (KOH) and covering with a cover slip. Examine under low–power microscope. *Candida albicans* is identified by pseudohyphae and spores.

Management

- Gentian violet 1% apply OD for 3 days (use cotton wool balls or speculum)

OR

- Nystatin pessaries inserted high in the vagina 1 BD for 7 days
- Nystatin cream applied to vulva BD for 14 days

OR

- Clotrimazole pessaries 1 OD for 6 days
- Partner may benefit from cream treatment.

Prevention

- People who get recurrent infection should be given concurrent prophylactic treatment whenever broad–spectrum antibiotics are prescribed.

TRICHOMONAS VAGINITIS

Common cause of vaginal discharge, mainly sexually transmitted and is caused by *Trichomonas vaginalis*, a flagellated protozoan.

Clinical Features

Symptoms depend on the severity of the infection and include a frothy, greenish–yellow, foul–smelling discharge. Other features are vaginal soreness, dyspareunia and post–coital spotting. Infection usually involves the vulva, vagina and the cervix may appear reddish and swollen. Diagnosis is mainly clinical.

Investigations

- Wet mount preparation demonstrates flagellated protozoa
- Trichomonas may also be noted on urine microscopy or pap smear.

Management

- Metronidazole 200 mg – 400 mg TDS for 7 days. The same dose for the male partner. (Alcohol consumption to be avoided during treatment with metronidazole. Drug to be avoided during first trimester of pregnancy. In pregnancy use tinidazole pessaries)
- Tinidazole 2 gm STAT. The same dose for the male partner.

BACTERIAL VAGINOSIS

Usually associated with *Gardnerella vaginalis*.

Clinical Features

Vaginal discharge greyish–white in nature with a characteristic fishy odour which increases in intensity after sexual intercourse. Not usually associated with soreness, irritation, pruritus burning sensation or dyspareunia. Diagnosis is usually clinical.

Investigations

- Wet mount preparation which will show vaginal epithelial cells with adherent clusters of Gram negative or coccobacilli (CLUE CELLS)
- Whiff–test in which a drop of discharge is mixed with a drop of KOH which gives a characteristic fishy odour.

Management

- Patient and male partner should be treated
- Metronidazole 200 mg – 400 mg TDS for 7 days (avoid alcohol).

Urethritis, usually caused by gonorrhoea and chlamydia

EXAMINE FOR DISCHARGE

DISCHARGE PRESENT

DISCHARGE ABSENT

URETHRITIS Rx and 4C's

SYMPTOMATIC Rx

IF DISCHARGE PERSISTS AFTER 7 DAYS

Alternative
URETHRITIS Rx and 4Cs

IF DISCHARGE PERSISTS AFTER 7 DAYS

REFER FOR INVESTIGATIONS

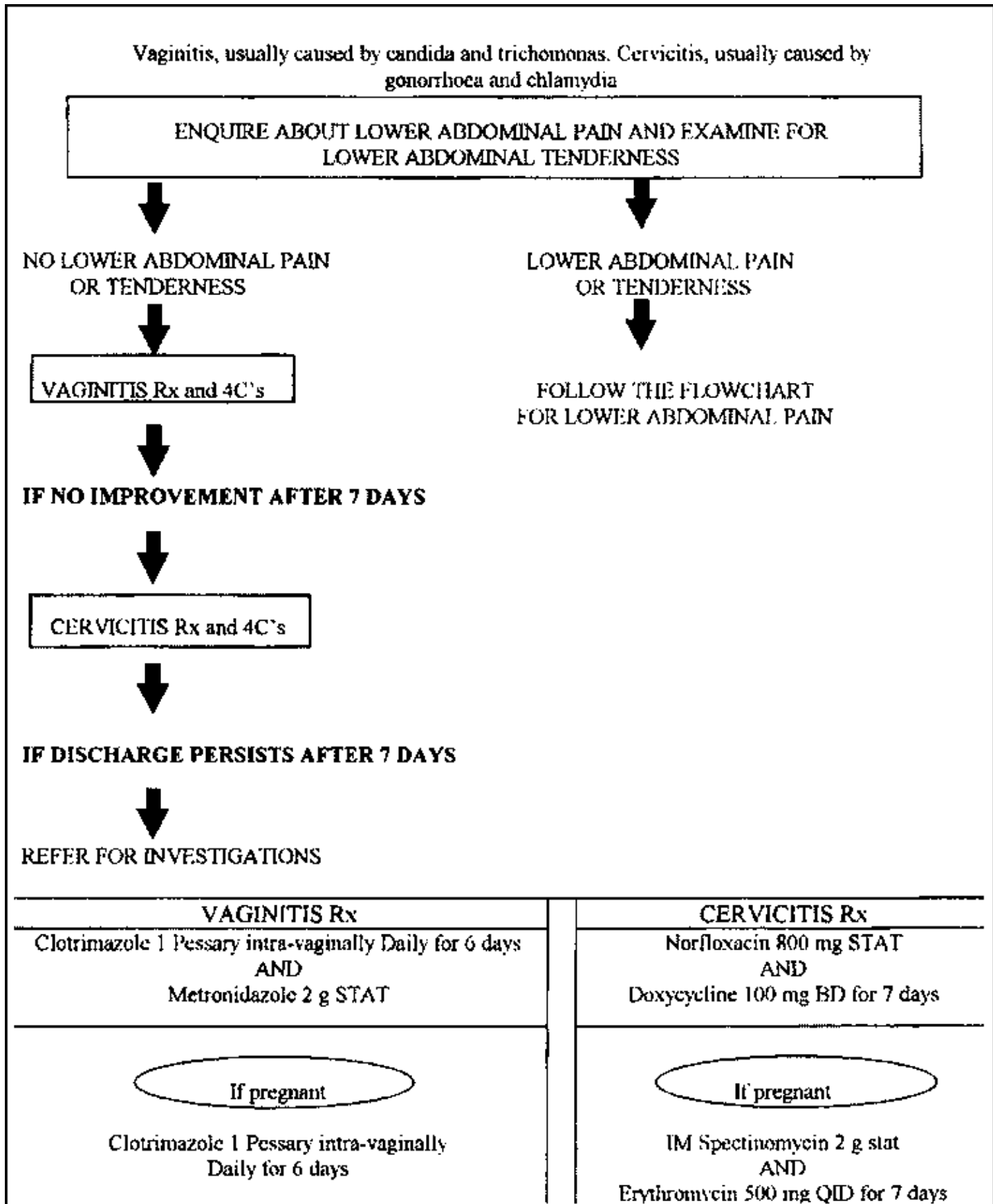
URETHRITIS Rx

Norfloxacin 800 mg stat
AND
Doxycycline 100 mg BD x 7 days

Alternative Rx

IM Spectinomycin 2 gm stat
AND
Doxycycline 100 mg BD x 7 days

Urethral Discharge



Vaginal Discharge or Pruritus

Management – Gonorrhoea and Other Urethritis

DIAGNOSIS	FIRST LINE TREATMENT	SECOND LINE TREATMENT
GONORRHOEA Adults	Aqueous procaine penicillin 4.8 mega units IM. + Amoxicillin–clavulanate 1 tab orally + Probenecid 1 g orally ½ hour before penicillin. OR Amoxycillin 3 g orally. + Amoxicillin–clavulanate 2 tablets orally + Probenecid 1 g orally.	Spectinomycin 2 g IM STAT. OR Norfloxacin 800 mg orally STAT. OR Kanamycin 2 g IM STAT. OR Ceftriaxone 250 mg IM STAT.
Pregnancy	As above	Spectinomycin 2 g IM STAT. OR Ceftriaxone 250 mg IM STAT.
NON-GONOCOCCAL & CHLAMYDIA URETHRITIS Adults	Tetracycline 500 mg QDS x 7 days. OR Doxycycline 200 mg STAT followed by 100 mg daily x 7 days.	Erythromycin 500 mg orally QDS x 7 days.
Pregnancy	Erythromycin 500 mg orally QDS x 7 days.	

CERVICITIS

About one third of all women presenting with vaginal discharge have cervicitis. The Commonest causes of endocervicitis are gonorrhoea, chlamydia, trichomonas and herpes simplex virus.

Clinical Features

Cloudy–yellow vaginal discharge which is non–irritating, non–odorous and mucoid. There may also be inter–menstrual or post–coital spotting or both. There may also be dyspareunia or pelvic discomfort or both. Cervical mucosa appears inflamed with focal haemorrhages. Cervix friable and bleeds easily on touch. Herpetic lesions which are vesicular will be found on vulva, vagina and cervix. Abdominal and bimanual pelvic examination should be done to rule out pelvic inflammatory disease.

Investigations

- Wet mount preparation: look for pus cells, trichomonas and yeasts
- Gram–stain of the discharge of endocervical swab (*Neisseria gonorrhoea* shows Gram negative intracellular diplococci)
- Culture for gonorrhoea or chlamydia if available
- Pap smear after treatment.

Management

- **[See Vaginal Discharge flow chart]**
- Norfloxacin 800 mg stat then 400 mg BD for 7 days
- Doxycycline 100 mg BD
- Metronidazole 2 g stat.

2.7. Dysuria in the Female

Can result from urinary tract infection, vaginitis, or cervicitis. See relevant sections of manual for clinical features, investigations and management. Gonorrhoea should be considered for patients at high risk for STIs.

2.8. Lower Abdominal Pain in the Female

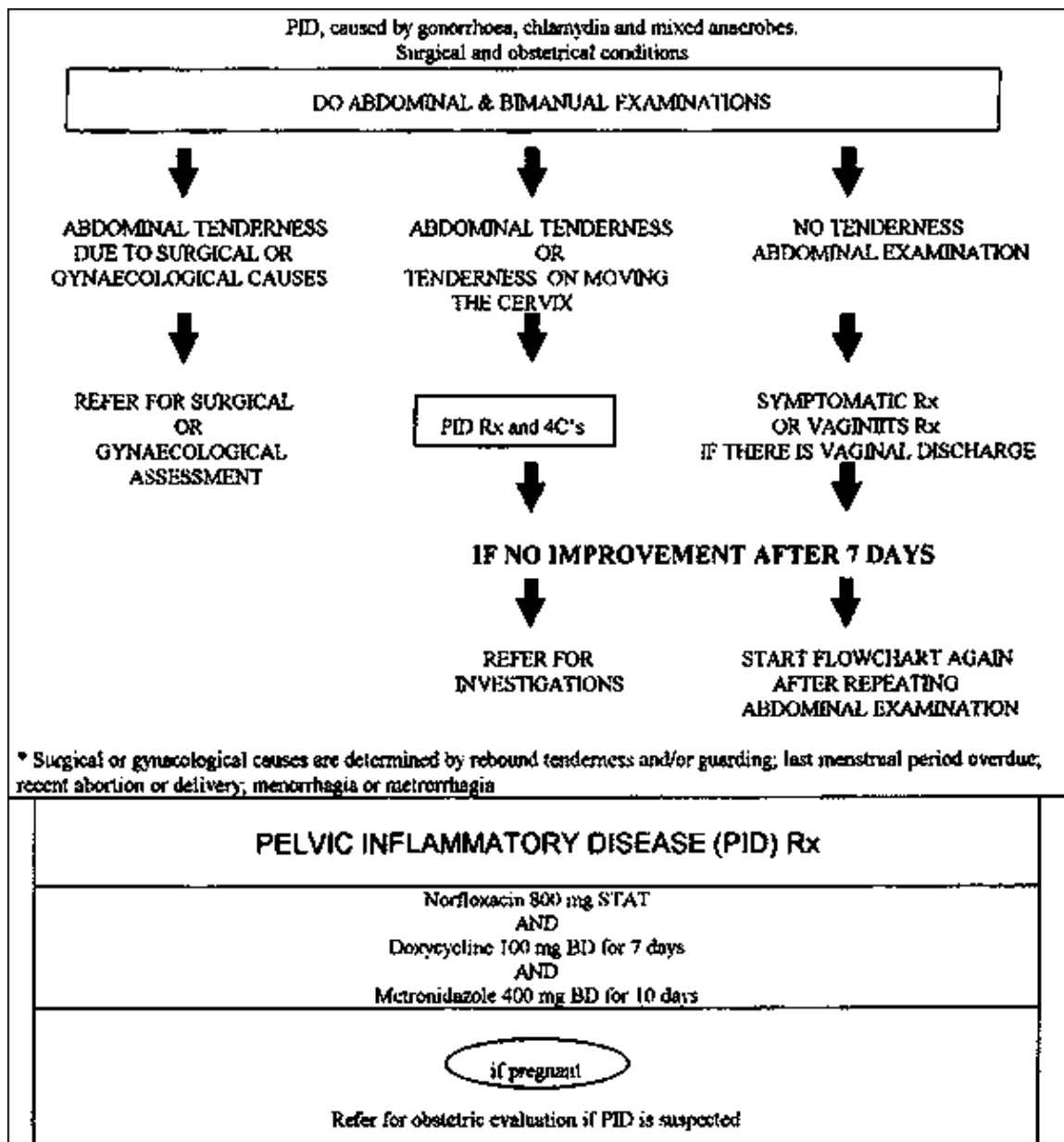
Clinical Features

Often due to pelvic inflammatory disease [PID – see gynaecology chapter]. Must be differentiated from urinary tract infection, ectopic pregnancy, threatened abortion, appendicitis, and other causes of acute abdomen.

An abdominal & pelvic examination must be done on all cases of lower abdominal pain in women

Management

- See flow chart and relevant sections of manual.



Lower Abdominal Pain in Women

2.9. Genital Ulcer Disease

Clinical Features

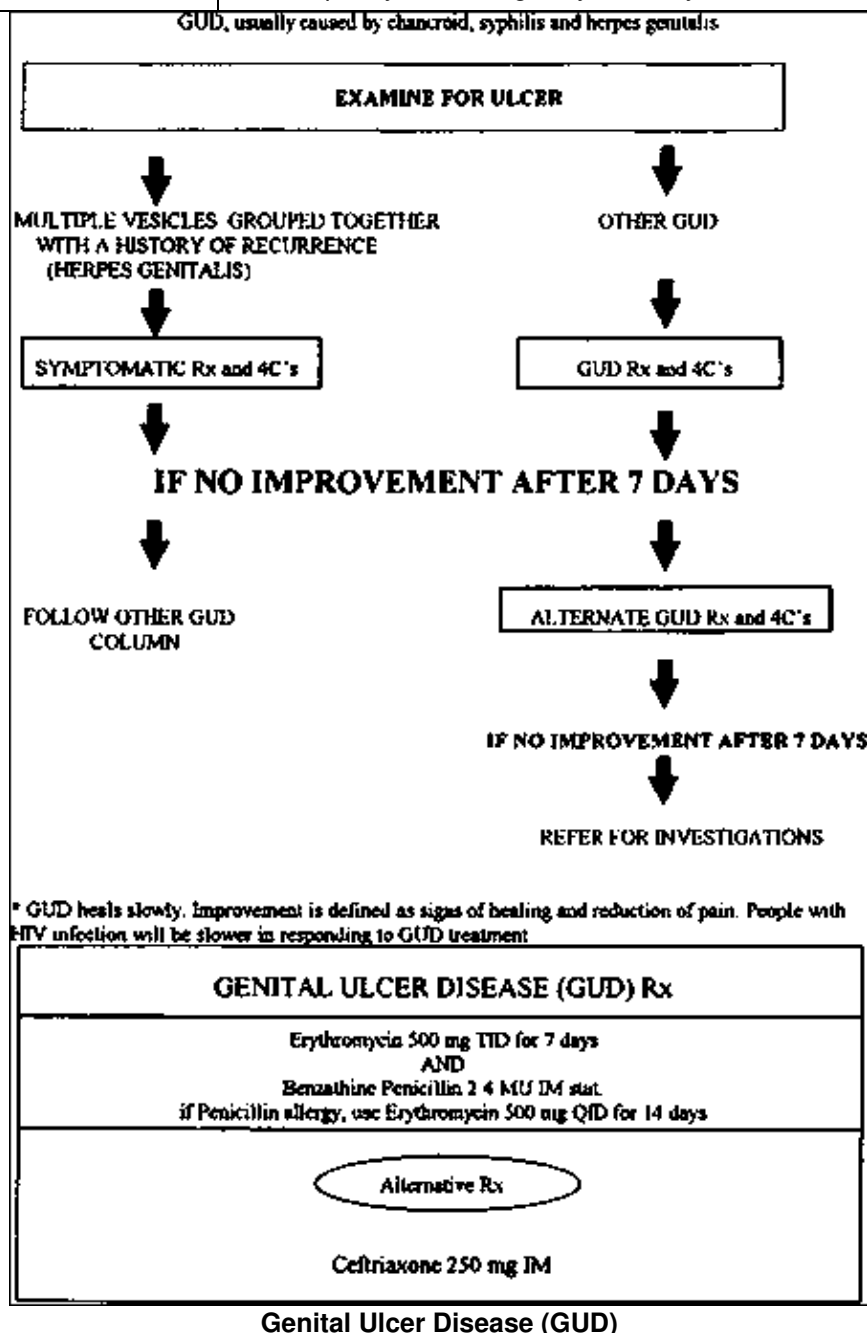
CLINICAL FEATURES	PROBABLE DIAGNOSIS & CAUSE
<ul style="list-style-type: none"> • Single, painless, relatively clean ulcers without pus • Incubation period up to 3 weeks • Painless lymphadenopathy 	Primary syphilis chancre <i>T. pallidum</i>
<ul style="list-style-type: none"> • Multiple, soft, deep, tender ulcers with profuse pus • Incubation period 1 week • Very painful lymphadenopathy which can be fluctuant • Disfiguration of the genitalia • Secondary infection 	Chancroid <i>H. ducreyi</i>
<ul style="list-style-type: none"> • Multiple shallow and tender ulcers • May start as vesicles grouped together. Itchy • Incubation period 1 week • Tender lymphadenopathy, may be recurrent, rarely suppurative 	Herpes genitalis <i>H. simplex</i>
<ul style="list-style-type: none"> • Single, small and transient ulcers • Incubation period 1 –2 weeks • Lymphadenopathy; several glands may be matted together • fistula and stricture formation 	Lymphogranuloma (LGV) <i>C. trachomatis</i>
<ul style="list-style-type: none"> • Large and beefy ulcers • Variable incubation period • None or rarely lymphadenopathy 	Granuloma inguinale <i>Calymmatobacterium granulomatis</i> <i>(Donovan Bacilli)</i>

Management – see flow chart and table.

Management – Genital Ulcer Disease

DIAGNOSIS	FIRST LINE TREATMENT	SECOND LINE TREATMENT
CHANCROID Adults	Trimethoprim 160 mg/sulphamethoxazole 800 mg 4 tablets once a day × 2 days. OR Cotrimoxazole 8 tablets daily × 2 days. Buboos if present, should be aspirated and not incised and drained (80/400)	Erythromycin 500 mg orally QDS × 7 days. OR Ceftriaxone 250 mg IM STAT. OR Ciprofloxacin 500 mg BD × 3 days.
Pregnancy Allergy	Erythromycin 500 mg orally QDS × 7 days. OR Ceftriaxone 250 mg IM STAT. OR Ciprofloxacin 500 mg BD × 3 days.	
EARLY SYPHILIS	Early syphilis (less than 1 year duration) Benzathine penicillin 2.4 m.u weekly × 2 weeks. OR Procaine penicillin (PAM) 600,000 units IM OD x 10 days.	
	In penicillin allergy use: Tetracycline capsules 500 mg QDS × 15 days. OR Erythromycin 500 mg QDS × 15 days. OR Doxycycline 100 mg OD × 15 days.	
LATE SYPHILIS *(more than 1 year)	Procaine penicillin (PAM) 600,000 units IM OD × 14 days. OR Benzathine penicillin 2.4 m.u. weekly x 4 to 5 doses.	
Pregnancy	Use either one of the penicillin preparations or erythromycin (see above). If erythromycin is used, the neonate should be treated soon after birth.	

CONGENITAL SYPHILIS	Aqueous crystalline penicillin G 25,000 units/kg IM, twice a day for a minimum of 10 days. OR Aqueous procaine penicillin G 50,000 units/kg/day IM OD for a minimum of 10 days.
HERPES GENITALIS	Lesions should be kept clean by washing the affected sites with soap and water and careful drying. Acyclovir 200 mg orally 5 times daily for 7–10 days only reduces the symptoms and their duration and does not prevent recurrences. It is expensive.
LYMPHOGRANULOMA VENEREUM	Tetracycline 500 mg QDS × 14 days. OR Erythromycin 500 mg QDS × 14 days. OR Doxycycline capsules 100 mg BD × 14 days. OR Sulphamethoxazole 1 g orally BD x 14 days.
GRANULOMA INGUINALE	Tetracycline capsules 500 mg QDS × 10 days. OR Erythromycin 500 mg QDS × 10 days. OR Cotrimoxazole 2 tablets twice daily × 10 days. OR Streptomycin 750 mg daily x 10 days.



2.10. Buboos or Swollen Inguinal Glands

Buboos are enlarged lymph nodes in the groin. They may be associated with an ulcer in the genital area or on the lower limbs. Refer to genital ulcer disease.

Clinical Features

Lymphogranuloma venereum Several nodes matted together on one or both sides, usually without suppuration.

Chancroid tender fluctuant bubo which suppurates leaving an undermined inguinal ulcer should be aspirated before suppuration.

Investigations

- Serology for syphilis should always be performed.

2.11. Genital Warts

Clinical Features

Condyloma acuminatum (Human papilloma virus) Cauliflower-like warts. May be single or multiple on the vulva, vagina, perineal area, penis, urethra and sub-prepuce. Vaginal discharge, pain and bleeding on coitus or touch may occur.

Molluscum contagiosum (Pox group virus) Umbilicated multiple papules with whitish, cheesy material being expressed when squeezed. Secondary infection and spread to other sites may occur.

Secondary syphilis should be ruled out when evaluating genital venereal warts

Management

- Apply podophyllin 25% in tincture of benzoin carefully to each wart, protecting the normal surrounding skin with petroleum jelly. Wash off the podophyllin thoroughly 1–4 hours later. Repeat 1–2 times weekly. If there is no regression after 4 applications, use one of the alternative treatments given below or refer
- Alternative treatments: Podophyllotoxin 0.5% electrotherapy, cryotherapy, 5-Fluorouracil, surgical removal, silver nitrate pencil application.
- **Pregnancy** Podophyllin should not be used in pregnancy, neither in vagina, cervical, internal urethral, anal or oral warts. Alternative regimens may be used, except 5-Fluorouracil and Podophyllotoxin.

3. CARDIOVASCULAR DISEASES

3.1. Congenital Heart Disease

CONGENITAL HEART DISEASES WITH CYANOSIS

These are predominantly Right to Left shunts.

TETRALOGY OF FALLOT

Classically consists of pulmonary stenosis, ventricular septal defect, dextroposition of the aorta, right ventricular hypertrophy.

Clinical Features

Cyanosis May not be present at birth but develops during first year. **Dyspnoea** Occurs on exertion, the patient/child may assume **squatting** position for a few minutes. Paroxysmal hypercyanotic attacks ("blue" spells): Common during first 2 years of life vary in duration but rarely fatal. **Growth and development** delayed. Stature and nutrition usually below average for age. Pulse normal but systolic thrill felt along the left sternal border in 50% of cases.

Investigations

- CXR – boot shaped heart
- Others at specialised centres.

Management

- "Blue" spells – manage by oxygen and put child in knee–chest position
- Avoid dehydration at all times
- Supportive:
 - venesection; maintain haematocrit at 55–65%
 - IV/oral propranolol
- Surgery.

Refer

- For investigations and surgery at a specialised unit.

Complications

Cerebral thrombosis due to polycythaemia. Brain abscess (usually after 2 years of age) with headache, fever, nausea and vomiting ± seizures. Bacterial endocarditis. Congestive heart failure.

PULMONARY ATRESIA WITH VSD

Clinical features as of TOF but more severe and of earlier onset.

Others

- Transposition of the great vessels
- Truncus arteriosus (associated VSD is always present)
- Eisenmenger syndrome
- Hypoplastic left heart syndrome
- For details consult standard paediatrics text.

CONGENITAL HEART DISEASES WITH LITTLE OR NO CYANOSIS

VENTRICULAR SEPTAL DEFECT (VSD)

This is the most common cardiac malformation accounting for 25% of congenital heart diseases. The magnitude of the left to right shunt is determined by the size of the defect and the degree of the pulmonary vascular resistance.

Clinical Features

Small defects with minimal left to right shunts are the most common. Patients are asymptomatic. The loud harsh or blowing left parasternal pansystolic murmur heard best over the lower left sternal border is usually found during routine examination. Large defects with excessive pulmonary blood flow and pulmonary hypertension are characterised by: dyspnoea, feeding difficulties, profuse perspiration, recurrent pulmonary infections and poor growth. Physical examination reveals prominence of the left precordium, cardiomegaly, a palpable parasternal lift and a systolic thrill. The murmur is as for small defect.

Investigations

- CXR – usually normal but some show minimal cardiomegaly and increased pulmonary vasculature
- ECG – may suggest left ventricular hypertrophy
- Others at a specialised centre.

Management

- Control CCF if present
- Closure of the defect surgically.

Refer If

- For investigations and surgery to a specialised unit.

Prognosis and Complications

Spontaneous closure (30–50%) of small defects. A large number remains asymptomatic and a significant number with large defects get repeated infections and CCF. Infective endocarditis occurs in some. Pulmonary hypertension may develop as a result of high pulmonary blood flow.

PATENT DUCTUS ARTERIOSUS (PDA)

Pulmonary arterial blood is shunted through the ductus arteriosus into aorta during foetal life. The ductus normally closes soon after birth but if it remains patent when pulmonary pressure falls and aortic blood is shunted into the pulmonary artery. Fluid overload in the first several days of life (more than 150 ml/kg/day) may play an aetiological role in PDA.

Clinical Features

PDA is the most common cause of CCF in the nursery. A systolic murmur heard frequently over the entire precordium, axilla and back. Bounding peripheral pulses. Features of CCF if this sets in.

Management

- Medical management of CCF if present
- Refer for confirmation of diagnosis by echocardiography and catheter studies
- Surgical ligation of the ductus.

MANAGEMENT OF CONGENITAL HEART DISEASE

- Majority of patients having mild CHD require no treatment. Make child and parents know that normal life is expected. Do not limit exercise
- Maintain good general health, eat a well-balanced diet, prevent anaemia and give usual immunizations
- Discourage rough, competitive sports in children with moderate to severe heart disease
- Children with severe disease will tend to limit their own exercise but if dyspnoea, headache and fatigability in cyanotic patients occur, limit exercise and other activities
- Treat bacterial infections vigorously and give endocarditis prophylaxis before dental procedures, urinary tract instrumentation and prior to lower GIT manipulation
- Observe for polycythaemia in cyanotic patients and avoid dehydration
- Venesection with volume replacement at intervals if Hct >65% in inoperable patients (maintain Hct at 55–65%)
- Counsel female patients on dangers of pregnancy and advise on use of FP.

Remember many murmurs during the neonatal period may be benign

3.2. Deep Vein Thrombosis

[see also 18.2.21. DVT in pregnancy]

Commonest site for DVT is the calf of the lower limbs followed by the pelvis.

Clinical Features

Pain usually of sudden onset, warmth on palpation, local swelling, tenderness, an extremity diameter of 2 cm or greater than the opposite limb from some fixed point is abnormal. Diagnosis is mainly clinical.

Investigations

- Whole blood clotting time
- Prothrombin Time Index (PTI) where available
- Partial Thromboplastin Time (PTT) where available
- Confirmatory tests are limited but venography may be useful.

Management – General

- Promote venous drainage:
 - bed rest
 - elevation of involved limb
 - place the foot of the bed in a slightly elevated position (Trendelenburg's)

- Apply warm packs around involved limb
- Encourage limited extension and flexion of involved limb
- Early ambulation as soon as pain and inflammation have begun to resolve.

Management – Pharmacologic

- Heparin 5,000–10,000 units SC/IV QDS for 2–5 days. Adjust dose to achieve a PTT 1.5–2.0 times the control
- Warfarin therapy is started on the first day with 10 mg OD for 2 days and subsequent doses are adjusted until the PTI stabilises in the therapeutic range (1.3–1.5 times the control). The required dose varies between 2–15 mg OD
- Calf vein thrombosis, warfarin for 6 weeks
- Proximal vein thrombosis, warfarin for 3–6 months.

NB: Warfarin interacts with aspirin, alcohol, other non-steroidal anti-inflammatory drugs, erythromycin, metronidazole, sulfonamides, tetracyclines, omeprazole, etc. All enhance warfarin's activity, therefore close monitor the patient's PTI.

Refer If

- Recurrent thrombosis
- Pulmonary embolism (however start heparin 10,000 units IV/SC QDS immediately).

Prophylaxis

- Recommended where DVT is likely to occur e.g. hip operations and prolonged immobilisation. Heparin 5,000 units/SC BD until the condition is treated.

3.3. Heart Failure

Heart failure occurs when the heart is unable to supply output that is sufficient for the metabolic needs of the tissues, in face of adequate venous return. **Common causes of Heart Failure** are hypertension, valvular heart disease, cardiomyopathy, anaemia and myocardial infarction.

Clinical Features – Infants and Young Children

Often present with respiratory distress characterised by tachypnoea, cyanosis, intercostal, subcostal and sternal recession. Tachycardia, gallop rhythm, feeding difficulties and excessive sweating. Presence of cardiac murmurs and enlargement of the liver are suggestive of heart failure. Cardiac failure frequently results from severe pneumonia. If in doubt, then treat for both appropriately.

Clinical Features – Older Children and Adults

Tachycardia, gallop rhythm, raised JVP, dependent oedema, tender hepatomegaly. Orthopnoea, fatigue, exercise intolerance, and basal crepitations. **Common precipitating factors of heart failure in cardiac patients** must be considered in treatment of acutely ill patients: poor compliance with drug therapy; increased metabolic demands e.g. pregnancy, anaemia; progression of underlying disease e.g. recurrent myocardial infarction, uncontrolled hypertension; cardiac arrhythmias; pulmonary embolism; infective endocarditis; infection e.g. pneumonia.

Investigations

- Chest X-ray: May show cardiac enlargement as well as evidence of other cardiac or pulmonary lesions
- Haemogram – to rule out anaemia, infection
- Urea & electrolytes
- Electro-cardiogram (ECG)

Management – General

- Restriction of physical activities
- Bed rest in cardiac position
- Oxygen by mask for cyanosed patients
- Restrict salt intake, control fluid intake and measure urine output
- Daily weight.

Management – Pharmacologic: Infants and Young Children Diuretics: Give frusemide (e.g. lasix)

- IV 1 mg/kg per dose
- PO 2–3 mg/kg/day.

Digoxin: In all cases give $\frac{1}{2}$ total digitalizing dose (TDD) initially, then $\frac{1}{4}$ TDD after 8 hours, then $\frac{1}{4}$ TDD after 16 hours. Daily maintenance dose, $\frac{1}{4}$ TDD given in one or two divided doses. Total digitalizing doses are:

- Premature babies: 0.03 mg/kg PO
- Full term newborn: 0.03–0.05 mg/kg PO
- Infants less than 2 years: 0.05–0.06 mg/kg PO
- Children more than 2 years: 0.04–0.05 mg/kg PO;
 - captopril (ACE inhibitors) – begin initially 0.5 mg/kg/24 hrs 8 hrly increase by 0.5 mg/kg/24 hrs every 24–48 hrs until dose reaches 3–8 mg/kg/24 hrs
 - neonates 0.03–2 mg/kg/24 hrs.

Note:

- Electrolytes should be monitored during therapy with diuretics and digoxin
- Treat anaemia and sepsis concurrently.

Management – Pharmacologic: Older Children and Adults

- Frusemide 40–160 mg PO OD, use higher doses in patients who were already on it
- Digoxin 0.125–0.25 mg PO OD, useful in atrial fibrillation. Loading dose digoxin may be given to patients who are not on digoxin beginning with 0.25–0.5 mg PO QDS up to a total of

1.0–1.5 mg and then put on maintenance

- Potassium supplements: Advice patient to eat fruits e.g. bananas or oranges
- Prophylactic anticoagulation: Heparin 2,500 units SC BD in those patients who are on strict bed rest and marked cardiomegaly
- Treat underlying causative factor such as hypertension and anaemia
- If patients fail to respond to above measures consider angiotensin converting enzyme inhibitors e.g. captopril 6.25–12.5 mg PO TDS. Enalapril 2.5–10 mg PO OD/BD.

Refer If

- Patients fail to respond to therapy e.g. non–subsiding oedema or patient deteriorates despite therapy
- Children with CHD or heart failure of uncertain origin.

3.4. Hypertension

Hypertension is diagnosed when blood pressure (BP) reading is greater than 140/90 mm Hg on three separate readings.

Clinical Features

Majority of patients are asymptomatic. Occasionally patients may present with early morning occipital headaches, dizziness or complication of hypertension e.g. renal failure, stroke, and heart failure. Majority of patients have essential hypertension.

Classification

	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	<130	and	<85
High–normal	130–139	or	85–89
Stage 1 hypertension (mild)	140–159		90–99
Stage 2 hypertension (moderate)	160–179		100–109
Stage 3 hypertension (severe)	? 180		? 110

*Hypertension classification is based on the average of >two (2) readings taken at each of two or more visits after initial screenings.

Investigations

- Urea and creatinine lipid profile
- Chest X–ray; cardiomegaly
- ECG.

Management – General

Aim to reduce diastolic BP to 90 mm Hg.; individualize treatment depending on age. Not all patients with hypertension need drug treatment.

- Weight reduction in obese patients
- Low salt diet
- Advising patients to give up smoking
- Regular dynamic exercises.

Management – Non–pharmacological

- High normal; non–pharmacological treatment.

Management – Pharmacologic

Summary of plan for care in hypertension:

MILD	HCTZ* OR propranolol/atenolol OR HCTZ* + propranolol/atenolol
MODERATE	HCTZ* + propranolol/atenolol + hydralazine OR HCTZ* + methyldopa OR HCTZ* + nifedipine/captopril
SEVERE	HCTZ* + propranolol/atenolol + hydralazine/captopril OR HCTZ* + propranolol/atenolol + nifedipine/captopril OR HCTZ* + propranolol/atenolol + methyldopa

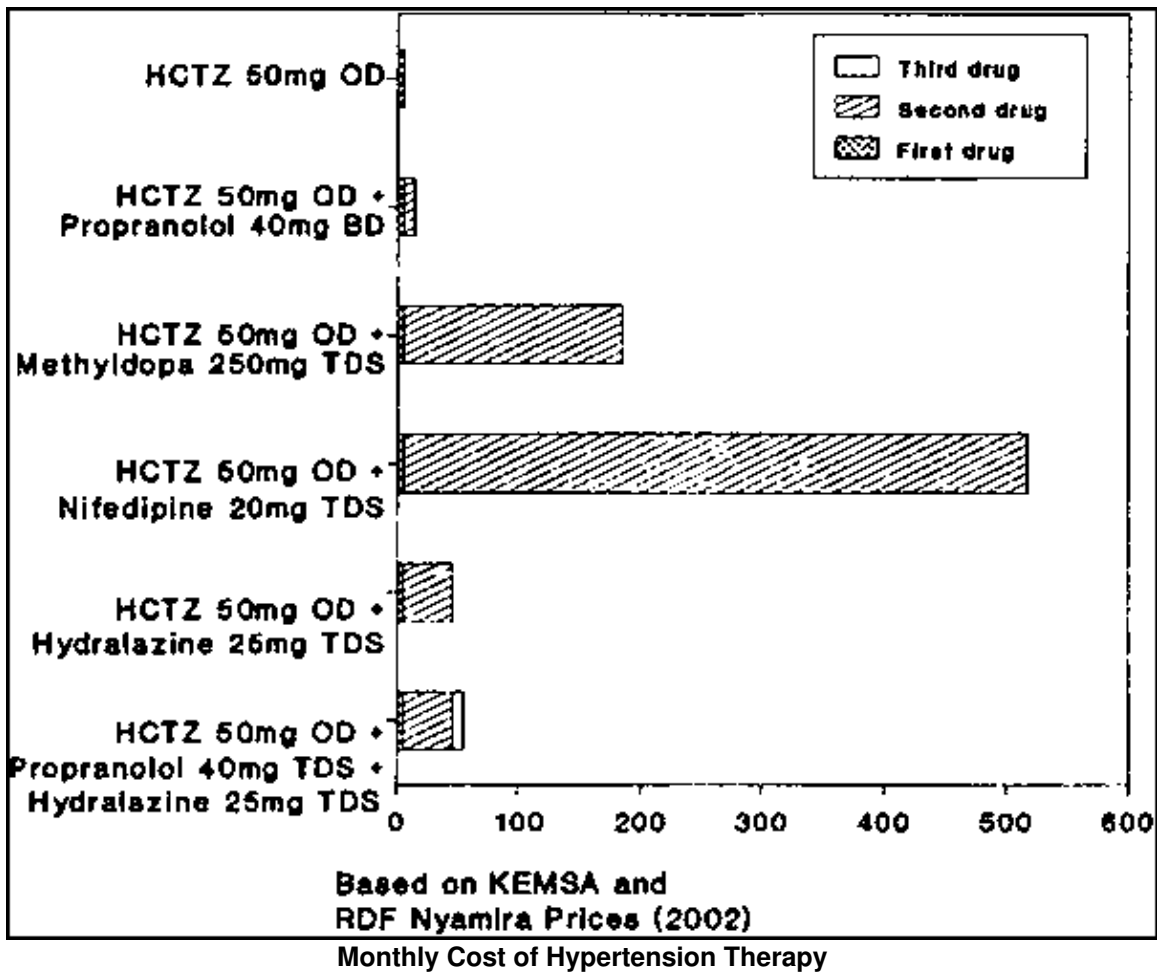
* HCTZ = hydrochlorothiazide; bendroflumethiazide, frusemide, or other appropriate diuretics may be substituted

Mild – Non–pharmacological. If no response after 4–6 months, hydrochlorothiazide 25–50 mg PO OD or bendroflumethiazide 2.5–5 mg or propranolol 40–160 mg **per day**.

Moderate – Non–pharmacological. Hydrochlorothiazide 25–50 mg PO OD. If no response within 4–6 weeks, add propranolol 40 mg PO gradually increasing the dose up to 160 mg daily, depending on patient's response and since BP response is often delayed with propranolol at least 6–8 weeks should elapse before changing the therapeutic regime. If no response, add hydralazine 25–50 mg PO QDS. If there are contra–indications to propranolol (chronic obstructive lung disease, congestive heart failure) use methyldopa 250–500 mg QDS OR nifedipine 10–30 mg TDS OR captopril 6.25–50 mg BD.

Severe hypertension – Start combination therapy as indicated in table. If patient fails to respond to above consider the following:

- Inadequate patient compliance
- Inadequate doses
- Drug antagonism e.g. ephedrine raises blood pressure
- Secondary forms of hypertension e.g. pheochromocytoma.



Cost for 30 Days (KShs.)

Refer If

- No response after excluding the above.

HYPERTENSION CRISIS

Sudden or sustained diastolic BP of more than 120 mm Hg. Papilloedema. Progressive decrease in renal function. Evidence of neurological dysfunction. BP SHOULD BE CONTROLLED WITHIN 1 HOUR IN ORDER TO PREVENT PERMANENT DAMAGE. HYPERTENSIVE EMERGENCIES

In both, the aim is to achieve diastolic BP of 100–110 mm Hg., rapid decrease of BP should be avoided to reduce risk of cerebral hypoperfusion.

APPROACH A	APPROACH B
Frusemide 40 IV + Hydralazine 10 mg IV every 15 minutes until desired effect or 50 mg has been administered. The total dose may be repeated IM or IV after 6 hours	Nifedipine 10 mg sub-lingually repeat after 30 minutes if necessary OR Nifedipine 20 mg PO repeated after 1 hour

Following initial control of BP, switch to multiple oral therapy (hydrochlorothiazide + propranolol + hydralazine **OR** nifedipine **OR** methyldopa **OR** captopril).

Admit For

- Severe hypertension

- Hypertension crisis.

Complications

Congestive Heart Failure: Refer to HEART FAILURE section. Chronic Renal Failure: Refer to RENAL FAILURE section.

Patient Education

- Untreated hypertension has a high mortality rate due to: renal failure, stroke, coronary artery disease, heart failure.

HYPERTENSION IN CHILDREN

Is defined as elevation of systemic blood pressure beyond the 95th blood pressure centile for age on at least three different occasions at weekly to monthly intervals (excluding acute hypertensive states)

Types

Essential – uncertain

– occurs in older children

Secondary – more common than essential hypertension in paediatric age group, 75– 80% of cases are of renal or renovascular aetiology.

Diagnostic criteria

- Any blood pressure values in excess of those shown in the table below should be treated
- If symptomatic, it presents with clinical features of underlying diseases or target organ system – hypertensive encephalopathy, pulmonary oedema or renal disease.

Blood Pressure values for – upper limit of normal						
Age	12 hrs	8 yrs	9 yrs	10 yrs	12 yrs	14 yrs
Systolic	80	120	125	130	135	140
Diastolic	50	82	84	86	88	90

Investigation – as in adults.

Treatment Objectives

- Maintain blood pressure at slightly or below 95th centile for age (Blood Pressure should not be reduced by more than 25% in the acute phase)
- Determine and treat any underlying cause of hypertension.

Drug treatment

- Essential hypertension – as in adults [see **annex b paediatric doses**]
- Secondary hypertension

Treat stepwise usually omitting a diuretic

If fluid overload is contributory, frusemide may be used. Potassium supplement may be required

Step (1) Beta-blockers – Propranolol oral 1–8 mg/kg/24 hrs on 3 divided doses

OR

Atenolol oral 0.1–0.5 mg/kg/24 hrs in 2 divided doses, maximum 20 mg per day

Calcium Channel blockers – Nifedipine oral 0.2–1 mg/kg/24 hrs in 3–4 divided doses (6–8 hourly).

HYPERTENSIVE CRISIS

Defined as when systolic or diastolic pressure exceeds the 95th centile by 50% or when signs of hypertensive encephalopathy or pulmonary oedema occur.

Management

- Nifedipine sublingual 0.2–0.5 mg/kg dose 4 hrly

OR

hydralazine IM/IV 0.1–0.8 mg/kg/dose 4 hrly

OR

Sodium nitroprusside IV continuous infusion 0.5–8 µg/kg/minute.

Monitor blood pressure during infusion, titrate dose according to response.

Complications – as in adults.

3.5. Pulmonary Oedema

An acute medical emergency due to an increase in pulmonary capillary venous pressure leading to fluid in the alveoli usually due to acute left ventricular failure.

Clinical Features

Breathlessness, sweating, cyanosis, frothy blood tinged sputum, respiratory distress, rhonchi and crepitations.

Investigations

- Chest X-ray: Loss of distinct vascular margins, Kerley B lines, diffuse haziness of lung fields.

Management ~ Pharmacologic

Must be immediate:

- Prop up patient in bed
- IV morphine 2.5 mg STAT, may be repeated. In children – 0.1 –0.2 mg/kg STAT
- 100% oxygen 3.5–5 L/min

- IV frusemide 40 mg initial, repeat with higher dose every 20–30 minutes to 200 mg. maximum total dose [see **annex b paediatric doses**]
- If not already on digoxin, digitalize **except if due to myocardial infarction [see 3.3 heart failure]**
- IV aminophylline 250–500 mg slowly [see **annex b paediatric doses**]
- Start on oral medication as soon as possible.

Watch for respiratory depression

Refer If

- Patient fails to respond to above therapy.

Admit For

- Management all patients with pulmonary oedema
- Investigative procedures for underlying causes
- Management of underlying cause e.g. hypertension.

3.6. Acute Myocardial Infarction

AMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and extensive care management.

Clinical Features

Chest pain: Severe, retrosternal/epigastric crushing or burning or discomfort. Radiates to neck and down the inner part of the left arm lasting at least 20 minutes to 7 hours. Occurs at rest and is associated with pallor, sweating, arrhythmias, pulmonary edema and hypotension. May also occur with physical activity.

Management

- Support and maintain vital functions
- Cardio–pulmonary resuscitation (CPR)
- 100% oxygen
- Alleviate pain and anxiety: morphine 10–15 mg IM OR IV 1 mg per minute max.
- 10 mg (morphine must be diluted with normal saline or water for injection) OR pethidine 50–100 mg IV/IM.
- Reduce further damage to heart muscle by: aspirin 150 mg PO stat plus glycerin trinitrate sublingual 0.5 mg every 5–10 minutes to a maximum of 5 tablets.
- **Refer urgently, and monitor continuously BP, pulse and respiratory rate during transfer.**

3.7. Acute Rheumatic Fever (ARF)

This is an acute, systemic connective tissue disease related to an immune reaction to untreated group A beta haemolytic streptococcus infection of the upper respiratory tract in children between the age of 3–15 years. The major importance of this disease is the cardiac involvement which can eventually lead to severe heart valve damage. This is the commonest cause of heart disease in Kenyan children. The initial attack of acute rheumatic fever occurs in most cases between the ages of 3 years to 15 years.

Clinical Features

Major criteria Migrating polyarthrititis. Carditis – signs of cardiac failure, persistent tachycardia, pericardial rub or heart murmurs. Sydenham's Chorea. Erythema marginatum and subcutaneous nodules.

Minor criteria Past history of rheumatic fever. Raised ESR. Fever. Arthralgia.

Diagnosis 2 major and 1 minor or 1 major and 2 minor manifestations.

Investigations

- Anti-streptolysin-O-titre (ASOT) – titre of 1:300
- Throat swab for B-haemolytic Streptococci group A for C&S
- ESR
- Chest X-ray – features of cardiomegaly
- ECG if available.

Management

- Eradication of streptococcal infection from the throat:
 - Amoxicillin 250–500 mg (children 25–50 mg/kg in divided doses) TDS for 10 days
 - if allergic to penicillin OR amoxicillin, erythromycin 12.5 mg/kg QDS for 10 days
- Aspirin: 75–100 mg/kg/day in 4–6 divided doses. Treatment continued until fever and joint inflammation are controlled and then gradually reduced over a 2 weeks period
- Treat failure [see **3.3. heart failure**]
- Chorea: Haloperidol 25 micrograms/kg (0.025 mg/kg) TDS.

Refer If

- Confirmation of diagnosis by specialist is required
- Significant valvular damage
- There is severe carditis with heart failure not responding to treatment.

Admit For

- Strict bed rest until symptoms resolve.

Prevention

- Avoid overcrowding
- Early treatment of streptococcal sore throat with Benzathine penicillin 1.2 mega units STAT dose OR Phenoxyethylpenicillin 125–250 mg TDS for 10 days.

Prophylaxis

- **Previous Acute Rheumatic Fever without carditis** give Benzathine penicillin 1.2 mega units monthly for 5 years or up to the age of 18 years whichever is longer
- OR
- Erythromycin 125–250 mg BD for 5 years for those sensitive to penicillin
 - **Previous Acute Rheumatic Fever with carditis** Benzathine penicillin 1.2 mega units OR Erythromycin 125–250 mg BD for those sensitive to penicillin **for life**

Complications

Rheumatic heart disease.

Patient Education

- Emphasize need for follow-up for prophylaxis.

3.8. Rheumatic Valvular Heart Disease

A complication of rheumatic fever. The main site of pathology is on the valves. There may be mitral stenosis, mixed mitral valve disease (both stenosis and incompetence), mitral incompetence, aortic stenosis and incompetence. Dyspnoea, palpitations, heart murmurs depending on the valvular lesion, patients may be asymptomatic and may be discovered to have the lesion during routine examination or during periods of increased demand such as pregnancy or anaemia. Patients may present also with congestive cardiac failure.

Investigations

- Chest X-ray
- ECG (where available).

Management

- Treat underlying complication e.g. heart failure, pulmonary oedema
- Continuous prophylaxis against recurrent rheumatic fever is indicated
- Infective endocarditis prophylaxis is indicated.

Refer If

- All patients with significant heart murmur for initial evaluation
- All patients with increasing cardiac symptoms.

Prophylaxis

Rheumatic fever – All patients with a history of rheumatic fever should be given prophylaxis for recurrences, for life, with:

- Benzathine penicillin 1.2 mega units IM monthly

OR amoxycillin 125–250 mg PO BD

OR erythromycin 125–250 mg PO BD.

Endocarditis prophylaxis – In addition to rheumatic fever prophylaxis:

- Dental procedures: Amoxycillin 3.0 gm PO 2 hrs before procedure and 1.5 gm PO 6 hours after the initial dose
- If penicillin allergy – Erythromycin 1 gm PO 2 hrs before procedure then half the dose 6 hours after the initial dose
- Lower gastrointestinal and genitourinary procedures: Amoxycillin 2 gm IM 30 minutes before procedure and 6 hrs after the initial dose + gentamicin 1.5 mg/kg IM 30 minutes before procedure and 8 hrs after the initial dose.

Patient Education

- Emphasize need for follow up
- Advise female patients on contraception.

Complications

Congestive cardiac failure, pulmonary oedema, bacterial endocarditis.

4. CENTRAL NERVOUS SYSTEM

4.1. Cerebral Palsy

Cerebral palsy (CP) is a term applied to any condition which consists of motor or other neurological problems caused by non–progressive brain damage or central nervous system lesion. **Aetiology: Prenatal** Hereditary, rubella, syphilis, toxoplasmosis, asphyxia, prematurity, excess radiation. **Perinatal** Difficult labour in 50% of CP cases gives asphyxia, intracranial bleeding, anoxia because of abruptio placenta, placenta previa.

Postnatal Asphyxia, kernicterus, meningitis, hydrocephalus, encephalopathy from pertussis, etc.

Clinical Features

Nature of motor dysfunction Spasticity, most frequent picture. Typical findings, hypertonic muscles also during sleep, increased deep tendon reflexes, typical posture of affected limbs with tendency to contracture e.g. short heel cord. **Changing muscle tone** First few months very hypotonic but with normal reflexes. At age of one year a change between abnormally high (if disturbed) and low tone (if left alone). No contractures.

Neonatal reflexes remain, sometimes combined with choreo–athetosis. **Choreoathetosis** gives involuntary movements and abnormal posture. First few months of life hypotonic, abnormal movements develop during second half of the year. Neonatal reflexes persist. Co–movements of face and hands, **deafness is common.**

Ataxia; flaccid during infancy, much retarded motoric development, low muscle tone, lack of balance, intention tremor, clumsy. **Related abnormalities** Visual defects: strabism. **Impaired hearing neuron type** Important to detect. **Speech** difficulties caused by involuntary movements of tongue, drooling, mental

retardation, hearing defect. Mental retardation in about 50%. Judge with great caution. **Convulsions. Growth retardation** Not to be mixed up with nutritional marasmus. **Kwashiorkor** could result from neglect of the child or real feeding problem.

Management

• Symptomatic therapy:

– Physical therapy: Encourage those mentally normal children. For mentally subnormal children encourage parents to show concern. The main aim is to prevent contractures and abnormal pattern of movements and to train other movements and co-ordination. Home training programme for the parents is the most important part: Anal and sphincter control, intermittent catheterisation, stool softeners and enemas where necessary

– Drugs: to decrease muscle tone in a few selected cases; e.g diazepam and other anticonvulsants [see **4.2. seizure disorders**],

• Support of family:

– The diagnosis should be discussed with the parents to prevent them from going to a lot of different doctors. Mentally retarded children with severe CP should, if possible, be cared for outside the home, if one of the parents has to give up a job because of the invalid child.

Note:

- All children should, if possible, be seen once by a doctor with some experience of CP children for correct diagnosis. The nature of the motor dysfunction, its distribution and all related abnormalities should be noted and a decision made on what could be offered to the child.

4.2. Seizure Disorders

Epilepsy is a clinical syndrome characterised by the presence of recurrent seizures. Seizures are result of excessive electric impulses discharge of cerebral neurones.

Classification

Partial

- Simple partial seizures; can be motor, sensory and sensory-motor (consciousness not impaired)
- Complex partial seizures; starting with an aura (later impairment of consciousness) and often accompanied by automatic behaviour
- Partial seizures becoming progressive (Jacksonian seizures) or generalised.

Generalised seizures

- Initially generalised;
 - absence seizures
 - tonic seizures

- myoclonic seizures
- tonic–clonic seizures
- clonic seizures
- atonic seizures.

Clinical Features

Meticulous history from patient and reliable witness is critical in diagnosing a seizure disorder. Ask about the prodromal phase, aura and the type, duration, frequency and the age of onset of seizures. Detail about the post ictal phase are important. Ask about precipitating factor e.g. alcohol use.

Investigations

- Skull X–ray: All cases for possible radiolucent focal lesion, raised intracranial pressure
- Full haemogram
- Malaria parasites (MPs) especially in children
- Blood sugar, urea and electrolytes in cases where metabolic conditions are considered as a cause of a seizure disorder
- Fundoscopy in newly diagnosed patients
- CT scan should also be considered.

Management – Acute

- During an epileptic attack:
 - patient should be placed on the left lateral position with head turned to the same side;
 - tight fitting dresses around the neck should be removed
 - dentures should be removed
 - no attempt should be made to insert any instrument into the mouth to avoid tongue biting as this may have already happened
 - patient should not be surrounded by too many eager observers
 - seizures should be allowed to complete its course without physically attempting to hold down the patient. However, remove patient from danger e.g fire
- After an attack:
 - patient should be investigated as outlined above and started on therapy.

Management – General

- Treat underlying diagnosed condition if possible e.g. hypoglycaemia, meningitis
- Establish **firm** diagnosis before starting therapy

- Most patients can be started on therapy as outpatients
- Start therapy if patient has had two or more seizures within one year
- Treatment is usually life long. Therapy may be discontinued after a seizure free period of at least two years. Reduce dose gradually over many months. Sudden discontinuation of drugs may precipitate **status epilepticus**. Complex partial seizures will require lifelong drugs

Management – Pharmacologic

- **Start therapy with one drug**, usually phenobarbitone. Increase at regular intervals until seizures are controlled or side effects appear. If side effects appear and fits are still not controlled, introduce other drugs and taper off the first drug.

Drugs of choice for common seizures

PARTIAL	First drug	Other drugs
Simple	Phenytoin	Carbamazepine, Valproic acid
Complex	Carbamazepine	Phenytoin
Secondarily generalised	Phenobarbitone	Phenytoin
GENERALISED	First drug	Other drugs
Absence	Ethosuximide	Valproic acid, clonazepam
Tonic–Clonic, clonic	Phenobarbitone	Carbamazepine, phenytoin
Tonic	as above	as above
Atonic	as above	as above
Myoclonic	Clonazepam	Nitrazepam, valproic acid, phenobarbitone
DRUG	DOSE	FREQUENCY
Phenobarbitone	60–240 mg	once daily
Phenytoin	50–400 mg	once daily * toxicity develops rapidly
Carbamazepine	400–1400 mg	in 2–3 divided doses
Sodium valproate	600–2400 mg	in 3 divided doses
Ethosuximide	20–40 mg/kg/day	in 2 divided doses
Clonazepam	1–12 mg	once daily

PAEDIATRIC SCHEDULE

DRUG	DOSAGE	FREQUENCY	REMARKS
Phenobarbitone	3–6 mg/kg	once daily	may cause hyperactivity in some children
Phenytoin	4–7 mg/kg	once daily	avoid in children unless impossible
Carbamazepine	20–30 mg/kg/day	3 divided doses	
Sodium valproate	30–60 mg/kg/day	3 divided doses	may precipitate, absence status if given with clonazepam. Also transient alopecia.

Ethosuximide	20–40 mg/kg/day	2–3 divided doses	
Clonazepam	0.1–0.2 mg/kg/day	once daily	may precipitate, absence status if given with sodium valpoate

NB: Sodium valpoate is the most broad spectrum anticonvulsant but it is very costly and is better used as second line drug

DRUGS USED AT MAXIMUM RECOMMENDED DOSE SHOULD BE WITHDRAWN IF FITS ARE NOT CONTROLLED

Admit For

- If underlying metabolic cause is suspected or raised intracranial pressure is present.

Refer If

- Seizures not controlled with maximum drug dose
- Raised intracranial pressure is suspected.

Patient Education

- Avoid becoming drunk especially drinking spree during weekends
- Eat at regular intervals
- Stress, physical or mental may precipitate a fit, thus manage stress
- Avoid sleep deprivation
- Never swim alone and all precautions should be taken when swimming
- Avoid operating heavy or sharp edged machinery
- To prevent burns, protective shield should be made around "jikos"(braziers)

STATUS EPILEPTICUS

A succession of seizures without regaining consciousness in between attacks. It could be due to partial, complex partial, absence, tonic–clonic or clonic. Only the latter two are life threatening.

Clinical Features

Patient is not able to talk, the tonic phase is not clear and the patient appears in continuous clonic phase, the short tonic phases being difficult to see. May be in respiratory embarrassment with cyanosis or may be hypoglycaemic.

Management – Supportive

- Place patient by the side (lateral position). Do NOT attempt to put anything into the patient's mouth to stop the biting of the tongue. You are likely to cause more damage.

Drugs

Give IV (not IM) diazepam 10 mg STAT, repeat if there is no response. The injection rate should not be faster than 3 minutes. If still no response put 80 mg in 500 mls of N/saline, adjust rate to control seizures. **Children:** 0.2–0.5 mg/kg in 5 minutes (max. 10 mg in 1–3 yrs and 15 mg in 3–15 yrs.). Repeat after 15 minutes if not controlled.

- Rectal diazepam 10–20 mg may be as effective. Children: 0.5–0.7 mg/kg.

Use rectal solution at 0.5 mg/kg

- OTHER useful drugs include:
 - phenobarbitone.

Adults: Loading dose 10 mg/kg IV at a rate of 100 mg/minute. Maintenance 1–5 mg/kg/day PO or IV. 3–6 mg/kg IM BD or TDS. Then maintenance 1–5 mg/kg/day.

Children: Loading dose 10 mg/kg IV in 5 minutes. If no response repeat 10 mg/kg (Max. 20 mg/kg). Maintenance dose 3–8 mg/kg/day.

- IV Phenytoin (with glucose-free solution, seek senior guidance). Loading dose 18–20 mg/kg. Infusion not to exceed 50 mg/minute. Maintenance 300–500 mg/day.

Children: 20 mg/kg once.

- Clonazepam by slow intravenous injection 1 mg

Maintain normal acid base status: Give NAHCO₃ 4.2% solution IV at 2 ml/kg.

Refer If

- No response to drip or respiratory depression appears after the doses required to control the seizures.

FEBRILE CONVULSIONS

This diagnosis should be made by exclusion of all other causes of convulsions. It is a form of generalised tonic-clonic seizure seen characteristically in childhood and meeting the following diagnostic criteria: Occurrence in infancy or early childhood, usually between ages 6 months and 5 years. Fever at the time of the attack, usually greater than 38°C. Brief duration (always less than 15 minutes). Absence of CNS infection and absence of neurological abnormalities in the inter-ictal period.

Investigations

- Lumbar puncture and CSF examination
- Blood slide for MPs
- Exclusion of intoxication by history
- If diarrhoea and vomiting: Urea & electrolytes.
- Blood for C&S.

Management

- Acute:
 - antipyretic measures including tepid sponging and antipyretic medication (avoid use of salicylates: underlying fever may be influenza or varicella)
 - anticonvulsant drug therapy unnecessary.
- Subsequent:
 - institute phenobarbitone therapy after second or third febrile convulsion especially if seizures are triggered by only modest rises in body temperature.

Tail off therapy if seizure free for 2 years.

5. DENTAL AND ORAL CONDITIONS

5.1. Abscess, Periapical

Usually a swelling found in relation to or around a carious tooth caused by the spread of infection following the death of the pulp.

Clinical Features

Tenderness of the tooth when tapped. Painful swelling which is either localised or sometimes spreads to other adjacent tissues. Usually it is found on the apical region of the tooth and could be with or without sinus. There is tenderness, headache and patient may be febrile. The abscess could be pointing or discharging.

Investigations

- X-ray (intra-oral).

Management

- Give oral antibiotics when abscess is localised e.g. amoxycillin 500 mg TDS for five days
- Analgesics and/or anti-inflammatory e.g. (indomethacin 25 mg TDS for 3 days – is preferred)
- Oral hygiene measures e.g. warm saline washes, povidone iodine washes

Admit If

- Patient is febrile, dehydrated and weak patient
- Severe trismus present
- Severe swelling is present:
 - give injectable antibiotics, preferably crystalline penicillin QDS for 5 days combined with metronidazole and analgesics. In cases of penicillin allergy, give other available alternative antibiotics e.g. erythromycin
- Abscess is pointing or discharging – drain under LA (2% Lignocaine with adrenaline).

Find extent and cause of abscess if possible.

REFER TO DENTAL SURGEON.

5.2. Acute Necrotizing Ulcerative Gingivitis (ANUG)

Commonly found in children who are nutritionally compromised and are in crowded dwellings. Sometimes in individuals with lowered resistance to diseases.

Clinical Features

Characterized by swelling and excessive bleeding of gum, there is severe pain and foul smell. Mouth is unhygienic and ulcerated. Sometimes affects the other related oral tissues. Diagnosis is mainly clinical.

Management

- Warm saline mouth-washes or any other available mouth washes
- Give metronidazole 7.5 mg/kg TDS combined with amoxicillin 12.5 mg/kg QDS for 5–7 days
- Improve nutritional condition.

Admit For

- Parenteral antibiotic therapy
- Treatment of underlying causes e.g. severe malnutrition.

Refer

- If not responding to treatment.

5.3. Alveolitis (Dry Socket)

Acute infection of the extraction socket.

Clinical Features

Severe pain 2–3 days after a dental extraction. The socket is hollow and infected. Diagnosis is mainly clinical.

Investigations

- X-ray: Intraoral.

Management

- Irrigation and curettage of socket with warm saline under LA
- Give amoxicillin 500 mg TDS for 5 days
- Give analgesics; paracetamol 1 gm TDS **OR** indomethacin 25 mg TDS for 3 days.

Refer

- If Condition persists.

5.4. Cellulitis (Oral)

Inflammation of floor of the mouth and other related structures – in this category the most important is Ludwig's angina. This is a life-threatening condition.

Clinical Features

Starts as a unilateral swelling of soft tissues around lower mandible usually arising from the lower second or third molars. The infection spreads to other tissues crossing the midline and becomes bilateral swelling. The tongue is elevated and falls back thereby obstructing the air-way and thereby causing difficulty in breathing. Severe trismus: patient unable to swallow both solids and liquids. Patient is dehydrated, weak and febrile. There may be septicaemia.

Investigations

- Full haemogram
- X-ray jaw (after acute phase is controlled).

Management

- Admit patient
- Assess the patient for vital signs
- If severe difficulty in breathing perform tracheostomy
- Give injectable antibiotics: Preferably crystalline penicillin 4 mega units STAT (adults) then 1 mega unit QDS for 5 days
- Give hydrocortisone 100 mg IV TDS for 3 days
- If dehydrated, give IV fluids
- Incision and drainage if abscess forms.

Refer

If infection persists despite treatment.

5.5. Gingivitis

Acute or chronic inflammation of the gums caused by infection from the accumulation of bacteria plaque around the necks of the teeth.

Clinical Features

Gum is red and swollen or puffy. Bleeds easily when touched. Diagnosis is mainly clinical.

Management

- Give paracetamol 1 gm TDS for 3 days
- Advice on saline mouth-washes or other antiseptic mouth washers
- Give oral hygiene instructions and motivate the patient to start proper tooth-brushing.

Refer

- If condition persists or calculus (tartar) is present.

5.6. Neoplasms, Salivary Gland & Hereditary/Developmental Disorders

The above conditions should be recognised. Some of them are benign while others are malignant. These could present in various ways such as swelling, ulceration or hardening or lump in the oral cavity and related structures including the jaws.

In this group there are other pre-cancerous lesions and cysts which will need to be identified early. Special attention should be given to fibrous dysplasia, ameloblastoma, leucoplakia, mottled and hypoplastic teeth, amelogenesis imperfecta and impacted teeth.

Clinical Features

These are varied, but any swelling of unknown aetiology or change in normal epithelial colouration should be viewed with suspicion.

Investigations

- Biopsy
- Haemogram
- X-ray.

Management

- Relieve pain with paracetamol

Refer to E.N.T. or dental surgeon for further investigation and management

5.7. Pericoronitis

Acute inflammation of the gum around an erupting or impacted tooth.

Clinical Features

Severe pain associated with offending tooth, sometimes abscess is present. There is swelling and tenderness (redness around the tooth).

Investigations

- X-ray: Intraoral.

Management

- Give antibiotics and analgesics
- Saline or other mouth washes. Antiseptics

REFER if patient does not improve.

5.8. Periodontitis

Acute or chronic inflammation of gums and periodontium (tooth attachment).

Clinical Features

May resemble gingivitis in its early stage. Gum recedes from the tooth or it is puffy resulting into a pocket. Pus may be found and the teeth may be loose (mobile). In severe cases the bony support of the tooth may be destroyed. In acute phase there is always tenderness.

Investigations

- X-ray: Intraoral.

Management

- In acute phase, where there is severe tenderness, give a combination of antibiotic and metronidazole
- Give warm saline mouth-washes and analgesics or other mouth washes. Antiseptics

REFER TO DENTAL SURGEON.

POST EXTRACTION BLEEDING

- Stop any treatment with aspirin
- Personally press adrenaline pack for 15–30 minutes
- Instruct a patient to avoid spitting and rinsing
- If persistent – give Vit. K 10 mg IM STAT and maintain the pack.

Ref er If

- Bleeding persists.

5.9. Pulpitis

Acute or chronic inflammation of the pulp. Can be suppurative and could lead to necrotic pulp.

Clinical Features

Throbbing continuous or intermittent toothache which is worse at night. Sometimes the pain is aggravated by hot or cold drinks. It is usually due to dental caries or trauma.

Investigations

- X-ray: Intraoral
- Pulp testing.

Management

- Give analgesics e.g. paracetamol 1 gm TDS for 3 days or in severe cases give indomethacin 25 mg TDS for 3 days
- When associated with abscess give amoxycillin 500 mg TDS for 5 days
- Find the cause and extent of damage.

REFER If no response to treatment.

REMEMBER:

Most of these conditions are preventable by good oral hygiene

5.10. Temporomandibular Joint Disorders

These are varied, of special concern is dislocation.

Dislocated mandible

The condylar head moves forward and out of the socket.

Clinical Features

The mouth remains open and cannot close spontaneously. Sometimes pain is present. Diagnosis is mainly clinical.

Management

Re-assure the patient that it is a temporary thing and that there is no irreversible damage.

Reduction of dislocated mandible

If the mandibular midline deviates to one side, the dislocation is unilateral.

Injection of L.A. 1% lignocaine (2–5 mls) into the joint or adjacent area of insertion of lateral pterygoid muscle may allow spontaneous reduction.

Manual reduction

Pre-medicate with a benzodiazepine (e.g. diazepam 5–10 mg IV). The patient's head is stabilised.

The operator places his thumbs on the external oblique line of the mandible (lateral to the third molars) with fingers placed under the chin.

A rotatory motion is performed by the thumbs pressing downwards and forwards, and the fingers pressing upwards until the mandible is resealed.

Stabilise the jaw to maintain mandible in position using Barton's bandage for at least six (6) weeks.

Refer If

- Manual reduction not possible
- History of habitual dislocation.

5.11. Trauma

Oral and maxillofacial trauma may result in the following:

- Fractures of the teeth and alveolar bone
- Fractures of the maxilla, mandible orbit and nose
- Contusions, lacerations and cuts of soft tissues in general, the trauma varies in severity and may be associated with a variety of complications
- Severe haemorrhage
- Airway obstruction
- Trauma to the eye
- Injury to intracranial structures
- Injuries to the cervical spine
- Contamination and/or infection of tissues
- Varying degrees of deformity and interference with the function(s) of the injured structure/organ.

Investigations

- X-ray:

Management

- Maintain patent airway
- Control bleeding without damaging tissue, by suturing or gauze packs
- Give injectable penicillin then orally when able to swallow
- Give tetanus toxoid
- Give analgesics e.g paracetamol 1 gm TDS
- When in severe pain give pethidine 50–100 mg IM STAT.
- Always suture the face with fine nylon 4/0 or 5/0
- Ensure proper apposition of skin edges
- Remove stitches on the 5th day.

Admit If

- In severe pain
- Blood loss is severe
- Injuries are extensive.

Refer

- When a tooth is completely removed and it is not fractured – put the tooth in normal saline and clean gently. Re-implant under local anaesthesia and give gauze pack for biting on while a dental surgeon is contacted for fixation
- All suspected fractures to a dental surgeon/maxillofacial surgeon.

Observe vital signs and in case of severe loss of blood and if dehydration is evident institute appropriate measures

6. EAR, NOSE AND THROAT CONDITIONS

6.1. Acute Otitis Media

An acute inflammation of the middle ear, usually suppurative, occurring after an upper respiratory tract infection, rhinitis and sinusitis. The commonest organisms are *Streptococcus*, *H. influenzae*.

Clinical Features

Pain in the ear. Loss or impairment in hearing with or without ear discharge. Loss of appetite, fever. Examination shows signs of URTI, fever, hyperaemic oedematous tympanic membrane with loss of normal contours. Purulent discharge with perforation (central) may be present.

Management

- Majority can be treated as outpatients
- Adequate rest
- Analgesics:
 - aspirin 10 mg/kg TDS for 5 days (avoid in children because of risk of Reye's syndrome)

OR

- paracetamol 10 mg/kg TDS for 5 days
- Antibiotics:
 - amoxicillin 15 mg/kg TDS for 10 days **OR**
 - cotrimoxazole 24 mg/kg BD for 10 days **OR**
 - erythromycin 30–50 mg/kg QDS for 10 days.
- Aural toilet and topical antibiotics can be given if spontaneous healing does not occur in a discharging ear.

Admit If

- Symptoms and signs of septicaemia appear
- Features of meningitis appear
- Convulsions occur (in children).

6.2. Otitis Externa

Inflammation of external ear most commonly due to bacteria, but may also be due to fungi e.g. *Candida* (whitish) or *aspergilla* (blackish) or herpes zoster virus. It may also occur in generalised allergic and seborrhoeic states. The commonest bacterial organisms responsible are *streptococcus*, *staphylococcus aureus*, *Ps. pyocyanea*, *B. proteus* and *E. coli*.

Clinical Features

Fever is uncommon. Pain and tenderness accentuated by movement of the tragus. Pre or post auricular or cervical lymphadenitis may be present. Obliteration of the canal lumen may occur due to inflammation causing deafness. Discharge with or without itching.

Management

- Admission is NOT necessary
 - Relieve pain; give analgesics such as paracetamol
 - In severe cases e.g. a boil/furuncle give antibiotics:
 - benzylpenicillin 50,000 units/kg IM STAT followed by
 - oral amoxicillin 50 mg/kg/24 hrs in 3 divided doses for 5 days
 - instill gentamicin ear drops or 2% acetic acid ear drops.
 - Fungal otitis externa (otomycosis) is treated with fungicides e.g. Clotrimazole 1% drops applied 8 hourly for at least 10 days.
 - Allergic (Eczematous) otitis externa is treated with antihistamine drugs and hydrocortisone ointment or drops:
 - Chlorpheniramine 0.4 mg/kg/day BD in children and 4 mg tablets BD in adults
 - Hydrocortisone ointment or drops apply BD
- Seborrhoeic otitis externa treatment includes scalp treatment with selenium sulphide and ketoconazole containing shampoos. Local treatment includes application of salicylic acid and sulphur 2% in aqueous cream applied twice daily after aural toilet.

6.3. Chronic Suppurative Otitis Media (CSOM)

There are 2 types of CSOM: Tubo–tympanic and Attico–antral.

TUBO–TYMPANIC TYPE

Discharge of pus from one ear or both ears for more than 2 weeks following untreated or unresolved acute otitis media with a central perforation. Recurrent ear discharge usually after URTI. Secondary infection may be present with Gram–negative organisms, yeast and fungi.

Clinical Features

A purulent discharge from the ear for more than 2 weeks, usually not foul smelling. Impaired hearing. A central perforation in the ear drum.

Management

- Admission is NOT necessary
- If no antibiotics were administered recently, treat with antibiotics as in acute otitis media
- Dry the ear by wicking. Show the mother how to dry the child's ear by wicking:
 - roll a piece of clean absorbent cloth into a wick or cotton wool on an applicator and insert it in the child's ear gently
 - roll the wick in the ear, then remove it and replace it with a clean wick
 - watch the mother repeat this until the wick is dry when it comes out
- Instill local antibiotic ear drops e.g. 5% chloramphenicol in propylene glycol or antiseptic ear drops like 2% Aq. acetic acid or boric acid in spirit QDS after drying the ear by wicking
- Tell the mother to continue to dry the ear by wicking at home at least 4 times a day, until the wick stays dry and perforation closed. Tell her that nothing should be left in ear between treatments. The child should not go swimming until the ear heals
- Reassess the child weekly. If the mother needs assistance in keeping the ear dry reassess more frequently.

Refer If

- The patient develops mastoiditis (see 6.7. mastoiditis)
- There is no improvement after 4 weeks
- The patient will benefit from tympanoplasty surgery
- The patient has attico–antral type of CSOM
- Patient complains of headache, earache, vertigo or facial paralysis which indicate complications.

ATTICO–ANTRAL

Clinical Features

Foul smelling discharge. Hearing impairment. Attic or marginal perforation with cholesteatoma.

Management

- Refer for ENT management. **Do not syringe such ears.**

6.4. Epistaxis

Bleeding through the nose, (usually 90% from a plexus of veins in Little's areas) due to nose–picking, trauma (fall in games, assault, etc), nasal and paranasal neoplasms, nasal infection, systemic derangements e.g. acute fevers, hypertension, renal disease with uraemia, abnormalities of blood clotting, foreign bodies in the

nose.

Management

- *Immediate*: Sit the patient up (to avoid aspiration);
 - pinch the nose for 10–20 minutes. This is usually sufficient to stop bleeding
 - Apply ice or cold packs on the bridge of the nose.
 - To pack the nose, remove clots with suction catheter. Apply xylocaine nasal spray then pack (preferably using Tiley's forceps) with ribbon gauze or narrow strip of gauze impregnated with liquid paraffin. Start packing from the floor of the nose towards the roof: The pack should fit lightly to be effective.
DO NOT USE ADRENALINE
 - A paraffin pack should be removed within 24–48 hours. BIPP (Bismuth Iodoform paraffin paste or ZIPP (Zinc Iodoform paraffin paste) packs can be left in situ for up to 48 hours.
- A patient with a nasal pack should be put on:
 - Broad spectrum antimicrobial e.g. cotrimoxazole or amoxicillin for seven days
 - Analgesic e.g. Paracetamol 500 mg 8 hourly for five days (children 40 mg/kg/day QDS)

Admit If

- Patient requires fluid replacement or blood transfusion
- Patient requires in-patient management of the underlying causative factor. Treat the underlying cause.

Refer If

- Bleeding is uncontrolled
- Bleeding is from the post-nasal space or posterior nose.

6.5. Foreign Bodies in the Ears

Types: Metallic pieces (hair clips, smooth pellets, needle, etc), wooden (e.g. match box sticks), vegetable matter (e.g. seeds), insects.

Clinical Features

Obvious history of foreign body (FB) in the ear. Conductive deafness. Pain. Discharging ear. Disturbing noise (insects). Bleeding (traumatic insertion especially by a child).

Management

- Most FBs can be removed fairly easily with crocodile forceps, a hook, an ear probe, or by suction and gentle syringing with warm, clean water

- Rounded objects may be pushed further into the ear and rupture the eardrum. Exercise care.

Refer If

A complication such as perforation of eardrum or FB in the middle ear is suspected. The foreign body is deeply seated in the external auditory meatus.

Admit

- Children and some adults (depending on the site and type of FB) for removal under general anaesthesia.

Complications

Conductive deafness. Vegetable matter is hygroscopic and leads to inflammatory reaction in the canal walls leading to otitis externa.

6.6. Foreign Bodies in the Nose

Occurs usually in children and mentally disturbed adults. Occasionally found in children with cleft palate. Types: **Animate** (e.g. maggots, regurgitated roundworms, etc).

Inanimate: vegetable (peas, beans, nuts, etc), minerals (pencils, paper, sponge, buttons, beads, pebbles, nuts, screws, etc), arising from surgery (pieces of polyp, cartilage, bone, etc), traumatic (bullets, shrapnel, arrow heads, etc).

Clinical Features

Pain, sneezing and epistaxis may occur. Unilateral nasal discharge with nasal obstruction.

Pyrexia, headache, etc, especially with animate foreign bodies.

UNILATERAL PURULENT NASAL DISCHARGE IN CHILDREN SHOULD BE REGARDED AS DUE TO FOREIGN BODY UNTIL PROVED OTHERWISE: examine the nose carefully, do anterior rhinoscopy, probe the nasal cavity carefully.

Investigation

- X-ray nose for radio-opaque FBs.

Management

- Animate FBs:
 - remove roundworms with forceps
 - instil 25% chloroform solution into the nasal cavities to kill maggots, screw worms, etc. Repeat twice a week for 6 weeks
- Inanimate FBs – Visible FBs;
 - patient in upright position
 - spray the nasal cavity with 10% Xylocaine or Lidocaine with adrenaline solution

– under bright light insert the nasal speculum with the left hand. Remove the foreign bodies which are near the vestibule with forceps. Other FBs are drawn forward with curved hooks passed carefully behind the object

- A general anaesthesia will be required:
 - in uncooperative patients
 - when a FB is embedded in granulation tissue (easily bleeds)
 - in posteriorly placed FB's (try and avoid pushing it backwards into the nasopharynx)
 - in suspected FB which cannot be easily found.

A CUFFED ORAL ENDOTRACHEAL TUBE AND A THROAT (PHARYNGEAL) PACK IS MANDATORY.

Refer If

- The foreign body is difficult to remove or some instruments are not available.

Admit For

- Removal under general anaesthesia.

6.7. Mastoiditis

Infection of the mastoid air cells and mastoid bone occurring as a complication of acute otitis media or **CSOM**.

Clinical Features

A painful swelling above the ear in children under 2 years of age. A painful swelling **behind** the ear in other children. Preceding otitis media and mastoid tenderness. Fever. Sagging of the posterosuperior meatal wall.

Management

- Admit
- Antibiotics as for otitis media.

Refer If

- The swelling points and/or bursts to discharge pus
- The child develops a squint in the eye or facial palsy on the same side as the mastoiditis
- The child develops signs of meningitis [see 12.4. meningitis] or brain abscess.

6.8. Wax in Ear

- If soft, remove by syringing with clean, warm water
- If hard but not blocking the eardrum, remove with a hook or by gentle syringing with clean water

- If hard and blocking the ear canal, soften over few days with constant use of water, wax solvents or liquid Paraffin and then syringe.

Advise patients to leave wax to migrate out of the ear on its own instead of attempting to remove with ear buds which encourages impaction.

6.9. Foreign Body in the Oesophagus

The commonest objects are coins in children, fish bones or meat in adults. All other forms of foreign bodies can be found in psychiatric patients.

Clinical Features

Pain in retrosternal area and/or in the back, dysphagia, pooling of saliva in the mouth, regurgitation of food, dyspnoea and hoarseness if there is laryngeal oedema from compression by the foreign body and localized tenderness in the lower part of the neck.

Investigations

Plain x-rays, anteroposterior and lateral views, may show opaque objects. Radiolucent objects are not seen on x-rays. However, an increase in the prevertebral soft tissue exceeding 1/3 of the anteroposterior distance of the patient's vertebral body is highly suggestive of the presence of a foreign body.

Management

Refer patient for oesophagoscopy and removal of the foreign body.

6.10. Laryngotracheal Trauma

These can be blunt or penetrating injuries. The priority is to secure and maintain an airway. Then refer urgently to an ENT specialist for endoscopy and repair.

6.11. Allergic Rhinitis

IgE-mediated rhinitis is characterised by seasonal or perennial sneezing, rhinorrhoea, nasal congestion, pruritus and often conjunctivitis and pharyngitis. Symptoms vary in severity from day today or hour to hour.

Management

- Avoid the allergen (precipitating factor)
- Antihistamines; chlorphenamine 4 mg 6 hourly adults and 0.35 mg/kg in children in 4 divided doses
- Sodium cromoglycate nasal spray as a prophylaxis given 4 hourly
- Topical steroids are safe and effective
- Systemic steroids in severe cases for 7 days then tapering off. Dose– prednisone or prednisolone 0.1 mg/kg hourly

Refer If

- There is gross nasal obstruction (hypertrophied inferior turbinates)

- There are polyp
- There is sinusitis
- There is deviated nasal septum.

6.12. Parotid Masses

These may be true parotid swellings (e.g. parotitis, parotid abscess, cysts, sialectasis, tumours, etc.) or pseudoparotomegaly due to swellings in nearby structures (e.g hypertrophy of the masseter, jaw swellings, parapharyngeal masses, lymph node enlargement, facial nerve tumours, etc.).

Parotid swellings may also occur in other systemic conditions (e.g malnutrition, diabetes mellitus, HIV/AIDS, Sjogren's syndrome)

Infective masses may be associated with other features of infection like fever, pain, local inflammation or discharge from the opening of the parotid duct.

Most parotid swellings are painless unless infected or malignant. Presence of facial nerve palsy is highly suggestive of malignant process.

Investigations

- Haematological tests e.g. WBC counts, ESR, serum protein, HIV antibodies, etc.
- Fine needle aspirate (FNA) for cytology.
- OPEN BIOPSY IS CONTRAINDICATED due to:
 - Risk of seeding of tumour in neoplastic conditions.
 - Risk of injury to the facial nerve or its branches.
- Should FNA report not be conclusive, then superficial or total parotidectomy (depending on suspected condition) is done to obtain the excisional biopsy.
- Radiology: Plain x-rays may show radio-opaque stones in the duct or gland but these are rare in the parotid gland. They are commonest in the submandibular gland.
- Sialography may be done to confirm sialectasis. CT- Scan will show the extend of the mass and its relation to other structures but is not an essential investigation.

Management

- Viral parotitis may not require more than analgesics and bed rest. In the presence of bacterial infection, clindamycin is the antibiotic of choice. Give 3–6 mg/kg 6 hourly in children and 150–450 mg 6 hourly in adults for 10 days.
- Where an underlying systemic disease is the causative factor for parotomegaly, manage the condition as appropriate.
- Refer the rest of the masses that may require surgical intervention.

6.13. ENT Manifestations of HIV/AIDS

Forty percent of AIDS patients present with otolaryngological symptoms. These include:–

Infections: These can be viral, bacterial or fungal e.g rhinitis, sinusitis, pharyngitis, glossitis, tonsillitis, laryngitis, parotitis, deep neck space cellulitis and abscesses, otitis externa, otitis media and labyrinthitis.

Tumours: There is an increase in head and neck cancers associated with HIV/AIDS especially Kaposi's sarcoma, lymphomas, squamous cell carcinoma and salivary gland tumours.

Others: e.g. adenoid hypertrophy, oropharyngeal and oral ulcers, atrophic rhinitis, lymphadenopathy, parotid cysts, otitis media with effusion, vertigo, deafness, tinnitus and cranial nerve palsies.

Management

- Is directed at the presenting lesion.

6.14. Hearing Impairment

In the paediatric age group, pay special attention to children born prematurely, low birth–weight difficult delivery, yellowness of eye (neonatal jaundice), mothers who had febrile illness during pregnancy and those treated for meningitis. Do not ignore parents' complaint of a child not hearing or a child who is slow to develop speech. Use changing voice intensity to assess grossly state of hearing. If suspicion of hearing loss, refer at whatever age. A child who does not hear can be helped at any age but the earlier the better.

6.15. Tracheostomy

[see 1.10. tracheostomy].

7. ENDOCRINE SYSTEM CONDITIONS

7.1. Diabetes Mellitus

Diabetes mellitus is recognised by chronic elevation of concentration of glucose in the blood (hyperglycaemia).

Clinical Features

Polyuria. Polydipsia. Polyphagia. Weight loss. Recurrent Infections. Mental changes and coma.

Classification

TYPE 1. (Insulin dependent diabetes mellitus) usually occurs in children and young adults and is associated with ketoacidosis. These patients are insulinopenic and require insulin to sustain life.

TYPE 2. (Non–insulin dependent diabetes mellitus) usually afflicts adults, a large number of whom are obese.

Investigations

- Plasma Glucose:
 - fasting venous plasma glucose more than 7.8 mmol/L on more than one occasion
 - plasma glucose more than 11.1 mmol/L in symptomatic patients
- Urinalysis – for protein, sugar, ketones
- Urea and electrolytes.

Management

AIM

- Abolition of symptoms of diabetes
- Correction of hyperglycaemia, glycosuria
- Prevention and management of complications.

Children:

- Maintain normal weight, growth and development
- Improve quality of life
- Avoid stress
- Keep urine free of ketones.

Management – General

Dietary Modification is important in both types 1 & 2. Consult hospital nutritionist as dietary modification must be individualised.

TYPE 1. Diabetes mellitus patients experience weight loss and will gain weight with therapy. Aim for caloric intake of 35 Kcal/kg body weight to maintain ideal body weight.

TYPE 2. DM patients are obese, for these caloric restriction of 15–20 Kcal/kg body weight is recommended.

Food Composition

- Carbohydrate 50–60% in complex form e.g. rice, beans, peas, etc
- Protein 10–20%. Vegetable protein source include soya beans, lentils and beans
- Fat 25–30%
- Fibre in diet can prolong absorption of sugar. Fibre containing foods include beans, legumes and bran
- Artificial sweeteners e.g. saccharin and aspartate are helpful in maintaining a palatable diet

- Strict adherence to meals schedule is important.

TYPE 2 DIABETES MELLITUS

- Manage as out-patient preferably in the hospital's diabetic clinic or medical clinic
- Consult hospital nutritionist for dietary modification.

Management – Pharmacologic

• ORAL HYPOGLYCAEMICS:

- glibenclamide 2.5 mg–10 mg OD max. 20 mg/day (or BD if dose is greater than 10 mg/day)
- chlorpropamide 125–500 mg PO OD max. 500 mg/day should be started if response to dietary modification is inadequate (nocturia, blood sugar more than 14 mmol/L). Dose adjustment should be gradual (weekly) to avoid hypoglycaemia.
- Metformin 500 mg TDS **OR** 850 mg BD (maximum 3 gm/day)

• INSULIN is indicated in Type 2 DM if:

- a) Oral hypoglycaemic drugs are not effective e.g. persistent polyuria, hyperglycaemia
- b) Ketonuria occurs
- c) Infection occurs
- d) Other complications e.g. renal failure are present
- e) Patients undergoing surgery.

Admit patient for insulin therapy in order to give him her opportunity to learn how to measure insulin, technique of injection, care of syringe, recognition and management of hypoglycaemia. Start patient on soluble insulin 10–16 units subcutaneously half an hour before meals TDS. The severity of hyperglycaemia will aid in selection of the dose. Maintain plasma glucose in the range of 8.3–13.4 mmol/L in the hospital to avoid hyperglycaemia at home. Optimum control at home is blood sugar less than 10 mmol/L and more than 4 mmol/L.

Plasma glucose should be monitored before meals and at bed time. Gradual adjustment of insulin dosage by 5 units are essential when blood glucose are near the desired range. When blood glucose level is between 8.3–11.0 mmol/L change to an intermediate acting insulin. The dose of intermediate acting insulin is 2/3 of the total daily soluble insulin requirement. Alternative strategy is to base control on two doses of intermediate acting insulin 2/3 in the morning and 1/3 before supper.

TYPE 1 DIABETES MELLITUS

Usually present with diabetic keto-acidosis (DKA). Patients with type 2 DM can also present with DKA especially in situations of stress such as infection or neglect of therapy. Clinical features include intense polydipsia, abdominal pain, vomiting, dehydration, acidotic breathing or coma.

Investigations

- Urinalysis;
 - Ketonuria and glycosuria

- Blood sugar – hyperglycaemia.

DKA is a medical emergency and should be treated as such. Not all patients with DKA are in coma. For management of DKA see below.

Most patients with Type 1 need hospitalization and are best managed with divided doses of intermediate acting insulin 2/3 lente A.M + 1/3 lente P.M. Alternative is to combine soluble insulin with intermediate acting insulin. NOTE: Animal insulin is in the process of being replaced by human insulin.

Management of DKA

- Admit patient.

Fluid Replacement

Adult	Children
1 Litre in 30 minutes 1 Litre in next 1 hour 1 Litre in next 2 hours 1 Litre in next 4 hours then 500 mls hourly or as clinical status indicates	<ul style="list-style-type: none"> • Assume 10% dehydration. Start IV infusion initial fluid is Normal saline. • Total fluid is 100 ml/kg/24 hrs + maintain fluid volume [see table on maintenance] First hour 20 mls/kg. Then rehydrate over 24 hrs. • If serum sodium <150 mmol/L: 0.9% sodium chloride • If serum sodium >150 mmol/L 0.45% sodium chloride • Change to dextrose – containing solution when blood sugar is controlled <p>NOTE: Cerebral oedema may occur during the rehydration phase.</p>
	<p>Maintenance fluid volume per 24 hrs for age</p> <p><24 months..... 100 mls/kg 2–4 yrs..... 85 mls/kg 5–10 yrs..... 70 mls/kg >10 yrs..... 20–30 mls/kg</p>

Initiate fluid replacement with normal saline then change to 5% dextrose alternating with N/S when blood sugar is between 12.0–14.5 mmol/L. If severely dehydrated **continue N/S and 5% dextrose together**. Continue intravenous fluids until fluid losses have been corrected and ketonuria has disappeared.

Insulin Therapy

Adult

Initial: 10 units IV + 10 units IM stat then, 6–10 units every hour until blood sugar is 14 mmol/L, then change to soluble insulin 8–16 Subcutaneous 4–6 hourly. Change to soluble insulin SC TDS when patient is taking orally.

Children

- Short acting(soluble) insulin at 0.1 IU/kg/hr as a continuous IV infusion
- IV insulin to continue until blood glucose is 10 mmol/L and base deficit is <5
- Change to maintenance SC insulin regime when patient is conscious, cooperative and able to eat.

Potassium Replacement

Hypokalaemia is a common feature. Confirmation should be through ECG and electrolytes. If present supplement as below.

Deficit: 300–600 mmol. Potassium replacement should commence immediately after the first dose of insulin and 1 litre of fluids. Potassium can safely be given at the rate of 10–20 mEq/hr (10 ml of 15% KCL=20 mEq K) in an infusion. Never give potassium as a bolus.

Serum Potassium (mmol/l)	Potassium supplements mmol/L of fluid
<3	40
3–4	30
4–5	20
5–6	10
6	None

Acidosis

If PH is <7.2 and serum potassium is >4 mmol/L give NaHCO₃ 8.5% (diluted to 4.2%). Use the following formula: Base excess x 0.3 x body mass(kg). Give 25% over 1 hour and reassess (1 ml NaHCO₃ 8.5% = 1 mmol HCO₃).

Use NaHCO₃ with caution

Maintenance of Insulin Therapy in Children

- Subcutaneous injection
- Total daily dose 0.6–1.5 units/kg/24 hrs, 2/3 in the morning and 1/3 in the evening
- Short-acting (soluble) insulin is injected 15–30 minutes before a meal
- Insulin dose should not increase or decrease by more than 2 units at a time
- Sites of injection:
 - upper outer areas of the arms
 - the front and sides of the thigh
 - the upper outer surface of the buttocks and the abdomen (except the areas close to the navel)

ANTIBIOTICS – Precipitating factor is usually an infection. Treat with broad spectrum bactericidal antibiotic while awaiting results of cultures where applicable.

ANTICOAGULATION – Heparin 2500 units SC BD to prevent DVT.

MONITORING

- 2 hourly plasma potassium (since potassium infusion is being given)
- Hourly blood sugar estimations are mandatory in the first few hours, (use glucose oxidase reagent strips)
- Monitor urine output, if no urine after 3 hrs catheterise patient
- Nasogastric suction should be done in comatose patients to prevent aspiration
- Oral intake is initiated after ketoacidosis has been corrected

- Careful monitoring of patients especially the elderly or those with renal or cardiac impairment.

• **HYPOGLYCAEMIA SHOULD BE CONSIDERED IN ALL DIABETIC PATIENTS WHO PRESENT WITH ALTERED CONSCIOUSNESS OR COMA. Take blood for glucose and give 20 ml of 50% dextrose immediately**

• **All diabetics with complications such as diabetic foot should be admitted**

Patient Education

- Teach patients on how to avoid foot injury. Hospital occupational therapist should advise patients on foot care
- Patients with any injury, however minor, should seek medical advice
- Patients should eat regularly
- Patients should carry sweets or glucose and chew them if they experience any symptoms of hypoglycaemia
- Patients should always carry "Diabetic Alert" card with them
- Patients should join any branch of the Kenya Diabetic Association for support and "Continuing Education."

Complications

Hypoglycaemia

Blood glucose lower than 4 mmol/L.

Management

Non-drug:

- Give sugar-containing soft drinks, snacks or sweets
- Monitor blood sugar every 15 minutes until blood glucose is 6–8 mmol/L

Drugs:

- IV 50% dextrose bolus 25–50 mls (children 1–2 ml/kg)
- IM/IV/SC glucagon:

<30 kg –0.5 mg stat dose

?30 kg – 1 mg stat dose

Give 5 or 10% dextrose fluid as a continuous infusion for normal maintenance of fluid requirements for age [see **fluid replacement table**].

7.2. Thyroid Diseases

GOITRE

Enlargement of thyroid gland.

Classification

- Simple goitre can be; diffuse or nodular. Usually caused by lack of iodine or defects in synthesis of thyroxine hormone
- Toxic goitre; diffuse or nodular. Produces excess thyroxine (T3, T4) and manifests with signs and symptoms of thyrotoxicosis
- Neoplastic goitre; benign or malignant
- Thyroiditis e.g. Hashimoto's disease
- Rare goitres e.g. tuberculosis or syphilitic.

Clinical Features

Most patients are asymptomatic. Pressure symptoms consist of engorged neck veins, dysphagia, stridor, hoarseness. In hyperthyroid patients weight loss, diarrhoea, heat intolerance, sweating, tachycardia, tremors, lid lag, exophthalmos, menstrual disorders may occur.

Investigations

- X-ray neck, thoracic inlet
- Thyroid function tests (levels T3, T4, TSH, etc) in thyrotoxicosis
- Fine needle aspirate and cytology
- Ultrasound of thyroid gland.

Management

- **Goitre** – Reassure patient:
 - smooth non-toxic colloid goitres: thyroxine 50–150 micrograms OD for 6 months
 - if no change stop drugs and follow up.
- **Toxic Goitre:**
 - usually managed conservatively with anti-thyroid drugs (carbimazole, methimazole) propranolol and diazepam.
- **Thyrotoxicosis**
 - Aim of treatment is to restore the euthyroid state. Use the pulse rate and thyroid function tests if available to monitor progress
 - Antithyroid Drugs: Carbimazole 15–20 mg TDS for 3 to 4 weeks thereafter reduce the dose to maintain euthyroid state, this ranges from 5–30 mg daily. Propranolol 60–240 mg in three divided doses.

Indications for surgery

Toxic goitre

- Failure to control symptoms despite adequate treatment with drugs
- Young subjects
- Adverse reaction to drugs
- Cosmetic.

Non-toxic goitre

- Pressure symptoms – dysphagia, venous obstruction, dyspnoea
- Cosmetic
- Suspicious histology e.g. follicular adenoma
- Solitary thyroid nodule
- Malignancy.

Patients presenting with above should be referred to a specialist.

Complications of thyroidectomy

- Haemorrhage and haematoma
- Dyspnoea – can be due to oedema haematoma or neurological
- Nerve palsy – recurrent laryngeal mainly tends to recover, if "paresis"
- Hypoparathyroidism – leading to tetany and convulsions
- Hypothyroidism – give thyroxine.

Refer If

- Increase in size of the goitre
- Suspicion of malignancy
- Pressure symptoms
- Large goitres for cosmetic reasons
- Thyrotoxic patients who fail to respond to medical treatment
- Goitres in children and male adults.

Prevention

- Iodination of salt has helped reduce incidence of endemic goitre.

HYPOTHYROIDISM

Deficiency of thyroid hormone.

Classification

- Congenital failure of thyroid development (complete or partial)
- Endemic cretinism
- Iatrogenic – (after, thyroidectomy, radio-iodine therapy, pituitary ablation, drug induced)
- Auto-immune thyroiditis
- Goitrogens e.g. cabbages
- Pituitary gland damage.

Diagnosis

The deficiency ranges from mild with minimal or unrecognised clinical manifestation to severe mental retardation (cretinism).

Congenital

Most neonates appear normal at birth. Diagnosis should be based on neonatal screening tests and not abnormal physical signs.

Clinical Features

Prolonged jaundice, feeding difficulty, lethargy and somnolence, apnoeic attacks, constipation, large abdomen, umbilical hernia, macroglossia, failure to thrive, delayed physical and mental development.

Investigations

Hormone levels:

- $T_4 \uparrow$; $TSH \downarrow$ – deficit in thyroid gland (most cases)
- $T_4 \uparrow$; $TSH \downarrow$ – deficit above level of thyroid gland
- $T_4 \downarrow$; $TSH \uparrow$ – thyroid hormone unresponsive (goitre is also present in most patients).

Management

- Treat underlying cause
- L-thyroxine sodium 75–100 $\mu\text{g}/\text{m}^2$ OD for life
- Neonates and infants 10–15 $\mu\text{g}/\text{kg}$ OD PO for life.

NB: Dosage should be adjusted to T_4 , TSH levels, growth and neuro-development assessments.

Adult Hypothyroidism

Clinical Features

Myxoedema is a very advanced form of hypothyroidism and this is not applicable to the more common milder degrees seen after thyroidectomy or autoimmune thyroiditis. Early symptoms include; tiredness, cold intolerance, menstrual disturbances, carpal tunnel syndrome.

The physical signs include; slow pulse rate, dry skin, sparse and dry hair, periorbital puffiness, hoarse voice. Comparison of facial appearance in a previous photograph is useful.

Investigations

- Serum T4
- TSH levels
- ECG changes: voltage reduced and flattened T-wave
- TRH.

Management

- Replacement with L-thyroxine.

8. EYE CONDITIONS

8.1. Common Eye Conditions

It is important to note that over 75% of all blindness in Kenya is either preventable or treatable. Most of the patients who come to clinics with eye complaints can be successfully treated by non-specialist medical workers.

Important causes of blindness in Kenya are: **Cataract** 42%, **trachoma** 19%, **glaucoma** 9%, others include **trauma, vitamin A deficiency.**

The table below shows some of the common eye diseases and the recommended management.

DO NOT EVER

- Use **steroid containing medicines in the eye without the written order of an eye specialist**
- **Put any medicines in any eye which may have been perforated**
- **Use atropine drops or ointment without the written order of an eye specialist.**

Management and Referral – see table on the following page.

8.2. Eye Injuries

The eye is a delicate external organ and so easy to injure. Eye injuries include: Corneal and conjunctival foreign bodies and abrasions, burns (dry heat and chemical burns), blunt trauma (contusions), penetrating injuries to the eyeball (perforations), injuries to the eyelids, orbital injuries and cranial nerve injuries.

Management – General

- Check vision of all eye patients

- Use topical local anaesthesia for examination (not treatment) of a painful injured eye
- Good lighting and magnifying lens make eye examination easier.

CORNEAL AND CONJUNCTIVAL ABRASIONS

Pad eye for 24 hrs, if no improvement refer.

FOREIGN BODIES(Conjunctival and corneal)

- Remove with moist cotton swab
- Remove under topical local anaesthesia then pad
- Antibiotic drops 3 times a day.

Refer If

- Not able to remove the FB
- There is progressive loss of visual acuity.

Management and Referral Guidelines

CONDITION	CLINICAL FEATURES	MANAGEMENT
1(a). Trachoma	Bilateral follicles	Tetracycline 1 % ointment 3 times daily × 6 weeks. Prevention: Good hygiene
1 (b). Trachoma with entropion and trichiasis	Inturned upper lids with eyelashes scratching cornea	Surgery: Refer to eye clinic Prevention: Good hygiene
2(a). Viral infections	Mucoid discharge. Photophobia	Eye drops – gentamicin/chloramphenicol TDS daily × 7 days Refer If no improvement after 3 days
2. (b) Purulent conjunctivitis	Bilateral pus discharge	Eye drops gentamicin/chloramphenicol TDS daily × 7 days Refer if no improvement
3. Asthenopia (eye strain)	Normal vision and complaint of pain when reading Majority also anxious	Reassurance; if persistent refer to eye clinic
4. Allergic conjunctivitis	Red itching eyes Commonest in children	0.5% zinc sulphate × 7 days Usually recur on and off with or without treatment Refer If no Improvement
5. Corneal ulcer	Red eye, especially around the cornea, or white spot on cornea	Eye drops gentamicin/chloramphenicol TDS daily × 7 days. Refer if no improvement
6. Conjunctivitis of the newborn (ophthalmia neonatorum)	Bilateral copious pus in the eyes of newborn Commonest cause is Chlamydia followed by Gonococcus	Careful, constant cleaning of eyes Local and systematic antibiotics. Refer infant and parents to clinic

7. Xerophthalmia	Night blindness, corneal dryness, Biters spot	6–11 months 100,000 I.U– Day 1, Day 2 and day 7 1 year and above 200,000 I.U. vitamin A capsule; 1st day, 2nd day and 7 th day. Nutrition education. Refer to eye clinic
8. Stye	An acute painful swelling on the lid margin (acute infection)	Warm water compressions Topical & systemic antibiotics; NO STEROIDS If no improvement within a week, refer to ophthalmologist for I&D.
9. Chalazion	Painless lid swelling Common in pregnancy, diabetes and obesity	I&D
10. Cataract	Loss of visual acuity, white pupil.	Refer to eye specialist
11. Un explained visual loss.	Sudden or progressive loss of vision. May be confused with cataract, could be glaucoma, retinal or optic nerve disorders.	Refer to eye specialist
12. Corneal scarring	Eye not red, white scar on cornea.	Refer to eye specialist
13. Leucocoria	White pupil in children could be more commonly congenital cataract or retinoblastoma.	Refer to eye specialist
14. Squint	Manifest deviation of the eyes.	Refer to eye specialist (especially children)
15. Refractive errors	poor vision for either far or near objects	Refer to eye specialist (especially children)
16. Presbyopia	cannot read small print	Prescribe reading glasses
17. Pterygium	Outgrowth on exposed parts of conjunctiva.	Reassure If It extends towards the pupil refer to eye specialist.
18. Proptosis	Protrusion of the eye could be. thyrotoxicosis. cellulitis, cysts, haemorrhage, tumours	Refer to eye specialists
19. Systemic disease e.g. diabetes, hypertension, rheumatoid arthritis	Decreased vision Dry eyes	Must be seen regularly by eye specialist

BLUNT TRAUMA

- Give analgesics, and pad the eye
- It might be a ruptured eyeball

Refer If

- Those with poor vision and/or blood in the eye (hyphaema).
- Severe pain persists after 3 days of treatment.

CHEMICAL BURNS

- Eye **must** be irrigated with **plenty** of running water or normal saline urgently; washing the face is not enough
- Use topical local anaesthetic drops; complications depend on the concentration of the chemical and the duration it stayed in the eye
- Pad with antibiotic ointment.

Refer

- To Ophthalmologist urgently after initial First Aid.

PENETRATING EYE INJURIES

Give:

- Systemic antibiotics and analgesics
- Tetanus Toxoid 0.5 mls IM STAT
- NO local medications to the eye
- Protection to the eye with a clean pad or shield and refer without delay.

INJURIES TO THE LIDS

- Lids have very good blood supply and so healing is good
- Stitch minor cuts only (use 5.0 suture)
- Avoid distorting lid margins.

Refer If

- There is tissue loss and all patients with injured lacrimal drainage system (nasal angle of the eye).
- There is involvement of lid margins
- There is involvement of the punctum and canaliculus.

ORBITAL INJURIES

- Take orbital X-ray of patients with suspected fractures of the orbit
- Tetanus 0.5 mls should be given if there is an open wound
- Give systemic antibiotics and analgesics and refer for specialised treatment.

OCULAR INFECTIONS

- Orbital cellulitis (**an ocular emergency**)

Clinical Features

- Purulent discharge
- Proptosis
- Reduced extra-ocular muscle movements.

Investigations

- X-ray – orbit/paranasal sinuses
- Pus swab.

Management

- Systemic antibiotics (IV)
- Refer without delay.

8.3. Ocular Manifestation of Common Systematic Diseases

DIABETES

May cause visual loss by cataract formation, retinopathy and glaucoma.

Refer

- All diabetics for ophthalmic examination.

HYPERTENSION

May cause retinopathy.

TUBERCULOSIS

May affect vision by:

- Direct infection causing a form of uveitis.
- Optic neuropathy secondary to anti TB drugs.

Refer If

- Patient complains of pain or visual disturbance.

LEUKAEMIA

- Reduced vision
- Proptosis

TUMOURS

- Orbit

- Ocular.

HIV/AIDS

Manifestations are many. Common ones are:

- Herpes zoster ophthalmicus. The eyeball is affected in about 50% of the cases.
- Cytomegalovirus retinitis
- Kaposi's sarcoma and other tumours of the conjunctiva.
- Toxoplasmosis.

Check visual acuity in the above conditions. Examine the eye with a torch.

Refer if

All cases if possible especially for initial assessment:

- All diabetics for ophthalmic examination.
- Vision is reduced
- Cornea is not clear
- Conjunctiva lesions are present
- Patient complains of visual loss

8.4. Orbital Cellulitis

This is a medical emergency.

Suspect in all patients who have painful proptosis (protrusion of the eye) and fever. In majority of patients, the illness is secondary to infection of paranasal sinuses. The infection may rapidly spread to the brain (carvenous sinus thrombosis and brain abscess) or lead to septicaemia.

Investigation

- X-ray paranasal sinuses

Management

- Monitor vital signs closely
- Start patients on crytalline penicillin, chloramphenicol and metronidazole

Refer

- Urgently to Eye specialist.

9. FAMILY PLANNING

FAMILY PLANNING METHODS

The essence of family planning, simply put, is that "everyone should plan their family so that all children are born when wanted, expected, and welcome". The health benefits of family planning play a major role in protecting the lives of infants, children, women and the family as a whole.

9.1. Hormonal Contraceptives

COMBINED ORAL CONTRACEPTIVE PILL

Contains a combination of PROGESTOGEN and OESTROGEN the quantities of which may vary with the particular preparation. The pill acts by: inhibiting ovulation and thickening cervical mucus, thus providing a physical barrier to spermatozoa and making the endometrium too thin for implantation.

Client Education

- Requires strict compliance in taking the daily regime
- Highly protective against pregnancy
- Pregnancy rate increases if pill not taken regularly
- May cause MINOR complaints; nausea, headache, weight gain, gastrointestinal upsets
- Unsuitable to breastfeeding mothers due to a relative reduction of milk output.
- If you forget to take one pill, take it as soon as you remember. Take the next pill at the regular time, even if this means you take 2 pills on the same day.
- Return to the clinic if you experience:
 - suspected pregnancy
 - swelling or pain in legs
 - yellowing of skin or eyes
 - pain in abdomen, chest, or arms; shortness of breath
 - severe headaches, depression, vision difficulties.

Side effects: Although many side effects of oral contraceptives use have been eliminated with low dose pills, some women still experience irregular menstrual bleeding, nausea, weight gain, headaches, skin colour changes, and other side effects that may go away after several months or continue as long as oral contraceptives are taken.

Complications

Increased risk of cardiovascular disease in women over 35 years of age who smoke and increased risk of hypertension; users exposed to STIs may be at risk of serious diseases, including PID and possibly cervical cancer.

Non-contraceptive Benefits

- Reduce menstrual flow (lighter, shorter periods)
- Decrease dysmenorrhoea.

- Protect against ovarian and endometrial cancer
- Decrease benign breast disease
- Prevent ectopic pregnancy.

Choosing a Family Planning Method

METHOD RECOMMENDED FOR:	NOT RECOMMENDED FOR WOMEN/COUPLES:
Combined Pill	
<ul style="list-style-type: none"> • Women under 40 years, of any parity • Women who want highly effective contraception • Breast-feeding mothers after 6 months post-partum • Younger women/adolescents who are sexually active and have been adequately counselled 	<ul style="list-style-type: none"> • with suspected pregnancy • who are over 35 years and a smoker • with history of blood clotting disorders or heart disease • with lump in either breast, liver disease • with unexplained abnormal vaginal bleeding • win BP over 140/90 mm/Hg confirmed on revisit
Progestin Only Pill	
<ul style="list-style-type: none"> • Women of reproductive age, of any parity • Breast-feeding mothers after 4–6 weeks post-partum 	<ul style="list-style-type: none"> • with suspected pregnancy • with history of blood clotting disorders or heart disease • with lump in either breast, liver disease • with unexplained abnormal vaginal bleeding
Injectable Methods	
<ul style="list-style-type: none"> • Women of proven fertility • Breast-feeding mothers after 6 weeks post partum • Women who want long-term contraception • Women who want at least 2 years between pregnancies 	(SAME AS PROGESTIN ONLY PILL)
Implants	
<ul style="list-style-type: none"> • Women with 2+ children needing long-term protection • Breast-feeding mothers after 6 weeks post partum • (Long term highly effective contraception) • Women who have their desired family size but do not want permanent surgical contraception 	(SAME AS PROGESTIN ONLY PILL)
Intrauterine Devices	
<ul style="list-style-type: none"> • Women who have delivered 1 or more times • Breast-feeding mothers • Women who want long-term contraception • Women in a stable monogamous sexual relationship • Women after 6 weeks post-partum; before 6 weeks if provider has specialised IUD insertion training. 	<ul style="list-style-type: none"> • with suspected pregnancy, history of PID or ectopic pregnancy • with anaemia or heavy menstrual bleeding • having no menses after 6 weeks post-partum • with history of heart disease • with abnormalities or cancer of pelvic organs • having unexplained vaginal bleeding or severe menstrual pains

	<ul style="list-style-type: none"> • at risk of exposure to STDs
Diaphragm, Cervical Cap, Spermicides, Sponge	NOT RECOMMENDED FOR WOMEN/COUPLES:
<ul style="list-style-type: none"> • Women needing an immediately effective method • Breast-feeding mothers • Women who do not want hormonal methods or IUCDs • Women waiting to rule out a suspected pregnancy • Women needing a back-up method (forgotten pill) • Women desiring some protection against AIDS, STDs 	<ul style="list-style-type: none"> • who are unable or unwilling to feel their own cervix • who desire more effective contraception • who do not want the inconvenience of the method • who themselves or their partners are either allergic to the spermicide or device • with frequent urinary tract infections, vaginal abnormalities • with poor vaginal muscle tone (for diaphragm only)
Condom	
<ul style="list-style-type: none"> • Men who desire to take contraceptive initiative • Couples needing an immediately effective method • Couples waiting to rule out a suspected pregnancy • Couples at risk of exposure to AIDS, STDs 	<ul style="list-style-type: none"> • who desire or require highly effective protection against pregnancy
Natural Family Planning	
<ul style="list-style-type: none"> • Couples willing to learn about the woman's cycle and to practise abstinence from 1–2 weeks each cycle • Couples who, for religious or any other reasons, desire to practise periodic abstinence 	<ul style="list-style-type: none"> • who need/want more effective contraception • with irregular menstrual cycle is irregular • who are breast-feeding • who must not become pregnant for health or any other reasons • who are unwilling to abstain during fertile period
Tubal Ligation or Vasectomy	
<ul style="list-style-type: none"> • Couples or individuals who have been fully counselled, understand and have voluntarily signed consent form. • Couples with desired family size? • Women for whom age or health problems might cause an unsafe pregnancy? • Couples certain they want no more children regardless of accidental death of a child or children 	<ul style="list-style-type: none"> • who do not fully understand VSC or are unwilling to agree to items on the consent form <p>NOTE: Men or women whose spouses oppose VSC should be considered on a case by case basis for the procedure.</p>

Guide to Family Planning Methods Pregnancy Rate = percentage accidental pregnancies in first year, typical rate and (rate when used perfectly).

METHOD	PREGNANCY RATE?	USED AT INTERCOURSE?	EFFECT ON STD RISK?	COMPATIBLE WITH BREASTFEEDING?	RETURN TO FERTILITY AFTER STOPPING?
Male sterilization	0.15 (0.1)	No	None	Yes	Permanent method
Female sterilization	0.4 (0.2)	No	None	Yes	Permanent method
Implants	0.2 (0.04)	No	Probably none	Yes, but not preferred method. Wait 6 weeks post-partum	Immediate on removal

Combined oral contraceptives	1–8 (0.1–3)	No	May protect against some forms of PID, but increase risk of infection with some STDs	After 6 months post–partum, but not preferred method if breastfeeding	Immediate to short delay (average 2–3 months)
Progestin–only minipill	3–10 (0.5–3)	No	None	Yes, but not preferred method. Wait 6 weeks post–partum	Immediate to short delay
Injectables	0.3–0.4	No	Unknown	Yes, but not preferred method. Wait 6 weeks post–partum	Delayed 4 to 12 months
Intrauterine devices (IUCD)	3 (0.3–2)	No	Increase risk of PID in women at risk of STDs	Yes	Immediate after removal by trained provider
Condoms	12 (2)	Yes	Protective (70% against AIDS)	Yes	Immediate
Vaginal spermicides	21 (3)	Yes	May have some protective effect	Yes	Immediate
Diaphragm, cervical cap, other vaginal barrier methods	18–28 (6–9)	Yes	May have some protective effect	Yes	Immediate
Natural family planning	20 (1–9)	No	None	No, method not reliable	Immediate

PROGESTOGEN–ONLY PILL (Minipill)

This is a pill that is taken daily and contains a progestogen only. They act by altering cervical mucus making it thicker/denser, thus preventing sperm transport. Also suppresses ovulation and inhibits implantation of fertilised ovum.

Client Education

- Used in breastfeeding mothers because it does not interfere with lactation
- Has a high level of pregnancy protection
- There is need for compliance on a daily regimen
- Unrelated to sexual intercourse
- May cause menstrual irregularities
- If you forget to take one pill, take it as soon as you remember (see combined pills)
- Return to the clinic immediately for a pregnancy check if 45 days have passed since your last menstrual period.

Side effects: Users may experience irregular bleeding patterns.

Complications

Studies to date have shown no long term complications.

Non-contraceptive Benefits

- Does not affect lactation
- Lighter shorter periods
- Decreased breast tenderness
- Do not increase blood clotting
- Decrease dysmenorrhoea
- Protect against endometrial cancer.

EMERGENCY CONTRACEPTIVES

Emergency contraceptives reduce the occurrence of pregnancy in unprotected intercourse from 8% to 2% (75% protection).

Indication

- Unprotected intercourse
- Rape
- Condom leakage
- Condom breakage/slippage.

Types

Combined Oral Contraceptives

- Two tablets of a 50 mcg pill e.g. eugynon to be taken within 72 hours of unprotected intercourse. Repeat same after in 12 hours. Requires total of 4 tablets of 50 mcg pill.

OR

- Four tablets of a 30 mcg pill (e.g. microgynon or nordette) to be taken within 72 hours of unprotected intercourse. Repeat same dose 12 hours later.

OR

- one tablet of 75 mcg levonorgestrel e.g postinor 2 and repeat same dose 12 hours later all within 72 hours of exposure.

INJECTABLE CONTRACEPTIVES

These are either progesterone only or combined progesterone + oestrogen.

They comprise of long acting progestogen usually administered as deep intramuscular injections. They act by: suppressing ovulation, inducing a thin atrophic endometrium, producing a thick cervical mucus difficult for

sperm penetration. It is available in two forms:

- MEDROXYPROGESTERONE ACETATE (DMPA) e.g. DEPO-PROVERA:
 - 150 mg per vial and given as a deep (depot) intramuscular injection every 3 months
- NORETHISTERONE ENANTHATE (NET) e.g. NORISTERAT:
 - as 200 mg vials and given at 2 months intervals.

Client Education

- May be associated with heavy menses, amenorrhoea or spotting
- Regular administration as required
- Return to the clinic as scheduled to continue using this method
- Return to the clinic if you suspect pregnancy, dizziness, heavy bleeding.

Side effects: Users may experience menstrual irregularity (amenorrhoea, spotting, and rarely, heavy bleeding).

Complications

Studies to date have shown no long term complications.

COMBINED INJECTABLE CONTRACEPTIVES

At present there are three types of.

- Cyclofem (DMPA 25 mg + oestradiol cypionate 5 mg)
- Mesiyne/Norigynon (NET EN 50 mg + oestradiol valerate 5 mg)

They give effective protection for 30 days hence the name monthly injectable.

Advantages:

They contain natural oestrogens and hence have a protective effect on CVS and CNS and give a better cycle control.

SUB-DERMAL IMPLANTS (Norplant)

A silastic system comprises of 6 small capsules which contain a progestogen and are inserted under the skin of the arm slowly releasing progestogen for up to 5 years. They act by: Thickening cervical mucus. Suppression of ovulation. Causing atrophic endometrium which is unsuitable for zygote implantation.

Client Education

- May be associated with prolonged menses, sporting or amenorrhoea
- Requires a minor surgical procedure for insertion and removal
- If possible return to the **same** clinic if you desire implant or removal
- Return for removal any time you desire, but it can be kept in place for 5 years

- Return to the clinic if you:
 - suspect pregnancy
 - experience pain, swelling or pus at the implant site
 - experience dizziness, headache.
 - experience heavy bleeding

Benefits

- Highly effective
- Immediate return to fertility
- Offer continuous, long-term protection
- Reduce menstrual flow
- Protect against endometrial cancer and ectopic pregnancy
- Do not affect lactation.

Side effects: Users may experience infection at insertion site, irregular menstrual bleeding (longer bleeding episodes, amenorrhoea, or spotting).

Complications

Studies to date have shown no serious long-term complications.

9.2. Intrauterine Contraceptive Devices (IUCDS)

A widely used family planning method. A plastic device usually bound with copper wire and placed in the uterus through the cervix. Lippes's loop has no copper. The IUCDs act by preventing implantation of fertilised ovum, inhibiting sperm mobility, and inhibiting fertilization.

Types	Duration of effectiveness
Copper T 380A	10 yrs
Nova T	5 yrs
Multiload-375	5 yrs
Multiload-250	3 yrs
Copper T 220	3 yrs

Client Education

- Check regularly to ensure IUD is in place
- Return for removal any time, but can be worn for 3–10 years and the Lippes Loop R for an indefinite period of time
- May cause dysmenorrhoea and menorrhagia
- Return to the clinic if you experience:

- signs of pregnancy, heavy bleeding or spotting
- abnormal sexual pain or vaginal discharge
- chills or fever.

Benefits

- Highly and immediately effective
- Long-term protection with immediate return to fertility upon removal
- Do not interfere with intercourse
- Can be used in women who are breastfeeding

Side effects: Users may experience pain on insertion and increased menstrual bleeding and abdominal cramps.

Complications

Increased risk of anaemia if heavy bleeding occurs, perforation (rare) and increased risk of PID and associated infertility, especially within four months of insertion and in women at risk of STDs.

DISPLACED IUCDs

- When threads not visible at cervix and pregnancy ruled out then:
 - attempt removal with a simple artery forceps. If it fails then localization by ultrasound, plain X-ray with tracer IUCD and removal
- If one conceives with IUCD remove it if possible, otherwise leave alone (ultrasound if possible) and counsel client accordingly.

9.3. Barrier Methods

THE MALE CONDOM

Offer physical barrier to sperm deposition into the vagina. Condoms also offer some protection against STIs including HIV/AIDS, HBV and carcinoma of the cervix.

Client Education

- Before every intercourse, place condom on erect penis, leaving tip empty to collect semen
- Withdraw the penis from the vagina after each ejaculation while the penis is still erect
- Remove condom after use
- Do not re-use condoms
- Discard used condom immediately in toilet or pit latrine
- Using spermicides with condoms increases the effectiveness
- Complications may include local irritation if allergic to latex/lubricants
- May interfere with sexual pleasure for some people.

Benefits

- Fairly effective if used properly
- Immediately effective
- Highly effective protection against STIs/HIV/AIDS
- May prevent premature ejaculation

Side effects: Some users experience sensitivity to rubber or lubricants.

THE FEMALE CONDOM

The female condom is a thin (0.05 mm) polyurethane sheath, 7.8 cm in diameter and 17 cm long. It is soft, loose fitting and has two flexible rings. One ring is inserted into the vagina and acts as an internal anchor. The other ring forms the open edge of the device and remains outside the vagina after insertion.

The female condom provides protection for one act of intercourse. It can be inserted (up to 8 hours) before intercourse but must be removed immediately after.

Complications

None.

SPERMICIDES

Spermicidal creams, jellies and/or foaming tablets are inserted into vagina before sexual intercourse and act by inactivating the spermatozoa and physically preventing entry into uterus. Best used with condoms.

Client Education

- Interferes with natural spontaneity of sexual act
- May cause local irritation
- May be difficult to insert by client
- Low effectiveness as a contraceptive.

Side effects: Some users experience sensitivity to spermicide.

Complications

None.

DIAPHRAGM AND CERVICAL CAP

A flexible rubber cover or cap to cover the cervix, inserted before sexual intercourse forming a physical barrier for sperm entry. Has to be used with a spermicide. It is not commonly used contraceptive due to difficulties of clients' self-insertion and its' associated high failure rate. However, it is protective against cancer of the cervix risks in the long term.

Client Education

- Diaphragm and cervical cap:
 - by a provider and refitted after marked weight change (5kg gained or lost, or after child birth)

- must be kept clean and stored properly
- must be used with spermicide
- Diaphragm, cervical, or contraceptive sponge:
 - can be inserted up to 6 hours before intercourse
 - can remain in place for 6 hours (not longer than 24 hours)
- Contraceptive sponge must be moistened with water to activate its spermicide; contraceptive sponge must never be re-used and must not be used during menstruation.

Side effects: Some users experience sensitivity to rubber or lubricants/spermicides; some diaphragm users experience increased frequency of urinary tract infection.

Complications

None.

9.4. Surgical Contraception

Many factors have contributed to improved safety of Voluntary Surgical Contraceptive in the last 20 years: These include improved anaesthetic methods, better surgical techniques, asepsis, improved training of personnel and better selection and monitoring of clients.

TUBAL LIGATION

A voluntary irreversible procedure for fallopian tubal occlusion which can be done under general or local anaesthesia by minilaparotomy and laparoscopy. It is one of the most widely used methods in Kenya.

Client Education

- IRREVERSIBLE (permanent)
- Failure **very** rare when done by trained professional
- Counselling **absolutely** necessary
- No loss of libido or vigour or health
- Return to the clinic if you experience:
 - post-operative fever, pus or pain at the surgical site
 - weakness or rapid pulse
 - vomiting or persistent abdominal pain.

Benefits

- Permanent, highly and immediately effective
- No change in sexual function
- Good for client if pregnancy would be a serious health risk

- Does not affect lactation

Side effects: Some users experience minor pain and bleeding and wound infection following procedure.

Complications

Injury to other organs (e.g. gut, bladder) and rarely death; risk of complications increased if general anaesthesia is used. Haemorrhage.

VASECTOMY

A voluntary surgical procedure done to cut and ligate the vas deferens so that spermatozoa cannot be ejaculated. Done under local anaesthesia. Now gradually becoming accepted in Kenya.

Client Education

- Counselling necessary, permanent and irreversible
- Use condom for at least 15 ejaculations
- Return to the clinic if you experience:
 - post-operative fever
 - excessive swelling, pus or pain at the surgical site.

Side effects: Some users experience minor swelling, pain, infection, and bruising following procedure.

Complications

Risk of serious complications or death extremely low.

9.5. Periodic Abstinence (Natural Family Planning)

Avoidance of sexual intercourse during ovulation and for a safety margin before and after ovulation. Various methods may be used to determine the fertile period: cervical mucus, basal body temperature, rhythm.

Benefits

- No physical side effects it is cheap
- No need for prescriptions by medical person
- Improved knowledge of reproductive system and possible closer relationship between couples.

Client Education

- Requires high motivation
- Has a high failure rate
- Assumes a regular, perfect menstrual cycle
- Requires proper record-keeping
- Has no health risks, except for pregnancy.

Side effects: None.

Complications

None.

10. GASTROINTESTINAL CONDITIONS

10.1. Amoebiasis

An infection usually of the colon caused by *Entamoeba histolytica*.

Clinical Features

Amoebic dysentery. Amoebic liver abscess. Amoebiasis and "vague" abdominal complaints. Asymptomatic cyst carrier.

Investigations

- Stool for microscopy – trophozoite with ingested RBC in amoebic dysentery
- Chest X-ray, full haemogram in amoebic liver abscess
- Stool for cysts of *Entamoeba histolytica*.

Management

- Amoebic dysentery:

- correct dehydration
- metronidazole;

Adults – 800 mg TDS for 5 days

Children – 30–50 mg/kg/day in 3 divided doses for 5 days

- Amoebic liver abscess

- metronidazole;

Adults – 1.4 gm OD for 3–5 days

Children – 30–50 mg/kg/day in 3 divided doses for 7 days

- aspiration is indicated to prevent spontaneous rupture in pointing abscesses. Consult a surgeon for drainage of pointing liver abscesses, bowel perforations (peritonitis), amoebomas and large bowel strictures

- Amoebiasis and "vague" abdominal complaints:

- where amoebiasis is common, there is a tendency to blame any abdominal complaints on amoeba. Usually these patients have cysts in stool but no

evidence of invasive disease e.g. ingested RBC in trophozoite. Exclude other causes of abdominal pain

• Asymptomatic cyst carriers:

– only treat cyst carrier if patient is a food handler. Use diloxanide furoate – metronidazole (e.g. entamizole)

Adults – 500 mg TDS for 10 days

Children – 30–50 mg/kg TDS.

Do not waste metronidazole: use it for appropriate indications

Prevention

- Provision of safe drinking water and sanitary disposal of faeces are important preventive measures
- Regular examination of food handlers and appropriate treatment when necessary.

10.2. Diarrhoeal Diseases

Diarrhoea is defined as occurrence of at least 3 loose or watery stools in a day. Commonest cause of diarrhoea: **Children:** viral; e.g. rotavirus, bacterial; e.g. shigella, cholera, salmonella spp. protozoa; e.g. amoeba, giardia, fungal/yeast; e.g. Candida. Others: Food intolerance e.g. lactose, poisoning (food, drug, chemicals).

Clinical Features – Dehydration

The major cause of death from diarrhoea is dehydration, especially in infants and young children. Management is aimed primarily at evaluation, prevention, and treatment of dehydration.

Diarrhoeal illness is classified for dehydration, dysentery and persistent diarrhoea.

Dysentery: Is the presence of fresh blood in the diarrhoeal stool.

Persistent diarrhoea: Is when diarrhoea has lasted for 14 days or more.

Assessment classification and management of diarrhoea in children below 5 yrs.

Clinical Features	No Dehydration	Some Dehydration (2 signs)	Severe Dehydration(? 2 signs)
General appearance: Young infants 1 wk –<2 months	Normal	Sunken eyes, restless; irritable, skin pinch goes back slowly	Lethargic or unconscious, very sunken eyes Skin pinch goes back very slowly
2 months–5 yrs	Normal	– Thirsty – Restless and irritable – Skin pinch goes back slowly – Eyes sunken	– Lethargic or unconscious – Very sunken eyes – Not able to drink or drinking poorly – Skin pinch goes back very slowly

Management – Rehydration Protocol

Degree of dehydration	Age	Where	Type of liquid	Volume to give	Rate
No dehydration	1 wk–2 mnths	home	ORS	50–100 mls	After every bout of diarrhoea
(Plan A see annex B)	? 2 mnths–5yrs	home	ORS	100–200 mls	After every bout of diarrhoea
Some dehydration (Plan B see annex B)	1 wk–5 yrs	Health Unit	ORS	75 ml/kg	4 hrs, then reassess.
Severe dehydration	1 wk–2 mnths	Health Unit	Ringers lactate or Hartmann's solution	100 ml/kg	– 30 ml/kg in 1 hr – 70 ml/kg in 5 hrs
(Plan C see annex B)	2 mnths–5 yrs	Health Unit	Ringers lactate or Hartmann's solution	100 ml/kg	– 30 ml/kg in 2 ½ hr – 70 ml/kg in 2½ hrs

Clinical evaluation of dehydration in older children and adults

CLINICAL FEATURES	MILD DEHYDRATION	MODERATE DEHYDRATION (?2 signs present)	SEVERE DEHYDRATION (?2 signs present)
General appearance: Older children and adults	Thirsty, alert	Thirsty, alert	Generally conscious, anxious, cold extremities, clammy, cyanosis, wrinkled skin of fingers, muscle cramps, dizzy if standing
Pulse	Normal	Rapid	Rapid, thready, sometimes absent
Respiration	Normal	Deep, sometimes rapid	Deep and rapid
Systolic BP	Normal	Normal	Low, sometimes unmeasurable
Skin elasticity	Normal: fold of pinched skin disappears at once	Decreased	Fold disappears very slowly (>2 seconds)
Eyes	Normal	Sunken	Severely sunken
Tears	Present	Absent	Absent
Mucous membranes (test mouth with a clean finger)	Moist	Dry	Very dry
Urine output	Normal	Reduced, urine dark	Anuria, empty bladder
% of body weight loss	1–5%	6–9%	10% or plus
Estimated fluid deficit	10–50 ml/kg	60–90 ml/kg	100 mls/kg

Management – Rehydration Protocol

In using the following table, bear in mind:

- The volumes indicated are guidelines only
- Rehydration must be evaluated **in terms of clinical** signs, not in terms of volume of fluids given
- If necessary, the volumes given below can be increased or else the initial high rate of administration can be maintained until there is clinical improvement
- Periorbital oedema is a sign of fluid overload in infants or hypernatraemia in those on ORS
- Maintenance therapy should begin **as soon as** signs of dehydration have resolved, **but not before**.

Rehydration Protocol for older children and adults

Degree of dehydration	Age	Type of liquid	Volume to give	Rate
Mild	All	ORS	50 ml/kg	In 4 hrs
Moderate	All	ORS	100 ml/kg	In 4 hrs
Severe	Older children and adults	Hartmann's solution, Ringer's lactate	110 ml/kg	In 4 hrs: at first as rapidly as possible until a radial pulse is palpable

NOTES: (a) Initially, adults can usually ingest up to 750 ml of ORS/hour, and older children 300 ml/hour. (b) If Ringer's Lactate or Hartmann's solution are not available, use:

- half-strength Darrow's solution
- normal saline with sodium bicarbonate and potassium chloride added
- normal saline diluted to half-strength with 5 % glucose (Dextrose)

NB None of these solution is as effective as Ringers Lactate or Hartmann's solution.

Management – Fluid Maintenance Therapy

- Fluid to be given after correction of dehydration
- Adapt re-dehydration treatment to the clinical status of the patient
- To avoid hypernatraemia alternate ORS with plain water or breastmilk in breastfeeding children.

(see the fluid maintenance therapy table on the next page)

Maintain nutrition

It has been shown that there is no physiological reason for discontinuing food during bouts of diarrhoea and that continued nutrition is beneficial to both adults and children. Continued feeding should be encouraged (see advice to mother on page 104).

Management – Pharmacologic

- that 50–60 % of acute gastroenteritis is viral
- Other anti-diarrhoea drugs (e.g. absorbents) and antiemetics are **contra-indicated** in children

- Always treat the fever and consider other diseases associated with diarrhoea (e.g. malaria, otitis media, pneumonia)
- Antimicrobial drugs should be used for children only as follows:
 - antibiotics **only** for dysentery and suspected cholera with severe dehydration
 - antiprotozoal drugs (e.g. metronidazole) for suspected amoebiasis **only** after antibiotic treatment of bloody diarrhoea has failed or faeces shows trophozoites of *E. histolytica*
 - antiparasitic drugs for giardiasis when diarrhoea has lasted over 14 days **and** cysts or trophozoites of giardia are seen in faeces
- Antibiotics for specific intestinal infections are listed in the table on page 104.

Most acute diarrhoea in children is viral AND does NOT require antibiotics

Fluid Maintenance Therapy (see also Plan A on page 100 for children under 5 years)

Severity of diarrhoea	Fluid	Administration	Quantity
Mild (no more than 1 stool every 2 hrs, or less than 5 ml/kg of stools per hour)	ORS	At home	Under 5 yrs (a): <ul style="list-style-type: none"> • 100 ml/kg/day until diarrhoea ceases <p>OR</p> <ul style="list-style-type: none"> • 10 ml/kg after each loose stool <p>Older children, adults:</p> <ul style="list-style-type: none"> • as much as desired (b)
Severe (more than 1 stool every 2 hrs, or more than 5 ml/kg of stools per hour)	ORS	At the health facility	Replace the same volume that is lost through continuing diarrhoea. If stool volumes cannot be measured, give 10–20 ml/kg per hour until diarrhoea diminishes, then treat as above for mild diarrhoea
Severe with reappearance of signs of dehydration	IV fluid	Health facility	Treat as for severe dehydration

NOTES: (a) As well as ORS give breastmilk on demand. Other liquids such as plain water, rice water, *uji*, mala etc can also be given. ORS should constitute about two thirds of the fluid intake until diarrhoea ceases, (b) Thirst is the best guide for maintenance fluid therapy in older children and adults. They should drink as much ORS (and other liquids) as they desire.

Antibiotics used in the treatment of diarrhoea

AETIOLOGY Clinical Features	MANAGEMENT
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<p>Cholera: very profuse watery diarrhoea (rice–water stools), often vomiting</p>	<p>Tetracycline</p> <ul style="list-style-type: none"> • Adults: 500 mg QDS × 2–3 days <p>OR</p> <p>Erythromycin</p> <ul style="list-style-type: none"> • Adults: 250 mg QDS × 3 days • Children: 30 mg/kg/day in QDS × 3 days. <p>2nd line</p> <p>Chloramphenicol syrup</p> <ul style="list-style-type: none"> • 50–100 mg/kg/day QDS
<p>Shigella dysentery: blood & mucus in stools, cramps, tenesmus, fever</p>	<p>Children:</p> <p>Nalidixic acid: 1st line</p> <p>15 mg/kg/day in QDS × 5 days. 2nd line according to stool c/s. If c/s is not possible and no improvement after 2 days of 1st line treatment, give metronidazole</p> <p>Adults:</p> <p>Cotrimoxazole</p> <ul style="list-style-type: none"> • 800 mg of SMX BD × 5 days <p>Amoxycillin</p> <ul style="list-style-type: none"> • 500 mg QDS × 5 days
<p>Intestinal amoebiasis</p> <p>(acute amoebic, dysentery): as with shigella, but usually no fever (except amoebic liver abscess)</p>	<p>Metronidazole</p> <ul style="list-style-type: none"> • Adults: 800 mg TDS × 5–10 days • Children: 30 mg/kg/day in 3 doses × 5 days
<p>Acute giardiasis:</p> <p>prolonged diarrhoea, often marked eructation (belching), flatulence</p>	<p>Metronidazole</p> <ul style="list-style-type: none"> • Adults: 800 mg TDS × 5–10 days • Children: 15 mg/kg/day in 3 doses × 5 days

Advice to Mothers

- Give the child more fluids than usual to prevent dehydration:
 - use ORS, food–based fluids (e.g. soup, rice water, *madafu, mala*, plain water, enriched *uji*). If still breastfeeding, allow it more and for longer
 - give as much of these fluids as child will take
 - continue fluids until diarrhoea stops
- Give the child plenty of food to prevent malnutrition:

- continue to breast–feed frequently or give usual milk (if not breast–fed)
- encourage eating and offer food at least 6 times a day or one extra meal per day. Give an extra meal per day for 2 wks after recovery.
- give cereal or starchy food mixed with some vegetable or protein foods
- give fresh fruit or mashed bananas to provide potassium

• Return to health worker if no improvement in 3 days or if the patient develops the following: many watery stools, very poor drinking, repeated vomiting, fever, marked thirst and blood in stool. Also if the caregiver is not happy with the condition.

Prevention

Health education directed at mothers in dispensaries, MCH clinics and feeding centres, at the time ORS is prescribed. Take–home messages:

- Breastfeeding exclusively up to age 6 months and continue with other foods up to age 2 years
- Solid foods ("complementary foods") should be introduced from about age 6 months
- Proper sanitation: Provision of safe drinking water in sufficient quantities and disposal of faeces.
- Hygiene during food preparation. Remember the 4Cs; Clean hands, Clean food, Clean utensils, Clean storage.

Feeding recommendation for a child with persistent diarrhoea.

- If still breastfeeding, give more frequent, longer breastfeeds, day and night.
- If taking other milk: **replace** with increased breastfeeding OR with fermented milk products such as Mala or other yoghurt drinks as these are tolerated better, OR half the milk with nutrients–rich semisolid foods such as fermented porridge, thick enriched porridge or enriched staple food.
- For other foods, follow feeding recommendations for the child's age.
- Encourage the child to feed
- Give an extra meal per day and continue until one month after diarrhoea has stopped.
- Vitamin supplements can be given where appropriate if available.

10.3. Gastritis

An acute ulceration of the stomach, usually multiple, non–recurrent and self–limiting. Aetiology: Drugs (NSAIDs), alcohol, acute stress associated with massive burns, head injuries

Clinical Features

Epigastric pain with or without vomiting. May follow ingestion of drugs and herbal preparations. Heartburn may be a feature. Examination reveals tenderness in the epigastrium and the regions around it.

Investigations

Not always necessary if cause is obvious. Otherwise Barium meal and endoscopy if **chronicity** sets in.

Management

- Treat the primary disease e.g. head injury, Renal failure
- Avoid drugs known to cause **ulceration**
- Magnesium trisilicate tabs 2–4 QDS or frequently **OR** mist antacids 30 ml 1 hr and 3 hrs after meals. Adjust dose according to pain
- Role of triple therapy – (see **10.5. peptic ulcer disease**).

10.4. Gastro–Oesophageal Reflux Disease (GORD)

Symptoms and pathology occur when the oesophageal mucosa has excessive contact with gastric contents as a consequence of continual failure of anti–reflux mechanism.

Clinical Features

- Heartburn is the characteristic symptom of GORD, with or without regurgitation of gastric contents into the mouth
- Pain on swallowing hot drinks or alcohol
- Oesophagitis causes bleeding which can be massive
- Peptic stricture causes gradually progressive dysphagia
- Aspiration of gastric contents resulting in pneumonia
- Oesophageal ulcers cause same type of pain as gastric or duodenal ulcer

Diagnosis

- Detailed history points to the diagnosis
- Barium swallow – will show oesophagitis, ulcers or stricture
- Oesophagoscopy – with oesophageal washing, or biopsy confirms the diagnosis.

Management

Uncomplicated GORD

- Elevate head of bed 6 inches
- Avoidance of strong stimulants of acid production (e.g. coffee, alcohol, fatty foods, smoking)
- Antacids 30 mls one hour after meals and at bed time
- H₂ receptors antagonists (see peptic ulcer)
- Cholinergic agonists (e.g. metoclopramide 10 mg PO 30 minutes before meals and at bed time)

Refer If

- Symptoms persist despite treatment.

10.5. Peptic Ulcer Disease

Ulceration of gastroduodenal mucosa that has tendency to be chronic and recurrent.

Clinical Features

Duodenal Ulcer

- Epigastric pain, typically at night and when hungry
- May present for the first time with complications [see **later in this section**]
- Wide individual variation in symptoms and food that give pain
- 95% of duodenal ulcers are caused by *Helicobacter pylori* (H. pylori).

Gastric Ulcer

- Epigastric pain, worse with food
- Other features as in duodenal ulcer above.

Investigations

- Stool for occult blood
- Barium meal
- Upper GIT endoscopy, where available and biopsy gastric mucosa for H. *pylori*.

Management

- Avoid any foods that, to the patient's experience, give pain
- Avoid obviously acidic foods e.g. Cola drinks
- Limit alcohol intake and smoking
- Bed rest in acute attacks
- Avoid gastric irritating drugs (NSAIDs)
- Give Magnesium based antacids or combined Magnesium–aluminium compounds, liquid preferred. Adjust dose to limit pain. If no response; give cimetidine:

Adults – 800 mg nocte for 4–6 weeks then 400 mg PRN

Children – 20–10 mg/kg BD for 4–6 weeks.

- *H. pylori* eradication by triple therapy:

Regime I:

- omeprazole 20 mg BD 14 days
- clarithromycin 500 mg BD 14 days

- amoxicillin 1 gm BDS 14 days.

Regime II:

- omeprazole 20 mg BD 14
- days amoxicillin 1 gm BD 14 days
- metronidazole 400 mg TDS 14 days

Refer If

- There is suspicion of malignancy
- Poor response to management outlined above.
- Any of the complications are present: Inform Surgeon (if available).

Admit For

- All of the above
- Indications for surgery in peptic ulcer disease:
 - intractable haemorrhage more than 5 units of blood in 24 hrs
 - recurrent bleeding after non surgical management during same hospitalisation
 - perforation
 - penetration to the pancreas
 - intractable ulcer pain
 - suspicion of malignancy especially in gastric ulcers.
 - Gastric outlet obstruction.

Complications

Haematemesis. Obstruction. Perforation. Penetration to the pancreas. Malignancy.

10.6. Upper Git Bleeding

Bleeding from the GIT above the ligament of Treitz.

Aetiology

- Oesophageal varices
- Gastritis and gastric ulcers
- Duodenal ulcers
- A–V malformation

- Malignancies – stomach and oesophagus
- Mallory –Weiss syndrome
- Polyps.

Clinical Features

Vomiting of fresh bright blood or coffee-ground vomitus (haematemesis). Forceful vomiting followed by haematemesis suggests gastroesophageal junction tear. Excessive alcohol intake or ingestion of anti-inflammatory drugs may suggest erosive gastritis, previous epigastric pain suggests peptic ulcer. In massive haemorrhage, blood may appear per rectum.

Investigations

- Hb, platelet count
- Investigate as per cause, if obvious e.g. liver function test in liver disease
- Barium Swallow/Meal after patient is stable
- Endoscopy if available.

Management

- Set up large IV line, start infusion of N/saline
- Group and cross-match at least 3 units of blood.
- Nasogastric suction to assess blood loss
- Infuse fluids to maintain normal pulse, blood pressure, urine output and substitute with whole blood as soon as possible
- Assess any further loss of blood as evidenced by: Persistent tachycardia, postural hypotension, continuing haematemesis.

Admit

- All patients with haematemesis.

Refer If

- Intractable bleeding. More than 5 units of blood in 24 hours, refer to surgeon.

10.7. Lower Gut Bleeding

This may be frank bleeding (haematochezia) or occult bleeding depending on the cause. Common causes are:

- Haemorrhoids
- Anal fistula and fissures
- Tumours:

- benign: polyps, leiomyoma, fibromas
- malignant

- Infections

- bacterial: shigella, campylobacter, salmonella
- protozoa: amoebiasis
- parasite: schistosomiasis

- Trauma

- Angiodysplasia

- Inflammatory bowel disease (Crohn's disease and ulcerative colitis)

- Diverticular disease

- Bleeding disorders.

Investigations

- Haemogram and ESR
- Stool for microscopy, C&S
- Double contrast barium enema
- Proctoscopy, sigmoidoscopy, colonoscopy and biopsy
- Coagulation screen, where available.

Management

- Group and cross match if necessary
- Treat the cause
- Refer suspicious rectal bleeding.

No physical examination is complete without a rectal examination
--

10.8. Worms

Clinical Features and Investigations

WORMS	CLINICAL FEATURES	INVESTIGATIONS
Ascaris Lumbricoides (round worms): Large round, cream coloured worms which live in the small intestines	<ul style="list-style-type: none"> • Infection by swallowed embryonated eggs • Loeffler's syndrome • Mild bouts of recurrent colic 	<ul style="list-style-type: none"> • Stool for ova

	<ul style="list-style-type: none"> • The mother has seen the worm in stool or vomits • Complications such as obstruction, vomiting may occur 	
Hookworms	<ul style="list-style-type: none"> • "Ground itch" • Features of anaemia (iron deficiency) 	<ul style="list-style-type: none"> • Stool for ova • Haemogram
Trichuris Trichiura (whip worms)	<ul style="list-style-type: none"> • Diarrhoea with blood • Rectal prolapse • Anaemia • Wasting 	<ul style="list-style-type: none"> • Stool for ova • Worms may be seen adhering to rectal mucosa
Strongyloides Stercoralis	<p>Most infections are asymptomatic but the following may occur:</p> <ul style="list-style-type: none"> • larva currens (buttocks) • Soiling of innerwear with stool • hyperinfection syndrome • diarrhoea • Gram negative septicaemia • bacterial peritonitis • encephalitis 	<ul style="list-style-type: none"> • Direct stool microscopy (Motile larvae, adult worms)
<p>Enterobius Vermicularis oxyuriasis (pin worm)</p> <p>Synonyms:</p> <p>Threadworm, pinworm, seatworm.</p> <p>The worm is 4 mm long and is just visible to the human eye</p>	<p>Mode of Spread</p> <p>Auto-infection:</p> <ul style="list-style-type: none"> • Direct anal to mouth transfer through the fingernail • Retro-infection; eggs may hatch into larvae at the anal-rectal area. Then larvae move retrogradely to the caecum. <p>Cross infection:</p> <ul style="list-style-type: none"> • Contamination of fingers with objects, clothing, toilet seats, etc. • By inhaling and swallowing eggs in the dust <p>Main presentation: perianal and perineal itching. Migrating larvae may cause:</p>	<ul style="list-style-type: none"> • Stool for ova • Ova can be obtained from the perianal region by use of adhesive tape.

	<ul style="list-style-type: none"> • Vaginitis, vulvitis, salpingitis and peritonitis • Irritation, Insomnia may occur 	
Taenia Saginata (beef tapeworm)	<ul style="list-style-type: none"> • Non-specific symptoms, irritability • Segment may be passed with stools • Egg in stools 	<ul style="list-style-type: none"> • Stool for ova (motile proglottides)

Management

WORMS	ADULTS	CHILDREN
Ascaris Lumbricoides (round worms)	Levamisole 2.5 mg/kg as a single dose OR Mebendazole 100 mg BD × 3 days OR Albendazole 400 mg STAT	Levamisole 2.5 mg/kg as a single dose OR Mebendazole 100 mg BD × 3 days OR Albendazole 200 mg STAT for children under 2 yrs
Hookworms	Levamisole 2.5 mg/kg as a single dose OR Mebendazole 100 mg BD × 3 days OR Albendazole 400 mg STAT	Levamisole 2.5 mg/kg as a single dose OR Mebendazole 100 mg BD × 3 days Albendazole 200 mg STAT for children under 2 yrs + ferrous sulphate
Trichuris Trichiura (whip worms)	Mebendazole 100 mg BD × 3 days Albendazole 400 mg STAT	Mebendazole 100 mg BD × 3 days Albendazole 200 mg STAT for children under 2 yrs
Strongyloides Stercoralis	Albendazole 400 mg BD × 3 days OR Thiabendazole 25 mg/kg × 3 days	Albendazole 200 mg BD × 3 days OR Thiabendazole 25 mg/kg × 3 days
Enterobius Vermicularis (pin worms)	Mebendazole 100 mg BD × 3 days Levamisole 2.5 mg/kg as a single dose REPEAT AFTER 10 days	Mebendazole 100 mg BD × 3 days Levamisole 2.5 mg/kg as a single dose REPEAT AFTER 10 days
Taenia Saginata (beef tapeworms)	Niclosamide 2 gm; 1 gm before breakfast, 1 gm 1 hr after breakfast	>6 yrs 1 gm before & 1 gm after breakfast 2 – 6 yrs 500mgs before & 500mgs after breakfast < 2 yrs 250mgs before & 250mgs after breakfast

HOOK WORM – Anaemia develops if iron intake is slow and infection is significant If patient fails to respond to therapy consider other cause e.g. blood loss, poor compliance.

Deworm children above 2 years at least every 6 months – with mebendazole 500 mg STAT.

Prevention

Appropriate prevention depends on the particular worm. In general:

- Safe water provision

- Hand washing and trimming of fingernails
- Frequent changing of innerwear and sheets
- Use of latrines.

11. IMMUNIZATION

The basic principle of immunization is to administer into a healthy person a vaccine that will prevent that person from getting a certain disease.

Vaccines may be of: Live attenuated (e.g. Rubella, OPV, Measles and BCG), inactivated or killed (e.g. Hib, IPV) micro-organisms and detoxified toxins (e.g. Tetanus).

Generally, several vaccines can be given at the same time. This is important since you do not know when you will see the child again. BCG, OPV, DPT–HeB–Hib and Measles vaccines can be given simultaneously if the child is of the appropriate age and has not received the early immunizations. A critically ill child needing hospital admission must be given the appropriate vaccines upon recovery.

Remember:

- That a slight fever and/or other minor illness should not prevent you from immunizing a child
- To inform mothers/child–caretakers about possible side effects of each of the given vaccines
- To record all vaccinations on tally sheets and on the Child–Health immunization cards and instruct the mothers always to bring the cards along with them when taking children to a health facility
- To instruct mothers to return the child for the next immunization date as indicated on the card
- That vaccines are easily destroyed by heat and rendered ineffective
- To handle the disposal of used sharp syringes appropriately
- To ensure appropriate cold storage of the vaccines and follow the recommended cold–chain instructions for each of the vaccines carefully.

ADVICE TO MOTHERS

Facts about the common vaccine–preventable diseases

Whooping cough (Pertussis): A communicable disease. Spread by droplets. Symptoms include severe cough followed by a whoop and vomiting, leads to malnutrition, can cause death, severe under 1 year old.

Diphtheria: An infectious disease. Spread by droplets. Symptoms include difficulty in breathing, swallowing, enlarged neck. Very severe when it occurs.

Tetanus: [see tetanus] A clinical syndrome involving primarily the central nervous system and resulting from the tetanus toxins. Enters through open wounds, cuts and umbilical stump. Symptoms include stiffness, locked jaw, inability to suckle and muscle spasms. Has a very high mortality (>50%). Immunizing pregnant mothers ensures protection of her new born baby.

Measles (Rubeola): [see measles] Killer disease. Highly infectious. Symptoms include rash, fever, cough, red eyes; is associated with blindness, malnutrition, deafness, pneumonia and death.

Poliomyelitis (Infantile Paralysis): [see poliomyelitis] An acute communicable disease. Spread by droplets and oro–faecal contamination. Symptoms include pain and flaccid paralysis in limbs, fever, vomiting; can lead to permanent deformity and can cause death.

Tuberculosis: [see tuberculosis] A communicable disease. Spread by droplet. Symptoms include fever, wasting, deep chesty cough, night sweats. May have lymphadenopathy. Leads to lowered resistance to other diseases and may be fatal.

Hepatitis B: is a highly infectious disease. Transmitted mainly by parenteral route, also from person to person by close contact through exchange of body fluids such as saliva, secretions from open wounds, blood, vaginal secretions and semen. Transmission between children is common, since they are often more infectious than adults. Transmission from carrier mothers can occur in up to 80% of babies during the perinatal period, the risk being higher in HBsAg. positive mothers. Infection may be transmitted either vertically (transplacentally from mother to unborn baby) or horizontally by close contact. Complications of HBV infection include: acute hepatitis, chronic hepatitis, liver cirrhosis, vascular disease, glomerulonephritis, and primary hepatocellular carcinoma. **Haemophilus Influenzae b:** is a bacteria recognised as one of the commonest agents causing pneumonia and meningitis in children (see **21.9. pneumonia, 12.4. meningitis**)

New Vaccines

The following new vaccines are now recommended to be adopted for universal childhood immunization programmes in developing countries where appropriate.

- Recombinant DNA Hepatitis B vaccine (HepB)
- Haemophilus influenzae type b conjugate vaccine (Hib)
- Yellow Fever viral vaccine (for routine use only; not for outbreak control).

CHILDHOOD IMMUNIZATION SCHEDULE IN KENYA

Vaccine	Age	Remarks
BCG POLIO (OPV 0)	At birth Birth Dose	Or at first contact with child
DPT ₁ –HeB ₁ –Hib ₁ DOSE POLIO (OPV 1)	6 weeks (1 ½ months)	Or at first contact with child after that age
DPT ₂ –HeB ₂ –Hib ₂ DOSE POLIO (OPV 2)	10 weeks (2 ½ months)	4 weeks after DPT 1 and OPV 1 can also be given anytime after this period, when in contact with the child.
DPT ₃ –HeB ₃ –Hib ₃ DOSE POLIO (OPV 3)	14 weeks (3 ½ months)	4 weeks after DPT 2 and OPV 2 can also be given any time after this period, when in contact with the child.
Measles	9 months	May be given between 6 and 9 months if child is admitted to hospital for any other illness. Repeat at 9 months as per KEPI schedule.

IMMUNIZATION SCHEDULE FOR PREGNANT MOTHERS (TT2+)

Tetanus Toxoid (TT)	Pregnant women	1 st dose with first pregnancy or subsequent pregnancy
		2 nd dose – 4 wks after first dose
		3 rd dose – 6 months after 2 nd dose
		4 th dose – at least 1 year after the third dose
		5 th dose – at least 1 year after the fourth dose

Immunizing a pregnant mother ensures protection of her newborn baby.

VITAMIN A SUPPLEMENTATION SCHEDULE

Dosage (in IU)	When to give
<6 months – 50,000 6–12 months– 100,000 >12 months–200,000	First dose at 9 months then every 6 months (twice per year) up to the age of 60 months.

VACCINE DOSAGE AND ROUTE OF ADMINISTRATION

VACCINE DOSE (* = Live vaccines)	ROUTE OF ADMINISTRATION
BCG* Child under 1 year, 0.05 ml. Child over 1 year, full dose, 0.1 ml	Intra-dermally into upper outer part of left forearm, at the junction of the upper and middle thirds. If given correctly a small wheal appears at the site of the injection. Inform the mother that a small sore will appear in 2–6 weeks. Let this heal by itself. It will leave a small scar. If no reaction develops, the vaccination should be repeated after 3 months.
POLIO (OPV)* 2 drops by mouth. Follow manufacturers instructions on dosage	Read the instructions on the bottle. Give vaccine by mouth. Use dropper provided. If child spits or vomits repeat the dose.
Pentavalent vaccine consisting of DPT–HeB–Hib 0.5 ml	Intramuscularly in the upper outer part of the thigh.
HB 0.5 ml – child 1.0 ml – adult	Intramuscularly in the upper outer part of the thigh for child and deltoid (left) for adult
Measles* 0.5 ml	Subcutaneously or intramuscularly in upper outer part of the arm (deltoid muscle)
Tetanus Toxoid (TT) 0.5 ml.	Intramuscularly in the outer part of the upper-arm (deltoid muscle)

Notes: Hands should be washed before and after handling vaccines. All the vaccines and diluents must be kept cold. DPT, HB, and TT vaccines are damaged if kept below 0°C and therefore should never be frozen. Always check Vaccine Vial Monitor (VVM).

Contra-indications. A definite severe reaction to a preceding vaccine dose is a contraindication to further doses.

Live vaccines should not be given to individuals with impaired immune response e.g. leukaemia, HIV/AIDS.

The intramuscular route should not be used in patients with bleeding disorders such as haemophilia or thrombocytopenia.

HIV/AIDS INFECTION AND IMMUNIZATION

Asymptomatic children infected with HIV should receive all standard Kenya Expanded Programme on Immunization (KEPI) vaccines. Non-immunized children with symptomatic HIV infection should receive all standard vaccines except BCG.

Side-effects and adverse reactions to vaccinations

Range from mild to severe for various vaccines.

BCG Vaccine

These include injection abscess, regional or wide–spread lymphadenitis, osteomyelitis and disseminated BCG infection. These should be treated with anti–tuberculosis drugs [see 12.8. TB]

Oral Polio Vaccine

Adverse reactions rarely occur.

Measles Vaccine

Adverse reactions include fever, mild rash and rarely convulsions, encephalitis and sub–acute sclerosing pan–encephalitis (SSPE).

DPT (Diphtheria, Pertussis, Tetanus)

Most adverse reactions are attributed to the pertussis component. Minor reactions include, pain at the site of injection and fever. Major reactions are persistent crying, high pitched cry, excessive somnolence, convulsions, encephalopathy and coma.

Recombinant DNA Hepatitis B Vaccine

Side effects include pain, fever and swelling at the site of injection.

12. INFECTIONS (SELECTED) & RELATED CONDITIONS

12.1. Bacterial Infections

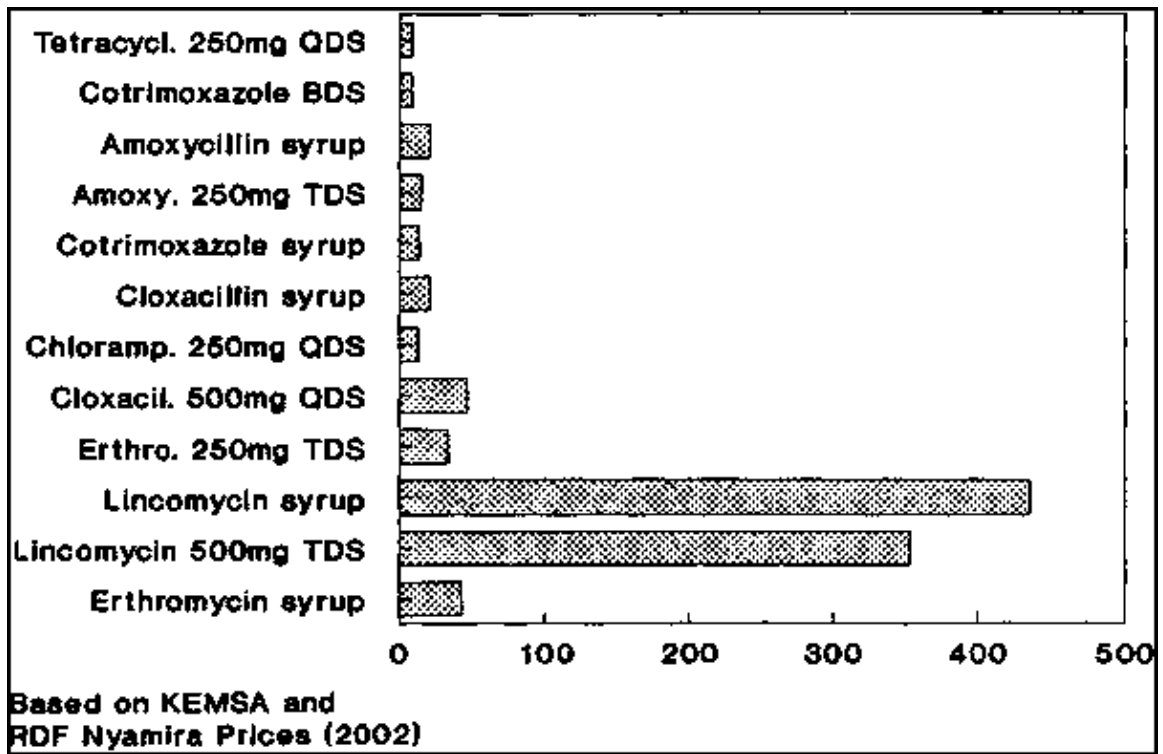
Bacterial infections are a leading cause of morbidity and mortality. Accurate diagnosis and appropriate, cost–effective treatment are essential. Individual infections are discussed in their respective sections. The following section summarizes the drugs of choice for common bacterial infections.

The charts which follow provide comparison of the treatment cost for common antibacterial drugs.

Penicillin Refers to narrow spectrum penicillin such as benzylpenicillin, procaine penicillin and phenoxymethylpenicillin. Benzylpenicillin is used in moderate to severe infections where high blood levels are required and because of its short half–life is given 4–6 hrly. Procaine penicillin is given by intramuscular route and is used in uncomplicated pneumonia and in treatment of gonorrhoea.

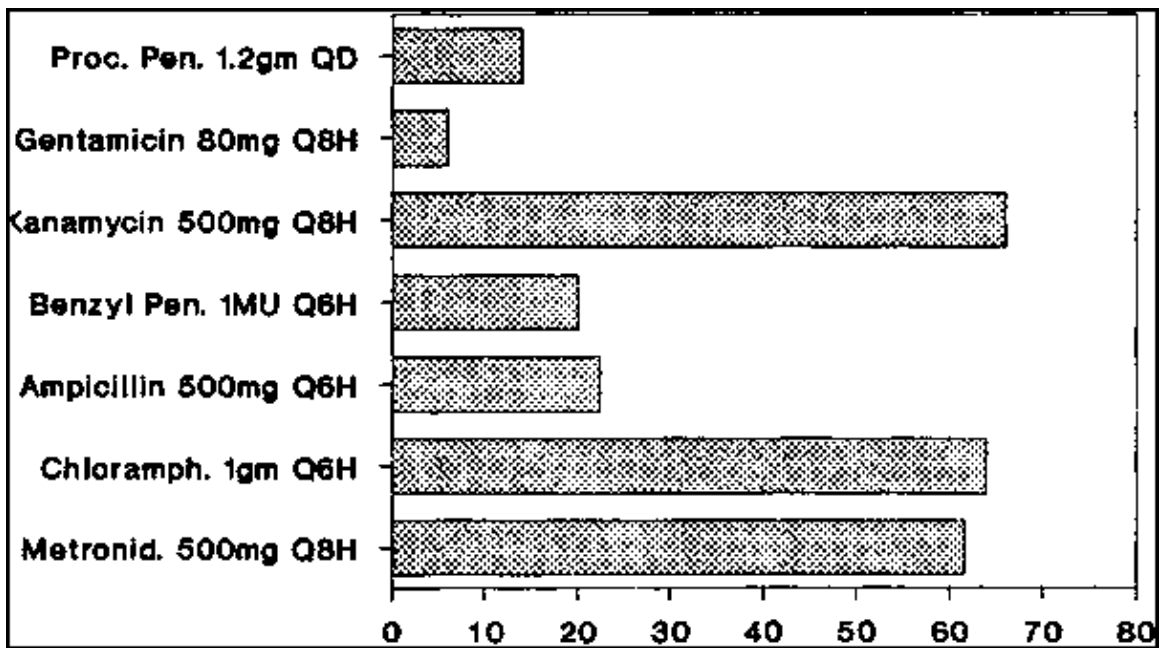
Gentamicin Dose should be adjusted according to renal function.

Chloramphenicol Oral absorption is excellent and peak plasma levels are reached at the same time whether given intravenously or orally. Fatal toxicities include aplastic anaemia.



Cost of Some Oral Antibiotics 5-Day Course (KShs.)

Based on KEMSA and RDF Nyamira Prices (2002)



Daily Cost of Some Injectable Antibacterials (KShs.)

Based on KEMSA and RDF Nyamira Prices (2002)

12.2. Malaria

Malaria parasites are usually transmitted by the bite of an infected female anopheles mosquito. *Plasmodium falciparum* is the commonest in Kenya and is associated with significant morbidity and mortality. The other species are: *P. malariae*, *P. vivax*, *P. ovale*.

Clinical Features

SIMPLE (uncomplicated) MALARIA

- Classically malaria presents with paroxysms of fever, chills, rigors and sweating
- Other features include: Malaise, headache, myalgia, joint pains, refusal to feed, nausea, vomiting, abdominal discomfort and diarrhoea.

SEVERE and COMPLICATED MALARIA

A combination of most of the above plus either one or more of the following:

- Parasitaemia >5%
- Anaemia Hb <5 gm %
- Cerebral malaria manifesting as confusion, stupor, convulsions or coma
- Jaundice
- Hyperpyrexia, temperature >39 degrees C
- Hypoglycaemia (blood sugar <2.2 mmol/L)
- Pulmonary oedema
- Disseminated Intravascular Coagulopathy – DIC (spontaneous bleeding)
- Malaria haemoglobinuria (Coca cola coloured urine)
- Oliguria
- Hypovolaemic shock
- Fluid electrolyte imbalance.

Investigations

OPD cases:

- Thick blood smear for malaria parasites – MPs (several slides may need to be done)

In-patient cases:

- Thin blood smear for parasite count, species identification and RBC morphology:
 - haemoglobin
 - Platelet count
 - blood sugar
 - serum bilirubin
 - urea and electrolytes, creatinine
 - urinalysis

NB: A negative slide does not necessarily rule out malaria. Where cerebral malaria is suspected appropriate

therapy must be instituted promptly.

EXCLUDE OTHER DISEASES e.g. MENINGITIS WHICH MAY PRESENT WITH SIMILAR FEATURES. DO NOT ASSUME A POSITIVE SLIDE EXPLAINS THE CAUSE OF A FEBRILE ILLNESS. 20–30% OF NORMAL POPULATION IN IGH ENDEMIC PARTS OF KENYA WILL HAVE POSITIVE SLIDE FOR MALARIA PARASITES WITHOUT SYMPTOMS AND SIGNS OF MALARIA.

Management

SIMPLE (UNCOMPLICATED) MALARIA

These are treated as outpatients.

The current recommended treatment of patients with uncomplicated malaria is a combination of a sulfa component and pyrimethamine (SP) and paracetamol.

Examples of SP are sulphadoxine pyrimethamine(500 mg/25 mg tablets) and sulfalene –pyrimethamine (500mg/25mg tablets)

SP is given as a single dose: Children;

DOSAGE OF SULFAMETHOPYRAZINE (SULFALENE 500 mg) + PYRIMETHAMINE (25 mg) AND PARACETAMOL FOR ALL AGE GROUPS.

Age Group	Weight Range (Kg)	Total SP as single dose		PARACETAMOL TABLETS
		Drops	Tablets	(Maximum of 4 doses in 24 hours)
<6 months	<7	12	¼	¼
6 mns – 11 mns	7–9	20	½	¼
1 – 3 years	10–14	30	¾	½
4–5 years	15–18	45	1	½
6–12 years	19–37	–	1½	1
Age Group	Weight Range (Kg)	Total SP as single dose		PARACETAMOL TABLETS
		Drops	Tablets	(Maximum of 4 doses in 24 hours)
13–15 years	38 –49	–	2	1½
16+ years	50–70	–	2	2
	70+	–	3	2
Dose/Kg		25 mg/Kg of SULFA component		15 mg/Kg for PARACETAMOL

- Patients in whom sulfa based drugs are contraindicated and those who fail to respond to SP treatment should receive alternative antimalarials like **amodiaquin** (AQ), **OR** oral **quinine** **OR** AQ/Artemisin **OR** any recommended combination therapy (CT).
- SP has no antipyretic effect. Administer paracetamol concurrently to reduce fever
- Avoid concurrent use of sulfa–based antibiotics e.g. cotrimoxazole in a patient on SP. Use alternative antibiotic(s)
- SP is not recommended in individuals with a history of sulphonamide hypersensitivity

- SP should not be repeated within 14 days of use in the same patient
- SP should not be given concurrently with folk acid.

ORAL TREATMENT OF MALARIA WITH AMODIAQUINE DOSE FOR 200 MG BASE TABLET FOR ALL AGE GROUPS

Age Group	Weight range (Kg)	Number of tablets (200 mg base)			
		Day 1	Day 2	Day 3	Total tablets
< 6 months	<7	¼	¼	¼	¾
6–11 months	7–9	½	½	¼	1¼
1–3 yrs	10–14	¾	¾	½	2
4–5 yrs	15– 18	1	1	½	2½
6–12 yrs	19–37	1	1½	¾	3¾
13–15 yrs	38–49	2½	2½	1¼	6¼
16 +	50 +	3	3	1½	7½
Dose/Kg 25–30 mg/Kg over 3 days		10 mg/Kg	10 mg/Kg	5 mg/Kg	

ORAL TREATMENT OF MALARIA WITH AMODIAQUINE DOSE FOR 50 MG/ML SYRUP FOR CHILDREN

Age Group	Weight range (Kg)	Volume of Syrup (50 mg/ml)			
		Day 1	Day 2	Day 3	Total mls
< 6 months	<7	7.5	7.5	5	20
6–11 months	7–9	10	10	5	25
1–3 yrs	10– 14	15	15	7.5	37.5
4–5 yrs	15–18	20	20	10	50
Dose/Kg 25–30 over 3 days		mg/Kg	10 mg/Kg	10 mg/Kg	5 mg/Kg

COMPLICATED MALARIA

Prompt diagnosis and management of the specific complication is vital.

- ADMIT PATIENT. Use IM quinine for pre-referral treatment

Management – – General

- Reduce temperature if hyperpyrexia is present – do tepid sponging
- Maintain fluid and electrolyte balance especially if there has been significant fluid loss
- Monitor output. Output should be at least 30 ml per hour. If hydration is inadequate and oliguria persists give frusemide 40–80 mg IV STAT
- **Convulsions:** Use diazepam 0.3 mg/Kg IV/IM **OR** Rectal 0.5 mg/Kg **OR** Paraldehyde 0.2 mls/Kg IM
- **Hypoglycaemia:** Monitor blood glucose regularly. Large doses of dextrose may be required” 25% 2mls/Kg or 50% 1 ml per Kg.

- **Anaemia:** Monitor Hb regularly. Transfuse if Hb is less than 5 gm% AND patient develops cardiorespiratory distress (grunting, nasal flaring, chest indrawing, heart failure)

- Check blood slide for malaria parasites daily to confirm if parasitaemia is falling.

Management – Specific

TREATMENT OF SEVERE AND COMPLICATED MALARIA IN CHILDREN IN THE IN-PATIENT SETTING

Treatment after evaluation/investigation:

Put up IV quinine drip (15 mg/Kg body weight loading dose in 100–250 mls of 5% dextrose) to run over 4 hours. Fluid intake should be calculated according to weight (minimum 10mls/Kg) and hydration status.

- 12 hours after commencing the initial dose, give 10 mg/Kg.
- Repeat 10 mg/Kg 12 hourly until the patient can take medication orally.

SP single dose can be given or quinine should be continued orally at 10mg/Kg TDS to complete a total of 7 days of quinine.

NB: Use quinine IM if IV drip cannot be monitored/maintained or fail to get IV access.

MONITOR BLOOD GLUCOSE DURING QUININE INFUSION

NB:

(I) Quinine dihydrochloride may be given IM in emergencies as shown in the table below.

DOSAGE OF INTRA-MUSCULAR INJECTION OF QUININE DIHYDROCHLORIDE

After Dilution to 50mg/ml (see notes below).

	Weight range (Kgs)	Volume of quinine injection(ml)	No. of injection sites
CHILDREN	< 5	1.0	1
(UPTO 30 Kg)	5 – < 8	1.5	1
	8 – < 11	2.0	1
	11 – < 13	2.5	1
	13 – < 16	3.0	1
	16 – < 19	3.5	2 inject
	19 – < 21	4.0	2 half
	21 – < 23	4.5	2 to each
	23 – < 26	5.0	2 thigh
	26 – < 29	5.5	2
	29 – 30	6.0	2

TREATMENT OF SEVERE MALARIA IN ADULTS

The management of adults with severe malaria must be appropriate to each complication that develops. Quinine is not contraindicated in pregnancy. Fluid and antimalarial drugs are given as for children. IV quinine should be given as follows:

1. first dose 20 mg/Kg in ½ litre of fluid in 5% dextrose given over 4 hours (max 1,200 mg).
2. then give 10 mg/Kg in ½ litre of fluid over 4 hours (max 600mg) 8 hours after commencing the initial dose
3. repeat 10 mg/Kg 8 hourly until the patient can take orally.
4. change to oral SP single dose or oral quinine to complete 7 days therapy.

Assessment of fluid should be monitored regularly including urine output.

Monitoring Response:

Is as for children with special attention to the complications.

- if patient cannot be weighed – Loading dose should be 900mg. Followed by 600mg 8 hourly.
- monitor for and correct hypoglycaemia with 50% dextrose (1 ml/Kg).

NB: Each infusion of quinine should be given over 4 hours.

Use quinine IM if IV drip cannot be monitored or fail to get IV access.

MONITOR BLOOD GLUCOSE DURING QUININE INFUSION

NB:

(I) Quinine hydrochloride may be given IM in emergencies as shown in the table below.

DOSAGE OF INTRA-MUSCULAR INJECTION OF QUININE DIHYDROCHLORIDE

After Dilution to 100 mg/ml (**see notes below**).

	Weight range (Kgs)	Volume of quinine injection (ml)	No. of injection sites
ABOVE 30 Kg	31 – < 36	3.2	2
	36 – < 41	4.0	2
	41 – < 46	4.5	2
	46 – < 51	5.0	2
	51 – < 56	5.5	2
	56 – < 60	6.0	2
	60 +	6.0	2

DILUTION TO 100MG/ML

Use 10 ml sterile syringe. Draw up 4 ml of sterile water for injection. Then into the syringe, draw up 600 mg (2 ml) from an ampoule of quinine and shake. The syringe now contains 100 mg quinine per ml.

NOTE: Each injection should not be more than 3 ml per injection site.

The Dose for adults above 60 Kg should not exceed 600 mgs.

- (i) Quinine hydrochloride may be given IM in emergencies.

(ii) Oral quinine may be introduced intragastrically by NG tube in situations when parenteral quinine is not available.

Refer patient if the following conditions are present or persist:

- Patient is in renal failure – oliguria and rising blood urea. Or any major complication?
- Complicated case with no general support facilities, IV, blood transfusion, coma, convulsions, signs of renal involvement (oliguria)

Chemoprophylaxis

A: Anti-malarial Prophylaxis should be given to the following groups:

1. All non-immune visitors to malarious areas;
 - (a) long term residence >4 weeks
 - (b) short term residence <4 weeks
2. Patient with sickle cell disease and thalassaemia
3. Children with impaired immunity (e.g. HIV, leukaemia)
4. Patients with tropical splenomegaly syndrome, leukaemia or splenectomy
5. Pregnant women

B: Chemoprophylaxis Regimes

1. Proguanil

- Group 1a and 1b proguanil daily beginning one week before arrival and continuing for 4 weeks after leaving malarious area. NB: for group 1b alternatively give doxycycline 100 mg daily for adults beginning on arrival, during stay and 4 weeks after leaving malarious areas
- Group 2, 3, and 4 – daily proguanil
- Group 5.

DOSAGE SCHEDULE

Proguanil Daily PO

< 1 yr	25 mg (¼ tablet)
1–4 yrs	50 mg (½ tablet)
5–8 yrs	75 (¾ tablet)
9–12 yrs	100 mg (1 tablet)
Adult	200 mg daily (2 tablets)

Patient Education

- To seek early treatment for fever
- Cover exposed skin in the evenings

- Importance of using Insecticide Treated Nets (ITNs)
- Community participate in indoor residual spraying (IRS) in epidemic prone areas.

12.3. MEASLES

Also called rubeola and morbilli. It is one of the commonest childhood infectious exanthems. Measles is never subclinical, however the severity of the disease is related to the infective dose of virus. Crowding tends to increase mortality.

All children 9 months of age or older who are not immunised against measles and are brought to a health facility for any reason should be immunised and given Vitamin A supplements before leaving that facility.

Clinical Features

Incubation 7–10 days. Febrile Catarrhal phase 2–3 days, followed by onset of rash.

Symptoms: Generalized rash and either cough, running nose or red nose.

Management

Most children can be treated at home

- Treatment with antibiotics is **not** recommended
 - Give an antibiotic only if pneumonia [see **21.8.–21.10. pneumonia**] or otitis media [see **6.1. and 6.3. otitis media**] are present. Consider *Staphylococcal* pneumonia if the child has had prior antibiotic treatment for pneumonia
 - Give two doses of oral Vit. A for treatment as follows: First dose in the clinic then give the mother one dose to give at home the next day
 - 50,000 IU for young infants (aged less than 6 months)
 - 100,000 IU for infants (age 6–12 months)
 - 200,000 IU for children 12 months up to 5 years
 - Treat fever, temperature 39°C [see **22.2. and 22.3. fever**] if present with paracetamol
 - Careful skin and eye care should be provided. Give antibiotic eye ointment for conjunctivitis only if there is purulent eye discharge.
 - **Nutrition** Severe stomatitis may prevent feeding, maintaining oral hygiene and application of gentian violet where there is candidiasis (thrush) in the mouth, after cleaning it with salt water, is necessary.
- Supervised feeding: expressed breastmilk feeds, and occasionally nasogastric tube feeding will be needed
- **Assessment:** Nutritional follow up is very necessary. Increasing the frequency of feeding (an extra meal per day over the usual feeding) after measles illness is very important to help the child regain lost weight adequately
 - For the hospitalised child, give supportive care.

Admit

If the following are present;

- A haemorrhagic rash
- Stridor (from infection of the larynx and trachea; laryngotracheitis)
- Pneumonia, dehydration, or severe undernutrition
- Great difficulty in drinking or eating.

Prevention

• **Immunisation** Measles immunisations is given to babies who are 9 months or above irrespective of whether they have suffered from measles/measles like illness. Measles immunisation should be given to babies 6 months and above in the following circumstances:

- siblings to a child with measles illness
- children living in crowded places, refugee camps; children's homes
- children admitted to hospital for any condition (age 6–9 months)
- children in a locality with measles epidemic.

Complications

These must be looked for in all patients:

- **Serious** signs Persistent fever with darkening of the rash (“black measles”) and subsequent desquamation.
- **Stomatitis** Compromises sucking and feeding.
- **Laryngitis** Distinguish a benign prodromal laryngitis from that due to a secondary infection, which may be severe.
- **Bronchopneumonia** Usually severe; Gram negative organisms or staphylococcus
- **Diarrhoea** Either due to virus or from a secondary infection
- **Vitamin A deficiency** Keratoconjunctivitis. Measles increases the consumption of vitamin A and often precipitates xerophthalmia and subsequent blindness
- **Encephalitis** Caused by the measles virus itself; it occurs on about the 5th day of the rash, Subacute Sclerosing Pan Encephalitis (SSPE) is an important late complication.
- **Malnutrition** Precipitated by anorexia, stomatitis, fever, vomiting, diarrhoea and other complications. Also important are frequent harmful cultural practices that impose fasting upon a child with measles.

Advice to mothers/Caretakers

- Ensure all her children are fully immunised
- Child should attend under 5 years children clinic on discharge.

12.4. MENINGITIS

An acute inflammation of the pia and arachnoid coverings of the brain with spread into the cerebro–spinal fluid (CSF). Most commonly due to invasion by bacteria (*Pyogenic meningitis*), and less so due to viruses (*Aseptic meningitis*), tubercle bacilli (*Tuberculous meningitis*) or fungi (*Fungal meningitis*). The commonest bacterial organisms are streptococcus pneumoniae (*Pneumococcus*), *Haemophilus influenzae* and *Neisseria meningitidis* (*Meningococcus*), but almost any other bacteria may be involved depending on circumstances of the invasion and the age of the child. Predisposing factors in children are low immunity, prematurity, septicaemia: infections in the nose, sinuses, ears, throat and lungs; penetrating injuries of the skull and spinal column and congenital malformations of the brain and spine. Meningococcal meningitis often occurs in epidemics.

Clinical Features

Neck stiffness, positive Kerning's sign, altered level of consciousness, headaches, fever, vomiting, convulsions, photophobia.

In children the following features occur; refusal to feed, bulging anterior fontanelle, irritability, cyanosis, focal or generalised fits, high pitched cry, opisthotonos.

Investigations

- Lumbar puncture (after fundoscopy to rule out papilloedema)
- Haemogram and ESR
- CXR
- Others: Mantoux test, History of contact with TB.

CSF Characteristics

	Colour	Protein	Sugar	Cells
Normal	Crystal clear	Below 0.4 grams/L	Above 2.5 mmol/L	0–5(x10/L)
Pyogenic	Cloudy	High	Low or NIL	Hundreds to thousands mainly poly–morph
Tuberculous	Clear OR opalescent	Moderately raised	Low	A few hundreds mainly lymphocytes
Viral	Clear OR opalescent	Moderately raised	Normal	A few hundreds mainly lymphocytes

Always treat as pyogenic meningitis if the CSF: is cloudy is blood stained cannot be obtained.

Admit patient if meningitis is suspected. Initiate treatment immediately.

Management – General

- When fits occur:
 - stop fits by giving IV diazepam 0.3 mg/Kgs IV/IM **OR** 0.5mgs/Kg STAT rectally. Repeat as necessary
 - prevent fits by giving phenobarbitone 3–6 mg/Kg IM BD or TDS **OR** 3–6 mg/Kg/day orally
- Treat coma as follows:

- keep airway clear and suck out secretions
- nurse the patient on his/her side; turn every 2 hrs
- give oxygen, if necessary, ½ to 1 litre/min by intranasal catheter
- give IV fluids if necessary
- observe vital signs carefully every 2 hrs till awake
- Follow the patient's progress:
 - each day see how “well” or “ill” child is
 - take the temperature and pulse
 - feel the fontanelle
 - assess neck stiffness/Kerning's sign
 - maintain fluid and electrolyte balance
 - ensure child is passing urine well
 - ensure child does not get further fits
- Treat for malaria if in malarious area
- Dexamethasone 4 mg IM/PO TDS for 72 hours in adults to reduce sequel of meningitis such as deafness.

Pharmacologic

Antibiotics – Paediatrics

Give penicillin + chloramphenicol as follows:

- Benzyl (crystalline) penicillin;
 - Under 1 year of age: 100,000 units/Kg IV STAT, then 250,000 units/Kg/24 hrs IV in 4 divided doses
 - 1–6 years of age: 1,200,000 units IV STAT then 2,500,000–5,000,000 units per 24 hrs IV in 4 divided doses
 - 7–12 years of age: 2,400,000 units IV STAT, then 5,000,000–10,000,000 units per 24 hrs in 4 divided doses
- Chloramphenicol;
 - Up to one month of age: 25 mg/Kg IV STAT, then 50 mg/Kg 24 hrs in 4 divided doses
 - Over one month of age: 50 mg/Kg IV STAT, then 100–150 mg/Kg 24 hrs in 4 divided doses.
- After 2–5 days of intravenous therapy and provided there is satisfactory improvement, benzylpenicillin can be given IM and the chloramphenicol can be given orally in the same doses
- Treatment should continue:

- for 5–7 days in meningococcal meningitis
- for 21 days in salmonella meningitis
- for at least 14 days in all other cases of pyogenic meningitis.

Antibiotics – Adults

- Normal CSF: Discontinue therapy and investigate patient as per other signs and symptoms
- *Streptococcus pneumoniae*: Crystalline penicillin 4 mega units IV QDS for 14 days or Chloramphenicol 1 gm IV QDS for 14 days
- *Neisseria meningitidis*: Crystalline penicillin 4 mega units IV QDS for 10 days or chloramphenicol 1 gm IV QDS for 10 days.

Refer If

- There is no improvement after 3–4 days of full treatment
- There is persistent fever and/or bulging fontanelle and/or persistent fits
- Patient develops a widespread skin rash, or easy bleeding before or during treatment
- The mother reports that the child cannot see, hear or cries all the time or his head is enlarging
- After full treatment, he is brought back with fits with or without fever.

Prophylaxis

To close contact or household members for meningococcal meningitis:

- Sulphadiazine 1 gm BD PO for 2 days (if the organism is susceptible) OR
- Rifampicin 600 mg BD PO for 2 days, OR
- Minocycline 100 mg BD PO for 2 days for adults only

Purified capsulate polysaccharide vaccine is available to control outbreaks but it must be administered within 3–7 days of case identification to prevent an epidemic. NB. The vaccine is not very useful for children <2 years.

Complications

Subdural effusion. Hydrocephalus. Blindness/or deafness. Secondary' epileptic fits. Mental and physical retardation.

Notify the medical officer of health if meningococcal meningitis is diagnosed

12.5. PARALYSIS (ACUTE FLACCID)

Common differential diagnosis.

- Poliomyelitis
- Acute transverse myelitis “ Spinal cord injury

- Guillain Barre syndrome
- TB spine
- Neoplasms of spine or cord

NB: Refer all cases.

POLIOMYELITIS

Infection of susceptible individuals by the polio enterovirus may lead to:

- **Asymptomatic infection** 90–95%.
- **Abortive poliomyelitis** Brief febrile illness with malaise, anorexia, nausea, vomiting, sore throat, constipation, coryza, cough and diarrhoea.
- **Non–paralytic poliomyelitis** Symptoms as above but headache, nausea and vomiting more intense, paralysis of the bladder and constipation frequent and **paralytic poliomyelitis (0.5%)**.

PARALYTIC POLIOMYELITIS

Symptoms as for non–paralytic polio plus weakness and pain of one or more muscle groups (skeletal or cranial) which may recover. Transient bladder paralysis and bowel atony is common. Flaccid paralysis is due to neuronal injury and the ensuing muscular atrophy due to denervation and atrophy of tissue.

Investigations

Stool specimen for viral culture and typing. The two should be kept and transported to KEMRI laboratory under vaccine temperatures.

Management

Mainly supportive. During early phase; analgesics, limb support to prevent deformities, nutrition and physiotherapy after acute phase.

Prevention

- Immunisation: Routine and National Immunisation Days (NIDs)
- Active surveillance and mopping up
- It is hoped that polio will be eradicated in the near future with intensified childhood immunisation combined with successful disease surveillance.

For purposes of polio eradication, notify the local Medical Officer of Health of any Acute Flaccid Paralysis

12.6. SCHISTOSOMIASIS

Infection with blood flukes of the genus *Schistosoma*, which may cause chronic disease of intestines, liver, genito urinary tract. Adult flukes are white worm–like creatures which inhabit parts of the venous system of man. All need molluscan intermediate host. Important species of schistosomiasis in Kenya are: *S. Haematobium* and *S. Mansoni*. Adult worms live and copulate within the veins of the mesentery. The sexually mature ones are found in the intestinal veins for *S. Mansoni* mainly, while those of *S. Haematobium* are

mainly located in the venous plexus of the GU tract, some eggs penetrate the intestinal or bladder mucosa and are passed in faeces or urine. Eggs hatch in fresh water liberating cercariae that multiply in snails (intermediate host) and produce thousands of cercariae. These penetrate human skin within a few minutes after exposure and transform into schistosomiasis which develop into sexually active adult worms in the intestinal veins or venous plexus of genitourinary tract depending on the species. Adult worms lifespan range from 3–37 years.

S. Haematobium is common along the coastline, Tana river, Kwale and Lamu.

S. Mansoni – widespread particularly in Machakos, rice schemes and parts of Nyanza and even Nairobi.

Clinical Features

Acute dermatitis and fever after exposure is a rare presentation. Occasionally transverse myelitis and convulsions may occur. Chronic schistosomiasis is the main presentation: In *S. Mansoni* – portal hypertension, splenomegaly, anaemia and oesophageal varices. In *S. Haematobium* – Terminal haematuria, dysuria. progresses to obstructive uropathy and bladder cancer.

Metastatic eggs can be found in other organs such as spinal cord, brain. Salmonella infection in patients with schistosomiasis is difficult to eradicate until schistosomiasis has been treated. Salmonella infection may present as recurrent pyrexia.

Investigations

- *S. Mansoni*:

- stool for ova, use concentration or Kato technique
- rectal snip
- barium swallow and endoscopy to demonstrate oesophageal varices
- abdominal U/S

- *S. Haematobium*:

- urine for RBC and for ova of *S. Haematobium*
- hatching test
- X-ray lower abdomen may show calcified bladder (sandy patches)
- intravenous urogram when obstructive uropathy is suspected.

Management

- Praziquantel 20 mg/Kg BD for a day (effective against all types)

NB: Patients should be examined for living eggs, if positive, re-treat.

Refer If

- Obstructive uropathy present
- Portal hypertension present.

Prevention

- Avoid contact with contaminated water
- Mass chemoprophylaxis in school age in endemic areas
- Environmental hygiene – use of toilets
- Eradication of intermediate hosts (snails).

First and Second Line Antibiotics

DIAGNOSIS	FIRST LINE TREATMENT	SECOND LINE TREATMENT
Acute Rheumatic Fever	Penicillin	Erythromycin
Acute Osteomyelitis.	Cloxacillin + Gentamicin	Cloxacillin + Chloramphenicol
Cellulitis	Penicillin	
Conjunctivitis (Bacterial)	Tetracycline Eye Ointment	Chloramphenicol Eye Drops
Dysentery (Shigella)	Cotrimoxazole	Ampicillin
Gonorrhoea	Penicillin + Amoxicillin–clavulanate + Probenecid OR Amoxicillin + Amoxicillin–clavulanate + Probenecid	Spectinomycin
Ludwig's Angina	Penicillin	
Meningitis		
Paediatrics Adults	Penicillin + Chloramphenicol Same as above	Ampicillin Same as above
Otitis media	Amoxicillin	Cotrimoxazole
Pelvic Inflammatory Disease (PID)		
severe	Penicillin + Gentamicin + Metronidazole	Penicillin + Chloramphenicol + Metronidazole
Acute	Treatment for gonorrhoea + Tetracycline + Metronidazole	Amoxicillin or Tetracycline + Metronidazole
Pneumonia		
Children <2 months	Penicillin + Gentamicin	Chloramphenicol
2 months to 5 yrs	Oral Cotrimoxazole	Oral Amoxicillin OR Benzyl penicillin
Adults	Penicillin	Amoxicillin OR Cotrimoxazole
Pneumonia (Severe)		
Children <2 months	Penicillin + Gentamicin	Chloramphenicol
2 months to 5 yrs	Benzyl Penicillin (Chloramphenicol as pre-referral drug)	Benzyl Penicillin + Gentamicin OR Chloramphenicol
Adults	Penicillin + Gentamicin	Amoxicillin OR Chloramphenicol

Puerperal Sepsis	Amoxycillin + Metronidazole	Ampicillin + Gentamicin
Septic Abortion	Penicillin + Gentamicin + Metronidazole	Chloramphenicol
Septic Arthritis	Cloxacillin + Gentamicin	Ampicillin + Gentamicin
Septic Shock	Penicillin + Gentamicin + Metronidazole	
Typhoid	Chloramphenicol	Amoxycillin Cotrimoxazole
Urinary tract infections		
Lower Upper (Outpatient) Upper (Inpatient)	Amoxycillin Amoxycillin Ampicillin + Gentamicin	Cotrimoxazole Cotrimoxazole

12.7. TETANUS

Neurological disorder characterised by muscle spasms due to endotoxin produced by *Clostridia tetani*. Tetanus occurs in several clinical forms including **generalised, neonatal** and **localised disease**.

Clinical Features

Trismus, (lock jaw), opisthotonos (rigid arching of back muscles), dysphagia, laryngospasm. Diagnosis is mainly clinical.

Management

- Maintain adequate airway (intubation if necessary)
- Insert a nasogastric tube as early as possible for nutrition and drug administration
- Toxin neutralization: 1000–3000 IU of human tetanus immunoglobulin IM (children: Neonates 500IU, Older children 2000IU) if available along site of source of wound. Horse serum is an alternative
- Elimination of toxin production
 - crystalline penicillin 1 mega unit IV QDS for 10 days(children 50,000IU/Kg/day. Neonates BD, older children QDS)
 - surgical toilet of the wound
- Control of spasms – **general**
 - diazepam is the drug of choice
 - add phenobarbitone or chlorpromazine if additional sedation is required
 - all 3 drugs may be needed in severe cases
- Control of spasms – **adults**
 - diazepam 10–60 mg IV/rectally QDS
 - phenobarbitone 30–90 mg IV/IM every 12 hourly chlorpromazine 100 mg IM QDS alternating with diazepam
- Control of spasms – **children**

- diazepam 0.5 mg/Kg IV/rectally QDS or an infusion over 24 hrs.
 - phenobarbitone 6 mg/Kg IV/IM 12 hourly
 - chlorpromazine 5 mg/Kg IM QDS alternating with diazepam
- Maintain fluid balance
 - Monitor for and treat intercurrent infections
 - Nurse in a dark, quiet isolation.

Guideline for dosage administration

Time (Hours)	0	3	6	9	12	15	18	21	24
Diazepam	+		+		+		+		+
Chlorpromazine		+		+		+		+	
Phenobarbitone	+								+

- Frequency of drug administration should be titrated against clinical condition. Optimum level of sedation is achieved when patient remains sleepy but can be aroused to follow commands.

Refer

- Patient with refractory spasms needing admission to the ICU.

Prevention

- Neonatal tetanus:
 - pregnant mothers – tetanus toxoid 2 doses at least 4 weeks apart as early as possible in pregnancy. One booster dose at every subsequent pregnancy
- People with open wounds – 2 doses of tetanus toxoid at least 4 weeks apart. Only 1 dose if immunized during the last 3 years and adequate surgical toilet.

12.8. TUBERCULOSIS

Tuberculosis is caused by *Mycobacterium Tuberculosis* also called Acid–Alcohol Fast Bacilli (AAFB) because of its staining properties. Transmission is by droplet infection through coughing and sneezing. The incidence of TB is on the increase due to its association with HIV/AIDS; poverty, malnutrition and overcrowding.

Clinical Features

Most cases of tuberculosis in Kenya (80%) are pulmonary. Features of pulmonary tuberculosis are cough for 3 weeks or more, haemoptysis, chest pain, fever and night sweats, weight loss and breathlessness.

Extrapulmonary tuberculosis symptoms depend on organs affected: TB adenitis – Lymphadenopathy, TB arthritis – painful swollen joints, TB meningitis – signs of meningitis, TB peritonitis – ascites, TB pleural – pleural effusion.

Investigations

- Sputum for AAFB. If 3 consecutive specimens are negative then;

- Mantoux test
- Chest X-ray
- Lymph node biopsy
- Body fluids for biochemistry/microscopy (CSF, pleural and peritoneal fluid).
- Gastric lavage for AAFB in children
- Sputum for AAFB culture and sensitivity (before the start of treatment in suspected resistant cases).

High index of suspicion is important in diagnosis of TB in children who seldom produce sputum and often have non-specific symptoms. Use of Jones criteria to assist in diagnosis is shown in the score chart below.

Paediatric tuberculosis score chart

(circle box and write score in the right-hand column)

Feature	0	1	3	Score
Duration of illness	less than 2 weeks	2–1 weeks	more than 4 weeks	
Nutritional status (weight for age)	more than 80%	between 60–80%	less than 60%	
Family history of tuberculosis	no family history	reported by family history	sputum +ve and family history	

Diagnosis of Tuberculosis in Children

Feature	Score
Positive sputum smear	5
Family history positive for TB	2
Tuberculin test result 15 mm or more (in unvaccinated child)	3
Enlarged painless lymph nodes, sinus present	3
Night sweats, unexplained fever	2
Abnormal chest X-ray	2
Malnutrition not improving after 4 weeks treatment	3
Angle deformity of spine	4
Finn, non fluid, non traumatic swelling of joint	3
Unexplained abdominal swelling or ascites	3
Change in temperament fits or coma	3

A score of 3 or less: TB unlikely

3–4: TB probable, further investigations necessary

5–6: Though TB not definite, this score justifies treatment (as further pending investigations are done)

>7: TB definite, institute treatment. **Tuberculosis prophylaxis in exposed Children**

- If a mother is started on treatment for pulmonary tuberculosis and has an under five child who has not received BCG, start child on isoniazid 10 mg/Kg body weight OD for 3 months.
- Do a tuberculin test at 3 months. If a reaction of more than 5 mm is recorded continue isoniazid for another 3 months. If test is negative stop isoniazid, wait 3 days and administer BCG vaccine.

Management

The success of tuberculosis treatment depends on strict adherence to WHO DOTS (Directly Observed Treatment Short–Course) strategy.

General Guidelines on TB Management

- Follow National treatment guidelines
- Ensure adequate supply of drugs
- Use correct regimens and dosages
- Ensure regular patient attendance
- Always supervise initial phase of treatment
- Trace defaulters promptly
- Maintain accurate patient information and clinic attendance records

Management – Pharmacologic

Classification of TB Patients

Patients are classified into the following groups for epidemiological and treatment reasons depending on the site, microbiology, severity of disease, and history of previous treatment. Same categories used in TB register for reporting.

- **New (N):** Patient who has never been treated before.
- **Relapse (R):** Patient who has received treatment and was declared cured but now has TB again.
- **Transferred in (TI):** Patient who was registered in another district initially and has now reported to continue treatment.
- **Treatment resumed (TR):** Patient who interrupted his/her treatment, and was declared “out of control”, but is now resuming treatment.
- **Other (O):** Other types of patients e.g. failure cases put on re–treatment.

Short course chemotherapy (SCC)

SCC is given to all TB patients registered by the NLTP. Different SCC regimens are used for the different categories of tuberculosis.

In the first two months (initial phase of treatment) should be administered under direct observation of either a health care provider in a health facility or another member of the household or community.

Drugs and tools for registration and reporting should be available before treatment is started. Admit if patient is too ill or **DOTS** cannot be ensured.

The continuation phase (4–6 months duration) in principle is available in all government and NGO health facilities. The patients should collect a supply of drugs four-weekly for daily self-administration at home.

Treatment Regimens and Drug Dosages

Treatment regimen for new adult smear-positive patients and other seriously ill cases of TB eg. TB meningitis, miliary TB and TB of vital organs: 2ERHZ/6EH (SEE TABLE BELOW)

Abbreviation of the regimen	2ERHZ/6EH	
Phase	Intensive phase	Continuation phase
Duration	Daily supervised for two months	Daily self-administered for six months
Drugs used	Ethambutol (E), Rifampicin (R) Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Isoniazid (H)

See dosage below.

Re-treatment regimen for relapse (R), treatment failure (F), or treatment resumed. (TR). with active TB disease and who have a positive sputum smear or culture result: 2SRHZE/1RHZE/5RHE (SEE BELOW)

Abbreviation of the regimen	2SRHZE/1RHZE/5RHE		
Phase	Intensive phase	Continuation phase	
Abbreviation of the regimen	2SRHZE/1RHZE/5RHE		
Duration	Daily supervised for two months	Daily supervised for one month	Daily self-administration for 5 months
Drugs used	Streptomycin (S) Ethambutol(E), Rifampicin (R) Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Rifampicin (R) Isoniazid (H), Pyrazinamide (Z)	Ethambutol (E), Rifampicin (R) Isoniazid (H),

For dosage see below.

Treatment regimen for new smear-negative and extra-pulmonary tuberculosis patients younger than 15 years: 2RHZ/4RH (see below)

Abbreviation of the regimen	2RHZ/4RH	
Phase	Intensive phase	Continuation phase
Duration	Daily for two months (once a week supervised)	Daily self-administration for four months
Drug used	Rifampicin (R) Isoniazid (H), Pyrazinamide (Z)	Rifampicin (R) Isoniazid (H)

See dosage below

The dosages, according to body weight, of the different anti-tuberculosis drugs used, are shown below

Drug Dosages	formulation	Pre-treatment weight		
		Over 49 Kg	49–33 Kg	Less than 33Kg
Streptomycin	i.m. injection	1 gm	0.75gm	0.50gm
Rifempicin 150mg Isoniazid 75mg, Pyrazinamide 400mg	Combination tablet	5	4–3	2–1
Rifampicin 150mg Isoniazid 75mg,	Combination tablet	4	3	2
Ethambutol 400mg Intensive phase	tablet	2½–3	1½–2	1½
Ethambutol 400mg Isoniazid 150 mg	Combination tablet	2½–3	1½–2	1½

CAUTION

- **Pregnant mothers and patients older than 40 years should not be given more than 0.75 gm of streptomycin per daily injection.**
- **Ethambutol should not be given to children (see side effects)**
- **Do not exceed 600 mgs of Rifampicin per day**

TREATMENT OF TB IN HIV/AIDS PATIENTS

HIV increases a persons susceptibility to infection with M. tuberculosis. In individuals infected with M. tuberculosis HIV is a potent cause of progression of tuberculosis infection to disease.

In HIV infected children, dissemination of TB is common. TB meningitis, miliary tuberculosis and widespread tuberculous lymphadenopathy occur.

Complications of TB

These include haemoptysis (coughing up blood), spontaneous pneumothorax, bronchiectasis, lung fibrosis and lung abscess.

Acquired Drug Resistant TB

Acquired drug resistance results from inappropriate use of one drug or poor adherence to treatment. This suppresses the growth of organisms susceptible to the drugs but encourages the multiplication of isolated strains with spontaneous drug resistance.

Multiple Drug Resistant TB (MDR –TB)

This is resistance to both rifampicin and isoniazid as a consequence of poor adherence to recommended treatment regimens by clinicians and patients. This resistance is further associated with increasing poverty and the HIV/AIDS epidemic.

MDR – TB is confirmed on culture and sensitivity.

Prevent MDR – TB by:

- strengthening TB programmes
- ensuring directly observed therapy whenever rifampicin is used
- use of fixed dose combination tablets containing rifampicin

Refer all drug-resistant TB patients to a TB Specialist for confirmation and management

12.9. SALMONELLA INFECTIONS

Disease caused by the following salmonella: *Salmonella typhi* and *Salmonella Paratyphi* A, B and C. Commonly cause Enteric fever. *Salmonella Enteritis* causes Gastroenteritis.

Typhoid Fever

Systemic disease caused by *S. Typhi*. Typhoid bacilli are shed in the faeces of a symptomatic carriers or in the stool or urine of those with active diseases.

Transmission: via contaminated food or water. This may occur through:

- Direct contamination by faeces or urine
- Flies from faeces to food
- Through healthy carriers who are food handlers
- Health personnel through inadequate hygiene when changing soiled linen.
- Healthy carriers who can shed organisms for more than one year.

Clinical Features

High fever, headaches, anorexia, weight loss. Diarrhoea, constipation, abdominal tenderness, changes in sensorium, splenomegaly, relative bradycardia, Rose spots (blanching lesions). High index of suspicion is required when investigating any patient with unexplained fever.

Investigations

- Full haemogram: Relative leukopaenia in relation to the fever
- Cultures: Positive in blood in first week, stool and urine cultures become positive in the third week
- Widal test: Fourfold rise in spared specimen acquired two weeks apart suggest *S. Typhi* infection. Rising titres of O antigen are significant. NB: **Only titres of O antibody of 1:160 or more are significant. The gold diagnostic standard should be isolation of bacilli in cultures.**

Management

- Chloramphenicol: (2–4 gm in adults OR 50 mg/Kg body weight per day in children) for 2 weeks
- Cotrimoxazole 4 tabs BD for 2 weeks
- Amoxicillin 4–6 gm or 100 mg/Kg/day in 3 divided doses for 2 weeks
- Ciprofloxacin 500–750 mg BD for 14 days

OR

Ofloxacin 400 mg BD for 14 days

OR

Norfloxacin 400 mg BD for 14 days

OR

Ceftriaxone 1 gm ODIV for 7–14 days

Complications

Intestinal haemorrhage, perforation. Chronic carrier state.

Prevention

- Wholesome drinking water (boil water for 10 minutes or chlorinated)
 - Pausterised milk
 - Avoidance of food handling by healthy carriers
 - Treat the healthy carriers
 - Hygienic waste disposal
 - Vaccination:
 - live attenuated oral vaccine 4 capsules given on alternate days. Avoid antibiotic for 1 week
- NB: contra-indicated in immuno-suppression cases.
- Typhim VI vaccine – single dose 0.5 ml IM. (70% efficacy boost every two–three years.

Surgical Complications

intestinal perforation leading to peritonitis, septicaemia.

Clinical Features

Abdominal pain and distension, rebound tenderness

Investigations

- Plain abdominal x-ray: Erect/decubitus which may show pneumoperitonium or multiple Quid levels

Management

- Drugs – as above
- Surgical – laparotomy.

Refer for

- Surgical intervention.

13. MENTAL DISORDERS

13.1. ACUTE CONFUSION (Acute Psychosis)

Sudden onset of mental symptoms in an otherwise previously **normal** person.

Aetiology

- Organic causes:
 - cerebrovascular accidents (CVA), brain tumours, subdural haematomas, brain abscess
- Infections
 - acute meningitis, encephalitis, malaria, HIV
- Metabolic/toxic causes:
 - metabolic derangements e.g DKA, hypoglycaemia
 - drug intoxication
- Psychiatric causes: Schizophrenia, depression and manic episode.

Clinical Features

Good history, physical examination are essential. The patient may be: ill looking, not appreciating surroundings, not alert. Not aware of time, place or who they are. Unable to remember and forgets easily. Poor attention and concentration. Visual/auditory hallucinations. Delusions (grandiose or paranoid). Aggressive and excited. Illusions (e.g. a stick is mistaken for a snake); in general, symptoms get worse at night.

Investigations

- HB, WBC, Blood slide for MPS, C&S, sugar, urea and electrolytes
- CSF examination (after fundoscopy)
- X-rays – skull.

Management – General

- Identify and manage physical (underlying) causes.

Management – Pharmacologic

- Chlorpromazine 50–100 mg TDS OR haloperidol 5–10 mg TDS.

Refer If

- No physical cause found (to a psychiatrist for treatment of schizophrenia, mania or depression).

13.2. ALCOHOL WITHDRAWAL (Delirium tremens)

Clinical Features

Suspect if a patient with acute psychosis also has history of excessive drinking, tremors, weakness, restlessness, insomnia, hallucinations (visual), profuse perspiration. May develop features of withdrawal when admitted to hospital for another disease.

Investigations

- Blood sugar to exclude hypoglycaemia
- Full haemogram for evidence of macrocytosis
- Liver function test (especially liver enzymes)

Management

- Admit patient
- Thiamine 100 mg parentally STAT to prevent brain damage then daily for 2 weeks

OR

Parentrovite I & II IV or IM OD for 5 days

- Sedation:
 - diazepam 10–40 mg QDS for the first 24 hrs and then gradually taper off.
Aim of therapy is sedate patient until he is calm
- Maintain fluid and electrolyte balance
- If hallucinations occur, give chlorpromazine 100 mg BD, then adjust dose according to symptoms. Do not treat with chlorpromazine alone since it reduces seizure threshold
- Give multivitamins containing folic acid
- Manage head trauma and treat pneumonia which are common in alcohol abusers
- Treat specific disorders symptomatically e.g. cirrhosis, neuropathy
- Treat seizures with diazepam IV
- Give 50 mls of 50% dextrose to correct hypoglycaemia
- Avoid long-term use of sedatives as they may lead to addiction.

Refer For

- Long term management by a psychiatrist.

Delirium tremens has a high mortality if not diagnosed and treated early

Patient Education

- Counsel the patient; abstinence may be essential
- Encourage healthy diet

- Involve the family in the long-term management.

13.3. SUBSTANCE ABUSE RELATED DISORDERS

These are syndromes arising out of repeated maladaptive use of substances; A substance being defined as any chemical with brain altering properties. They are characterised by significant impairment in psychological, social and occupational functioning as observed over a 12-month period. Commonly abused substances in Kenya include tobacco, *cannabis sativa*, *khat* (miraa), opioids (heroin), cocaine and solvents (glue, petrol, wood vanish). Substance-related syndromes include: Intoxication, dependence, withdrawal, psychosis, mood disorders, anxiety, sleep disorders, sexual disorders.

High Risk Group

- 12 to 20 year-olds
- Patients with primary mental disorders

SUBSTANCE ABUSE BY THE ADOLESCENT

Usually present with a self-neglect, slovenliness, deteriorating school performance, excessive sleeping, rough appearance, increasing and unexplained demand for money from care givers, involvement in petty crime (pilfering), running away from home in addition to aforementioned substance-related disorders.

Investigations – General

- Liver function tests
- HIV screening – especially for opioids abusers
- Urinalysis
- Blood for toxicology

Management – General Principles

Substance Specific

- Detoxification
- Patient/family education/counselling
- Alternative leisure activities
- Work/school rehabilitation
- Involvement of community agencies e.g. religious organisations, alcoholic anonymous, narcotic anonymous where available.

Refer For

- Long term management by psychiatrist.

Management of Selected Substances of Abuse

- **Opioids detoxification:** Opioids abused include heroin, morphine, dihydrocodeine and pethidine. Tolerance develops rapidly and withdrawal features include agitation, lethargy,

sweating, goose flesh, running nose, shivering, musculo–skeletal pains, diarrhoea and abdominal cramps. These effects peak at 48 hours and subside over a period of 10 days. Due to highly addictive nature of the opioids, admission to hospitals is necessary.

Management – Pharmacologic

- For agitation, use; diazepam 20–80 mg PO daily to be tapered off in 10 days
- For the parasympathetic upsurge, use; clonidine 0.15 mg to 3 mg PO daily for 10 days
- For any assaultive behaviour, use; haloperidol 5–10 mg TDS PO OR chlorpromazine 50–100 mg TDS as necessary
- For pain, use; paracetamol 1 gin PO every four hours as necessary

CANNABIS DEPENDENCE

Chronic users may develop psychosis, anxiety, mood disorders and a withdrawal state. Admission is usually necessary for initiating abstinence. Treatment of the psychiatric * complication is the same as for the primary syndromes.

KHAT (MIRAA) DEPENDENCE

Chronic users (“2 kilos” or more per day) may develop anxiety, mood disorders and schizophrenia–like psychosis. Abstinence is to be encouraged. Treatment of the related psychiatric disorders is the same as for the primary syndromes.

SOLVENT ABUSE

Solvents have powerful euphoriant properties. They are mainly abused by street children and the homeless. Chronic users may develop organ damage (liver, heart, kidney, apart from neurological damage. Patient education is vital. Involve family and relevant authorities in rehabilitation.

13.4. ANXIETY

An unpleasant, vague and diffuse feeling of apprehension. It is an alerting signal. Usually the threat is unknown and patient functioning gets impaired. **Pathological** anxiety includes: Panic disorder; dramatic in presentation. Phobias: fears which are out of proportion. Obsessive compulsive disorder (irresistible urge to act). Generalised anxiety disorder.

Clinical Features

Empty feeling in the stomach, lightness in chest, pounding heart, perspiration, urge to void, non–exertion dyspnoea, blurred vision, hyper reflexia, dizziness, light headedness. Hypertension (transient), restlessness (e.g. pacing). Good history and physical examinations; exclude physical causes e.g. thyrotoxicosis, pheochromocytoma, hypoglycaemia, temporal lobe epilepsy.

Management

- Correct hypoglycaemia, if present
- Uncomplicated anxiety:
 - re–assure patient
 - benzodiazepines e.g. diazepam 20 mg/24 hrs. Taper off once symptoms abate.

Refer For

- Investigations to exclude organic causes; thyrotoxicosis, temporal lobe epilepsy, etc
- Complicated anxiety with presence of phobias, panic attacks, etc. Start on benzodiazepines and consult psychiatrist for:
 - psychotherapy
 - behaviour therapy
 - other pharmacological interventions.

13.5. CHILDHOOD PSYCHIATRIC DISORDER

DEPRESSION

Clinging to parents. School refusal. Poor academic performance. Drug abuse. Conduct disorder. Truancy. Promiscuity. Running away.

EMOTIONAL DISORDER

Children who experience repeated and excessive depression, anxiety or other states of personal distress, secondary enuresis; regression, encopresis.

Management

- Involve family; school
- Imipramine 10–25 mg daily until symptoms disappear.

CONDUCT DISORDER

Children who present with truancy, drug abuse, defiant to authority, stealing, excessive lying, running away from home, aggressiveness and involvement in criminal activities. They often have a background of family disharmony.

Management

- Involve family and other relevant authorities.

DEVELOPMENTAL DISORDER

Children whose neuromotor and cognitive development is delayed.

Management

- Involve family; school.

CHILDHOOD PSYCHOSIS

Childhood schizophrenia, bipolar mood illness and depression may present with psychotic features as for adults, [see **13.1 acute confusion**]

Management

- Haloperidol tabs 5–10 mg daily OR chlorpromazine 25–100 mg daily.

Refer If

- To psychiatrist if no response within 6 weeks.

13.6. CONVERSION SYNDROMES

These are mental disorders in which there is a psychogenic disturbances of either motor or sensory function in some parts of the body.

Clinical Features

Could present as: Paralysis of a part of the body, tremors, blindness, deafness, seizures, aphonia. The severity of disability fluctuates, patient fails to exhibit the seriousness the disability accords.

- Good psychiatric history may reveal the source of conflict
- Thorough physical examination, though often normal, should be done.

Refer

- To psychiatrist for proper diagnosis and management.

13.7. DEPRESSION

The primary and dominant characteristic is a change in mood, consisting of depressive mood with characteristic changes in behaviour, attitude, thinking efficiency and physiological functioning.

Clinical Features

Dysphoric mood characterised by sadness, crying spells or irritability. Negative views of self environment and the future, indicated by guilt, loss of interest, difficulties in concentrating or suicidal thoughts. Insomnia. Loss of appetite or increased appetite. Weight loss or gain.

Multiple somatic complaints e.g. fatigue, weakness, headaches, backache etc. Meticulous history is important as under-diagnosis is common and many patients suffering from depression, receive inadequate treatment. Many depressed patients have a precipitating factor e.g. loss of income or are on drugs, which produce depression as a side effect e.g. methyl dopa.

Management – General

Most patients are managed as outpatients.

- Maintain positive hopeful attitude to the patient
- Involve relatives in management, especially to improve drug compliance.

Management – Pharmacologic

- Antidepressants:

amitriptyline 50–150 mg daily: Start with 75 mg on the first day and increase by 25 mg weekly.

OR

imipramine 50–150 mg daily: Start with 75 mg on the first day and increase by 25mg weekly

OR

fluoxetine 20 mg OD: Start with 75 mg on the first day and increase by 25 mg weekly

Give antidepressants at bed time to reduce day time sedation – this may improve patient compliance. Antidepressants take 2 weeks to take effect. If medications are effective, continue for 3 months and then withdraw at 25 mg/week. Failure to respond to therapy is due to:

- Poor compliance
- Inadequate dosage
- Mis–diagnosis
- Inadequate therapeutic trial (usually 6 weeks).

Refer For

- Re–evaluating the diagnosis
- Instituting chronic treatment (prophylaxis) in those with recurrent serious depression
- Changing to second generation antidepressants e.g. maprotiline, monoamine oxidases inhibitors.
- Considering Electroconvulsive therapy (ECT).

Admit If

- Risk of suicide is judged high
- There is significant weight loss
- There is imminent stupor.

Patient Education

- Inform the patient that there will be a delay of 2 weeks before beneficial effects of treatment are experienced
- Explain about the side effects e.g. dry mouth, constipation, hypotension, day time sedation (drowsiness)
- Warn patient about dangers of alcohol consumption
- Review the patient at least once every two weeks till maintenance dose is reached then once a month till total drug withdrawal or as necessary
- Involve the relatives in long term management.

Do not give large prescriptions to patients. There is risk of suicidal overdose. Drug II administration should be monitored while at home

13.8. BIPOLAR MOOD DISORDER (MANIC EPISODE)

The primary characteristic is a change in mood consisting of a sense of well being, enhanced esteem.

Clinical Features

Hyperactivity usually goal oriented, over generosity, extravagance, disinhibition (promiscuity, drug abuse), irritability, accelerated speech, infectious elated congruent mood, grandiose delusions enhanced self esteem, insomnia, weight loss (no time for food). In severe forms patient appears disorganised, may be violent and has legal involvement. History and physical examination to establish if ever depressed in past.

Management – General

- Rule out intoxication
- Involve family members in management.

Management – Pharmacologic

- Immediate if disturbed:
 - haloperidol 10 mg IM or
 - chlorpromazine 150–200 mg IM
- Long-term:
 - start on haloperidol PO 5–10 mg TDS

For Non-compliant patients, haloperidol decanoate 100–200 mg IM monthly or fluphenazine decanoate 25–50 mg IM monthly.

Clopentixol decanoate 200 mg IM monthly.

Refer If

- No response in 4–6 weeks and have excluded:
 - poor compliance
 - inadequate dose
- Considering ECT.

Admit

- If patient is a risk to others or self
- If exhausted.

13.9. SCHIZOPHRENIA

A form of mental illness which is characterised by loss of contact with reality, hallucination, delusions, abnormal thinking, flattened affect, and disturbed work and social function, occurring in a setting of clear consciousness memory and orientation.

Clinical Features

Withdrawal Generalised loss of interest in the environment. Thought disorder. Normal association of ideas is lost. Incongruity of affect is characteristic. Delusions. Hallucinations in any sensory modality. Disturbances in behaviour and motor function e.g. grimacing, odd postures, etc. History from patient and relatives is most important. Continuous signs of illness should be present for 6 months at some point in patient's life, with some signs at the time of diagnosis.

Management – General

- Psychological and Social.

Use psychiatric community nurses and social workers in involving family to understand the illness and helping the family in rehabilitation of the patient into community activities. Importance of drug compliance should be explained to relatives and patients.

Management – Pharmacologic

- Severely disturbed patient – admit;
 - give chlorpromazine 100–200 mg IM and then start on oral chlorpromazine 100– 200 mg TDS OR haloperidol 5–10 mg TDS
- Mildly disturbed patient:
 - manage as outpatient;
 - give chlorpromazine 100 mg TDS OR haloperidol 5 mg TDS. If patient was diagnosed as a schizophrenic and missed his drugs, restart the drug as before
- Maintenance therapy, chlorpromazine 100–200 mg TDS OR haloperidol 5–10 mg TDS
- Onset of extra pyramidal side effects: reduce dose and start on benzhexol 2.5–5 mg TDS
- For patients who are not dependable about taking oral drug, depot preparations are available;
 - fluphenazine decanoate 25 mg IM monthly
 - haloperidol decanoate 50 mg IM monthly
 - clopenthixol decanoate 200 mg IM monthly
 - flupenthixol decanoate 40 mg IM monthly.

Caution: Aim to use lowest dose that is therapeutic in cases of long term use to minimize risk of side effects.

Refer If

- Poor compliance
- Inadequate dosage/therapeutic treatment up to 6 weeks

- Misdiagnosis.

Admit

- If patient is severely disturbed, violent or catatonic.

Patient Education

- Compliance to therapy is important to prevent relapses
- Relatives should bring the patient to the hospital at early signs of relapse
- Drugs may have to be taken for a long time depending on response.

13.10. SLEEP DISORDERS

Insomnia is difficulty in initiating or maintaining sleep, leaving patient feeling unrested. Insomnia can be a symptom of most other psychiatric and physical disorders which should be excluded. Rule out use of addictive drugs (caffeine, etc).

Management

- Hypnotics eg. diazepam 5–10 mg nocte for 1–2 weeks and then taper off. Caution Avoid chronic use (over 30 days) of hypnotics.

Refer If

- No response in 4 weeks.

OTHER SLEEP DISORDERS

- Hypersomnia (narcolepsy/cataplexy):
 - complains about excessive sleep without any demonstrable cause.

Management

- Forced naps at regular times of the day
- Methyl phenidate 30 mg morning and 20 mg midday until symptoms disappear, maximum dose 60 mg daily.

13.11. SUICIDE ATTEMPTS

Unsuccessful attempt by one to end one's life.

Clinical Features

Suicidal threats. May occur in the following conditions: Depression, schizophrenia, under influence of alcohol/drugs, under severe social problems or stress, personality disorder. Often the attempted suicide itself is the first symptom.

Management

- ADMIT PATIENT

- Urgent restoration of physical fitness

- Once patient's life is out of danger, take a full history without accusing the patient. Treat the patient with understanding and respect. An emphatic approach is very important if you are to win the confidence of the patient so that he/she will be able to tell you the true story

- Assessment of seriousness of the attempt: Every suicide attempt should be regarded as serious. A successful attempt may follow. Do not regard an attempt as just attention seeking. Factors indicating seriousness include:

- patient living alone, divorced or single
- history of a relative committing suicide
- chronic incurable physical illness
- suspicion of or diagnosis of cancer or AIDS
- presence of a suicidal note
- attempt done in a place unlikely to be discovered
- impotence in males and infertility in females
- continuous difficulty in sleeping (insomnia)
- alcohol and drug abuse – continuous social problems
- whether patient regrets having failed to die
- if tablets taken, did the patient believe the dose was lethal
- previous attempted suicide
- failure to succeed, particularly at examinations.

Refer If

- Any of the above symptoms present
- Has a mental illness
- Has difficult social problems.

13.12. VALUE OF ELECTRO-CONVULSIVE THERAPY (ECT)

- Shortens hospital average length of stay, where necessary, e.g. elderly patients, puerperal patients
- Alternative treatment where side effect of psychotropic drugs are to be avoided, e.g. elderly patients, pregnant mothers
- Suicidal patients
- Refractory mental illnesses where there is an indication.

Classical indications

- major depressive disorder;
 - psychosis
 - suicidal attempts
 - stupor
- Schizophrenic stupor
- Bipolar mood disorder (manic episode) refractory to pharmacotherapy.

Management of side effect of anti-psychotic drugs

• For extra Pyramidal Side Effects (EPSE) and Anticholinergic side effects, administer tabs Benzhexhol Hydrochloride 2–5 mg TDS PO.

OR

Biperiden tabs 2–4 mg TDS PO.

14. MUSCULOSKELETAL CONDITIONS

14.1. ARTHRALGIA, NON-SPECIFIC

Joint pain without features of inflammation.

Clinical Features

General malaise, joint pains, joint mobility not affected, joint not red, not warm, not tender or only slightly tender. Usually it is a feature of another illness and careful systemic examination is warranted.

Investigations

- None except for the illness of which arthralgia is a feature.

Management

- Acetylsalicylic acid 300–600 mg 6–8 hourly (children 75–100 mg/kg/day QDS) or paracetamol 1 gm TDS (children 40 mg/kg/day QDS).

Daily Cost of Some Analgesics (KShs.)

14.2. GOUT

A metabolic disorder due to hyperuricaemia. Causes are **primary** or **secondary** (e.g. myeloproliferative, lymphoproliferative disorders, haemolytic anaemia, polycythaemia; tumour lysis syndrome following cytotoxic therapy and thiazide diuretics).

Investigations

- Uric acid may or may not be elevated
- Haemogram, ESR, WBC elevated.

ACUTE GOUT

Excruciating joint pain, usually single joint commonly the big toe. Pain becomes more severe as attack progresses, but subsides spontaneously in 4 days. Tophi are found primarily in the pinna, and overlying olecranon bursa. There is erythema and warmth over the affected joint.

Management

- Indomethacin 75 mg orally STAT, then 50 mg QDS till 24 hours after relief, then 50 mg 8 hourly for 48 hours then 25 mg 8 hourly for 48 hours OR
- Colchicine 0.5 mg hourly till patient improves or GIT side effects or maximum of 6 mg has been taken.

INTERCRITICAL GOUT

Defined as period between attacks. Initially intercritical periods are long but later acute attacks occur more frequently. If arthritic attacks frequent, renal damage present or serum uric acid significantly elevated, serum uric acid should be lowered. Maintenance: Colchicine should be started before manipulation of uric acid. Colchicine 0.5–0.6 mg BD should be started a few days prior to initiation of uric acid lowering drugs. Allopurinol 300 mg OD is drug of choice.

ASYMPTOMATIC HYPERURICAEMIA

Management

- No drug treatment is needed
- Weight reduction
- Avoidance of alcohol
- Avoid heavy consumption of purines, e.g. roasted meat.

TOPHEOUS AND GOUTY ARTHRITIS

Deposition of crystal deposits in cartilage, tendons, soft tissue. In 90% of cases there is renal involvement.

Management

- Allopurinol 300 mg per day or probenecid 250 mg BD
- Colchicine prophylaxis should be initiated before starting allopurinol.

Refer If

- Renal impairment
- Uric acid nephrolithiasis
- No response to therapy.

14.3. OSTEOARTHRITIS

This is a degenerative joint disease characterised by cartilage degeneration and bone hypertrophy at the articular margins. It is chronic but does present commonly with acute– on – chronic flares.

Clinical Features

Pain, stiffness, immobility and “cracking” of the joints. Pain worse towards end of day. Joint tenderness, bony swelling, loss of full range of movement and crepitus on movement, Heberden's nodes. Joints commonly involved are cervical and lumbar spines, the knees and hip as well as the hands and feet. It may also occur secondarily in response to severe or chronic joint injury (e.g. after fractures).

Investigations

- Haemogram, ESR
- X-ray, Joints – loss of joint space, osteophytes, marginal bone lipping and bone cysts.

Management

- Resting of joints, including use of crutches: involve physiotherapist
- Acetylsalicylic acid 300–900 mg TDS
- Indomethacin 25–50 mg TDS

Refer If

- Medical therapy fails to relieve pain
- Surgery is contemplated.

14.4. RHEUMATOID ARTHRITIS

Systemic disease of unknown aetiology, which is symmetrical, peripheral, polyarthritic, most commonly involving the small joints of hands, wrists, metatarsophalangeal joints, ankles, knees and cervical spine.

Clinical Features

Symmetrical peripheral polyarthritis mostly of small joints (warm, painful, stiff, swollen). Stiffness worse in the morning. Muscle wasting. Deformity, ulnar deviation, boutonniere deformity. **Extra–Articular:** fever, weight loss, lassitude, anaemia, subcutaneous nodules, splenomegaly, lymphadenopathy, keratoconjunctivitis, pericarditis, pleuritis.

Investigations

- Haemogram –moderate hypochromic, microcytic anaemia; or leucopaenia in Felty's syndrome
- ESR – elevated
- X-ray, especially hands and/or any other involved joint
- Rheumatoid factor
- Antinuclear antibodies.

Management

Outpatient:

- Physiotherapy
- Acetylsalicylic acid 600–900 mg 8 hourly (children 75–100 mg/kg QDS), 6 or 4 hourly preferably after food **OR** with antacid **OR** indomethacin 25–50 mg TDS (not recommended in children).

Refer If

- Deformities are present (seek surgical opinion)
- Disease not responding to non-steroidal anti-inflammatory (NSAIDs)
- Systemic organ involvement.

Admit For

- Acute exacerbation
- Bed rest (may need to splint the affected joint)
- Intensive physiotherapy
- Systemic complications

Complications

All the systems are involved in this disease; this would need specialists attention as would the use of steroids or chloroquine. Refer patients.

JUVENILE RHEUMATOID ARTHRITIS (JRA)

Arthritis beginning at or before the age of 16 years. Similar to adult rheumatoid arthritis (RhA). Tends to affect large and small joints and may interfere with growth and development.

- **Classification:** Three types. Systemic (Still's disease), Pauciarticular types I&II and Polyarticular.

(Presentation is shown in the table below)

Type	Systemic disease	Pauciarticular (JRA)	Polyarticular (JRA)
Percentage	20%	40%	40%
RhF	-ve	-ve	+/-+ve/-ve
ANF	-ve	75%	
HLA B27		+/-+ve/-ve	-ve
Presentation	High fever, rash, splenomegaly, generalized	Type I: mainly male	As for adult rheumatoid arthritis.

	lymphadenopathy, serositis. striking leucocytosis and thrombocytosis	Type II: mainly female	
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Management

Supportive treatment is as for adults.

Drug treatment is similar to that in adult type except that aspirin is used with caution because of concerns of Reyes syndrome. For dosage see under adult treatment or paediatric schedule (annex B).

Prognosis

Overall prognosis is better than adult rheumatoid arthritis.

Complete remission occurs in 50–75% of patients.

Those with polyarticular and RhF positive have a less favourable prognosis.

NB: For osteomyelitis and septic arthritis see chapter 20 (orthopaedics).

15. NEONATAL CARE & CONDITIONS

15.1. NEONATAL ASPHYXIA & RESUSCITATION

A newborn who fails to establish regular breathing and appears blue and or pale is likely to have asphyxia.

Apgar scoring is used for assessing the degree of asphyxia.

Clinical Features	score		
	0	1	2
Heart rate (per minute)	Absent	Less than 100	Over 100
Respiration effort	Absent	Irregular, slow	Regular
Muscle tone	Limp(floppy)	Some flexion of arms, legs	Well flexed, active motion
Reflex irritability (nasal catheter)	No response	Some motion, grimace	Cries
Colour	Blue, pale	Pink body, blue extremities	Completely pink

Causes of neonatal asphyxia and anoxia include placental accident (abruptio placentae), cord prolapse and cord compression, maternal administration of drugs which depress respiration (e.g. pethidine), prolonged labour and difficult delivery.

Clinical Features

Irregular foetal heart: Foetal bradycardia or tachycardia (normal foetal heart; 120–140/min). Meconium stained liquor. Low APGAR score: less than 5 at 5 minutes.

Management – APGAR Over 2

- Apgar score 8–10 – none
- Apgar score 5–7;
 - clear the airway
 - provide oxygen by mask over the face

- Apgar score 3–4 heartbeat below 100/minute;
 - clear the air way
 - ventilation by bag and mask, pressure 20–25 cm of water at a rate of 30 breaths per minute.

Management – APGAR 0–2

Usually blue and limp with heart rate below 100 per minute the baby should be resuscitated in a warm heated room:

- Suction of nasal and oral pharynx
- Use laryngoscope if possible for suction of oral pharynx
- Give oxygen by bag and mask
- Heart rate: If less than 60 per minutes do cardiac massage
- If no spontaneous respiration intubate
- Establish IV line

If the mother had received pethidine:

- Give naloxone 0.01 mg/kg/IV STAT
- Give sodium bicarbonate 2 mEq/kg IV STAT
- Give 10% dextrose 10 ml/kg slowly

If the heart rate is still below 60 per minute:

- Epinephrine 0.05–0.1 ml; concentration 1:1,000 IV STAT.

Complications

Low Apgar at 1 minute. Recover well with successful resuscitation.

Low Apgar at 5 minutes may end up with having cerebral palsy and/or convulsions.

15.2. CARE OF THE NORMAL NEWBORN

- Suction of the mouth and oral pharynx
- Apgar scoring
- Look for any congenital malformation
- Weigh the baby
- Wrap in dry linen
- Keep warm

- Instill tetracycline eye ointment within 1 hr in both eyes once.

Baby friendly initiative

- The infant should join the mother as soon as possible
- Breastfeeding should start within the first ½ hr
- Baby who cannot breastfeed should receive expressed breast milk by cup and spoon
- Babies should be fed on demand at least 8 times/24 hrs
- No food supplement within the first 6 months unless with advice from health worker
- Bottle feeding should be discouraged
- Breastfeeding should be continued up to 2 yrs if possible
- HIV positive mothers who have chosen not to breastfeed should be encouraged to cuddle their babies.

15.3. BIRTH INJURIES

Birth injuries may be classified as: Intracranial injuries, soft tissue injuries, nerve injuries, bone injuries, organ injuries. Intracranial injuries are the most serious. They may result in cerebral palsy and/or epilepsy. Brain damage is most often due to brain asphyxia. Organ damage is uncommon. The lungs may be ruptured during resuscitation causing pneumothorax and surgical emphysema. Rupture of diaphragm may cause severe respiratory distress. Liver, spleen and adrenal damage may cause severe bleeding and associated hypovolaemic shock.

BIRTH INJURIES

Injury	Causes	Clinical Features	Investigations & Management
HAEMORRHAGES			
Sub-arachnoid haemorrhage	Direct injury, anoxia, bleeding disorders (e.g. haemorrhagic disease of the newborn)	Most cases asymptomatic, localised neurological signs, convulsions, infant appears normal in-between the convulsions.	LP (with care!) Vit. K – 0.5 mg IM STAT Daily sub-dural taps (remove 10–15 ml of fluid from each side daily)
Sub-dural haemorrhage	Direct intracranial injury with tear of dura, falx.	Lethargy, poor feeding. Convulsions, Respiratory distress (apnoea).	Vit. K Platelets if indicated Daily taps as above.
Intra-ventricular haemorrhage	Prematurity It occurs in 40–50% of babies below 1500 gms. Intra & post-partum anoxia.	Apnoeic attacks. Respiratory distress, Convulsions, Fever	Vit. K Conservative (supportive) Careful handling & minimal disturbance

COMPLICATIONS OF INTRACRANIAL HAEMORRHAGE INCLUDE HYDROCEPHALUS, CEREBRAL PALSY, EPILEPSY

SOFT TISSUE INJURY

Cephalohaematoma	Collection of blood between periosteum and skull bones due to trauma during delivery	swelling over the skull – confined to one bone. Does not cross midline Bilateral or unilateral	Leave alone to slowly subside but may become infected calcified or lead to jaundice or anaemia.
Sternomastoid tumour	Tear of sternomastoid muscle during delivery (especially breech).	Lump on the side of neck appearing within first two weeks. May cause muscle shortening	Gentle passive physiotherapy to prevent deformity.
NERVE INJURIES			
Facial nerve injury	Compression of facial nerve in instrument delivery	Affected side smooth with wide open eye. Mouth drawn to normal side.	Cover open eye, recovery usually spontaneous
Brachial plexus injury (Erb's paralysis)	Stretching of C5, C6 with or without haemorrhage in the nerve.	Affects muscles of shoulder and elbow with extension of elbow, pronation of forearm and flexion of the fingers (Waiters tip position)	Restart for 1 week to allow healing and subsiding of oedema. Passive movements of shoulder elbow and wrist during feeds
Klumpke's paralysis	Nerve stretching of C7, C8 and T1.	Flaccid paralysis of the hand and wrist often with associated ipsilateral Horner's syndrome (Miosis, ptosis & anhidrosis)	Splint hand in neutral position. Passive movements (if persists more than three months possible exploration and repair)
BONE INJURIES			
Skull	Very rare.	Depression fracture of skull may occur.	Heals spontaneously.
Clavicle		Usually diagnoses when a lump of callus forms. No treatment is required in the second or third week.	
Long bones			Healing takes place so readily that only minimal splinting is necessary, even where there is misalignment.

15.4. BORN BEFORE ARRIVAL (BBA)

- Baby should be kept warm if cold

- Ensure the cord is properly clamped and not bleeding
- Do a thorough physical examination
- Take swabs for culture and sensitivity from the cord, ears, nose, mouth, arm pits, axillary and inguinal regions
- Swab the cord with spirit
- Give antibiotics if there is sign of infection
- Use crystalline penicillin 50,000 IU/kg BD and gentamicin 2.5 mg/kg BD
- Apply 1% tetracycline ointment in both eyes once.

15.5. CONGENITAL ANOMALIES

HYDROCEPHALUS

An increase in the volume of cerebro–spinal fluid (CSF) within the ventricular system (may be communicating or non–communicating).

Clinical Features

Uniform enlargement of the head before birth causing obstructed labour or developing insidiously after birth. Prominent dilated scalp veins. Wide, bulging and tense fontanelles. Brow overhangs the roof of orbit. Crack–pot sound when the head is percussed (Macewen's sign). Clear margin of sclera beneath the upper lid (setting sun sign). Wide sutures. Nystagmus is common. Transillumination is positive later.

Investigations

- Skull X–ray is useful
- CT scan where possible.

Management – Pharmacologic

- To decrease CSF production (acetazolamide, frusemide, ethacrynic acid), but of little efficacy.

Management – Operative

- A shunt from the ventricle to the atrium or peritoneal cavity inserted in a specialised centre.

Contraindications to referral (surgery)

- Multiple congenital abnormality
- Large hydrocephalus associated with spina bifida with paralysis
- Severely infected chest, anaemic, blind and vomiting patients.

SPINA BIFIDA

This results from failure in development of vertebral arches and is frequently associated with mal–development of the spinal cord and membranes.

There are two main types: Spina bifida occulta, spina bifida cystica.

SPINA BIFIDA OCCULTA

Clinical Features

Many cases are symptomless and are undiagnosed. In other cases the patient may present with: <ul style="list-style-type: none">• Nocturnal enuresis• Foot-drop• Persistent urinary tract infections	There may be tell-tale signs on the back such as: <ul style="list-style-type: none">• Lipoma• Dimple• Tuft of hair (hypertrichosis)• Naevus• Telangiectasia
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Investigations

- X-ray of full spine will show absent lamina on one side or bilaterally
- Myelogram may be useful to rule out associated conditions such as diastematomyelia.

Management

- The patient should be referred to a neurosurgeon in a specialised centre.

SPINA BIFIDA CYSTICA

There is a defect in the spine-laminar segment.

Clinical Features

- All cases are obvious as a mass on the back: Many cases are born as still-births
- Meningocele and meningo-myelocele can be transilluminated.

Management

- This is by operative closure in a specialised centre.

Contraindications to referral (surgery)

- Spina bifida with severe paralysis
- Associated severe hydrocephalus or other neural defects
- Severe infections (local or systemic).

CLEFT LIP

Cleft lip and cleft palate may occur singly or in combination. Cleft lip results from abnormal development of the medial nasal and maxillary processes during their development. This may present as unilateral, bilateral or median cleft lip (rare). These clefts may be complete or incomplete.

CLEFT PALATE

Cleft palate results from a failure of fusion of the two palatine processes. These again may be unilateral, bilateral or median.

Management

The aim of treatment is to prevent or diminish the complications and hence achieve:

- Normal appearance
- Well aligned teeth
- Normal sucking and swallowing
- Normal speech and normal hearing.

Timing

Operations may be done soon after birth: gives best aesthetic results between 6–12 weeks. This is the optimum timing as other congenital abnormalities have been excluded, baby is showing steady weight and is safe for anaesthesia. **The haemoglobin should be at least 10 gm/dl.** Cleft palate repair is best at 12 – 15 months.

Refer

- All children with cleft lip and palate to a specialist. The parents must be assured that the results of operation are good.

Complications

Effects on functions

- Sucking: Sucking is greatly affected by cleft palate. Cleft palate babies need to be fed by a cup and spoon
- Speech: Speech development is impaired
- Hearing: Acute and chronic otitis media are common especially in unrepaired cleft palate, due to poor ventilation and drainage of middle ear through the eustachian tubes, **deafness may ensue.**

TRACHEO-OESOPHAGEAL FISTULA (TOF)

This is an anomaly in the development of the oesophagus where there usually is a proximal atresia (with a distal tracheo-oesophageal fistula. 85%).

<p>This condition is an emergency. It must be diagnosed within the first 48 hours of birth</p>

Clinical Features

- The new born baby regurgitates all its first and every other feed
- Saliva drools continuously from the mouth
- Attacks of coughing and cyanosis (choking) during feeding
- Abdomen distends especially at the epigastrium (due to swallowed air in the stomach).

Investigations

- Insert a soft neonatal nasogastric tube through the mouth. An obstruction occurring 10 cm from the lips is diagnostic. DO NOT FEED
- 1 ml of Dianasil (water soluble contrast) **and not barium** is injected down the tube, radiographs demonstrate an obstruction. Suck out the contrast after the examination.

Management

Once diagnosis is made, do the following:

- Put the baby in a warm incubator
- Place in head-up position to prevent gastric juice reflux
- Start a broad spectrum antibiotic treatment intravenously
- Start intravenous therapy: Dextrose solution/half strength darrow's solution
- Institute intermittent suction/continuous drainage using the N/G tube to clear the secretions from the pouch.

Refer For

- Operative repair as this is the only cure. The baby should be transported under the above circumstances to a specialist centre equipped for this type of operation.

It is important to communicate on telephone with the respective surgeon before any movements are made

NB:

- There are certain congenital abnormalities commonly associated with TOF. These are vertebral, anal, tracheo-oesophageal and renal abnormalities, generally referred as VATER Syndrome.
- Surgery may be carried out immediately after birth in a well baby. In some other cases gastrotomy is necessary to allow time for correction on intercurrent conditions. Inform parents/guardian accordingly.

ANORECTAL MALFORMATIONS

ANAL ATRESIA

Clinical Features

The child is born without anal opening. This should be detected during the routine examination of a newborn. There are two groups: **high** and the **low**. A careful differentiation should be made as the treatment differs. Congenital abnormalities are frequently multiple: a careful general examination of the baby is an important prerequisite.

Investigations

- It is urgent and important to determine whether the abnormality is high or low. Do an X-ray (Invertogram) 6 hours after birth (air has collected in the large intestine). This X-ray may have to wait for 24 hours for rectal gas to collect.

Procedure of doing the invertogram

- Strap a coin on the site of anus
- Hold the infant upside down for 3–5 minutes
- Put the thighs together and parallel to one another
- Take a radiograph and measure the distance between the metal coin and the shadow in the rectum. If the distance is over 2.5 cm the abnormality is high OR draw a line on the radiograph from the tip of coccyx to the pubic crest (pubo–coccygeal line). If the gas shadow is above the line, the abnormality is high.

Management

High abnormalities

- Nasogastric suction
- Intravenous fluids
- Keep baby warm
- Refer to a specialised centre for surgery'.

Low abnormalities

These are easy to diagnose, simple to treat and the out look is good. There are 4 types of low imperforate anus.

- **The stenosed anus** the opening is in the normal position but very minute. The first treatment is careful dilatation with well lubricated hegar dilators and thereafter digital dilatation. The mother is taught how to dilate the anus
- **The ectopic anus** the anus is situated anteriorly and opens in the perineum in boys or vagina in girls. A careful search will reveal the low subcutaneous opening. This should be distinguished from the high vaginal opening of fistulae. The treatment is pull through operation. **Refer the baby for this after resuscitation**
- **The covered anus:** the treatment is as for stenosed anus
- **The membranous anus:** treatment is a cruciate incision.

Refer If

- Child has high abnormality
- Child has ectopic anus.

15.6. INFANTS OF DIABETIC MOTHERS

Infants of diabetic mothers and those mothers who later develop diabetes share certain common characteristics; large size, high foetal mortality rates. Infants of diabetic mothers are also subject to perinatal asphyxia, congenital anomalies, hypoglycaemia, hypocalcaemia, hyperbilirubinaemia, Respiratory Distress Syndrome (RDS), polycythaemia and feeding problems.

Investigations

- Blood sugar
- Serum calcium
- Bilirubin
- Haematocrit.

Management – General

- Close co-operation between obstetrician and paediatrician
- Maintain normoglycaemia in the mother [see 18.2.6. diabetes in pregnancy]
- Decision on timing of delivery is made in consultation with the obstetrician.

During delivery

- Obtain sample of amniotic fluid for culture
- Assess infant on basis of Apgar score
- Clear airway
- Keep baby warm
- Obtain cord sample for blood sugar
- Dextrose 10% 5 ml/kg OR dextrose 50% 1 ml/kg IV slowly STAT
- Evaluate infant especially for congenital abnormalities.

In nursery

- Keep baby warm
- Monitor:
 - blood sugar at 1, 2, 3, 6, 9, 12, 24, 48 hrs
 - calcium levels at 6, 12, 24, 48 hrs
 - haematocrit at 1 & 24 hrs
 - bilirubin levels at 24 & 48 hrs
- Oral dextrose 10% 60 ml/kg/day to all babies
- If hypoglycaemic (blood sugar <2.2mmol/L)
 - dextrose 10% 10 ml/kg STAT OR dextrose 50% 2 ml/kg IV STAT then IV dextrose 10% 60 ml/kg/24 hrs
- If hypocalcaemic (serum calcium <7 mg%)
 - 3 ml/kg of 10% calcium gluconate slowly IV STAT
- If haematocrit >65%

– partial exchange transfusion 10–20 ml of fresh plasma/kg

- Jaundice [see **15.7. neonatal jaundice**].

Refer If

- Congenital malformation(s) is/are present.

15.7. NEONATAL JAUNDICE

PHYSIOLOGICAL JAUNDICE

Many babies have some jaundice in the first week of life. This is referred to as physiological jaundice and has the following characteristics:

- Appears about third day. Peak levels 5–8 mg/dl (85–135 $\mu\text{mol/L}$) in term babies. Reduces to normal in about a week
- Peak levels of 10–12 mg/dl (170–205 $\mu\text{mol/L}$) in preterm babies. Falls to normal about 10 days
- Levels >12 mg/dl in term babies and >15 mg/dl (>255 $\mu\text{mol/L}$) in preterm require investigation.

NON-PHYSIOLOGICAL JAUNDICE

Common and important causes:

- ABO incompatibility, ie;
 - mother group O – baby A or B
 - mother group A – baby B or AB
 - mother group B – baby A or AB
- Rhesus incompatibility mother Rh–ve baby Rh+ve
- Sepsis.

In ABO and Rhesus incompatibility jaundice may appear from the first day, whereas in sepsis it usually appears after the third day.

Investigations

- Hb. Packed Cell Volume (PCV) and Peripheral Blood Film(PBF)
- Determine mother and babies blood group
- Serum bilirubin levels; Direct and Indirect
- Appropriate cultures if sepsis suspected.

Management

- In most cases of physiological jaundice only observation is required. Ensure adequate feeding and hydration

- Phototherapy – indications:

- babies with rapidly rising bilirubin levels
- all jaundiced babies with blood groups or Rhesus incompatibility
- term babies with bilirubin level >300 µmol/L (15 mg/dl)
- preterm babies with bilirubin level >200 µmol/L (10 mg/dl).

Phototherapy is not an alternative to blood exchange transfusion where it is indicated.

- Exchange transfusion – indications:

- severe haemolytic disease and whenever bilirubin levels approach neurotoxic levels.

Below is a rough guide:

NEUROTOXIC BILIRUBIN LEVELS

Birth weight	Bilirubin level
? 1000g	10 mg/dl (170 µmol/L)
1001–1250 g	12.5 mg/dl (210 µmol/L)
1251–1500 g	15 mg/dl (255 µmol/L)
1501–2000 g	18 mg/dl (305 µmol/L)
? 2500g	20 mg/dl (340 µmol/L)

The following factors predispose to development of kernicterus. In their presence exchange transfusion will be required to be done at a lower level: sepsis, prematurity, acidaemia, hypothermia, administration of sulphonamide, hypoglycaemia.

Exchange transfusion

The exchange transfusion should be carried out over 45 – 60 minutes period alternating aspiration of 20 ml of infant blood and infusion of 20 ml of donor blood. Small aliquotes (5 – 10 ml) may be indicated to sick and premature infants. The goal should be an exchange of approximately 2 blood volumes of infant (2x85 ml/Kg). Ensure aseptic environment.

Complication

Kernicterus: Brain damage due to deposition of bilirubin in the basal ganglia and brain stem nuclei.

Risk of kernicterus is increased in preterm infants with high bilirubin concentrations, low serum albumin concentrations or those on certain drugs such as ceftriaxone and aspirin.

Fasting respiratory or metabolic acidosis and sepsis also increase the risk.

Diagnosis

Symptoms include lethargy, poor feeding and vomiting, opisthotonos, oculogyric crisis seizures and death may follow.

Later mental retardation, cerebral palsy, hearing loss and learning disorders.

Management [see jaundice above].

15.8. PRETERM INFANT

An infant who has not finished 37 weeks of intrauterine life. **Cause:** of prematurity in most cases is not known. **Maternal:** Acute febrile illness, malaria, pneumonia, chronic diseases and uterine abnormality. **Foetal:** Malformations. Infection. Placental malformations. Induced abortions.

Problems associated with prematurity:

- Poor thermal regulation, hypothermia
- Respiratory: RDS, apnoeic attacks, aspiration
- Feeding – hypoglycaemia
- Infections
- Hyperbilirubinaemia
- Congenital malformations.

Management

- General physical examination:
 - age and maturity
 - whether AGA, LGA, SGA
 - congenital abnormalities
- Keep warm: cotton wool, heated room, kangaroo baby (maternal warmth), incubator where available
- Feeding:
 - should be done within the first 3 hours to avoid hypoglycaemia
 - use;
 - a nasogastric tube for those below 1.5 kg
 - cup and spoon 1.5 kg to 1.8 kg
 - breast feed if above 1.8 kg
- Give:
 - multivitamins 2.5 ml/day
 - iron supplement 6 mg/kg/day after age of 2 weeks
- IM vitamin K 0.5 mg STAT
- Rectal aminophylline 6–8 mg/kg/day
- Monitor for apnoeic attacks
- Look for infections.

FEEDING CHART

Amount of milk to give every 3 hours (ml)								
DAY:	1	2	3	4	5	6	7	8 or more
BIRTH-WEIGHT (KG)								
1.0–1.4	8	10	15	20	25	30	30	35
1.5–1.9	10	15	20	25	30	40	45	50
2.0–2.4	15	20	30	35	40	50	55	65
2.5–2.9	20	25	35	40	50	60	70	75
3.0–3.4	20	30	40	50	60	70	70	75
3.5–3.9	25	35	45	60	70	80	80	80

15.9. APNOEIC ATTACKS

Cessation of breathing for 15–20 seconds. This may be due to prematurity, sepsis, hypoglycaemia, hypoxaemia, hypothermia, hyperthermia.

Clinical Features

Apnoea. Bradycardia. Pallor. Cyanosis. Hypotonia. Metabolic acidosis.

Investigations

- Screen for sepsis
- Haemogram
- Blood glucose levels.

Management

- Frequent monitoring
- Gentle shaking of the infant during individual spell
- If frequent give continuous oxygen by nasal catheter
- Give oxygen by bag and mask in cyanosed
- Rectal IV aminophylline 5–7 mg/kg/day in 3 divided doses
- IV 5% dextrose drip 60 ml/kg/day
- Avoid oral feeding due to aspiration
- Treat the cause if known.

15.10. RESPIRATORY DISTRESS

Neonatal respiratory distress is due to failure to maintain adequate exchange of oxygen and carbon dioxide due to a variety of reasons. It is characterized by: Tachypnoea, respiration rate more than 60 per minute, expiratory grunt and cyanosis, intercostal, subcostal and sternal recession, flaring of alae nasi. These features may be present at birth or develop within hours of birth. This may be due to Respiratory Distress Syndrome

(RDS), pneumonia, aspiration of meconium or feeds, transient tachypnoea of newborn, congenital heart disease, diaphragmatic hernia.

Features that may assist in diagnosis include:

- **RDS** More common in premature babies, following Caesarian section, in infants of diabetic mothers and in multiple pregnancy. Chest X-ray shows a reticulogranular pattern.
- **Pneumonia** History of prolonged rupture of membranes (more than 24 hours) and maternal fever, offensive liquor or vaginal discharge.
- **Meconium aspiration** Meconium stained liquor and staining of skin, nails and cord
- **Transient Tachypnoea of newborn** Difficult to differentiate from RDS but usually in term/near term babies
- **Diaphragmatic hernia** – CXR.

Management

- Oxygen should be administered to relieve cyanosis
- Fluid and electrolyte balance should be maintained through an IV line
- Babies with more than mild distress should not be fed. IV 10% dextrose at 60 ml/kg/day should be used instead
- Antibiotics: As infection cannot usually be excluded, start a course of crystalline penicillin 50,000 units/kg BD and gentamicin 2.5 mg/kg BD
- IM vitamin K 0.5 mg as a STAT dose.

Refer

- To paediatrician for further management.

SEPSIS AND MENINGITIS

Have similar aetiology, epidemiology, clinical manifestations and pathogenesis. Characterised by symptomatic illness and bacteraemia. In meningitis the CSF contains low sugar, increased cells and protein, bacteria or bacterial antigens. Common organisms are *E. coli* and *group B streptococcus*, which together cause 50–75% of cases. Other organisms are *Staph aureas*, *Klebsiella-enterobacteriaceae sp.*, *Pseudomonas aeruginosa*, *Proteus*, and *Listeria monocytogenes*.

Clinical Features

Temperature instability. Jaundice. Respiratory distress. Lethargy. Vomiting. Abdominal distension. In meningitis irritability and convulsions.

NB Bulging fontanelle and stiff neck are absent in 75% of neonates with meningitis

Investigations

- Blood – HB, PBF especially immature WBC Blood – C&S
- CSF – Microscopy, C&S
- Urine – Microscopy, C&S

- Obtain simultaneous blood sugar to rule out hypoglycaemia which is common in neonates.

Management

- Immediate antibiotic therapy (after collecting samples)
- Crystalline penicillin 50, 000 units/kg BD and gentamicin 2.5 mg/kg BD
- Amikacin 7.5 mg/kg BD is indicated in hospital acquired infections.

If suspecting

- Staphylococcus sepsis – start cloxacillin 25 mg/kg BD and gentamicin 2.5 mg/kg BD
- Sepsis – therapy should be continued for a total of 10–14 days or at least 5–7 days after clinical response where there is no evidence of deep tissue sepsis or abscess formation.

Treatment for meningitis should be continued for 3 weeks.

Prevention

- Increased and improved pre–natal care
- Regular cleaning and decontamination of nursery equipment
- Sound hand–washing principles
- Regular surveillance for infection.

Complications

Significant neurological sequelae: Hydrocephalus, blindness, mental retardation, hearing loss, motor disability, abnormal speech patterns.

16. NEOPLASMS

Patients with suspected malignancies should be urgently referred to appropriate consultants.

16.1. NEOPLASMS IN CHILDHOOD

Neoplasms can occur in any age group. In general most will require to be treated in a referral hospital. The common childhood malignancies are listed below.

Tumour	Clinical Features	Investigations	Management
Leukemias	Anaemia Bone pains Haemorrhagic tendencies, epistaxis and gum bleeding Repeated infections	Haemogram Bone marrow	Refer to haematologist for specialised care
Burkitt's Lymphoma	Usually a jaw tumour	Biopsy of the mass;	Refer for specialised

	May also present as an abdominal mass OR Central Nervous System tumour	Hemogram, Bone marrow, X-ray Lumbar puncture	care
Hodgkin's Disease	Lymph node enlargement, usually cervical Splenomegaly abdominal masses	Hemogram Chest X-ray Lymph node biopsy Bone marrow	Refer for specialised care
Nephroblastoma (Wilms' tumour)	Average age 2 years: Embryonal tumour Early childhood Painless loin mass (abdominal mass) Fast growing	Full haemogram U/E in normal IVU (Intravenous urography) shows displaced calicynes FNAC shows malignant embryonal tumour cells CXR for metastasis	Refer to specialised care Chemotherapy Surgery –nephrectomy with post surgical chemotherapy has good prognosis
Neuroblastoma	Embryonal tumour Abdominal mass in loin region Markedly elevated blood pressure Fast growing often crossing midline Child is sick looking	Full haemogram IVU shows caudally displaced normal kidney FNAC–malignant embryonal cells Ultra sound shows supra renal tumour with normal kidney CXR – look for metastasis, 24 hr urine – VMA grossly elevated	Refer to specialist centre Chemotherapy Surgery NB: – challenging anaesthesia – has poor prognosis
Dysgerminoma	Commonest midline tumour in neonatal period Commonest in ovary, testis, thymus, sacrococcygeal (most dramatic – teratoma) Presents with pressure symptoms May ulcerate especially when malignant	Plain X-ray may show calcification U/S – defines extent/site of tumour Foetoprotein tumour marker	Surgical excision; – if benign, leave alone; – if malignant, chemotherapy Good prognosis
Rhabdosarcoma/Rhabdomyo–sarcoma	Tumour of muscle; can occur anywhere commonest in pelvis; bladder, vagina may present with a fungating mass (sarcoma botryoid) May ulcerate and bleed	Good physical examination: Full haemogram U/S, CXR CT scan when available biopsy FNAC	Surgery Chemotherapy Poor prognosis
Retinoblastoma			

	Age usually below 3 years Inherited through chromosome 13 May be unilateral or bilateral Yellowish whitish reflex	Skull X-ray Urine catecholamines Fundoscopy CT scan head	Refer to ophthalmologist for specialised treatment
CNS Tumours	Headache, Convulsions, Vomiting, Papilloedema Disturbance of gait & vision	X-ray skull CT scan	Refer to neurosurgeon

16.2. NEOPLASMS IN ADULTS

Tumour	Clinical Features	Investigations	Management
Cancer of the oesophagus	Progressive dysphagia Regurgitation Weight loss Anaemia	Haemogram; iron deficiency anaemia Ba. Swallow; shouldering, rough mucosa, rat tail appearance Endoscopy; visualise and biopsy tumour CXR'	Curative: Oesophagectomy in early presentation Palliative: Nutritional support Intubation Radiotherapy
Gastric cancer	Anorexia Weight loss Anaemia Vomiting/haematemesis Pain Epigastric mass Melaena stool	Haemogram; iron deficiency anaemia Occult blood in stool Barium Meal; filling defects in the stomach Endoscopy; visualise and biopsy	Gastrectomy; various types Palliative in late cases; nutrition, pain relief
Colorectal cancer & Anal cancer	Change in bowel habits; constipation, diarrhoea, frequency changes Blood in stool Anaemia Tenesmus Weight loss Lower abdominal mass	Haemogram; iron deficiency anaemia Occult blood in stool Barium Enema; double contrast preferred Sigmoidoscopy and colonoscopy; visualise and biopsy tumour	Colectomy Chemotherapy Radiotherapy Palliative: Colostomy or Bypass surgery for intestinal obstruction (in advanced disease)
Breast cancer	Breast lump Nipple changes; discharge, retraction, ulceration Skin changes (<i>peau d'orange</i>) Skin ulceration Pain	Mammography FNAC Biopsy Excisional biopsy	Mastectomy Chemotherapy Radiotherapy Hormonal manipulation
Melanoma	Suspect where naevus shows: A Asymmetry B Border irregularity C Colour variegation D Diameter >6 mm Ulceration Regional lymphnodes	Biopsy: Wide excision punch biopsy CXR Abdominal U/S	Surgery: Wide excision Regional node dissection Metastatic lesions Adjuvant radiotherapy

	Jaundice Chest symptoms		Biologic (BCG)
Squamous cell ca. of skin [see also skin ulcers in chapter 241]	Non-healing ulcers Bleeding pain Lymph nodes	Biopsy: Wide excision incisional biopsy X-rays of bones CXR	Surgery is mainstay of treatment Radiotherapy
Kaposi's sarcoma (KS)	Indolent Kaposi's Sarcoma: Nodular skin lesions Fungating nodules Bone involvement Lymphadenopathic KS: Lymph nodes Visceral involvement GIT symptoms. AIDS related Kaposi's. Sarcoma (very aggressive) KS: Skin nodules mucous membranes, mouth palate, ENT lesions Lymphadenopathy Paraplegias Any organ can be	Biopsies Full blood count HIV screen CXR; pleural effusions Abdominal X-ray CT scan (as indicated); chest, abdomen, brain, etc.	Include: Localised radiation Chemotherapy * Refer to specialised centres

16.3. HEAD AND NECK CANCERS

Majority present with neck mass(es) or cervical lymphadenopathy. Lymph node biopsy SHOULD NOT be taken because:

It promotes metastases treatment of metastatic nodes cannot be effected until the primary site has been identified and biopsied.

TUMOUR SITE	CLINICAL FEATURES	INVESTIGATIONS	MANAGEMENT
Nose and paranasal sinuses	Nasal blockage, rhinorrhoea, epistaxis, nasal mass, facial swelling, paraesthesia, headaches, proptosis and neck node(s)	Refer for: CT scan EUA and biopsy	Refer to ENT specialists
Nasopharynx	Nasal obstruction, epistaxis	Refer for EUA and biopsy	
Oropharynx	Sore throat, mass, pain radiating to the ear, trismus. bleeding	Refer for EUA and biopsy	
Hypopharynx	Pain on swallowing radiating to the ear, increasing dysphagia, nodes and hoarseness,	Barium swallow Refer for endoscopy and biopsy	
Larynx	Persistent hoarseness, stridor, cough Neck nodes appear late	Refer for endoscopy and biopsy	

17. NUTRITIONAL AND HAEMATOLOGIC CONDITIONS

HAEMATOLOGY

17.1. ANAEMIA

Patients with anaemia have a reduction in total red blood cell mass, decreased concentration of red cell (RBC) and haemoglobin (Hb) in the peripheral blood and a corresponding decrease in the oxygen carrying capacity of the blood.

Normal Hb

Newborns	14 g/dl
Children aged under 5 years	10 g/dl
Children aged 5–9 years	11 g/dl
Children aged 9 years and above	12 g/dl

Anaemia except in the newborn may therefore be classified as follows:

- Severe below 5 g/dl
- Moderate 5–8 g/dl
- Mild above 8 g/dl

Common causes of anaemia in Kenya are:

- **Haemolysis** due to infections especially malaria and haemoglobinopathies. especially sickle cell disease.
- **Iron deficiency** due to chronic blood loss, nutritional deficiency and intestinal parasites e.g. hookworm.
- **Bone marrow depression** (aplastic anaemia) due to e.g. chronic illness or infection.

Clinical Features

Meticulous history is essential e.g. history of previous hospitalization for sickle cell, blood loss due to menorrhagia. Irritability, listlessness, anorexia, easy fatigability. Pallor of the mucous membranes (conjunctivae, lips and tongue) nail beds and palms. There may be splenomegaly and a short, soft, apical "haemic" systolic murmur. Severe cases may present in heart failure and shock.

Investigations

- Hb estimation
- Thin blood film examination for cell morphology and blood parasites
- Stool for ova of helminths, occult blood
- Full haemogram
- Sickling test/Hb electrophoresis
- Bone marrow

- Urinalysis.

Management

- Identify the cause and treat
 - Malaria:
 - Give a full course of an appropriate antimalarial drug. Thereafter give antimalarial prophylaxis [see **12.2. malaria**] for 3 months. If the spleen is palpable continue prophylaxis until it is not palpable.
 - Iron: Give iron orally if;
 - the anaemia is mild or moderate
 - the child is malnourished and not on antibiotics or soon after the completion of antibiotics
 - review the child and check the Hb every two weeks.

Dose: 6 mg/kg/day of iron. Ferrous sulphate 30 mg contains 6 mg of elemental iron

Adults: ferrous sulphate 200 mg TDS

 - If patient is not able to tolerate oral iron or if compliance is poor consider iron dextran as total dose infusion
- Dose of iron dextran (Adults) iron (mg)=(normal – patients Hb) x weight (kg) x 2.21 + 1000. Give as total dose infusion.
- This also replenishes body stores of Iron
- Folic Acid: Give to all patients who have malaria and anaemia. Dose:
 - below 2 years of age 2.5 mg daily for three months
 - above 2 years of age 5 mg daily for three months
 - continue with the doses **once** weekly as for malaria prophylaxis above
- Hookworm treatment:
 - Give albendazole 400 mg STAT for adults
 - 200 mg STAT for children or levamisole 2.5 mg/kg as single dose
- Sickle cell anaemia:
 - Folic acid, malaria prophylaxis [see **3.2. malaria**]
 - DO NOT GIVE Blood transfusion unless patient develops cardiorespiratory distress (nasal flaring, intercostal or subcostal retractions, heart failure, grunting).

- **Blood transfusion**

Blood transfusion:

- Use blood only when required to save life
- Do not transfuse based on Hb alone, but also on the clinical status of the patient

Transfuse patient if the Hb is less than 5 g/dl AND there is ALSO:

- high fever
- severe infection
- heart failure
- severe symptoms e.g. grunting, intercostal or subcostal retractions, shock, nasal flaring, very rapid breathing or in adults; orthostatic hypotension, dizziness.

Transfuse any patient if the Hb is less than 8 g/dl AND there is ALSO:

- more than 20% blood loss (more than 1 litre in an adult)
- active bleeding with shock, hypotension, cold extremities, slow capillary refill.

Refer If

- An infant requires exchange transfusion
- You cannot give blood transfusion for any reason
- Anaemia is due to persistent or recurrent bleeding which cannot be easily controlled
- Anaemia has not improved after one month of supervised treatment (Hb should increase by 2–4 g/dl in one month)
- Anaemia recurs within 6 months of full treatment.

Admit patients with

- Severe anaemia
- Active and severe bleeding
- Anaemia and/or jaundice and aged below 2 months
- The anaemia (any degree of severity) is accompanied by pneumonia, heart failure, dizziness, confusion, oedema, severe malnutrition.

Advise to mothers

- Give enough protein foods e.g. meat, fish, groundnuts, beans and protective foods like dark green leafy vegetables and fruits.

SICKLE CELL DISEASE (ANAEMIA)

A chronic haemolytic anaemia found mainly in Nyanza, Western and Coast provinces, characterised by sickle-shaped RBCs as a result of homozygous inheritance of HBS. In HBS, amino-acid valine is substituted for glutamic acid in the position 6 of the β -chain. This Hb polymerises at sites of low Partial Pressures of

Oxygen (PO₂) and the RBCs assume the 'sickle shape' and adhere to vascular endothelium and plug small capillaries and arterioles leading to occlusion and infarction.

Because sickled RBCs are too fragile and cannot withstand the trauma of circulation, haemolysis occurs in the small blood vessels. These abnormal RBCs are also destroyed within the spleen.

Presentation

- Impaired growth and development
- Susceptibility to infections (malaria, H. influenza, pneumococcal)
- Anaemia and mild jaundice
- Hepatosplenomegaly in young children
- Bone pain (especially long bones in children)
- Pain and swelling of the hands and feet (hand and foot syndrome)
- Arthralgia with fever may occur
- Avascular necrosis of the femoral head is common
- Severe abdominal pain with vomiting
- Occlusion of major intracranial vessels may lead to hemiplegia. cranial nerve palsies and other neurological deficits
- Acute Chest Syndromes (sudden onset of fever, chest pain leucocytosis and pulmonary infiltrates on x-ray) may be fatal.
- Tower shaped ("bossing") skull.

Investigations

- Full haemogram to include peripheral smear. Hb,
- Sickling test
- Hb electrophoresis
- X-ray:
 - long bones; cortical thinning, irregular densities and new bone formation.
 - Skull bone – widening of diploic space

Management

Transfuse for very severe anaemia (aplastic crisis, infections)

Sickle cell crisis

There are three types: thrombotic (vaso-occlusive, painful or infarctive), aplastic (sequestration) and haemolytic.

Management of the crises

- IV or oral fluids

- Analgesics given regularly. In the acute phase if pain is severe, give narcotic analgesics (eg. Pethidine 0.5–2mg/kg 4hrly)
- Treat infections vigorously and promptly if present
- Give prophylaxis for malaria (see malaria)
- Give supplementary folic acid but **AVOID** iron.

17.2. BLOOD TRANSFUSION

- Blood must be given immediately at the time that it is needed. Re-evaluate the patient immediately prior to transfusion to ensure that blood is still required to save life
- Only use blood which is free of HIV, has been properly grouped and cross matched and is in the correct bag labelled for the patient
- Remove the bag of blood from the Blood Bank refrigerator just before transfusion
- Never transfuse blood which has been out of the refrigerator for more than one hour or out of the donor for more than 21 days
- Give frusemide (1 mg/kg STAT) IV at the beginning of the transfusion (but only if the patient is NOT actively bleeding). If patient has heart failure, give frusemide immediately; do not wait until blood is available [see **annex b paediatrics dosage**]
- Give antimalarial drugs (full course) to all patients having blood transfusion
- For children, the volume of blood to be transfused [V] may be determined by use of the formula:

$$V = 6WD \text{ if whole blood is used}$$

OR

$$V = 3WD \text{ if packed red cells are used}$$

where W is the weight of the child in kilograms and D is the Hb deficit, ie. the difference between the initial Hb before transfusion and the desired Hb for age after transfusion

- Neonates less than one week old who may require **exchange** transfusion should be referred
- Transfusion of adults requires a minimum of 2 units of blood. Transfusion of only 1 unit in an adult is probably not needed.

Transfusion Reactions

If the patient develops fever, skin rash or becomes ill, then:

- Stop blood transfusion immediately
- Give chlorpheniramine 5 mg IV STAT **OR** 5 mg 1M STAT (children 0.4 mg/kg STAT)
- Return blood to the bank with a fresh sample of patient's blood
- Monitor urine output
- Monitor cardiovascular & renal function

- If hypotension develops start IV fluids.

NUTRITION

17.3. FAILURE TO THRIVE

A child fails to gain weight or continues to lose weight for no apparent reason. Causes: **Non-organic** Poor nutrition, poor child care e.g. lack of active feeding and emotional deprivation. **Organic** Chronic illnesses; TB, HIV, parasitic infections. Congenital malformations; cleft palate. Endocrine abnormalities; hypothyroidism, diabetes. Metabolic disorders: rickets.

A complete history including nutritional, social and growth monitoring is essential. Do a thorough physical examination.

Investigations

- Stool for ova and cysts
- Blood smear for malaria
- Haemogram
- Urea and electrolytes
- Urinalysis.
- Mantoux test
- CXR—to rule out chronic chest infections

Management

- Treat the cause if known.

Refer If

- No apparent cause.

17.4. GROWTH MONITORING AND NUTRITION

Serial weight checking and recording in the growth chart should be done as part of Maternal and Child Health (MCH) programme. On the Child Card the upper line represents the 50th centile for boys and lower line 3rd centile for girls. Each infant has his/her growth curve, but if a child drops from his/her curve the reason should be investigated.

BREASTFEEDING

All infants should be breastfed unless there is medical contraindication.

• Advantages of Breastfeeding:

- economical
- always available

- at the right temperature
- prevents diarrhoea and other infections
- has the necessary nutrients
- emotionally satisfying to both mother and infant
- free of contamination
- reduces incidence of allergy

- Mother should be prepared and counselled for breastfeeding during antenatal and postnatal periods

HOW TO FEED YOUNG CHILDREN WELL

Birth to 6 months	9 Breast milk ONLY . Breastfeed as often as the child wants day and night at least 8 times in 24 hrs. • No other food or milk or fluid for healthy babies except medicines including ORS when indicated.
6 to 12 months	• Breastfeed on demand introduce enriched complementary foods like <i>uji</i> mixed with milk, sugar or oil Mashed green vegetables, and proteins (fish meat egg chicken) Also give fresh fruit juice or mashed fruit. Feed – 3 times a day if breastfed – 5 times a day if not breastfed
13 to 24 months	• Breastfeed on demand • Continue Energy rich foods at least 5 times a day

What should be done if a child does not grow well:

Poor growth is detected by the regular use of the growth chart. As soon as a slowing growth is detected **action** must be taken. The advice given to a mother depends on the age of the child. The advice must be practical – the mother must be able to do what she is told. The following are good examples of messages that can be given to mothers if their child's growth starts to slow down.

Signs of growth problems requiring further evaluation are:

- Children whose weight has not increased in the last 2 months even though the advice on feeding practices had been followed by the mother/care giver
- Sick children who are not gaining weight adequately. (Of course, sick children may need to be referred immediately for other reasons)
- Children whose weight is well below the bottom line on the chart
- Children with any sign of swelling of the feet and face (Kwashiorkor) or have severe wasting (marasmus).

When a child does not grow well: Assess for nutritional status

Classification	Signs
Normal	No low weight for age and no other signs of malnutrition
Very low weight	Very low weight for age Poor weight gain

Severe malnutrition	Visible severe wasting, buggy pant sign Oedema of both feet
---------------------	--

When a child does not grow well: Recommendations for parents

AGE	GROWTH CHART SHOWS	RECOMMENDATIONS
0 to 6 months	No/poor weight gain for 1 month	Breastfeed as many times as possible, day and night. Check that mother is breastfeeding properly
	No/poor weight gain for 2 months	As above. In addition, the mother should be encouraged to eat and drink enough
7 to 12 months	No/poor weight gain	Breastfeed as often as child wants. Give adequate servings of enriched complementary feed at least 3 times a day if breastfed and 5 times if not breastfed
13 to 24 months	No/poor weight gain for 1 month	Feed family foods 3 times a day. Continue breastfeeding. Give snacks at least 2 times between meals
	No/poor weight gain for 2 months	Increase variety of foods. Give child things he likes. Take history and refer if necessary
>24 months and over	No/poor weight gain	Child should eat half as much food as his father Child should be encouraged to eat with other children but should have an adequate serving of food served separately. Take history and refer if necessary

NB:

- From 12 months onwards the child should be actively encouraged to feed

All children not gaining weight well and those who are sick should receive an extra feed per day upto 2 weeks after illness.

Watch the direction of the line showing the child's health

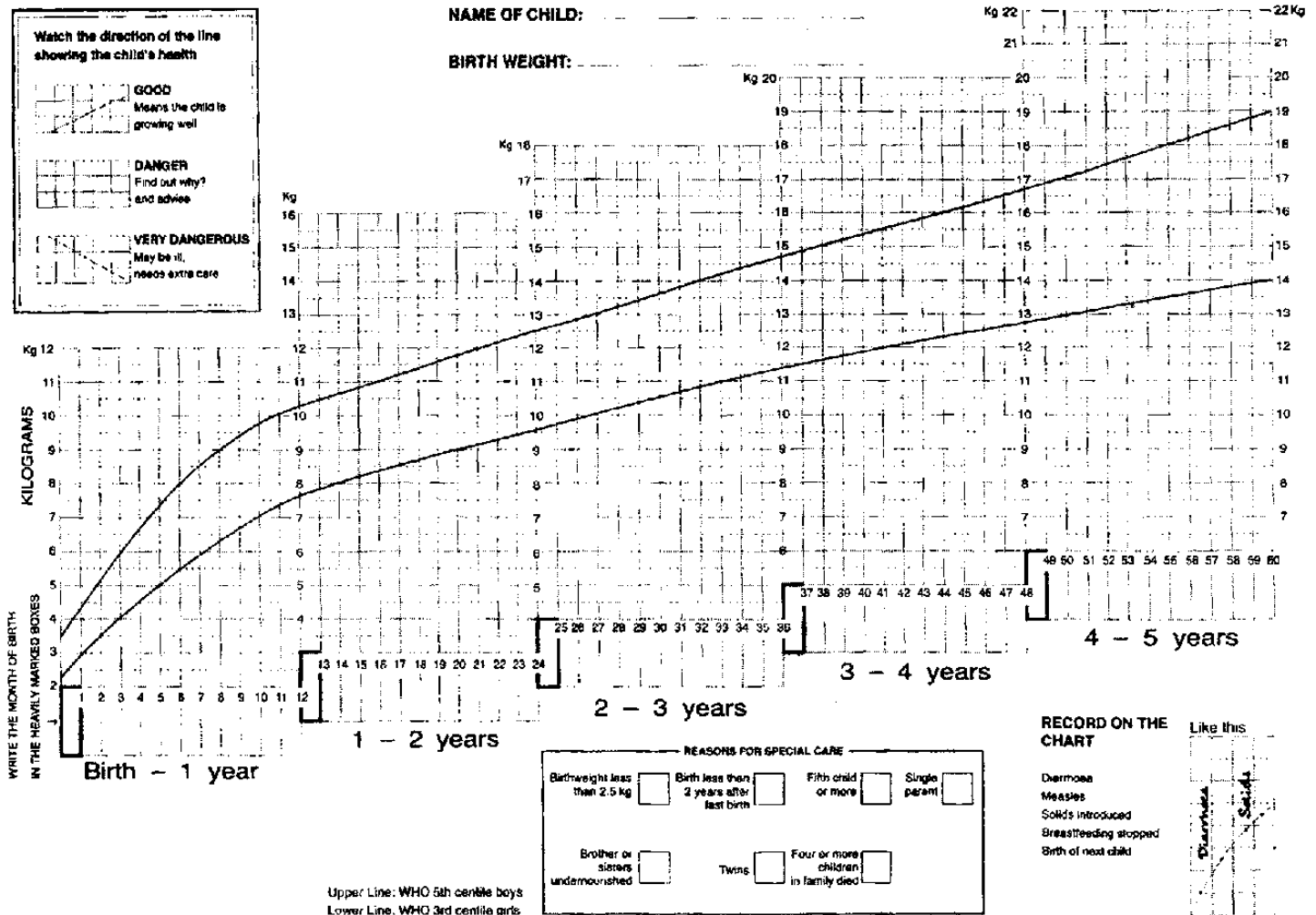
GOOD
Means the child is growing well

DANGER
Find out why? and advise

VERY DANGEROUS
May be ill, needs extra care

NAME OF CHILD: _____

BIRTH WEIGHT: _____



If child does not grow well:

- assess the child's feeding
- ask what the child is fed on
- ask how many times in a day
- counsel the mother on feeding (**see 17.4. table on feeding**)
- Review the progress of the child in 5 days
- Re-assess feeding
- Counsel mother about any new or continuing feeding problems
- Ask the mother to return 14 days after the initial visit to monitor the child's weight If child is very low weight for age
- Encourage the mother to continue feeding until the child gains appropriate weight for his age if after 14 days the child is no longer very low weight for age.

Exception:

If the child continues to loose weight or is not gaining weight consider TB, HIV infection among other problems.

Advice to Mothers

- Well babies less than 6 months old need no other milk or food apart from breast milk
- Adding oil, margarine or sugar and milk, egg or groundnuts makes 'uji' and other foods energy rich and helps young children grow well
- Feed often: small children have small stomachs (at least 5 times a day)
- Feed older children at least 5 times a day.
- Feed sick children at least one extra meal per day and continue for 1–2 weeks after they recover.

17.5. CHILD ABUSE & NEGLECT

Maltreatment of children or adolescents by parents, guardians or other caretakers. Early recognition is very important for prompt intervention.

Types:

- Physical abuse (non–accidental trauma) 70%. This includes bruises, burns, head injuries, fractures etc. Their severity can range from minor bruises to fatal injuries.
- Nutritional neglect or deliberate underfeeding 5%. This is a common cause of underweight in infancy. May account for a high percentage of cases of failure to thrive.
- Sexual abuse – 25% usually occurs with family members and is the most overlooked (or under reported) form of abuse.
- Others:
 - Intentional drugging (or poisoning)
 - Neglect of medical care.

Most child abusers (90%) are related caretakers who tend to be lonely, unhappy, angry and under heavy stress, many with similar experiences during childhood.

Abused children may have certain provocative characteristics, negativity, difficult temperament, offensive behaviour or disability

Types of sexual abuse include molestation, sexual intercourse and rape.

In nutritional neglect a 1/3 is due to accidental error in feeding habits and 2/3 of the cases are deliberate.

Presentation

Unexplained inconsistent injuries, delay in seeking medical help. Sexual abuse may remain concealed for fear of reprisal and not knowing where or to whom to report. Most victims report to a health facility due to acute stress, vaginal bleeding, STIs, UTI, anuresis, encopresis (faecal incontinence in absence of organic defect) or pregnancy.

Children with nutritional neglect present late with failure to thrive, poor hygiene, delayed immunisations, delayed speech, mental and social development.

Most abused children are shy, have expressionless faces and avoid eye–to–eye contact.

Investigations

- Thorough history and examination for all types of abuse. Indicate who accompanies the child.
- In physical abuse: Total skeletal survey (X-ray –may find fractures at various healing stages)
- Sexual abuse: Examine for sperms, acid phosphatase and infections e.g. gonorrhoea. Rape cases may require examination under GA to determine the type and extent of genital injury.
- Nutritional neglect. Must rule out all other causes of failure to thrive.

Management

- Should be medical/surgical, legal and psychological.
- Must immediately remove the child from the source of the abuse in order to protect the child until the evaluation of the family with respect to the safety of the child is completed.
- The offender requires psychiatrist evaluation
- Consider legal action

Rape/Sodomy:

- Sedation may be necessary with phenobarb 5–8 mg/kg/day or diazepam at 0.1 –0.25 mg TDS.
- Give prophylaxis for HIV/AIDS (see under HIV/AIDS).
- Surgical repair of injuries (sphincter injury which may require colostomy with secondary repair).

Prevention

High index of suspicion from health workers on likelihood of abuse. Encouraging the older children not to keep 'secrets' and to say 'no' especially in the case of sexual abuse.

Also not to leave the young children in high-risk situations.

Refer

- For long term psychological and psychiatric care.

17.6. MALNUTRITION

MICRO NUTRIENTS DEFICIENCY

Iron

The commonest sign of iron deficiency is anaemia (see **17.1. anaemia**).

Iodine

Iodine deficiency leads to deficiency of thyroxine hormone (see **7.2. hypothyroid**)

Vitamin A

A retinol ester, can either be ingested or synthesized within the body from plant carotene.

Its deficiency is a major cause of blindness among poor communities worldwide.

Vitamin A is important in:

- Epithelial membrane integrity
- Night vision
- Immunity
- Growth
- Reproduction
- Maintenance of life

Source:

- Animal products eg. Liver, milk, kidneys
- Dark green leafy vegetable.

Consequences of deficiency: Reduced immunity, keratinizing metaplasia of epithelial membranes, xerophthalmia, night blindness, keratomalacia and blindness.

Vitamin A supplementation has been shown to result in 23–34% reduction of all childhood mortality (6–59 months), 50% reduction in measles mortality and 33% reduction in diarrhoeal disease mortality.

Prevention of Vitamin A deficiency

Vitamin A supplementation in health (see **11. immunization**)

Disease targeted supplementation

Give a dose of Vitamin A for any of the following conditions:

- Malnutrition
- Diarrhoea
- Malaria
- TB
- Pneumonia
- Worm infestation
- Fever.

NB. Ensure that the child has not received Vitamin A in the last 1 month.

Treatment for xerophthalmia

Give Vitamin A on day 1, 2 and a third dose between 1–4 weeks after 2nd dose. Give children with measles vitamin A as for xerophthalmia.

MACRONUTRIENT MALNUTRITION

Presents as Protein Energy Malnutrition (PEM). PEM is a common disorder which covers a wide spectrum of deficiency in nutrition ranging from mild or underweight to severe forms like marasmus and kwashiorkor. The first sign of PEM is poor weight gain.

The Wellcome Classification of PEM

Weight	Oedema	
	Present	Absent
% of 50th centile		
80–60 <60	Kwashiorkor Marasmic–kwashiorkor	Underweight child Marasmus

Clinical Features

Kwashiorkor	Marasmus
Pedal oedema	Very low weight for age
Low weight	Gross loss of subcutaneous fat
Apathy	“Wise old man look”
Poor appetite	Good appetite (if no complications)
Muscle wasting	
Flaky paint dermatosis	
Hair changes (thin, sparse)	

MILD MALNUTRITION (Grade I)

Child <5 yrs who is failing to gain weight for 3 months and who is between 75–89.9% of the expected weight for age.

Management

- Bi-weekly attendance at the clinic
- Treat any intercurrent problem e.g. diarrhoea, pneumonia, malaria.

Admit

- For further assessment if no change after 3 months
- If child develops moderate to severe malnutrition.

Advice to mothers

- Nutrition counselling.

MODERATE MALNUTRITION (Grade II)

Child <5 yrs who is between 60–74.5% of the expected weight for age.

Investigations

- Blood slide for malaria parasites

- Stool for ova/cyst Hb, PBF
- Urinalysis – microscopy, C&S
- CXR – to rule out pneumonia and PTB
- Mantoux test.

Management

- **Admit child**
- Treat underlying disease eg. pneumonia, malaria
- Intensive feeding regime:
 - Calories – – 120–150 cal/kg/day
 - Protein 2–4 gm/kg/day

Give high protein, high calorie diet such as special milk with 1 calorie per 1 ml
- Folic acid 2.5–5 mg OD
- Ferrous sulphate 30 mg/kg/day

Advice to mothers

- Nutrition counselling.

SEVERE MALNUTRITION (Grade III)

Child who is <60% of expected weight for age or with generalised oedema.

Investigations

- Blood slide for malaria parasites
- Stool for ova/cysts
- Hb, PBF
- Urinalysis – microscopy, C&S
- CXR – to rule out pneumonia, PTB.
- Mantoux test

Management

- **Admit child**
- Intensive feeding regime:
 - high energy milk (via nasogastric tube if necessary). Start with 2 hourly feeds then reduce to 3 hourly. Increase from 100 to 200 ml/kg/24 hrs as tolerated

- Frequent spaced feedings throughout 24 hrs are essential to prevent hypoglycaemia
- Multivitamin syrup 2.5 to 5 ml OD for 1 month
- Folic acid 2.5–5 mg OD for 1 month
- Ferrous sulphate 30 mg/kg/day after infections have been treated.
- Give antibiotics:
 - cotrimoxazole 24 mg/kg BD for 5 days OR if sepsis crystalline penicillin 25,000 units/kg IM QDS and gentamicin 3–5 mg/kg IM TDS for 5 days
- Keep baby warm. Heat room, mother's warmth
- If hypoglycaemic give dextrose 50% 1 ml/kg IV STAT then 5% dextrose 2 ml/kg/hour
- Update immunizations
- Soak skin ulcers in Eusol solution
- **Mouth ulcers:** clean mouth with normal saline (or salt water) and apply Gentian violet. If already on other antibiotics add metronidazole 7.5 mg/kg TDS orally for 7 days
- Give Vitamin A
- Dietary education. Involve mother.

Prevention

- Appropriate nutritional advice in the MCH clinic
- Use of growth chart in the MCH clinic for all under 5 years
- Health education to mothers attending hospitals, on child rearing and appropriate feeding.

Advice to mothers

- Involve the mother in feeding the child i.e. encourage active feeding
- Advise mother on how to mix nutritious food from the 3 food groups.
- Show the mother how well the child is doing on the weight chart.

18. OBSTETRIC AND GYNAECOLOGICAL CONDITIONS

18.1. GYNAECOLOGY

18.1.1 Abortion (Miscarriage)

The OLD working clinical definition of abortion denotes termination of pregnancy before the 28th week of gestation. With advancement in modern neonatology the technical definition denotes termination of pregnancy to a foetus weighing less than 500 gm. There are many types:

THREATENED ABORTION Little vaginal bleeding and little or no lower abdominal pain; on vaginal examination the cervical os is closed, and the size of the uterus corresponds to the dates.
COMPLETE ABORTION Passed products of conception (conceptus) are complete and there is little or no bleeding and no pain. The cervical os is patulous, uterine cavity is empty and the uterus is well contracted.
INCOMPLETE ABORTION Heavy bleeding associated with cramping, labour like lower abdominal pains and the cervical os is open or products of conception (POC) are passed. It may be spontaneous or induced.
SEPTIC ABORTION Incomplete abortion associated with evidence of sepsis (fever, foul lochial discharge, pelvic pain and tenderness). There may have been interference with the pregnancy (induced, criminal). Shock may be worse than the blood loss would suggest.
MISSED ABORTION Spotting of dark blood with little or no pains. The cervical os is closed and the uterine size is smaller than gestational age. Signs and symptoms of pregnancy previously experienced are minimal or absent and there is no increase in abdominal girth.
THERAPEUTIC ABORTION Where the health of the mother and/or foetus is in jeopardy therapeutic abortion may be performed if recommended by two registered medical practitioners, generally a Psychiatrist and a Gynaecologist.
INDUCED ABORTION Abortion on demand is illegal in Kenya. Illegal induced abortion by mainly, unqualified medical personnel is associated with incompleteness, sepsis, genital injuries and death. Investigations and management is as for septic abortion. Repair to genital injuries is mandatory.
HABITUAL ABORTION Considered when three or more consecutive abortions have occurred in one patient.
MOLAR ABORTION Usually presents as a threatened or incomplete abortion. In the threatened stage, before the cervix opens, the diagnosis of hydatidiform mole is suspected if bleeding does not settle within a week of bed rest. The uterine size is larger than gestational age. Foetal parts are not palpable. Foetal movements are not felt at gestation 18–20 weeks.

THREATENED ABORTION

Clinical Features – see section 18.1.1 table

Investigations

- Hb
- VDRL
- Blood slide for Malaria Parasites (BS for MPs) in endemic malarial areas
- Blood group and X-match
- Urinalysis and microscopy
- An ultra sound examination (if available) can be helpful in excluding "Blighted Ovum" or hydatidiform mole and is very reassuring if normal intrauterine pregnancy is seen.

Management

- Bed rest at home
- For pain offer hyoscine butylbromide 20 mg TDS **OR** paracetamol 1 gm TDS for 5 days
- Sedation with phenobarbitone 30 mg TDS for 5 days **OR** diazepam 5 mg TDS for 5 days helps allay anxiety and enforce bed rest.

Admit

- If more bleeding and signs of progression to incomplete abortion occur.

Patient Education

- Return to hospital if features of progression to incomplete abortion intensify e.g. more bleeding
- Abstain from coitus for at least 2 weeks to prevent progression to incomplete abortion and risk of infection.

COMPLETE ABORTION

Clinical Features – see section 18.1.1 table

Investigations

- Are as for threatened abortion.

Management

- Resuscitate first with IV fluids (normal saline and dextrose) if the patient is in shock, consider blood transfusion if necessary
- Antibiotics; amoxycillin – clavulanate 625 gm BD **OR** tetracycline 500 mg QDS for 7 days and metronidazole 400 mg TDS for 7 days
- Ferrous sulphate and folic acid in standard dosage for appropriate period. Ferrous sulphate should be given after completing the course of tetracycline.

Admit If

- Significant blood loss occurs.

Patient Education

- If further pregnancy is desired, investigate further as under habitual abortion
- If further pregnancy is not desired, discuss and offer appropriate contraception.

INCOMPLETE ABORTION

Clinical Features ~ see section 18.1.1 table

Investigations

- As for threatened abortion.

Management

- Resuscitate with fluids (normal saline and dextrose) if the patient is in shock, consider blood transfusion if necessary
- Give Ergometrine 0.5 mg IM or IV STAT
- Remove POC from cervical os digitally or with ovum forceps

- Evacuate the uterus with manual vacuum aspiration (MVA) or by blunt and/or sharp curettage as soon as possible. Curettage may require sedation with pethidine 100 mg and diazepam 10–20 mg or para–cervical nerve block. MVA does not require sedation
- Antibiotics; amoxicillin–clavulanate 625 mg BD + metronidazole 400 mg TDS OR tetracycline 500 mg QDS + metronidazole 400 mg TDS for 7 days.

Patient Education

- As for complete abortion.

SEPTIC ABORTION

Clinical Features – see section 18.1.1 table

Investigations

- As for threatened abortion
- Blood cultures for patients in endotoxic shock.

Management

- Admit all cases having evidence of septic abortion
- Resuscitation as in incomplete abortion
- Give IV crystalline penicillin 2 mega units QDS and IV gentamicin 80 mg TDS + IV metronidazole 500 mg TDS **OR** chloramphenicol 500 mg IV/PO QDS for 7 days + metronidazole 500 mg TDS
- Evacuate the uterus soon after initial antibiotic doses.

Refer If

- Laparotomy is indicated where pelvic abscess develops.

Admit

- All cases having evidence of septic abortion.

Patient Education

- As in complete abortion.

MISSED ABORTION

Clinical Features – see section 18.1.1 table

Investigations

- As for threatened abortion
- Ultrasound where available will confirm intrauterine foetal death

- Bleeding and clotting time in case disseminated intravascular coagulopathy (DIC) has developed.

Management

- Antibiotics; amoxicillin–clavulanate 625 mg BD or crystalline penicillin 1 mega unit QDS for 7 days to prevent gas gangrene + metronidazole 500 mg TDS 7 days
- Evacuation of the uterus as in incomplete abortion
- In case complicated with disseminated intravascular coagulopathy (DIC) fresh blood transfusion is life–saving.

Refer If

- DIC develops.

Admit For

- Evacuation

Patient Education

- As for complete abortion.

HABITUAL ABORTION

Investigations

- As in threatened abortion
- Blood sugar
- Urine C&S
- Brucella titres
- Widal test
- Blood urea
- Pelvic U/S
- VDRL/RPR.

Management

- Correct any anaemia and ensure positive general health
- Treat positive VDRL serology plus spouse with benzathine penicillin 2.4 mega units IM weekly for 3 doses. More often a single injection will suffice. In penicillin sensitivity use erythromycin 500 mg QDS for 15 days
- Control blood pressure to normal pre–pregnant levels
- Ensure diabetes is controlled

- Cases of recurrent urinary tract infections need repeated urine cultures and appropriate chemotherapy
- Brucellosis positive cases need tetracycline 500 mg QDS for 3 weeks + streptomycin 1 gm IM daily for 3 weeks. If pregnant, substitute cotrimoxazole for tetracycline
- Offer cervical cerclage in cases of cervical incompetence
- Cases with poor luteal function need a progestin early in pregnancy e.g. oral gestanon 5 mg TDS for 5 days **OR** hydroxyprogesterone 500 mg weekly for 6 months.

Refer

- All cases of habitual abortion to a gynaecologist.

POST ABORTION CARE

Abortion is common and is often associated with serious medical and psychosocial complications/problems. Fertility may return soon (11 days) after an abortion. All women should have access to comprehensive quality services for the management of post-abortion complications. Post-abortion counselling, education and family planning services should be offered promptly to help reduce repeat abortions.

MOLAR ABORTION

Clinical Features

A mole usually presents as a threatened or incomplete abortion. In the threatened stage, before the cervix opens, the diagnosis of hydatidiform mole is suspected if bleeding does not settle within a week of bed rest. The uterine size is larger than gestational age. Foetal parts are not palpable. Foetal movements are not felt at gestation 18–20 weeks. Features of hyperemesis gravidarum, nausea, vomiting, ptyalism, etc are still present and severe after 3 months. When the cervix opens, passage of the typical grape-like vesicles confirms the diagnosis. Bleeding may be very heavy when a mole aborts spontaneously.

Investigations

- Positive pregnancy test in dilutions after 12 weeks gestation
- Confirmation is by ultrasound.

Management

- Treat the shock with IV fluids or blood as necessary
- Put up oxytocin drip (20 units in 1 litre of normal saline or 5% Dextrose at 60 drops per minute)
- Evacuate the mole with suction curettage, followed by sharp curettage of the uterine cavity. Send tissue for histology
- Give ergometrine 0.5 mg IV after evacuation and continue oxytocin drip
- Repeat sharp curettage 2 weeks later to make sure all remains of the mole have been evacuated and send tissues for histology
- Offer reliable contraception for 1 year: Pills, IUCD, DMPA (e.g. Depo provera) may be used
- Follow up monthly for pelvic examination and repeat pregnancy test.

Choriocarcinoma is suspect if there is:

- Recurrent bleeding
- The pregnancy test remains positive for 3 months after evacuation
- The pregnancy test becomes negative and positive again. Confirm by serum beta-HCG test.

Admit

- If diagnosis of molar abortion is suspected
- Choriocarcinoma is suspected.

Refer If

- Choriocarcinoma is suspected.

CHORIOCARCINOMA

If choriocarcinoma is confirmed as per protocol of management of hydatidiform mole, treatment depends on risk classification.

Criteria for high risk (poor prognosis)

- Duration of antecedent pregnancy event >4 months
- Beta HCG levels > 40,000 IU/ML
- Metastases to brain, liver or GIT
- Failed chemotherapy (recurrence)
- Following term pregnancy.

18.1.2 Ectopic Pregnancy

Ectopic pregnancy is a pregnancy outside the uterine cavity of which most are in the fallopian tube. Ectopic pregnancy is usually due to partial tubal blockage and therefore the patient is often subfertile. There are two types: **Acute** or **Chronic** (slow leak). The acute type may be ruptured or unruptured. Differential diagnosis include PID, appendicitis, abortion, and ruptured ovarian cyst.

Clinical Features

Acute Rupture Amenorrhoea 6–9 weeks. Abdominal pain of sudden onset. Shock and anaemia. Abdominal distension and tenderness. Shoulder tip pain due to haemoperitoneal diaphragmatic irritation. Cervical excitation present.

Chronic (Slow leak) Abdominal pain. Irregular PV bleeding, usually dark blood (amenorrhoea may be present). Anaemia, fainting attacks. Low grade fever may be present, usually rapid pulse. Low abdominal pelvic tenderness and possibly a mass.

Cervical excitation present.

Investigations

- Paracentesis of non-clotting blood is diagnostic in acute and some chronic cases
- Culdocentesis in experienced hands is positive with dark blood, especially in chronic cases
- Group and cross-match blood. Haematocrit and/or Hb estimation.

Management

- Start IV line with saline and plasma expanders after obtaining specimen for grouping and cross-matching to treat shock
- Emergency laparotomy
- Transfuse if necessary
- Routine salpingectomy of damaged tube is done. Make note of condition of the other tube and ovary in the record and discharge summary
- Where experienced gynaecologist is available, conservative management of affected tube should be attempted
- Discharge on haematinics
- Review in outpatient gynaecology clinic to offer contraceptives or evaluate further sub-fertility status.

Admit

- All patients suspected to have ectopic pregnancy.

18.1.3 Infertility

Infertility is usually defined as the failure to conceive after one year of sexual intercourse without contraception. It is divided into:

- *Primary*. The couple has never conceived despite of having unprotected intercourse for at least 12 months
- *Secondary*: The couple has previously conceived but is subsequently unable to conceive for 12 months despite unprotected intercourse.

Causes

- Tubal factor: Bilateral occlusion of fallopian tubes as a result of PID
- Male factor: Sperm duct are damaged as a result of previous STIs leading to abnormalities of sperm function
- Endocrine disorders
- Tropical diseases in male and females including leprosy, filariasis, schistosomiasis or tuberculosis
- Cervical mucus abnormalities
- Congenital disorders.

Any couple desiring children who do not achieve a pregnancy within one year of adequate exposure should have a systematic evaluation of their reproductive function.

Most patients will require detailed work-up thus refer patients to gynaecologist after a good history and examination rule out immediately treatable causes.

Since infertility results from female problems OR male problems, both partners should be prepared to undergo evaluation.

Diagnosis

- History from couple and individually
- Physical examination of both partners.

Investigations

- Basal Body Temperature
- Semen alysis
- HSG for tubal patency
- Hormone assays where indicated
- Dye laparoscopy.

Management

Definitive treatment depends on the cause as per the investigations above and may include:

- Counselling on sexual technique and fertility awareness
- Ovulation induction: Clomiphene citrate 50 mg OD for 5 days starting from day 2 of menstrual cycle
- Tubal surgery
- Vas surgery
- Assisted reproduction
- Adoption.

18.1.4 Pelvic Masses

NORMAL PREGNANCY

Is easy to discern from menstrual history, clinical signs and ultrasound if available.

DISTENDED URINARY BLADDER

Acute retention of urine is the commonest. It is commonly associated with acute urinary tract infection in young girls and may be associated with other pelvic tumours in older women. Catheterisation and appropriate antibiotic and culture will suffice in UTI.

UTERINE FIBROIDS

Clinical Features

Benign uterine growths: Sub-serous, interstitial or submucous. Occur commonly in age group about 30 years and above. Associated with nulliparity, low parity, sub-fertility and infertility. Present with features of mass in lower abdomen or dysmenorrhoea or heavy periods. Vaginal examination reveals a mass that is firm, nodular, non-tender and moves with the cervix. Diagnosis is essentially clinical.

Investigations

- Hb, VDRL, blood group, blood urea, urinalysis
- IVU in selected cases
- Hysterosalpingography in subfertile and infertility cases
- Ultrasound where facilities exist.

Management

- Treat associated pelvic inflammatory disease
- Correct any anaemia associated with menorrhagia by haematinics or blood transfusion
- Where fertility is desired plan myomectomy and where obstetric career is complete, plan hysterectomy with conservation of one ovary in women under 45 years of age.

PELVIC ABSCESS AND TUBAL-OVARIAN MASS: [see 18.1.7 PID]

Essentials of diagnosis.

- History of pelvic infection
- Lower abdominal and pelvic pain
- Nausea and vomiting
- Tender adnexal mass
- Fever and tachycardia
- Rebound tenderness

Investigations

- Haemogram, ESR. urinalysis, U/E, blood sugar, group and cross-match
- U/S
- culdocentesis

Management

- Parenteral broad spectrum antibiotics [**see 18.1.7. PID**]
- Surgical: Laparotomy and drainage/excision.

OVARIAN CYSTS

Clinical Features

Can occur in any group. Normal menses in simple cysts. Abnormal menses including amenorrhoea in functional cysts. May undergo torsion to cause acute pain. Diagnosis is essentially clinical.

Investigations

- Hb, Urinalysis
- Plain abdominal X-ray may be useful in calcified tumours and some dermoid cysts
- Ultrasound where facilities exist.

Management

- Cysts greater than 8 cm need laparotomy
- Cystectomy or salpingo-oophorectomy and histology.

Patient Education

- Annual pelvic examination or ultrasound.

NEOPLASMS

May present as pelvic masses. [see 18.1.6 Neoplasms].

18.1.5 Menstrual Disturbances

Most women suffer some form of menstrual disturbance in their life time. Common types are mentioned here.

AMENORRHOEA

Amenorrhoea means the absence of menstruation for 2 cycles or more. It is a symptom and not a disease. Primary amenorrhoea refers to a patient who at any age has never menstruated. Secondary amenorrhoea refers to cessation of the periods after menstruation has been established. Two varieties are cryptomenorrhoea and true amenorrhoea (primary and secondary).

CRYPTOMENORRHOEA

Clinical Features

The menstrual fluid is retained in the body. Commonest variety seen is imperforate hymen occurring at menarche (12–14 years) with cyclic abdominal pains. Vulval inspection will reveal bluish bulging hymen. There may be or may not be lower abdominal mass.

Management

- Admit to hospital for cruciate incision, which is a cure for imperforate hymen. **Follow up** is not necessary.

TRUE AMENORRHOEA

True amenorrhoea can be physiological as in before puberty, during pregnancy, during lactation and after the menopause or pathological.

Clinical Features

Depend on age of presentation in physiological type and level of disturbance in pathological type.

Investigations

- In physiological type. A good menstrual history and physical examination is sufficient: a pregnancy test or ultrasound are sufficient to diagnose early pregnancies
- In the pathological type investigations focus on uterine lesions, ovarian lesions, pituitary disorders, other endocrine disorders, psychiatric illness or emotional stress and severe general illness.

Primary amenorrhoea is investigated after age 18 and secondary amenorrhoea at any age when 6 or more cycles are missed. Refer to a gynaecologist.

Management

In physiological amenorrhoea, reassurance is sufficient. In pathological type, management depends on the cause.

DYSFUNCTIONAL UTERINE BLEEDING (DUB)

Normal menstrual period lasts 2–7 days, average 3–5 days. Normal cycle lasts between 21–35 days. Menorrhagia is excessive bleeding at the menstrual periods. Polymenorrhoea refers to frequent cycles shorter than 21 days. Epimenorrhoea refers to frequent and heavy periods. Metrorrhagia refers to irregular uterine bleeding independent of or in between regular periods.

Dysfunctional Uterine Bleeding refers to those cases in which the bleeding is neither due to some obvious local disorder, such as pelvic infection or new growth, nor to some complication of pregnancy. This denotes some form of hormonal imbalance to be confirmed or excluded on MVA histology and hormonal assays. Metropathia haemorrhagica describes periods of amenorrhoea of 6–12 weeks followed by prolonged spotting 2–4 weeks and on curettage and histology there is cystic glandular hyperplasia.

Clinical Features

- Irregular periods associated with anovulation are commonest at puberty and perimenopause and at some stage during reproductive years, (14–44 years). Menorrhagia may be associated with anaemia and poor health.
- Associated features: At puberty ascertain changes in climate and environment, examinations, stress, and intercurrent illness and pregnancy. In reproductive years exclude abortion or ectopic pregnancy, and fibroids. In perimenopausal years exclude pregnancy, uterine and cervical cancer.

Investigations

- Haemoglobin estimation is mandatory in cases with menorrhagia
- Pregnancy test
- Curettage and histology
- HSG and semen analysis in those with associated infertility.

Management

- At puberty re-assurance may suffice

- Irregular periods with associated anovulation need hormonal therapy at any age. Those with associated infertility can be given ovulation inducers such as clomiphene after HSG and semen analysis, those not desiring children can have cyclicity of periods re established using contraceptive pills for 3 cycles. Those with metropathia haemorrhagica can have spotting stopped with norethisterone 5 mg OD for 10 days. Withdrawal bleeding is taken as normal period and pill started **OR** norethisterone (progestin) 5 mg BD or TDS 19–26 days of cycle, for 3 cycles
- Manage cases of fibroids and genital cancer as appropriate
- Those with pregnancy complications can be similarly managed, as appropriate
- Those with anaemia require transfusion or haematinics with iron and folate in standard doses
- Sometimes and more often, curettage is curative but it may be so in patients amenable to spontaneous cure.

Follow up is as appropriate.

DYSMENORRHOEA

Pre or intra-menstrual pain, sufficient to interfere with the woman's normal occupation. May be associated with nausea, vomiting and disturbance of bowel function. There are 2 types: **Primary** or **Secondary**.

PRIMARY DYSMENORRHOEA (Spasmodic or intrinsic, membranous)

Clinical Features

It is the commonest type of dysmenorrhoea, occurring in girls or young women less than 20 years of age. The pain is spasmodic or colicky in nature. It starts on first day, may last a few hours or throughout the period. It may be associated with nausea, vomiting and/or diarrhoea or constipation. It may be incapacitating and interfere with normal daily activity.

Diagnosis

- Good history and examination to rule out concurrent illness.

Investigations

- Haemoglobin estimation in cases of anaemia.

Management

- Re-assurance
- Counsel on stress and treat as appropriate
- Analgesics: Aspirin 600 mg TDS, paracetamol 1 gm TDS or ibuprofen 200 mg TDS
- Suppression of ovulation by use of contraceptive pill for several cycles. e.g. microgynon
- MVA or D&C are not recommended in young girls as a remedy
- In a majority of cases, pain may cease after first delivery.

Follow up is as appropriate.

SECONDARY DYSMENORRHOEA

Clinical Features

Secondary to organic disease e.g. PID, fibroids and associated infertility. Features of underlying cause. Often the pain precedes the onset of a period by a week to 10 days.

Investigations

- In line with underlying cause.

Management

- Treat underlying cause.

Follow up Is appropriate to underlying cause.

PRE-MENSTRUAL TENSION SYNDROME

Clinical Features

Premenstrual discomfort in lower abdomen and back 7–10 days preceding menses. Gives sensation of distension or pelvic engorgement. There is relief after flow begins. Accompanied by nervous irritability, depression, headache, listlessness and discomfort in breasts. Occasional fluid retention. Good history and physical examination is important in diagnosis.

Management

- Re-assurance
- Mild tranquillisers; phenobarbitone 30 nocte or diazepam 5 mg nocte
- Norethisterone (progestin) 5 mg BD orally 19–26 days of cycle for 3 cycles.

18.1.6 Neoplasms

OVARIAN CANCER

Clinical Features

Usually occurs in women of age 40 years and above. Usually presents late with mass in lower abdomen. Pain and irregular vaginal bleeding are late features. Ascites and wasting are further late features. In late cases the mass is usually irregular and fixed. Diagnosis is essentially clinical.

Investigations

- Hb, blood group, urinalysis, blood urea
- Ultrasound
- IVU
- Ascitic tap for cytology
- Fine needle aspiration and cytology (FNAC)
- Laparotomy for biopsy and histology and staging.

Management

- Improve general health with high protein diet and transfusion in some cases
- Palliative surgery in inoperable cases and staging
- Total abdominal hysterectomy and bilateral salpingo–oophorectomy in operable cases
- Chemotherapy in addition to surgery, drugs available include vinblastine, Cisplatin
- Surgery is the mainstay treatment.

Refer If

- Surgery is required for operable cases.

Admit For

- Confirmation of diagnosis.

Prevention

- Annual pelvic examination and/or pelvic ultrasound.

CERVICAL CANCER

This is the most common gynaecological cancer. **Risk factors** are early age of first coitus, multiple sexual partners, spouse with multiple sexual partners, high parity, human papilloma virus, herpes simplex type II.

Clinical Features

Commonest in age group 30 and above. Post–coital bleeding. Post–menopausal bleeding. Foul smelling vaginal discharge. Intermenstrual PV bleeding. Many patients present late with advanced disease. Pain, anaemia, cachexia are late presenting features. Diagnosis is confirmed by histology.

Investigations

- Speculum examination shows easily bleeding lesion on the cervix
- Hb
- Biopsy.

Management

- General supportive care e.g. correction of anaemia
- Examination under anaesthesia is undertaken for staging and biopsy of the lesion for confirmation by histology
- Treatment is supportive, surgery and/or radiotherapy.

Refer

- To a specialist as appropriate

- If histology confirms malignancy.

Admit For

- Investigations if cancer suspected.

Prevention

- Avoid risk factors
- Annual pap smear for early detection.

High index of suspicion is essential as early detection is important

VULVAL CARCINOMA

Accounts for 3–4% of all gynaecological cancers.

Clinical Features

Majority of the patients present after the menopause. It may be preceded by pruritic conditions of the vulva. Presents as an ulcer on the vulva. May have inguinal lymphadenopathy. Diagnosis is by clinical features and confirmed by biopsy and histology. Differential diagnosis include: Granuloma inguinale, lymphogranuloma venereum, syphilitic chancre or gummata and chancroid.

Management

- Suspicious lesions should be referred to gynaecologist
- Treatment is by surgery (Radical vulvectomy)
- Extent of surgery will depend on the primary tumour
- Radiotherapy and chemotherapy and surgery for advanced disease.

CARCINOMA OF THE VAGINA

1% of gynaecologic malignancies. Peak incidence is from age 45 to 65.

Clinical Features

Post coital bleeding, dyspareunia, watery discharge, urinary frequency or urgency or painful defecation. Tumour commonly found in the upper of the vagina on posterior wall.

Investigations

- Pap smear: reveals carcinomatous cells
- Schiller's Test
- Biopsy.

Management

- Depends on location and extent of the disease

- A tumour localised in the upper 1/3 of the vagina is treated either by radical hysterectomy with upper vaginectomy and pelvic lymph node dissection or with radium and external radiotherapy
- Treatment of secondary carcinomas and 1 ° carcinoma is usually combined and may be either radiotherapy or radical surgery. The 5 year survival rate without recurrence is about 30%.

18.1.7 Pelvic Inflammatory Disease (PID)

Pelvic inflammatory disease is the inflammation of pelvic structures above the cervical os. It is essentially a consequence of STI (Gonorrhoea and Chlamydia trachomatis), but can follow puerperal sepsis or abortion. Gonorrhoea and Chlamydia trachomatis principally results in endosalpingitis whereas puerperal and post-abortion sepsis result in exosalpingitis. PID may be acute, subacute, acute on chronic or chronic.

Clinical Features

Acute PID is diagnosed by: Lower abdominal pain usually starting soon after a menstrual period, fever, signs of pelvic peritonitis in lower abdomen and bilateral adnexal tenderness and positive cervical excitation on vaginal examination, the patient may be toxic with vomiting. **Chronic PID** is diagnosed by: Chronic or recurrent lower abdominal pains, dyspareunia, infertility, mucopurulent cervical discharge, bilateral adnexal tenderness, adnexal induration and/or masses (tubo-ovarian). Diagnosis is mainly clinical.

Investigations

- Urethral and cervical smears may be helpful in acute cases for gram-stain and culture
- Hb
- BS for MPs
- Urinalysis
- VDRL.

Management

Acute PID – MILD to MODERATE where the patient is not toxic and there are no features of peritonitis:

- Amoxicillin 500 mg TDS for 7 days or tetracycline 500 mg QDS for 7 days + metronidazole 400 mg TDS for 7 days; avoid alcohol.

STI related PID [see 2.5.–2.8 STI]:

- Amoxicillin 3 gm STAT + amoxicillin-clavulanate 625 mg STAT + probenecid 1 gm + tetracycline 500 mg QDS for 10 days. In pregnancy use erythromycin 500 mg QDS for 10 days + metronidazole 400 mg TDS for 10 days.

Acute PID – SEVERE CASES with TOXICITY and FEATURES of PERITONITIS:

- Start IV fluids
- Parenteral or oral analgesic e.g. pethidine 100 mg IM PRN (3 doses)
- IV crystalline penicillin 2 mega units QDS for 7 days + IV gentamicin 80 mg TDS + metronidazole 500 mg IV 8 hrly for 3 doses then 400 mg orally TDS for 7 days **OR** IV crystalline penicillin 2 mega units QDS for 7 days + chloramphenicol 1 gm QDS for 7 days +

metronidazole 500 mg IV 8 hrly for 3 doses then 400 mg TDS orally for 7 days **and** then doxycycline 100 mg BD for 10 days.

If fever persists after 48–72 hrs of antibiotic cover, perform vaginal examination. If there is pelvic collection (bulge in pouch of Douglas) and/or adnexal masses – pelvic abscess is suspected and laparotomy for drainage done.

At laparotomy, drainage, peritoneal toilet with warm saline and leave drain in situ for about 3 days and continue parenteral antibiotics post-operatively.

Chronic PID

- Antibiotics as for mild to moderate acute PID
- Spouse or sexual partner is also treated.

Admit

• Severe PID:

- dehydration
- suspicion of abscess
- febrile patient
- suspicion of induced abortion.

• Acute PID: if

- vomiting
- follow up cannot be guaranteed.

Patient Education

- In case of multiple partners, condom should be used.

18.1.8 Abscesses and Fistulae

BARTHOLIN'S ABSCESS

Bartholin's glands are located bilaterally in the vulva, adjacent to the vaginal orifice. Cysts arise when the glands duct become occluded. Bartholin's abscesses occur when the gland becomes secondarily infected with one of many common bacteria.

Clinical Features

Patient may complain of any combination of symptoms: Local pain, low-grade fever, perineal discomfort, labial swelling, dyspareunia, purulent discharge, difficulty in sitting. Physical examination may reveal; tender, fluctuant abscess lateral to and near the posterior fourchette, local swelling, erythema, labial oedema, painful inguinal adenopathy. Most abscesses develop over 2–3 days and spontaneous rupture often occurs within 72 hours.

Management

- Treatment of acute phase includes bed rest, analgesics, e.g. aspirin 600 mg TDS for 5 days, hot wet compresses

- Doxycycline 200 mg STAT, 100 mg OD for 10 days, OR tetracycline 500 mg QDS for 10 days then re-evaluate
- When abscess formation is obvious, incision and drainage as follows:
 - apply topical ethyl chloride spray if available
 - incise distended mucosa as close to hymenal ring as possible or through skin if point of abscess is obvious
 - marsupialize to prevent recurrence
 - pack cavity with impregnated gauze for 24 hours.

GENITAL FISTULAE

Communication between the genital tract and the urinary or alimentary tracts may occur singly or in combination due to: **Obstetrical Injury** Obstructed labour usually leads to pressure necrosis of the bladder and vaginal wall and the rectum. Necrotic tissue slough leading to vesicovaginal fistula (VVF) and recto-vesical fistula (RVF). Instrumental delivery may cause perforation of the vagina and rectum; **Operative injury** A fistula may be caused during total abdominal hysterectomy and Caesarian section; Extension of Disease Malignancy of the bowel or any pelvic abscess may perforate into the rectum and posterior vaginal wall; **Radiotherapy** Heavy radiation of the pelvis causes ischaemic necrosis of the bladder wall and bowel causing urinary or faecal fistula.

Clinical Features

Complains of urinary or faecal incontinence or both. Secondary amenorrhoea is common.

Management

- Confirm diagnosis using Simm's speculum
- Examination under anaesthesia is always mandatory for the diagnosis and definition of fistula. In case of recently formed VVF continuous bladder drainage for 2 weeks is useful because a small fistula may close or a large fistula may reduce in size
- Vulval excoriation is treated by water repellent substances like zinc oxide before repair is done. If a VVF co-exist with RVF, VVF is repaired first.

Admit For

- Confirmation of diagnosis
- Continuous bladder drainage.

Refer If

- Diagnosis is confirmed after examination
- Reconstructive surgery is deferred 3 months after the initial injury or after a previous attempt at repair to allow- all tissue reaction to subside.

18.1.9 Sexual Assault

Sexual assault (rape) is a violent crime directed predominantly against women. Under Kenyan laws rape is defined as carnal knowledge of a woman without her consent or by use of force, duress or pretence. A girl

below 14 years of age in Kenya is not legally deemed to be able to give consent. Neither are mentally retarded or psychiatric women.

Clinical Features

These will range from none or mild to very severe injuries that may be life threatening. The medical personnel must approach the rape victim with great understanding, respect and concern for her well being. The patient may appear deceptively calm, and is usually withdrawn and detached. Careful history and medical record is important because this will be required in court. If the patient has eaten, drunk, bathed or douched, this may affect the outcome of laboratory test. History must be taken to evaluate the risk of acquisition of sexually transmitted disease and pregnancy.

During physical examination, document location, nature and extent of external trauma to face, neck, breast, trunk, limbs, the genitalia, vagina and cervical trauma must also be documented. Clothes and attire are retained as exhibits. Psychological trauma is evaluated.

Investigations

- Swabs for microscopy and culture:
 - vagina
 - throat
 - rectum
 - urethra

- Swab the cervix for sperm microscopy
- Pubic hair combings and clippings
- Scrapping of finger nails for DNA studies for purposes of identification of the assailant
- Blood is taken for baseline RPR and HIV serology then after 3 months
- Urine for baseline pregnancy test and repeat after 4 weeks.

Management

- All cases should be reported to the police
- Treat physical injuries that may require surgical repair of tears
- Tetanus toxoid for soiled lacerations
- Give prophylactic treatment to prevent pregnancy after ruling out already existing pregnancy. This is ethynyl oestradiol 50 mg + norgestrel 0.5 mg 2 tabs orally on examination and 2 tabs 12 hrs later, e.g. Eugynon or Neogynon
- Give prophylactics against sexually transmitted disease [**see 2.5.–2.11. STIs**]
- Examination and sperm collection of the rapist follow the same guidelines
- Post exposure prophylaxis (**see 2.1.–2.4 AIDS/HIV**).

Refer If

- Psychological and psychiatric review is important. The patient may be put on tranquillisers e.g. diazepam 5 mg TDS or sedatives phenobarbitone 30 mg TDS
- Long term psychological and psychiatric care may be required.

18.2 OBSTETRICS

ANTE-NATAL CARE & COMPLICATIONS

18.2.1 ANTE-NATAL CARE

Ante-natal care is organized **to achieve several main objectives viz:**

- Identification of the high risk pregnancy
- Prevention and treatment of pregnancy complications
- Satisfying the un-met needs of the pregnant woman: nutritional, social, emotional or physical
- Provision of patient education
- Planning for labour and delivery.

CONDUCT OF ANTENATAL CARE

Antenatal care should start as early as possible. The **first visit** should be in the first trimester. During this visit a **detailed history** is taken. It should include age, marital status, occupation, education, ethnic origin, area of residence, drinking, smoking and any substance abuse habits, past obstetric and gynaecological history. Record of each pregnancy in chronological order should include date, place, maturity, labour, delivery, weight, sex and fate of the infant and any puerperal morbidity.

The patient's **past medical and surgical history** is recorded as is any family history of diabetes, hypertension, TB, hereditary diseases, multiple pregnancy. The history of the current pregnancy is enquired into: LMP, EDD, maturity at present, any problems encountered so far e.g. bleeding. LMP is first day of LMP, gestation is calculated in weeks from LMP, EDD is calculated by adding 7 days of LMP and 9 to the month e.g. LMP 1/1/93, EDD 8/10/93.

Physical exam is then done to include:

- BP, weight, urinalysis
- General physical exam
- Abdominal exam: Fundal height, lie, presentation, foetal heart sounds, presence of multiple gestation, liver spleen and other masses.
- Vaginal exam – indicated as follows:
 - early pregnancy; to confirm and date pregnancy
 - in late pregnancy at 36 weeks; to assess pelvic adequacy
 - in labour; to confirm diagnosis and monitor progress

– other times; to evaluate symptoms/complaints.

TABLE OF COMMON COMPLAINTS IN PREGNANCY

COMPLAINT	WHAT TO DO	WHAT TO AVOID
ABDOMINAL PAIN, BACKACHE	Exclude UTI and local lesion. If none re-assure	Avoid unnecessary medication
MORNING SICKNESS (Nausea & Vomiting)	Re-assure up to 3 months. If severe with dehydration admit for hydration. Exclude UTI and malaria and typhoid	Avoid anti-emetics
INDIGESTION (Flatulence, heartburn & Constipation)	High roughage diet. If severe give mild laxative and antacid e.g. senokot 2 at bed time x 5 days. Mg trisilicate 10 mls TDS x 5 days	Avoid strong laxatives or enema
PTYALISM (Excessive salivation)	Re-assurance	Avoid anti-cholinergic drugs
FOOD FADS PICA (Craving for unusual foods and substances)	Advise on balanced diet. Eat according to desire. Give haematinic supplements as for prophylaxis	Discourage harmful and contaminated materials eg. soil
GENERALISED PRURITUS	Re-assurance: Mild anti-pruritic, phenobarbitone 30 mg TDS x 5 days Exclude skin and systemic diseases	Avoid steroids
PRURITUS VULVAE	See under vaginal discharge	Avoid douching
MUSCLE CRAMPS	Calcium tablets 2 TDS x 5 days	Avoid NSAIDs
FATIGUE	Re-assurance, bed rest 3–7 days Advise on balanced diet	Avoid Drugs
BREAST TENDERNESS	Reassure. Advise on breast support	Avoid NSAIDs and breast massaging
BLEEDING GUMS	Oral hygiene, massage gums, vitamins ABC Refer to dentist if necessary	Do not excise hypertrophied gums (epulis)

Investigations

Should include a **minimum** of:

- Blood group – ABO + Rhesus
- VDRL
- Hb
- HIV screening as per protocol

Other tests as appropriate for individual patient.

The **second visit** is scheduled 2 weeks later to discuss the laboratory results and assess the degree of the patient's risk (e.g. normal or high risk).

Revisits are scheduled according to the patient's needs but at least **monthly up to 28 weeks. Fortnightly between 28 and 36 weeks** and **weekly thereafter**. Patients should be told how to recognize and report promptly any deviation from normal so that prompt treatment may be initiated.

At each **return visit** care should include:

- Interval history of symptomatology and/or problems. Date of first foetal movements
- Weight: amount and pattern of weight change
- Blood pressure, check for oedema
- Urinalysis for glucose, proteins, ketones
- Obstetric examination, vaginal examination/speculum as indicated
- Repeat laboratory tests, if necessary, e.g.
 - Hb at 28–36 weeks
 - serology for syphilis at 36 weeks
 - if Rh –ve, Indirect Coombs' Test every 4 weeks
- Special laboratory tests as indicated for individual patients to assess maternal/fetal well being:
 - examination of amniotic fluid
 - ultrasound
 - foetal heart/movements monitoring and evaluation
- Decision on place and expected mode of delivery should be made and communicated to the patient not later than 36 weeks of gestation
- Counselling should be provided for FP in general and for postpartum voluntary surgical contraception (VSC). Duly signed informed consent forms should be available at admission
- Patients should be advised to report to the health facility promptly if they have PV bleeding, draining of liquor, blurred vision, or labour pains.

18.2.2 HIGH RISK PREGNANCY CONCEPT

Concept of high risk pregnancy (HRP) denotes a higher probability of an adverse outcome e.g. abortion, intrauterine death, still birth, prematurity, other morbidity or mortality for mother or baby.

High risk criteria – history or current

- Extremes of reproductive age: below 18 and above 35
- Primigravida: especially too young, too short, too old
- High parity 5+, short birth interval
- Large infants 4000 gm or above
- Prematurity, LBW below 2500 gm
- Obstructed and difficult labours
- Still births, neonatal deaths, abortions, C/S
- Genetic or familial diseases

- Medical Diseases: diabetes, cardiac, renal, hypertension, Rhesus, anaemia and HIV infection
- APH, PPH, DVT, IUGR
- PROM, postdates, CPD and multiple pregnancy

Management

- Refer for management to high risk clinic of the hospital.

Principles of management include:

- Identification of high risk patient cases
- Prophylaxis and prenatal counselling – to prevent some high risk patients
- Early start of antenatal care
- Close medical supervision during pregnancy
- Special tests and examinations to evaluate foetal development and well being as well as maternal well-being
- Timely intervention for therapy and delivery.

NB: [see also 18.2.1 antenatal care].

18.2.3 ANAEMIA IN PREGNANCY

Is a major obstetric problem in Kenya. In Kenya, anaemia is generally accepted as Hb < 10 gm%. Mild anaemia Hb 8–10 gm, moderate Hb 6–7 gm, severe Hb 4–5 gm, very severe below Hb 4 gm.

In severe anaemia the pregnancy is in danger of abortion, premature labour or IUFD, while in very severe anaemia the mother's life is also in danger. Most cases are due to **Iron deficiency**: Dietary deficiency, blood loss from hookworm infestations. **Haemolysis** due to malaria and sickle cell disease.

Folate deficiency due to inadequate intake especially in urban areas, also due to haemolysis of malaria.

Iron deficiency and **folate deficiency** often occur together causing “Dimorphic Anaemia”.

Clinical Features

General weakness, dizziness, pallor, oedema, in haemolytic anaemia; jaundice, hepatosplenomegaly occur in haemolytic anaemia.

Investigations

- Full haemogram (Hb, PCV, PBF)
- Stool for hookworm ova and schistosomal ova, where applicable
- Urine urobilinogen and schistosomal ova, where applicable
- Blood slide for malaria parasites
- Sickling test.

Prevention

- Balanced diet
- Prophylaxis iron throughout pregnancy
- Prophylaxis antimalarial [see **18.2.8. malaria in pregnancy**]

Early detection

- Routine antenatal screening first visit and near term.

Principles of treatment

- Raise Hb (oral or parenteral haematinics, transfusion)
- Eradicate cause – dietary deficiency, treat malaria, treat hookworms, give haematinics if dietary deficiency exists
- Prevent recurrence.

Management of Anaemia in Pregnancy

Severity	Hb (gm %)	Management
MILD	8–10	<ul style="list-style-type: none">• Treat cause• Oral haematinics, as for prophylaxis
MODERATE	6–7	<ul style="list-style-type: none">• As above• Iron dextran (Imferon)
SEVERE	4–5	<ul style="list-style-type: none">• As above• Transfusion and iron depot
VERY SEVERE	Below 4	Resuscitation and as severe

Use of blood transfusion in pregnancy

- Severe and very severe anaemia only where cardiac failure or labour is imminent [see **APH and PPH**]
- Transfuse slowly: 500 mls in 3–4 hours
- Give frusemide 80 mg IV or IM
- Give packed cells, if available, cover with sultadoxine 500 mg + pyrimethamine 25 me 3 tabs STAT
- Use iron dextran in moderate anaemia in first and second trimester and in very severe anaemia transfuse blood and give iron dextran (for dose of iron dextran [see **17.1. anaemia**])
- AIDS risk in blood transfusion: use screened blood only and sparingly [see **17.2. blood transfusion**].

Complications of Anaemia in Pregnancy

Cardiac failure: may lead to death. May worsen effects of minor PPH leading to death. May worsen effects of minor hypoxia during anaesthesia causing death. Reduces resistance to infection. Causes late abortions,

premature labours. Perinatal mortality and morbidity is increased even in term babies. Babies become anaemic (iron deficiency) after 2–3 months of life. Cover baby with prophylactic haematinics [see **17.1. anaemia**].

18.2.4 ANTEPARTUM HAEMORRHAGE (APH)

Antepartum haemorrhage (APH) is defined as vaginal bleeding after the twentieth week of pregnancy (≥20/40). APH is associated with increased foetal and maternal morbidity and mortality. The foetal and maternal status will depend on extent of bleeding, duration and aetiology.

Aetiology The causes of APH are:

- **Extraplacental** Bleeding from sites other than the placental surface, including cervical lesions e.g. trauma, cancer of cervix, cervical polyps. Vaginal lesions; tears/lacerations (rare) and infections. Vulvoperineal tears (rare).

- **Placental causes: Placental Abruption (Abruptio Placentae)** This is defined as occurring when a normally implanted placenta separates from the uterine wall (decidua basalis) after the 20th week and prior to the third stage of labour: Bleeding may be absent, mild, moderate or severe (this does not reflect extent of separation or severity). Bleeding may be; concealed when little or no bleeding is seen PV; Revealed when bleeding PV is evident.

- **Placenta Praevia** Occurs when any part of the placenta implants in lower part/segment of the uterus. Further clinical classification is feasible depending on the relationship to internal cervical os;

- **Minor Degree:**

- **Type 1** Placenta in the lower uterine segment but not encroaching the internal os

- **Type 2** Placenta partially encroaches internal os but not during labour

- **Major Degree:**

- **Type 3** Placenta partially encroaches the internal os and remains the same even during labour

- **Type 4** The placenta totally covers the internal os and this relationship does not change during “labour”

- **Vasa Praevia** A rare cause of APH in which umbilical cord is inserted into placental membranes with blood vessels traversing and presenting over the internal cervical os.

Investigations

- Hb, PCV
- Urinalysis: Haematuria, proteinuria
- Bed–side clotting time
- Bleeding time
- Platelet count
- Others: Ultrasonography, which offers a high degree of diagnostic accuracy in APH.

Management – General

- Always admit to hospital a patient with a history of APH even if bleeding is not apparent and the patient appears quite well
- Take a careful history and note:
 - amount and character of bleeding
 - any associated pain
 - history of bleeding earlier in pregnancy
 - history' of trauma
- Do a thorough physical examination including abdominal examination for:
 - tenderness/guarding
 - contractions
 - foetal heart presence
- Carry out speculum examination:
 - bleeding from uterus
 - other sites of bleeding
 - cervical dilatation
- In patients with APH:
 - quickly evaluate the maternal and foetal status
 - take blood for grouping and cross–matching
 - start IV 5% dextrose or normal saline using a wide bore branula
 - monitor vital signs; blood pressure, respiratory rate, pulse rate, temperature and insert an indwelling urethral catheter
- If bleeding is severe or patient is in shock then:
 - ensure open airway and breathing
 - establish and maintain adequate circulation: may transfuse whole blood or packed cells
 - monitor fluid input and output: insert an indwelling foley's catheter

Specific management depends generally on:

- gestational maturity
- condition of foetus
- continuous bleeding or not

- onset of spontaneous labour
- sedation of diazepam 10 mg IV.

Management – Specific

ABRUPTIO PLACENTAE

Essentials of diagnosis

- Continuous abdominal and/or back pain
- Irritable tender and often hypertonic uterus
- Visible or concealed haemorrhage
- Board-like rigidity
- Evidence of foetal distress

Rupture of the uterus may be confused with abruptio placentae. The following features suggest rupture of the uterus:

- Efforts at resuscitation of the mother unrewarding (e.g blood pressure remains low while the pulse remains rapid and thready.
- Uterine contractions absent
- Difficulties in determining shape and outline of the uterus (due to peritonium and the empty uterus): THIS IS A VERY IMPORTANT SIGN.

For mothers who have been in labour recession of the foetal presenting part and disappearance of foetal heart sounds suggest rupture of the uterus. Once rupture of the uterus has been ruled out then treatment for abruptio placentae should be instituted.

Principles of treatment:

- Rapid correction of hypovolaemia/shock or anaemia, as above
- Correction of coagulation defect:
 - whole blood
 - fresh frozen plasma
- Early uterine emptying
- Vaginal delivery whenever possible
- Prevent postpartum haemorrhage
- Do a thorough physical examination including abdominal examination for;
 - tenderness/guarding
 - contractions
 - foetal heart presence
- Speculum examination: bleeding from uterus other sites of bleeding cervical dilatation

- If above measures do not establish diagnosis then do examinations under anaesthesia (EUA) in theatre, rule out placenta praevia then do;
 - artificial rupture of membranes
 - start oxytocin infusion (if no contraindications) 5 units in 500 mls 5% Dextrose and administer as per normal labour. This is done when vaginal delivery is evaluated as imminent and feasible
- Indications for abdominal delivery; Caesarian section, hysterotomy
 - intrauterine foetal death with severe uterine bleeding
 - severe degree of placental abruption with a viable foetus
 - haemorrhage severe enough that it jeopardizes life of mother
 - any incidental complication of labour
- Postpartum; continue oxytocin for about 2 hours.

Placenta Praevia

The management of placenta praevia depends on gestation, extent of bleeding and clinical findings.

Conservative management is done when: BLEEDING IS MINIMAL and a significant risk to PREMATUREITY exists. The decision follows after evaluation, complete examination of maternal and foetal status. Speculum examination is mandatory.

The following must be done:

- Hospitalisation mandatory in a place with C/S facilities
- Restriction of physical activities
- Weekly Hb/PCV
- Avoid unnecessary physical examinations
- Ultrasonographic monitor if possible

Patient may be discharged if placenta is normally situated and be re-admitted at 38 weeks (as below), THEN:

- if no bleeding recurs by 37 weeks prepare patient for theatre under a DOUBLE SET-UP for EUA and for C/S
- if a minor degree of placenta praevia is found, then do; Artificial rupture of membranes (ARM), start oxytocin and DELIVER
- if a major degree of placenta praevia is found prepare the patient for theatre immediately for C/S
- do C/S if: bleeding severe and threat to life, in doubt about degree of placenta praevia and any contraindication for normal delivery.

18.2.5 CARDIAC DISEASE IN PREGNANCY

In Kenya, this is often of rheumatic heart disease origin, involving the valves.

Clinical Features

History of Rheumatic fever in childhood, known Rheumatic Heart Disease, dyspnoea.

Palpitations, body oedema, cough, easy fatigability, evidence of heart enlargement, murmurs, thrills, left parasternal heave, raised jugular venous pressure. Tachycardia.

Hepatomegaly and ascites may be present. Basal crepitations may be present.

Investigations

- Shielded chest X-ray in early pregnancy
- ECG
- Routine ante-natal profile (Hb, VDRL, blood group, urinalysis)
- Urine C&S, blood culture, urea and electrolytes.

Management

This depends on functional classification of the New York Heart Association, viz:

Class I ASYMPTOMATIC

Class II SYMPTOMATIC WITH HEAVY WORK

Class III SYMPTOMATIC WITH LIGHT WORK OR EXERCISE

Class IV SYMPTOMATIC AT REST

- Class I and II are managed as out-patients until 34–36 weeks when they are admitted for bed rest and observations in hospital
- Class III and IV are admitted on first visit at any gestation for entire duration of pregnancy.

Management – Supportive

- Bed rest
- Haematinic supplementation
- Treat intercurrent infections
- Avoid undue physical and emotional stress
- Regular urine analysis and culture
- Ensure dental hygiene
- Regular U/E.

Management – Pharmacologic

- Digitalization is indicated in imminent and overt cardiac failure, if not previously on digoxin
- Continue maintenance therapy with digoxin, frusemide
- Continue prophylactic benzathine penicillin monthly.

LABOUR AND DELIVERY

- Spontaneous labour and delivery are preferred
- Prop up
- Keep oxygen and emergency tray available
- Start antibiotics – amoxycillin 2 gm + gentamicin 80 mg STAT then amoxycillin in 8 hrs after delivery and gentamicin 8 hrs after delivery and then continue amoxycillin for 2 weeks
- Adequate analgesia with morphine 15 mg IM STAT at 4–6 cm cervical dilatation
- Avoid lithotomy position
- Assisted vacuum delivery in second stage
- Do not give ergometrine, massage uterus after delivery of placenta to achieve uterine contraction
- Give oxytocin 5 IU IV in the event of PPH
- Give frusemide 80 mg IV STAT after third stage
- Observe closely for evidence of cardiac failure
- Keep in hospital for two weeks. Continue antibiotics for entire period.

Patient Education

- Advise on family planning. Cardiac patients should have small families of 1 or 2 children or none. Suitable methods include minilaparotomy, tubal ligation under local anaesthesia, vasectomy, barrier methods, progesterone only agents e.g. microлют pill, depo, noristerat injection and norplant.

18.2.6 DIABETES IN PREGNANCY

Diabetes mellitus is a metabolic disorder characterised by hyperglycaemia.

Clinical Features

Overt diabetes If not already diagnosed the symptoms include: polydipsia, polyuria, weight loss, blurred vision, lethargy. Glycosuria is common but not diagnostic.

Gestational diabetes This will occur in 1–5% of pregnancies. Historical risk factors include: Previous gestational diabetes, family history of diabetes, previous macrosomic infant, previous unexplained still birth, polyhydramnios, obesity, advanced maternal age. Glycosuria may be present but not diagnostic.

Complications of diabetes include Chronic hypertension and nephropathy, pregnancy-induced hypertension, foetal macrosomia, intrauterine growth retardation, polyhydramnios, foetus distress, hypoglycaemia.

Investigations

- Post-prandial blood glucose level
- Glucose tolerance test (GTT) to confirm diabetes.

Management

- Diabetes in pregnancy should be managed in hospital
- Regular daily physical activity should be maintained
- Diet should be 30–35 calories/kg/day i.e. 1800–2400 calories per day, carbohydrate 200 gm/day and protein 90 gm/day
- Non–insulin requiring gestational diabetes can be managed by diet alone and monitored with serial blood sugar
- Delivery:
 - non–insulin requiring gestational diabetic should be delivered at term
 - well controlled insulin–requiring diabetic should progress to 38 weeks before delivery
 - insulin dependent diabetic with hypertension, renal, retinal or cardiac disease, PET, intrauterine growth retardation must be delivered at 37/52
 - intrapartum blood glucose is monitored hourly and insulin doses adjusted accordingly in small doses (Discontinue usual insulin regime)
- Post–Partum:
 - insulin requirement can alter after delivery, serial glucose monitoring should be done allowing adjustment of insulin dose to achieve stable control.

Patient Education

- Pre–pregnancy counselling: Achieve optimum glucose control before pregnancy to minimize foetal complications in diabetic pregnancy
- Family planning: Advise on a small family.

Recommended FP methods include VSC, barrier methods, norplant IUD and progesterone only pill.

18.2.7 DRUGS IN PREGNANCY

Drugs taken by the mother during pregnancy can be harmful to the developing foetus in a variety of ways. Drugs taken just before delivery can also affect the baby. The following table provides guidelines on drugs which are considered safe or relatively safe in pregnancy, drugs which should be used with caution and only when necessary, and drugs which are contraindicated.

18.2.8 MALARIA IN PREGNANCY

[Refer also to 12.2. Malaria]

Falciparum malaria is particularly dangerous in the pregnant women. The clinical features of malaria in pregnancy depend, to a large extent, on the immune status of the woman, which in turn is determined by her previous exposure to malaria.

Clinical Features

Non-immune (women from endemic area): High risk of maternal perinatal mortality. Acute febrile illness; severe haemolytic anaemia; hypoglycaemia; coma/convulsions; pulmonary oedema. Abortion; intrauterine death; premature labour; intrauterine growth retardation.

DRUGS IN PREGNANCY

TYPES OF MEDICATION	SAFE OR RELATIVELY SAFE	SOME RISK – USE WITH CAUTION	CONTRAINDICATED IN PREGNANCY
ANALGESICS	Codeine, Morphine, Paracetamol, Pethidine	Indomethacin, Salicylates	
ANTI-CONVULSANTS	Ethosuximide, Phenobarbitone, Primidone	Clonazepam, Phenytoin	
ANTI-INFECTIVES	Ampicillin, Amoxicillin, Cephalosporins, Clidamycin, Dicloxacilin, Erythromycin, Gentamicin, Isonizid, Miconazole, Oxacillin, Penicillin	Chloramphenicol, Metronidazole, Nitrofurantoin, Streptomycin, Sulfonamides, Trimethoprim, Rifampicin, Kanamycin	Tetracycline
ANTICOAGULANTS	Dipyridamole, Heparin	Dicumarol, Warfarin	
ANTIEMETICS	Hydroxyzine, Meclizine, Prochlorperazine	Phenothiazines	
ANTIHYPERTENSIVE	Hydralazine, Methyldopa, Propranolol	Diazoxide	Reserpine, Nitroprusside
BRONCHODILATORS	Aminophylline, Beclomethasone	Cromolyn sodium	
CARDIAC DRUGS	Atropine, Digoxin, Lidocaine, Procainamide, Quinidine	Dispyramide, Nifedipine	
DECONGESTANTS	Pseudoephedrine		
DIURETICS	Furosemide, Hydrochlorothiazide		Acetazolamide
GASTROINTESTINAL DRUGS	Antacids, Cimetidine, Ranitidine		
HYPOGLYCEMICS	Insulin		Chlorpropamide, Tolbutamide
SEDATIVE & PSYCHIATRICS	Barbiturates, Flurazepam	Diazepam, Chlordiazepoxide, Haloperidol, Lithium, Phenothiazines, Tricyclic antidepressants	
THYROID PREPARATIONS	L-Thyroxine, Propylthiouracil		Iodide
VACCINES	Polio, Tetanus, Rabies		Rubella, Measles, Smallpox
OTHER DRUGS	Ferrous sulphate, Probenecid		Antineoplastic drugs, Oestrogens, DES

Semi-immune (women from endemic area): May be asymptomatic, despite placental infection. Causes severe anaemia and low birth weight. More common in primigravidae than multigravidae. One of the dangers of malaria in these settings is that it is not detected or suspected. Antimalarials should form part of the case management of all women with severe anaemia who are from endemic irrespective of whether they have a

fever or a positive blood slide [see 18.2.3 anaemia in pregnancy].

Investigations

- Hb, PCV
- Blood slide: peripheral blood film for identification of parasites. This may however be negative in a woman from endemic areas, despite placental parasitisation.

Management – Supportive

- Check blood sugar regularly as hypoglycaemia is a common problem in women with severe disease
- Correct dehydration
- Evacuation if incomplete/inevitable abortion
- Delivery if foetal death or established labour

Management – Pharmacologic

- For clinical disease it is essential to use the most effective antimalarial drug available.
- Immediate treatment is essential
- Uncomplicated disease:
 - sulfadoxine–pyrimethamine (SP) e.g. fansidar. falcidin. 3 tablets STAT
- Severe or complicated disease
 - quinine hydrochloride orally 600 mg TDS 5–7 days or 600 mg in 5% or 10% dextrose IV 8 hourly, usually 3 doses then orally. Dextrose use helps avoid quinine– induced maternal hypoglycaemia
- Other drugs that can be used for treatment in pregnancy in the second and third trimesters are artemisinin derivatives (e.g cotexin), amodiaquine or mefloquine.

Prevention

In endemic areas all women should receive 2 doses of SP – one in the second trimester (between 16 and 27 weeks) and one in the third trimester (between 28 and 36 weeks).

Doses should be given at last 4 weeks apart.

Non-immune pregnant women should be advised not to visit a malarious area. If travel is not avoidable they should take special precautions in order to prevent being bitten such as using mosquito repellents and an insecticide treated bednet. In addition, they should take chemoprophylaxis of either daily proguanil (e.g. paludrine) 200 mg or if in the second or third trimesters, mefloquine 250 mg weekly.

Drugs that are contraindicated in pregnancy are: halofantrine, tetracycline, doxycycline and primaquine.

18.2.9 MULTIPLE PREGNANCY

A condition in which there is more than one foetus in utero. Mostly twin pregnancy but others may be encountered, triplets, etc and these may be associated with use of fertility drugs. Multiple pregnancy generally

carries a much higher risk (antenatal, intrapartum and postpartum) than a singleton.

Clinical Features

Uterus larger than dates. Multiple foetal parts or more than two foetal poles. Family history of twins. Foetal heart rates at two different areas with a difference of 15 beats per minute. Increased risk of; PET, polyhydramnios, anaemia, APH, PPH, malpresentation, congenital foetal anomalies, premature labour.

Investigations

- X-ray at 34–36 weeks
- Other investigations as for routine antenatal care

Definitive diagnosis can be made by ultrasonography.

Management – Antenatal

- Preferably in a hospital “High Risk” clinic
- Monthly Hb check
- Administration of:
 - Ferrous sulphate 200 mg TDS
 - Folic acid 5 mg OD
- Monitor for associated obstetric complications, e.g. PET. APH. anaemia, malpresentation
- X-ray at 34–36 weeks gestation (or ultrasound if available) to determine:
 - presentation of first twin
 - detect anomalies, e.g., co-joined twins
 - mode of delivery
- Admission may be necessary to observe and manage for premature labour
- Bed rest while at home.

Management – Intrapartum

- Mode of delivery determined by presentation of first twin:
 - if cephalic allow vaginal delivery
 - any other presentation or anomaly, then Caesarean section
- Vaginal Delivery:
 - monitor as per normal labour (refer to normal labour and delivery)
 - after delivery of first twin the lie and presentation of the second foetus is determined. Foetal heart also evaluated
 - if longitudinal, cephalic and foetal heart are satisfactory, then perform ARM and await spontaneous delivery

- if lie is not longitudinal, do external cephalic version (ECV) If ECV fails then do internal version and perform assisted breech delivery after bringing down a leg and stabilizing the head
 - if longitudinal lie and cephalic presentation with ruptured membranes but with inadequate contractions and stable foetal heart rate, then osytocin at 2 units per litre at 30 drops per minute
 - CPD or other contraindication e.g. high parity must be excluded. Otherwise do a Caesarean section to expedite delivery at shortest possible interval which should be the overall goal.
- Retained second twin:
 - Perform abdominal a vaginal examination and assess: membranes; if intact rupture, lie and presentation, whether cervix oedematous
 - Look for evidence of foetal and maternal distress and manage accordingly
 - If assessment favourable then oxytocin and delivery
 - C/S if evaluation poor.
 - Third Stage:
 - Ergometrine IM administered after delivery of second twin
 - Look for and anticipate post partum haemorrhage.

Patient Education

- Family planning
- Early ante-natal visit at subsequent pregnancies.

18.2.10 PRE-ECLAMPSIA & ECLAMPSIA

Despite the ever increasingly confusing terminology Pre-eclamptic Toxaemia (PET) has borne the test of time and continues being used. PET is defined as the onset of HYPERTENSION with either PROTEINURIA, OEDEMA **or** BOTH at a gestation of twenty (20) weeks or more. Hypertension being defined as a blood pressure of 140/90 or higher on more than 2 occasions of about 6 hours apart. ECLAMPSIA is the presence of convulsive fits in a patient with PET. It carries a high foetal mortality and maternal morbidity and mortality if undiagnosed or poorly managed. The aetiology of PET remains unknown.

Risk factors

- Parity; mostly a disease of the primigravida
- Family history of PET
- Associated medical Diseases:
 - diabetes mellitus
 - chronic hypertension
 - renal disease; chronic pyelonephritis, acute glomerulonephritis, polycystic kidneys

- Age extremes
- Obstetric conditions
 - multiple pregnancy
 - hydatidiform mole
 - hydrops fetalis.

Clinical Features

For management purposes the clinical features may be graded by the following criteria:

PET GRADING

CATEGORY	BP	PROTEINURIA (DIPSTIX)	OEDEMA (VARIABLE)
Mild	> 140/90	–	+
Moderate	> 150/100	+	++
Severe	> 160/110	++	++

IMMINENT ECLAMPSIA manifests as severe PET with these features:

- Headaches
- Nausea and vomiting
- Epigastric pain
- Visual disturbances e.g. blurred vision, diplopia, blindness, ocular signs
- Restlessness
- Oliguria.

Investigations

- Hb, PCV
- Urinalysis for protein (bedside):
 - qualitative; dipstix
 - quantitative; Esbach's reagent
- Blood urea and electrolytes
- Liver function tests
- Coagulation tests (where available)
- Ultrasonpgraphy may be done to evaluate foetal status.

Management – General

- Proper management of PET is necessary to optimize the maternal and foetal outcome.

The optimal time for delivery to be considered.

- Continuous assessment of maternal and foetal conditions
- Bed rest
- Drug therapy where appropriate
- Delivery options must be evaluated.

Admit For

- PET at term for delivery
- Severe PET at any gestation
- Imminent eclampsia
- Eclampsia for delivery
- Complicating obstetric condition e.g. APH, premature labour
- Foetal conditions:
 - intrauterine foetal death
 - intrauterine growth retardation.

MILD PET

Can be managed at outpatient with weekly:

- Blood pressure record
- Body weight
- Urinalysis by dipstix
- Foetal heart rate
- Foetal/uterine size
- Advise on bed rest at home on sedation with phenobarbitone 30 mgs TDS and to report to hospital if:
 - onset of features suggesting severity (see above)
 - decrease/change in foetal movements
- Admission at 38 weeks for delivery:
 - surfactant test
 - Bishop's score.

MODERATE PET

Admit and manage in hospital as follows.

Management – General

- Absolute bed rest
- BP 4 hourly
- Daily urinalysis by dipstix if more than ++, then do quantitative:
- Daily foetal heart rates
- Foetal kick count chart
- Weekly blood urea and electrolytes
- Weekly Hb
- Input/output chart (if necessary)

Management – Pharmacologic

- Tabs phenobarbitone 30 mg TDS
- Tabs methyldopa 250 mg QDS to 500 mg QDS (depending on response)
- Tabs propranolol 40 mg OD

If this regimen does not work, then deliver immediately.

SEVERE PET

The definitive treatment of severe PET is DELIVERY.

Management

- **Admit** preferably in a quiet room with a 24 hour nursing coverage (a PET room)
- Put an indwelling foley's catheter for monitoring output of urine
- Keep an input/output chart
- Maintain adequate sedation. Put an IV line and put in 40 mg of IV diazepam. This to titrate against level of consciousness to keep them well sedated but arousable. The diazepam to be put in 500 mls of 5% dextrose
- Control blood pressure:
 - through another IV line mix 40mg hydralazine in 500ml of 5% dextrose and titrate against the blood pressure level to maintain a diastolic blood pressure of 90–100 mm Hg
- Do a vaginal examination and decide on the mode of delivery, either:
 - abdominal delivery (Caesarian section, hysterotomy)
 - vaginal delivery (artificial rupture of membrane, oxytocin injection IV)
- Intrapartum management:
 - maintain the above guidelines

- if foetus is alive, monitor the foetal heart rate ½ hourly to detect signs of foetal distress
- maintain PARTOGRAM [**see 9.14. normal labour**]
- vacuum extraction with episiotomy may be required at second stage
- continue diazepam and hydralazine as above for 24–48 hours.

18.2.11. ECLAMPSIA

Admit in the PET room.

Management – General

- Clear the airway:
 - suction of excess secretions
 - nurse on the lateral position
 - introduce a mouth gag, plastic airway or spatula
 - administer oxygen through a nasal catheter
 - introduce an indwelling foley's catheter to monitor urine output and check for proteinuria
 - assess condition of mother and foetus.

Management – Pharmacologic

- Control the convulsions:
 - diazepam 20 mg IV immediately
 - then put an IV line of 500 mls 5% dextrose with 40 mg diazepam to keep patient deeply sedated
- Control the blood pressure:
 - if the diastolic blood pressure is 110 mm Hg or more then administer IV hydralazine 20 mg immediately/STAT. then 40 mg in 500 ml of 5% dextrose, tritrate according to BP
- **Determine the mode and expedite delivery immediately [see 18.2.10. severe PET].**

NOTE Imminent eclampsia is managed as eclampsia; prophylactic antibiotics IM amoxycillin 500 mg QDS to be given.

- IV frusemide 40 mg STAT to be administered if there is pulmonary oedema.

ESSENTIAL HYPERTENSION

- Is managed along the same lines as PET.

18.2.12 RHESUS (Rh) INCOMPATIBILITY

Rhesus isoimmunization occurs in pregnancy where a Rhesus negative mother is pregnant with a Rhesus positive foetus. Other ways of isoimmunization include transfusion with Rhesus incompatible blood, ectopic pregnancy, hydatidiform mole, and abortion.

Clinical Features

Usually none but severe isoimmunization can lead to: Spontaneous abortion. Intrauterine foetal death (hydrops foetalis). Neonatal death. Severely affected neonates who require exchange transfusion to avoid hyperbilirubinaemia.

Investigations

- Blood groups and Rhesus factor in all pregnant women
- Rhesus status of husbands of women who are Rh –ve. If he is Rh –ve then the foetus should be Rh –ve and hence no risk of isoimmunization in the mother. However do remember that extramarital pregnancies do occur
- Rhesus antibody screening in those who are Rhesus –ve (i.e. indirect Coombs' test) as soon as possible and every month starting at 20 weeks
- If Rhesus antibody titre is above 1:8 then do amniocentesis for bilirubin spectrophotometry. The results of this are read on the Liley's graph and the pregnancy managed accordingly.

Management

- Pregnancies that are severely affected while the foetus is premature and can benefit from intrauterine transfusion. Rhesus disease should be managed by an obstetrician.

Prevention

- A Rh –ve woman who deliver a Rh +ve baby must have anti D within 72 hours of delivery if they are not already isoimmunised (i.e. Rh antibody –ve)
- The same applies for un-isoimmunised Rh –ve mothers who have an abortion, ectopic pregnancy, hydatidiform mole and obstetric amniocentesis.

Refer

All Rh incompatibility mothers to hospital with appropriate facilities.

18.2.13 URINARY TRACT INFECTION (UTI) IN PREGNANCY

This is infection of the urethra, bladder, ureter and the kidney. It is more common in pregnancy due to physiological changes that cause dilatation of the urinary system and relative stasis of urine. Glycosuria and ammo aciduria in pregnancy also encourages bacterial growth. UTI can lead to abortion, premature labour, low birth weight and intrauterine growth retardation.

ASYMPTOMATIC BACTERIURIA

Clinical Features

This condition occurs when there are 100,000 or more bacteria per millilitre of urine without any symptoms. It occurs in 2–10% of all pregnant women. If left untreated pyelonephritis will develop in 25–30%.

Investigations

- Urinalysis
- Urine C&S.

Management

- Oral antibiotic therapy, oral amoxicillin 500 mg TDS **OR** nitrofurantoin 100 mg QDS **OR** nalidixic acid 500 mg QDS **OR** erythromycin 500 mg TDS. All for 10 to 14 days.

URETHRITIS AND CYSTITIS

Clinical Features

Dysuria. Frequency. Urgency. Hesitancy. Suprapubic pain. False labour.

Investigations

- Urine specimen for microscopy, C&S.

Management

- Advice on adequate hydration
- Oral antibiotic therapy as above
- Pain relief using hyoscine butylbromide 20 mg TDS or paracetamol 1 gm TDS for five days.

PYELONEPHRITIS

Clinical Features

Fever. Vomiting. Renal angle tenderness, particularly on the right. Rarely premature labour.

Investigations

- Urine culture will usually grow *E. Coli* or *K. enterobacteria*.

Management

- Admit immediately
- Hydration using intravenous fluids
- Antibiotic therapy as above until the patient responds. Then continue orally for 10 days. If patient is vomiting ampicillin 500 mg IM QDS then change to oral therapy for 10 days.

Recurrence cases are high and may indicate resistant organism, urologic abnormalities (e.g. polycystic kidneys), renal calculi, ureteric obstruction or perinephric abscess. Ultrasound if available may be helpful. However, X-ray examinations may be done after the puerperium.

INTRAPARTUM CARE & COMPLICATIONS

18.2.14. NORMAL LABOUR & DELIVERY

Normal labour is characterised by onset of regular uterine contractions at term accompanied by progressive cervical dilatation and expulsion of the foetus.

Stages of labour

Labour is divided into 3 stages:

- **FIRST STAGE:** from onset to full dilatation of the cervix
- **SECOND STAGE:** from full dilatation to expulsion of the foetus
- **THIRD STAGE:** from delivery of the baby to delivery of placenta.

Management – General

Proper management of labour reduces maternal and perinatal mortality and morbidity. Active Management involves:

- Correct diagnosis of labour; cervical effacement and dilatation 3–4 cm and regular uterine contractions
- Regular assessment; maternal BP/TPR 1 hourly, foetal heart rate half hourly, VE 4 hourly
- Use of Partogram, a simple but essential tool in labour management. It is a graphic display of labour record to show progress of labour: cervical dilatation, descent of the head, foetal condition, maternal condition. An “alert line” and an “action line” should be noted, Parameters are charted against time. The partogram is especially useful where there is shortage of staff, and where majority of labours and deliveries are managed by midwives, clinical officers, medical officers or patients have to be transferred to other facilities for operative deliveries (e.g. Caesarian Section)
- The expected rate of cervical dilatation is at least 1 cm/hour:
 - Artificial rupture of membranes is undertaken at 4 cm cervical dilation and above when the foetal head is engaged and no cord felt, releasing liquor slowly by controlling head position. ARM has advantages of improving the descent and quality of contractions. Note colour of liquor e.g. in meconium staining
- Vaginal examination is done at least 4 hourly to assess cervical dilatation, moulding, caput, position. Descent assessed by abdominal palpation, noting the number of fifths of the head felt above the pelvic brim.
- Foetal condition is monitored by the foetal heart sounds and the colour of liquor.
- Maternal condition is monitored by BP, temperature, pulse, and urinalysis. Most normal labours are completed by 12 hours. The few (Approx. 20 %) that go beyond 12 hours should be critically evaluated to rule out cephalopelvic disproportion (CPD), inadequate uterine contraction, malpresentation or malposition.

Management – Supportive

Proper management of the first stage ensures the woman reaches second stage strong enough for safe delivery. Patients in labour require:

- Psychological support
- Appropriate analgesia if desired by patient, e.g. pethidine 100 mg IM STAT at 4–6 cm cervical dilation
- Hydration and nourishment.

Management – Pharmacologic

- Oxytocin drip indicated for inadequate or incoordinate uterine action in absence of CPD or foetal distress:
 - dose is 2.5–5 IU in 500 mls of 5% dextrose starting at 10 drops per minute (DPM) increasing by 10 DPM every half hour to maximum of 60 DPM or when 3 contractions in 10 minutes, lasting over 20 seconds are achieved.
 - contraindicated in Para 5 and above and in patients with a previous scar, who should be referred to operative delivery
- Dextrose drip (5% or 10%):
 - Indicated in mild foetal distress (light meconium staining of liquor with normal foetal heart rate) and maternal dehydration
 - give at 30 DPM or 20 cc of 50% dextrose, bolus.

NORMAL DELIVERY

Clinical Features

Second Stage (full dilatation) is recognized as follows: contractions become strong and frequent, patient grunts and bears down and develops the urge to push, the head further descends, the perineum bulges and the overlying skin becomes tense and glistening, and the anus may “gape”.

Management

- Full dilatation should be confirmed by digital vaginal examination (VE)
- Mother should be encouraged to bear down with contractions and relax in between
- At crowning, perineum should be supported with the fingers to prevent perineal tear
- If necessary episiotomy should be done at this time under local anaesthesia
- When head is born, it is allowed to rest, the cord round neck is checked and loosened if present
- Anterior shoulder is delivered followed by the posterior
- Ergometrine 0.5 mg or syntometrine 1 vial are given IM or IV after delivery of shoulders unless contraindicated (hypertension, cardiac disease, delivery of first twin)
- Cord is clamped and cut leaving adequate length for administration of drugs if needed
- Application of tetracycline 1% eye ointment is recommended as prophylaxis against ophthalmia neonatorum
- APGAR scoring is done

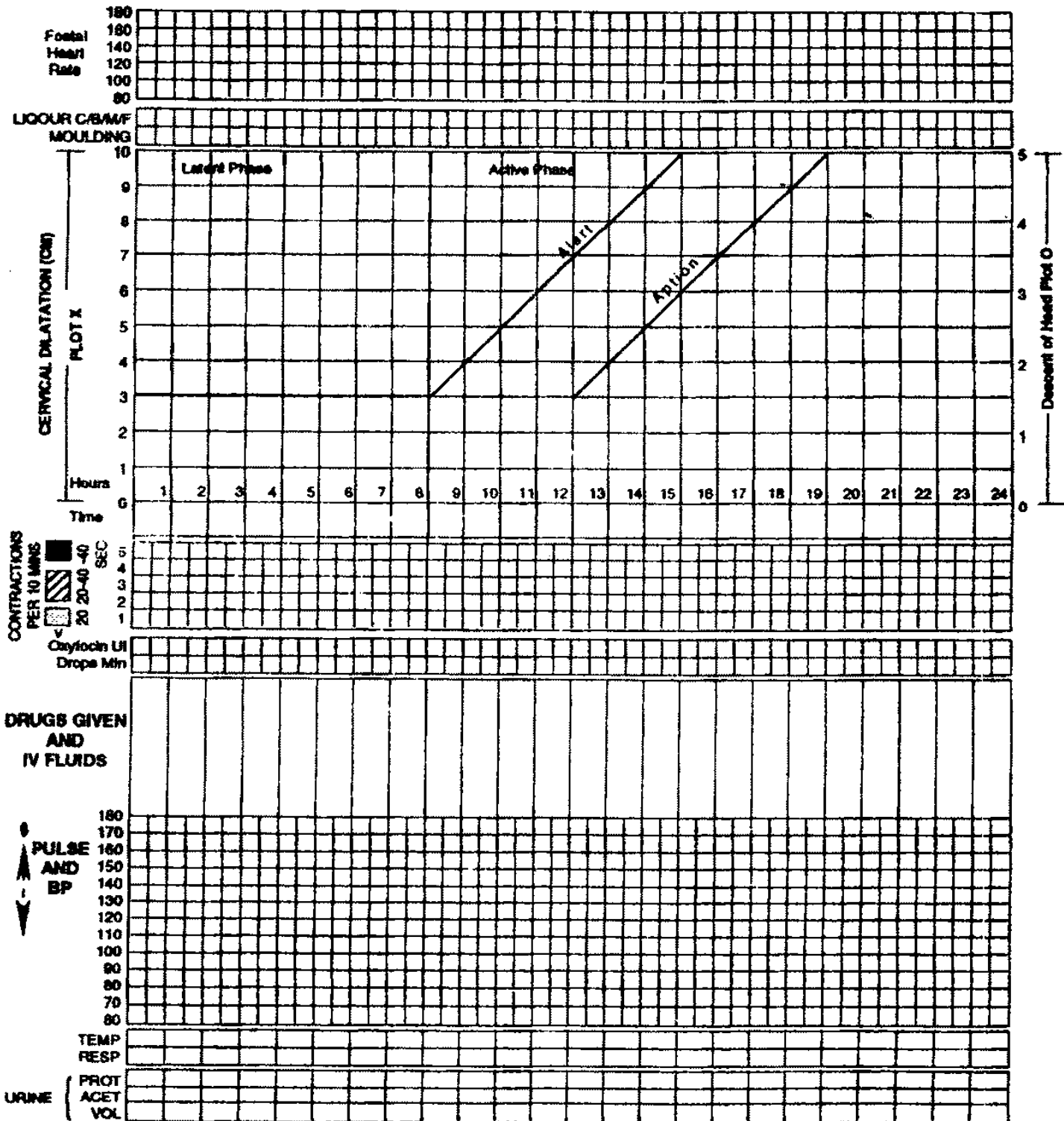
- Identification tag applied, baby wrapped in warm towels and given to the mother to introduce breastfeeding
- Baby is given a full physical examination when stable
- Following delivery of the baby the mother is observed for signs of placental separation: uterus becomes harder and more globular, sudden gush of blood PV, uterus rises higher in the abdomen, length of the cord outside vaginal increases. When this happens:
 - placenta delivered by controlled cord traction
 - uterus gently massaged
 - placenta and membranes examined for completeness, infarcts, retroplacental clot and any other abnormalities
 - placenta weighed.
- The perineum, vagina and cervix are examined for tears. The episiotomy and any tears discovered are repaired immediately. Patient then observed closely for 1–2 hours before being transferred to the postnatal ward. This period of observation after delivery of the placenta is called FOURTH STAGE OF LABOUR and involves BP, T and pulse rate hourly, uterine palpation, vulva inspection and degree of blood loss.



KENYATTA NATIONAL HOSPITAL PARTOGRAPH

KNH 329

Name Age Gravida Para IP No.
 Date of Admission Time of admission Ruptured membranes Hours on admission



SUMMARY OF LABOUR

1st Stage	Induction labour: Yes/No	Duration _____ Hrs	No. of VE _____
2nd Stage	Mode of delivery: _____	Duration _____ Mins	Syntometrine/Egometrine IV/IM
3rd Stage	Baby Alive/SB M/F	Apparacore 1 Min _____ 5 Min _____	Resuscitation Yes/No Duration _____ Min
	Placenta complete/Incomplete Membranes complete/Incomplete Cord normal/Abnormal Placenta Wt _____		
	Blood loss _____ Mls. Perineal tear/Episiotomy. Repair Yes/No Mother BP _____ Pulse _____ Temp _____ Resp _____		
243	Baby Length _____ Weight _____ Gm. HC _____ Cm Drugs given _____		
	Delivered by: _____ Time and Date of Delivery _____		

18.2.15. COMPLICATED LABOUR & DELIVERY

Complications of labour may affect the mother, baby or both. Most complications are associated with obstructed labour. Cephalopelvic disproportion (CPD) is the major cause of obstructed labour and ruptured uterus.

Maternal complications of labour include:

- Genital tract infection
- Fistula formation
- Laceration of the genital tract
- Peripheral nerve palsies
- Foot drop

Foetal/infant complications of labour may be:

- Foetal distress
- Meconium aspiration
- Hypoxia/Asphyxia
- Injuries
- Foetal death.

CEPHALOPELVIC DISPROPORTION (CPD)

("Baby too big for pelvis or pelvis too small for baby"). CPD may be due to faults in pelvis or faults in the foetus or combination of both. The faults in pelvis may be:

- Contracted pelvis
- Deformed pelvis.

The faults in the foetus may be:

- Too large baby
- Hydrocephalus
- Foetal monsters, locked twins (rare).

CPD is the most important cause of obstructed labour. Other causes of obstructed labour are malpresentations or malpositions of the foetus, and soft tissue abnormalities of the genital tract. Obstructed labour is the commonest cause of ruptured uterus and a major cause of maternal mortality. Obstructed labour and ruptured uterus can be prevented by appropriately timed Caesarean section.

OBSTRUCTED LABOUR

Essentials of diagnosis

- The cervix fails to dilate despite good uterine contractions
- Oedema of the cervix and vulva
- The head fails to descend
- The degree of moulding increases
- Bandl's ring occurs
- Urinary retention, blood stained urine on catheterisation
- Foetal distress
- Maternal distress:
 - dehydration
 - fever
 - tachycardia

Management – Supportive

- Resuscitation, rehydration (IV fluids), parenteral antibiotics, bladder care (empty bladder and continuous bladder drainage for at least two weeks)
- Relief of obstruction: C/S or destructive operation if the foetus is dead
- Laparotomy, if there is rupture of the uterus: repair or subtotal hysterectomy.

RUPTURED UTERUS

- Is an obstetric catastrophe and should be prevented. Major causes are:
 - Obstructed labour
 - Previous operations on uterus (C/S, myomectomy)
 - Ecbohic herbs and improper use of oxytocin
 - Grand multiparity
 - Perforations during evacuation of uterus or D&C are a type of ruptured uterus.

Clinical Features

Clinical features may be insidious (“quiet”) or obvious (“classical”). In classical cases the patient who was in labour complains of severe abdominal pains, has PV bleeding and goes into shock. Examination shows hypovolaemic shock with signs of intraperitoneal haemorrhage. Impending rupture of the uterus can be diagnosed by:

- Observing rise in maternal pulse (more than 100 beats per minute)
- Localised abdominal pains
- Foetal distress (irregular foetal heart, meconium stain)
- PV bleeding.

Management

- Quick resuscitation with drip, blood
- Cross-match adequate blood
- Arrange for laparotomy as soon as possible or refer
- Decision to repair the tear or remove uterus (hysterectomy) depends on extent and number of tears. Whichever is best to achieve haemostasis quickly is done.

CAESAREAN SECTION (C/S)

When properly applied C/S is an important operation in reducing maternal and perinatal mortality and morbidity.

The major indications for C/S are:

- Cephalopelvic disproportions (CPD)
- Foetal distress
- Previous C/S; 2 or more C/S or 1 C/S with CPD
- Malpresentations: breech, transverse lie
- Cord prolapse or presentation
- Antepartum haemorrhage (APH)
- Placenta praevia (major types), placental abruptions (sometimes)
- Hypertensive disease: Where induction is unlikely to succeed or is contraindicated.

Types of C/S operation

- Lower uterine segment transverse incision – routinely done nowadays because of its low morbidity and safety during subsequent pregnancies
- Classical C/S – vertical incision in upper uterine segment – done very rarely e.g. for:
 - inaccessible lower segment because of tumours or adhesions
 - in cancer of cervix to avoid dissemination
 - impacted shoulder presentation.

Preparation for C/S and Procedure

- Catheterisation of the bladder
- Empty the stomach (if not fasted), premedicate with atropine 0.6 mg only
- Cross-match 1 –2 units, fix drip
- Anaesthesia may be general or regional, requires special skills to avoid foetal respiratory depression and maternal gastric acid aspiration. Preparation of operation field done when mother is awake to shorten induction delivery interval to 10 minutes or less

- Incision through the abdomen and uterus done quickly (but carefully) to avoid foetal respiratory depression.

Post operatively

Patient requires IV fluids for 24 hours, analgesia, and close observation. Early ambulation is encouraged, and chest and leg exercises given to prevent hypostatic pneumonia and DVT. Patient can be discharged from 4 to 7 days. Alternate stitches are removed on the sixth day and all stitches on the seventh day.

INDUCTION OF LABOUR

This is artificial initiation of the process of labour.

Indications

- Intrauterine foetal death from any cause
- Prolonged gestation (post-dates, 41 weeks and above)
- Diabetes mellitus
- Pre-eclampsia and eclampsia
- Rhesus isoimmunisation.

Technique

Generally induction is achieved by ARM and oxytocin drip as described above in active management of labour. Bishops score:

- If 7 and above, OBE then ARM and oxytocin
- If less than 7, cervical ripening is indicated. The following option is available:
 - Foley's catheter (can only be used when the membranes are intact) inflated maximally and left for 8–12 hours will normally achieve ripening.
 - prostaglandins F2, E2 and PGE can be used under specialised care.

OPERATIVE VAGINAL DELIVERY

The method commonly taught and used in Kenya is vacuum delivery– (ventouse). It must be performed by properly trained and experienced personnel.

Indications

Must be right to avoid maternal and/or foetal injuries

- Poor maternal effort
- Delayed second stage (within 30 minutes from full dilatation) in the absence of CPD
- Cardiac/respiratory maternal disease in second stage
- Cord prolapse in second stage.

Requirements

- Cephalic presentation
- Full cervical dilation
- Low head
- Empty bladder
- Episiotomy.

Contraindications

- CPD
- Previous scar
- Malpresentation (Breech, transverse lie, oblique, etc)
- Malpositions (Brow & face malpositions).

POSTPARTUM CARE & COMPLICATIONS

18.2.16. POST NATAL CARE

Is the care of the woman in the immediate postpartum period and within 6 weeks of delivery. This is the time the woman is returning to her normal pre-pregnant condition. The aim of PN care is to protect and promote maternal and infant health, support breastfeeding and provide family planning and counselling service.

Immediate postpartum

- The episiotomy should be repaired as soon as possible
- Observe and monitor maternal BP, pulse and temperature closely for 1 –2 hours
- Ensure uterus is well contracted, lochia loss is normal and urine has been passed
- Encourage mother to establish bonding and initiate breastfeeding
- Give paracetamol 2 tabs TDS for after pains and episiotomy pain.

Later postpartum period

- Transfer mother to postnatal ward
- Continue above observations at least twice daily
- Encourage rooming-in (or “bedding-in”) of mother and baby
- Continue paracetamol 2 tabs TDS
- Advise on nutritious diet, generous fluid intake for successful lactation
- Give baby first immunisations (BCG and first Polio)
- If no problem, discharge after 24–48 hrs to avoid ward congestion.

Followup

- If possible, see at 2 weeks to check for secondary PPH, sub-involution of uterus, puerperal infection, and whether breastfeeding is satisfactory
- After one month for those not breastfeeding for family planning
- Otherwise routine postnatal review is at 6 weeks to check for:
 - any problems in mother or baby
 - whether periods and/or intercourse has resumed and to provide counselling on family planning, baby care, breastfeeding and immunizations
- At 6 weeks provide family planning service if required. Suitable methods for lactating mothers include:
 - progesterone – only pill (e.g. microlut)
 - intrauterine device (“coil”)
 - depo–provera or noristerat (“injection”)
 - voluntary surgical contraception (VSC); (“Tubal ligation”)
 - norplant.

18.2.17. COMPLICATIONS OF PUERPERIUM

The puerperium is defined as the time period 6 weeks following parturition. This is a time when complex adaptations of physiology and behaviour occur in women. Although usually a low risk period, life threatening emergencies or serious complications may occur that must be recognised and managed efficiently. For the majority, however, a minimum of interference is warranted. Those caring for women postpartum should be sensitive to the initiation of family bonding, a special process not to be disturbed unless maternal or neonatal complications arise.

Some of the maternal complications include postpartum haemorrhage, puerperal sepsis, deep vein thrombosis, psychosis, breast engorgement, mastitis or breast abscess.

18.2.18. POSTPARTUM HAEMORRHAGE (PPH)

This is defined as bleeding from the genital tract after delivery. Further defined as primary or secondary PPH.

Primary

- Bleeding of more than 500 mls within the first 24 hours postpartum. But clinical experience and empiric estimates of blood loss are important for diagnosis of PPH to be made.

Secondary

- Abnormal bleeding occurring after 24 hours and up to 6 weeks postpartum.

PPH is a condition that can sometimes be preventable by proper management of all stages of labour. An understanding of the factors that predispose to PPH will lead to the practice of precautionary measures that minimize its occurrence.

High risk patients. These include;

- Prolonged labour/obstructed labour
- Grand multiparity
- Past history of PPH
- Past history of retained placenta
- Multiple pregnancy
- Polyhydramnios
- Antepartum haemorrhage either placental abruptions or placenta praevia.

Aetiology

The commonest causes of PPH are:

Uterine atony

Failure of adequate contraction and retraction of uterus after delivery associated with:

- Prolonged labour
- Precipitate labour
- Over–distension of the uterus by e.g. multiple pregnancy and/or polyhydramnios
- Grand multiparity Fibroids
- Halothane use in general anaesthesia
- Concealed haemorrhage in placenta abruptions leading to intramyometrial haemorrhage and manifested as COUVELAIRE uterus
- Uterine sub–involution.

Retained placental fragments or membranes

A common complication in which there is delay in completion of the third stage of labour. Spontaneous detachment of placenta occurs within 15 minutes – 90% of cases and 30 minutes – 95% of cases. Any further delay beyond this should be considered as retention.

Retained Placenta

- Where the placenta is free but still within the uterus due to:
 - partial separation of a normally implanted placenta **OR**
 - entrapment of a partially or completely separated placenta by a uterine constriction ring at the junction of upper and lower uterine segments.

Adherent placenta

- Manifested usually as actual placental invasion of the myometrial wall

- Placenta accreta: Superficial myometrial invasion
- Placenta increta: Deep myometrial invasion
- Placenta percreta: Uterine perforation by placenta.

Lacerations or tears of the birth canal

- Can be cervical, vaginal or vulvoperineal.

Other causes include

Disseminated intravascular coagulation (DIC) which is usually secondary to other causes e.g.

- Intrauterine foetal death
- Amniotic fluid embolism
- Abruptio placentae
- Pre-eclampsia/eclampsia.

Rupture of the uterus in e.g.

- Previous scars
- Oxytocin hyper-stimulation
- Obstructed labour in multigravidae
- Use of ecbotic herbs

Uterine inversion and when there is:

- Excessive cord traction
- Adherent placentae
- Manual removal of placenta
- Poor technique of placental delivery.

Investigations

- Hb or PCV, most important
- Bleeding time
- Clotting time
- Coagulation factors.

Management

- General measures:

- put up an IV line
 - take blood for group and cross-match
 - put in a self-retaining catheter, foley
 - determine aetiology.
- Specific: Depends on the cause.

UTERINE ATONY

- Do a bimanual uterine massage and express any clots, this may also provoke contractions
- Put up an oxytocin drip 20 units in 500 mls dextrose or normal saline to run at 20 drops per minutes for about 2 hours
- Prostaglandins are also useful when and where available:
 - prostaglandins F2? 1 mg as a direct intramyometrial injection
 - intravenous prostaglandins F2? 1 mg in a normal saline drip. 1 mg in 500 mls N/S. (adequate precautions to be taken and complications of prostaglandins use to be anticipated)
- Surgery:
 - subtotal hysterectomy if above measures do not achieve haemostasis.

RETAINED AND ADHERENT PLACENTA

RETAINED PLACENTA also causes uterine atony.

- Apply general measures as above
- Manual removal of the placenta in lithotomy position on the delivery couch, administer:
 - 100 mg pethidine IM
 - 10–20 mg diazepam IV, THEN;
 - try manual removal of placenta using the ulnar surface of the right hand with the left hand supporting the uterus. If this is not possible then see below.

ADHERENT PLACENTA

This will require management in the major theatre in some cases of placenta accreta where manual removal and limited instrumental use, e.g. ovum forceps, blunt curette under general anaesthesia. Other types will require surgery ie. subtotal hysterectomy.

LACERATIONS/TEARS OF GENITALIA

Cervical

- In lithotomy position and in good light
- Good exposure of cervix by two Sims's specula
- Careful evaluation of extent of tear

- Repair with No. 1 catgut and achieve haemostasis
- General anaesthesia may be required if upper limit of tear not defined or laparotomy being further required.

Vaginal

- Examination in lithotomy position
- Ligation of bleeders and repair of tears and laceration with No. 1 catgut
- Evacuation of haematomata.

Vulvoperineal

- Proper management of episiotomy:
 - define upper end
 - stitch vaginal epithelium with continuous catgut No. 1 suture
 - muscle layer with same interrupted stitch
 - skin with interrupted catgut.

Repair of other tears

- Second degree or third degree perineal tears
- Lithotomy position
- Local anaesthesia
- Skilful repair in experienced hands especially for third degree tears.

Disseminated Intravascular Coagulopathy (DIC)

- Administer fresh blood
- Fresh frozen plasma
- Surgery as appropriate.

Ruptured Uterus

- Laparotomy:
 - repair of the tear or
 - hysterectomy.

Uterine Inversion

- Perform manual replacement:
 - if inversion recognized before corpus is trapped

- manual compression and insertion
- initiate oxytocin drip 20 units in 500 mls 5% dextrose 20 drops per minute
- the inserting fist to remain until uterine cavity is well contracted.

If above is not possible then:

- general anaesthesia using halothane to relax uterus
- replace and compress uterus
- use oxytocin as above
- leave fist during the G/A till uterus is well contracted

If above measures fail, then hysterectomy is recommended.

18.2.19. PUERPERAL INFECTIONS

These are any postpartum infection of the genital tract complicating labour or delivery. An important contributor being wound sepsis after Caesarian section. Extragenital causes of puerperal fever must be considered and looked for. These include upper and lower urinary tract infections; deep vein thrombosis; respiratory tract infections; mastitis: breast engorgement.

Clinical Features

Confirmed pyrexia $>38^{\circ}\text{C}$ during the first 6 weeks after delivery. Features include lethargy/general malaise, toxicity, dehydration, lower abdominal tenderness, foul-smelling lochia, parametrial pain and thickening, retained membranes.

PUERPERAL SEPSIS

Usually a polymicrobial infection presenting as a combination of endometritis, endomyometritis and endoparametritis. Associated risk factors are: prolonged labour, prolonged rupture of membranes, low socioeconomic status, Caesarian section, underlying chronic debilitating disease. Anaerobic organisms are encountered in most infections associated with puerperal sepsis.

Investigations

- Hb, PCV
- Total white cell count (TBC) and differential
- Culture of lochia cervical specimen
- Blood cultures
- Urinalysis and culture
- Sputum: Gram-stain, culture
- Chest X-ray.

Management – General

- General measures/non-pharmacological therapy on admission:

– rehydration: Start an IV line of 500 mls 5% dextrose. At the same time urgent blood for group and cross–match, Hb, white cell count, blood cultures

- Blood transfusion if necessary
- Keep patient warm
- Arrange for infant care in nursery or by relatives
- Evacuation of uterus for any remaining placental tissue or membranes.

Management – Pharmacologic

- Oral therapy:
 - amoxicillin capsules 500 mg TDS for 5 days + metronidazole tablets 200 mg TDS for 5 days + paracetamol tablets 2 TDS for 5 days
- Parenteral therapy:
 - ampicillin injection 500 mg IV or IM QDS for 5 days + gentamicin 80 mg IV or IM TDS + metronidazole 500 mg IV TDS for 5 days.

Management – Surgical

- Laparotomy to be done if any complicating sequelae occur: the most common one being **pelvic abscess**. Others are abdominal abscess and diffuse peritonitis
- Wound sepsis following C/S may require surgical wound debridement to remove haematomata, necrotic material.

Admit If

- Patient toxic
- Patient febrile $>39^{\circ}\text{C}$
- Patient dehydrated
- Patient not able to take oral drugs
- Pelvic abscess suspected.

SEPTIC PELVIC THROMBOPHLEBITIS

- Occurs with development of ovarian vein thrombophlebitis in a patient with preceding pelvic soft tissue infection.
- A rare condition diagnosed mainly by exclusion; poor response to therapy, and a definite mass extending caudally (upwards). Treatment, as under puerperal sepsis above, but including heparin 10,000 units 4 hourly till symptoms abate. Surgery may be indicated.

EXTRA–GENITAL DIFFERENTIAL DIAGNOSES

Urinary tract infection [see **25.1. UTI**].

Deep vein thrombosis [see **18.2.21. DVT**],

Respiratory tract infections [see **21. Respiratory System**]. Respiratory complications are an infrequent cause of puerperal morbidity. Lobar pneumonia being the most serious infection and may be complicated by atelectasis. Post C/S patients mostly susceptible.

18.2.20. BREAST CONDITIONS

- **Breast engorgement** Accompanied by inflammation of breast and fever. Adequate breastfeeding and paracetamol 500 mg TDS for 5 days are usually adequate
- **Mastitis** This is infection of the parenchyma of mammary glands. It may occur any time postpartum but usually 2–3 weeks after. Predisposing factors include:
 - breastfeeding *per se*
 - fissures in nipple
 - recent weaning.

Diagnosis of mastitis is usually by pain on the same side, localised cellulitis and axillary lymph nodes may be palpable and tender. The most commonly causative organism is staphylococcus species.

Management includes:

- expressing out milk on affected side
- ice packs
- support of affected breast.
- Antibiotics: amoxycillin 500 mg TDS **OR** cloxacillin 500 mg QDS.
- **Breast abscess** It may be a sequelae of mastitis. In addition to the above measures incision and drainage will be necessary as well as stoppage of breastfeeding when there is a purulent discharge. If abscess does not respond to this, refer to specialist.

18.2.21. DEEP VEIN THROMBOSIS (DVT)

The risk of symptomatic thromboembolic disease is about 6 times greater than in the non-pregnant state and the incidence is even higher in the postpartum interval. **Risk Factors** include advanced maternal age, grand multiparity, history of DVT, operative delivery, venous stasis (e.g. prolonged bed rest).

Clinical Features, Investigations, Management – General [see 3.2. DVT]

Management – Pharmacologic

The main stay of DVT treatment is anticoagulation.

Admit

- Heparin:
 - 10,000 units SC or IV every 4–6 hourly for 48 hours then 5,000 units SC QDS for 5 days. Adjust dose to achieve clotting time of 1.5–2.5 times normal
- Acetylsalicylic acid {aspirin}: Due to the minimal problems in monitoring administration may be used in puerperium;

- Dosage: 600 mg daily to be continued up to 6 weeks post-partum
- CARE: secreted in breast milk!!
- Warfarin (to be used in consultation with physician) care to be taken as secreted in breast milk;
 - Start at the same time with heparin 10 mg OD for 3 days then 2.5–15 mg OD for PTI to be in the range of 1.5–2.0
 - Dosage: 2.5–15 mg daily orally.

Patient Education & Prophylaxis

- Avoid oestrogen containing contraceptives e.g. eugynon. Injectable contraceptives or mini Pill are appropriate
- Avoid protracted bed rest, where appropriate.

18.2.22. PUERPERAL PSYCHOSIS

The following aspects in the patients' history' may help to identify the emotionally high-risk patients and anticipation of puerperal psychosis:

- Family history of major psychologic illness of close relative e.g. mother
- Major emotional complications during and after a previous pregnancy
- “Reaction” of current pregnancy
- “Fear” of labour from a previous experience
- Traumatic childhood
- Deprivation of emotional support during adult life e.g. single mother
- Severe prolonged or multiple somatic symptoms with no apparent organic cause during current/or succeeding pregnancy
- Major sustained mood changes or repeated rapid mood swings or abnormal sleep patterns
- Refer to **Mental Illness** chapter for clinical features and management.

19. ORTHOPAEDICS

ORTHOPAEDICS & FRACTURES

19.1. FRACTURES

Definition – Discontinuity of bone.

Classification

- Open (compound)
- Closed

Most fractures are secondary to trauma although pathological fractures secondary to tumours, infections osteoporosis and congenital deformities also occur.

COMPOUND FRACTURES

Fractured bone segments communicate with wound “in” or “through” the skin in these cases and these fractures are always contaminated

CLOSED FRACTURES

The bone fragments do not communicate with the skin

Clinical Features

- Pain
- Swelling
- Loss of function
- Abnormal movements/deformity/crepitus
- Signs of blood loss and neurovascular complications e.g. pulselessness, cold extremity and bleeding. Always look for compartment syndromes.

Investigations

- Hb, PCV
- Group and cross match blood for fractures of major bones
- AP and Lateral x-rays of the affected bones. Some fractures may need special views e.g. hip fractures

Management

- Relieve pain and immobilize fracture.
This prevents soft tissue damage and also reduces pain
- Reduce under sedation or general anaesthesia
- Immobilize with POP, traction or splints e.g. Thomas or Braun splint
- Fixation – This can be internal or external.

Period of immobilization

Upper limbs (Adults) 6–8 weeks, (Children) 3–4 weeks

Lower limbs

- Femur (Adults) 12 weeks (Children) 6 weeks
- Tibia (Adults) 8–10 weeks (Children) 4 – 5 weeks.

Check x-ray before removing the splint.

Check for neurovascular complications and if present split the plaster or decompress the affected compartment

Hazards of POP

Reassess patient after application of POP to avoid the first two of the following:

Complications

- Compartment syndrome
- Gangrene and even loss of limb
- Stiffness of joint
- Contractures

OPEN FRACTURES

The management is as for closed fractures except that these are contaminated and the following should be done first:-

- Thorough surgical toilet and debridement (in theatre)
- Give tetanus toxoid and antibiotics
- External fixation is preferred for these fractures

Delayed healing may occur due to:

- Poor immobilization
- Poor reduction
- Poor blood supply
- Infections
- Soft tissue interposition and
- Systemic diseases

Complications

Include: Fat embolism, neurovascular injuries, infections, joints stiffness, non union, mal-union and delayed union

Rehabilitation

- Physiotherapy
- Occupational therapy

JOINT AND TENDON INJURIES

19.2. JOINT INJURIES

Aetiology – usually due to sports injuries, road accidents, assault and occupational hazards

Classification

- Dislocations
- Fracture dislocations
- Haemarthrosis
- Ligamentous injuries

Haemarthrosis may occur as a complication of any of the above injuries or may occur spontaneously as in haemophilia.

Ligamentous injuries may occur following twisting, traction or bending forces

The knee

Commonly affected are the medial and lateral, collateral and the cruciate ligaments. Occasionally the menisci.

The ankle joint

This is a major weight bearing joint and its stability depends on the surrounding ligaments. Proper diagnosis, accurate reduction is important if congruency of the joint is to be maintained.

The elbow

Dislocations here occur in the posterior direction resulting from a fall on an outstretched hand. Spasm of the triceps muscle then locks the elbow in the dislocated position.

Clinical Features

In general joint injuries present with the following:

- Pain
- Swelling
- Loss of function
- Deformity
- Crepitus (if there is an associated fracture)
- Neurovascular complications

Diagnosis

This is made after clinical examination and radiology

Always look for neurovascular complication

Management

Treatment of dislocation should be urgent because of possible damage to neurovascular structures

- Relief of pain
- Splintage of the dislocation/fracture
- Urgent reduction and immobilisation.

Check X-ray and refer if reduction is not accurate.

**In children suspect epiphyseal/growth plate injuries.
Refer to surgeon**

Period of immobilization

This is the same as for fractures of the adjacent bones. (See fractures above)

19.3. OSTEOMYELITIS

This is bacterial infection of bone. It presents in two forms.

- Acute osteomyelitis and chronic osteomyelitis.

Acute Osteomyelitis

This is caused by haematogenous spread of bacteria from a primary source which may or may not be obvious. The commonest causative agent is staphylococcus aureus. Other organisms, which may be responsible, include streptococcus, pneumococcus, staphylococci albus and sometimes salmonella in sickle cell disease.

Clinical Features

Pain is the major presenting symptom. The severity increases with time. There is accompanying fever, and the patient becomes toxic. The main physical signs are localized tenderness, loss of function of the limb and swelling. Commonly involved bones are proximal tibia, distal femur and distal humerus.

A high index of suspicion and proper history is important

Investigations

- Haemogram: A leucocytosis will be demonstrated.
- X-ray of affected limb may not show any changes in the early stages – periosteal elevation is a late feature (2–3 weeks).
- Blood cultures and sensitivity
- Sickling test in suspected sick cell disease.
- Pus C&S

Management

Admit the patient for:

- Relief of pain
- Elevation and resting of limb

- Administration of appropriate parenteral antibiotic therapy for three weeks

- cloxacillin – 50–100 mg/kg QDS

OR

- flucloxacillin – 50–100 mg/kg

OR

- clindamycin – 15–40 mgs/Kg. (4 Divided Doses)

OR

- sodium fusidate – 20 mgs/Kg per day (3 divided doses or 500 mgs 8 hrly).

Surgical drainage if fever and tenderness persist after 24 hrs of appropriate antibiotic therapy and pus is present.

Always submit pus for cultures.

19.4. CHRONIC OSTEOMYELITIS

This is a sequelae of mismanaged acute osteomyelitis and infected compound fractures, spread from infected tissue including prosthesis; and bone surgery.

Clinical Features

Infection may remain quiescent, with acute or sub–acute exacerbations which manifest as discharging sinuses. X–ray features include; periosteal reaction and new bone formation, dead–bone (sequestrum), bone abscesses, rarefaction of bone.

Investigations

- As for acute osteomyelitis.

Management

- Antibiotic therapy; as per culture/sensitivity results
- Refer for surgical drainage, sequestrectomy and irrigation.

19.5. OSTEOSARCOMA

This is a highly malignant bone tumour of late childhood and early adulthood. Commonly involves long bones i.e distal femur, and proximal humerus.

This tumor presents with pain, noticeable swelling, tenderness or pathological fractures.

History of Pain and previous trivial trauma can easily mask underlying osteosarcoma

The x–ray findings:

Periosteal elevation with new bone formation (Codmann's triangle); sunray appearance; chest x–ray may show metastatic lesions.

Refer all cases of suspected bone tumour.

19.6. SEPTIC ARTHRITIS

This is an acute infection of the joint.

Aetiology

- Haematogenous spread from a primary focus elsewhere in the body
- Direct penetrating injuries into the joint
- Extension from a compound fracture of the neighbouring bone

The commonest causative organisms are staphylococcus, streptococcus, haemophilus influenzae and to a lesser extent salmonella. Large joints such as shoulder, knee, ankle and hip are more often affected. Septic arthritis is most common in children under 3 years of age.

Clinical Features

- Fever, chills and irritability
- Swollen, warm, very tender joint
- Pseudoparalysis of the joint
- Multiple joints may be affected.

Investigations

- Haemogram – anaemia and leucocytosis present
- Pus for C&S
- X-ray of the affected joint shows increased joint space, synovial thickening and later rarefaction of the adjacent bone surfaces.

Management

- Admit the patient
- Start on intravenous antibiotics – cloxacillin 50–100 mg/kg QDS + gentamicin 5–7.5 mg/kg TDS change according to C&S results and continue for 4–6 weeks
- Splint the joint
- Analgesics and antipyretics
- Aspirate the joint and if there is frank pus then refer for arthrotomy

Review daily until discharge.

Refer If

- The fever persists for more than 7 days of full treatment
- The joint swelling does not subside within 3 weeks
- New joints get involved while on treatment

- The affected joint starts to discharge pus spontaneously
- Shortening of the limb occurs
- There is persistent deformity of the joint
- Loss of function related to the infection.

Review monthly after discharge.

20. POISONING

Poisoning refers to development of harmful effects following exposure or ingestion of chemicals. Overdose refers to excessive amounts of a substance or drug normally intended for therapeutic use. It may be LOCAL, SYSTEMIC or BOTH.

Self poisoning with pesticides, drugs or parasuicide are the commonest causes of emergency admission in adults whereas in children it is accidental or intentional.

Diagnosis

- **History:** To include time, route, duration and circumstances of exposure, name and amount of drug or chemical, medical and psychiatric history. The clothes and other patient's belongings, or even suicide note are useful.
- **Physical examination:** Focus on vital signs, cardiopulmonary and neurologic status – assess pupillary size, mental state, focal deficits, tendon reflexes, nystagmus
- Toxicology studies are not always conclusive.

General and specific measures should be taken prior to toxicology and confirmation

Management

General Principles

- Identify the poison; container brought or found near patient, history
- Immediate supportive care: (DO NOT DELAY)
 - airway protection e.g. lateral position, suction, intubation
 - oxygenation/ventilation – avoid mouth to mouth ventilation
 - circulatory support – IV line and fluids, maintain Blood Pressure [**see 1.10. shock**]
 - manage convulsions [**see 4.2. seizure disorders**]
- correct temperature abnormalities
- Prevent further poison absorption:
 - skin decontamination – remove all clothes, wash with soap and water
 - gastrointestinal decontamination: emesis – contraindicated in infants, unconscious patients, corrosives and petroleum products
 - gastric lavage (as above)

Specific Measures

- Enhanced poison elimination
 - activated charcoal 1 gm/kg
 - Dialysis
 - haemoperfusion
 - forced diuresis
 - chelation.

These should be performed in specialised centres

- Antidotes administration [see table on common poisons and treatment in the next page]
 - Prevent re-exposure:
 - adult education
 - child-proofing
- psychiatric referral

21. RESPIRATORY DISEASES

ACUTE UPPER RESPIRATORY TRACT INFECTIONS

21.1. COMMON COLD (ACUTE RHINITIS, CORYZA)

An acute, usually afebrile, viral infection of the respiratory tract with inflammation of all the airways including the nose, paranasal sinuses, throat, larynx, and often the trachea and bronchi. **Causes** include rhino-, influenza, parainfluenza, respiratory syncytial, corona adeno- and caucasian viruses.

Clinical Features

Nasal obstruction, watery rhinorrhoea, sneezing, sore throat, cough, watery red eyes, headache and general malaise.

Management

- Most colds resolve spontaneously in 7–10 days.
- *Avoid aspirin* which may increase the risk of Reye's syndrome in children
- Treatment includes:
 - bed rest and warmth
 - analgesics e.g. paracetamol
 - steam inhalation

Patient Education

Instruct mother to

- Clear the nose regularly and return the child if condition worsens or the child is unable to feed
- Advise the mother to keep the child warm, to breastfeed frequently, and clear a blocked nose if it interferes with feeding
- RETURN QUICKLY if the child's condition worsens, if breathing is difficult, or if feeding becomes a problem.

Remember antibiotics are of no value in viral infections.

Common cold can be complicated by bacteria like *staphylococcus*, *streptococcus*, *klebsiella* and should be treated with antibiotics e.g. amoxicillin, cotrimoxazole.

21.2. PHARYNGOTONSILLITIS, TONSILLITIS

Acute inflammation of the pharynx and tonsils caused by streptococcus, viruses and occasionally diphtheria.

Clinical Features

Sore throat, painful swallowing, general malaise, fever, body aches, rhinitis, tender cervical or submandibular lymph nodes.

In children vomiting and abdominal pain may be present.

Look for membrane of diphtheria

Management

- If conjunctivitis present consider viral infection and treat symptomatically at home
- If there are yellowish spots or membrane on tonsils treat as streptococcal infection at home with amoxicillin 250 mg (children 20–50 mg/kg/day) TDS for at least 10 days.
- (If patient is allergic to penicillin use erythromycin or cotrimoxazole).

Refer For

- Drainage of retropharyngeal abscess
- Tonsillectomy If peritonsillar abscess recurs with the current illness.

Admit If

- Patient deteriorates or goes on to develop peritonsillar or retropharyngeal abscess.
- There is a grey adherent membrane on tonsils and throat, exclude diphtheria by a throat swab. Barrier nurse patient who may be toxic. Give crystalline penicillin 25,000 units/kg QDS for 7 days and anti-toxin if available.

DEEP NECK INFECTIONS

These are infections (cellulitis or abscesses) in the potential spaces around the neck e.g. peritonsillar space, retropharyngeal space, submandibular space, parapharyngeal space, etc.

Management

- Start on systemic antibiotics e.g. amoxycillin or amoxicillin + clavulanic acid if due to dental origin then refer because of the risk of airway obstruction and the risk of injury to important structures in the neighbourhood during incision and drainage of the abscesses.

Complications

Streptococcal infection include otitis media, rheumatic fever with or without carditis.

Treatment with antibiotics for LESS THAN 7 days may NOT prevent Rheumatic fever

21.3. DISEASES OF THE ADENOIDS

ADENOID HYPERTROPHY

Commonly occurs in children. It may be due to simple enlargement, to inflammation or to both. It is the size of the mass relative to the nasopharyngeal space that is important; not the absolute size.

Clinical Features

Nasal obstruction leading to mouth–breathing, difficulty in breathing and eating, drooling, snoring and toneless voice. “Adenoid facies” may later develop. Eustachian tube obstruction leads to deafness. Other features are nasal discharge, postnasal drip, cough, cervical adenitis and inflammatory process in the nose, sinuses, and ears.

Mental dullness and the apathy may be marked due to poor breathing, bad posture or deafness. Nocturnal enuresis, habit tics and night terrors may be aggravated.

Diagnosis

Is based on history and narrowing of the nasopharyngeal air space on lateral soft tissue x–ray of the nasopharynx.

Management

Conservative – for patients with mild symptoms:

- Chlorpheniramine 0.4 mg/kg/day (or other antihistamine)
- Non–irritant nasal decongestants e.g. oxymetazoline, xylometazoline, applied BD for a period not exceeding 2 weeks
- Antibiotics in presence of infection as for acute tonsillitis.

21.4. SINUSITIS

This is usually a complaint following a URTI or is seasonal. It can be acute or chronic. It can be infective or allergic in origin.

Management

- If the nasal discharge is purulent, with nasal obstruction, an early nocturnal cough and an inflamed nasal mucosa, treat with antibiotics for a week
- If the nasal discharge is watery, with nasal obstruction, sneezing and a pale/bluish nasal mucosa, treat with antihistamines
- In children, treat any bilateral purulent nasal discharge of more than 10 days duration with

cotrimoxazole for 5 days OR amoxicillin for 7 days. If the purulent nasal discharge is unilateral, exclude FBs especially in children. If the discharge is bloody in adults, exclude malignancy.

Refer For

- Failure of treatment, the onset of complications, suspected malignancy or need for surgical intervention.

21.5. ACUTE EPIGLOTTITIS

A severe rapidly progressive infection of the epiglottis and surrounding tissues that may be rapidly progressive and fatal because of sudden airway obstruction by the inflamed tissues. *Haemophilus influenzae* type B is almost always the pathogen. Very rarely *streptococci* may be responsible.

Infection through the respiratory tract extends downwards to produce a supraglottic cellulitis with marked inflammation. The inflamed epiglottis mechanically obstructs the airway. The work of breathing increases; resulting CO₂ retention and hypoxia may lead to fatal asphyxia within a few hours.

Clinical Features

Onset frequently acute, fulminating. Sore throat, hoarseness, high fever and dysphagia developing abruptly. Respiratory distress with drooling, tachypnoea, dyspnoea and inspiratory stridor. Child may lean forward and hyperextend the neck. Deep suprasternal, supraclavicular, intercostal and subcostal inspiratory retractions.

Management

- Admit immediately if the diagnosis is **suspected** clinically
- **Direct visualisation of the epiglottis by a designated trained person may reveal a beefy red, stiff and oedematous epiglottis.** (An airway should be placed immediately!!)

Remember manipulation may initiate sudden fatal airway obstruction

Speed in treatment is vital

- Secure airway immediately (nasotraheal intubation or tracheostomy)
- Careful and skilled nursing care to remove secretions which may cause obstruction even after intubation
- IV chloramphenicol 50–100 mg/kg in 4 divided doses in 24 hours
- After isolation of organism if sensitive to ampicillin give IV ampicillin 200 mg/kg/day in 4 divided doses
- Avoid sedatives.

21.6. CROUP (ACUTE LARYNGOTRACHEOBRONCHITIS)

An acute viral inflammation of the upper and lower respiratory tracts characterised by inspiratory stridor, subglottic swelling and respiratory distress (most pronounced on inspiration). Infection produces inflammation of larynx, trachea, bronchi, bronchioles and lung parenchyma. Obstruction caused by swelling and inflammatory exudate is most severe in the subglottic region and leads to increased work of breathing, hypercapnia and at times atelectasis.

Clinical Features

A “barking” often spasmodic cough (following a URTI) and hoarseness may mark the onset of respiratory stridor commonly at night. Respiratory distress, tachypnoea, supraclavicular, suprasternal, substernal and intercostal inspiratory retractions. In severe cases cyanosis occurs; Fever in 50% of children. **Auscultation** Prolonged inspiration and stridor. Some expiratory rhonchi and wheezes, and diminished breath sounds if atelectasis is present. The illness lasts 3–4 days and during this period may improve in the morning and worsen at night.

Management

- Admit to hospital and prepare equipment for intubation and/or tracheostomy
- Administer humidified O₂ (at 30–40% concentration)
- Nasotraeheal intubation if signs of severe obstruction occur: Severe chest indrawing, agitation, anxiety (air–hunger) and cyanosis
- Tracheostomy may be done if intubation is impossible.

LOWER RESPIRATORY TRACT INFECTIONS

21.7. APPROACH TO COUGH OR DIFFICULT BREATHING IN CHILDREN

Acute respiratory infections form a major cause of mortality in children under 5 years. Early diagnosis and proper treatment of pneumonia is essential to reduce mortality. Assessment of cough or difficult breathing in children is described in this section.

Clinical Features

History – Ask:

- How is the child?
- Is the child coughing? For how long?
- Has the child had fever? For how long?

Examination – The child must be calm:

- Count breaths in one minute
- Look for chest indrawing
- Look and listen for stridor
- Look and listen for wheeze.
- Look for severe malnutrition.

Danger signs to look for

- Age 2 months up to 5 years: Is the child able to drink?
- Age less than 2 months: Has the young infant stopped feeding well?

- Has the child had convulsions or is convulsing now?
- Abnormal sleepiness or difficult to wake

These could indicate severe disease

REMEMBER that presence or absence of either fever OR crepitations (rales) on auscultation are NOT reliable clinical features for diagnosing pneumonia. Reducing mortality depends on identifying the clinical features listed above

FAST BREATHING CUT OFF POINTS	
AGE	FAST BREATHING
Under 2 months (young infant)	60 breaths per minute or more
2 months up to 12 months	50 breaths per minute or more
>12 months up to 5 years	40 breaths per minute or more

Management

Admit ALL infants under 2 months of age with suspected pneumonia, sepsis or meningitis

- ANTIBIOTICS should be given; oral dosages are listed below
 - if treated as outpatient, give first dose of antibiotic in clinic
 - instruct mother on how to give the antibiotic for the five days at home (or to return to clinic for daily procaine penicillin injection).

AGE:	<2 months	2–12 months	>12 months to 5 years
WEIGHT:	< 5kg	6–9 kg	10–19 kg
COTRIMOXAZOLE – Two times daily for 5 days*			
Adult tablet (Single strength) 80 mg trimethoprim + 400 mg sulphamethoxazole	¼	½	1
Syrup 20 mg trimethoprim + 200 mg sulphamethoxazole per 5 ml	2.5 ml	5 ml	7.5 ml
AMOXYCILLIN – Three times daily for 5 days			
Tablet (if available) 250 mg	¼	½	1
Syrup 125 mg in 5 ml	2.5 ml	5 ml	10 ml
PROCAINE PENICILLIN – Once daily for 5 days			
Intramuscular injection	200,000 units	400,000 units	800,000 units

* If the child is less than 1 month old, give paediatric tablet or 1.25 ml syrup twice daily. Avoid cotrimoxazole in infants less than one month of age who are premature or jaundiced.

21.8. PNEUMONIA – Infant age less than 2 months

Clinical Features

Pneumonia, sepsis, and meningitis in infants less than 2 months can quickly result in death. Specific symptoms may be lacking. Suspect these conditions if any of the following are present in an infant under 2 months: **Stopped feeding well** (if feeding well before). **Convulsions**. **Abnormally sleepy** or difficult to wake. **Stridor** in calm child. **Wheezing**. **Fever** (38°C or more) or low body temperature (below 35.5°C). **Severe chest indrawing**. **Fast breathing** (60 per minute or MORE). **Central cyanosis** (of the tongue). **Grunting**. **Apnoeic episodes**. **Distended and tense abdomen**.

Management

- ADMIT
- OXYGEN if: severe chest indrawing, central cyanosis, grunting
- ANTIBIOTICS – First Choice:
 - Benzylpenicillin 50,000 units/kg IM BD for first week of life, 50,000 units/kg IM QDS for infants 1 week to 2 months old and Gentamicin 2.5 mg/kg IV BD first week of life, 2.5 mg/kg TDS for infants 1 week to 2 months old
 - Treat for at least 5 days. Continue for 3 days **after** child is well
- If meningitis suspected: Treat for at least 14 days. Ampicillin plus gentamicin may be more effective than penicillin plus gentamicin
- Chloramphenicol can be substituted for first choice drug 12.5 mg/kg BD for infants 0–14 days, 12.5 mg/kg QDS for infants 14 days to 2 months old. **Do NOT give to premature infants**
- If gentamicin or other aminoglycoside not available, benzylpenicillin plus cotrimoxazole can be used.
- ANTIMALARIAL: If cerebral malaria is suspected
- Treat fever, if present
- Give supportive care
- Reassess twice daily.

21.9. PNEUMONIA – Child age 2 months to 5 years

Children age 2 months to 5 years should be assessed and managed according to the following table.

CLINICAL FEATURES	CLASSIFY AS –	MANAGEMENT SUMMARY
<ul style="list-style-type: none"> • Any danger signs OR • Chest indrawing • Stridor in a calm child 	SEVERE PNEUMONIA OR VERY SEVERE DISEASE	<ul style="list-style-type: none"> • ADMIT • Give oxygen • Give an antibiotic: benzyl penicillin • If cerebral malaria is suspected give parenteral quinine • Treat fever; if present • Give supportive care • Reassess twice daily

<ul style="list-style-type: none"> • Fast breathing 	PNEUMONIA	Advise mother to give home care Give an antibiotic – cotrimoxazole Treat fever, if present Treat wheezing, if present Advise mother to return in 2 days for reassessment, or earlier if the child is getting
<ul style="list-style-type: none"> • No chest indrawing and • No fast breathing 	NO PNEUMONIA: COUGH OR COLD	If coughing more 30 days, refer for assessment for TB. Assess and treat ear problem or sore throat if present. Assess and treat other problems. Advise mother to give home care. Treat fever, if present. Treat wheezing, if present.

ANTIBIOTIC SUMMARY

Severe pneumonia

- If a child is being referred, give IM chloramphenicol single dose
- As inpatient: Benzylpenicillin 50,000 units/kg IM QDS. If no improvement, add gentamicin 2.5 mg/kg IM TDS.
- Give oxygen if child is in respiratory distress OR is cyanotic.

Pneumonia – (see table on antibiotics above).

Advice to Mothers

If child can be treated as outpatient, also:

- Feed the child;
 - feed the child during illness
 - increase feeding after illness
 - clear the nose if it interferes with feeding
- Increase fluids;
 - offer the child extra drink
 - increase breastfeeding
- Most important: In the child classified as having NO Pneumonia; Cough or Cold, watch for the following signs and return quickly if they occur,
 - **breathing becomes difficult**
 - **breathing becomes fast**
 - **child is not able to drink**
 - **child becomes more sick.**

21.10. PNEUMONIA – Adults

Consolidation of the lung parenchyma due to infection.

Clinical Features

Breathlessness, cough with or without sputum which may be rust coloured, fever, pleuritic chest pain. Bronchial breathing, reduced chest movements, reduced breath sounds, tachypnoea, crackles and percussion dullness. Features less pronounced in the elderly patients.

Classification

Primary: Occurring in a previously healthy person living in the community. This is usually lobar due to pneumococci. Usually a very short history.

Secondary Develops in association with prior respiratory' disease, immunocomprised patients, debilitated patients, alcoholics or post operative patients.

Investigations

- Haemogram – PBF, WBC
- Chest X–ray: PA.
- Sputum microscopy and C&S

Management – Lobar pneumonia

Outpatients

- IM Benzyl penicillin 2 MU STAT. then amoxicillin 500 mg TDS for 7 days
- If penicillin allergy present: Erythroycin 500 mg QDS for 7 days. Alternative antibiotics include cotrimoxazole and tetracycline.
- Analgesics: paracetamol **OR** aspirin.

Inpatient care

- IV/IM Crystalline penicillin 2 MU QDS till response, then discharge on amoxicillin 500 mg TDS. If allergic, erythromycin 500 mg QDS **OR** cotrimoxazole **OR** tetracycline for 5 days. If no response consider TB.

Admit If

- Cyanosis is present
- Respiratory distress (R.R. >25 per minute) is present
- Heart failure or pleural effusion is present
- More than one lobe is involved
- There is poor response as out–patient
- Patient is dehydrated
- Secondary pneumonia is suspected.

Management – Secondary Pneumonia:

Admit patient

- Treat with crystalline penicillin 2 mega units IM IV QDS + gentamicin 80 mg IM IV TDS for 5 days OR chloramphenicol 500 mg QDS OR erythromycin 500 mg QDS for 5 days

Special precaution

Consider pseudomonas and staphylococcus.

21.11. ACUTE BRONCHITIS–Bronchitis (tracheobronchitis)

Bronchitis is common in children. It is almost always caused by viral infection (due to respiratory syncytial virus, influenza virus, para-influenza virus, or rhinovirus). Bronchitis is usually associated with an upper respiratory infection (a cold) in young children. It is usually caused by *Mycoplasma pneumoniae* in older children.

Clinical Features

- Productive cough **without** cyanosis, chest indrawing, wheezing, or fast breathing.
- Bronchitis usually begins with a dry cough that becomes loose after 2 or 3 days. (On auscultation, rhonchi [low-pitched, continuous sounds] may be heard. Rhonchi are often difficult to distinguish from transmitted upper airway sound. Auscultation is not necessary for diagnosis). **If wheezing is present**, it is often due to asthma or bronchiolitis. The term “wheezy bronchitis” should **not** be used.

Management

- Treatment is the same as for cold without pneumonia
- If wheezing for the first time and child has respiratory distress then antibiotics as for pneumonia and wheezing treatment.

21.12. WHEEZING AND ASTHMA – Children Under 5 yrs

Wheezing occurs when the air flow from the lungs is obstructed, due to narrowing of the small airways. Infection or an allergic response cause narrowing of the airways.

Clinical Features

Wheezing sound. Prolonged expiratory phase of respiration. Increased effort at expiration. Diminished air entry. Lower chest indrawing. Recurrent cough especially at night. Hyper-inflated chest. Cyanosis in severe cases. When it occurs repeatedly in one child then it is treated as asthma. Wheezing may or may not be complicated by pneumonia of bacterial or viral aetiology.

Management – The wheezing child

Children with first episode of wheezing

- If in respiratory distress Give a rapid-acting bronchodilator and admit
- If not in respiratory distress Give oral salbutamol.

Children with recurrent Wheezing (Asthma)

- Give a rapid acting bronchodilator
- Assess the child's condition 30 minutes later: (Table below)

IF:		THEN:		
CHEST INDRAWING OR ANY DANGER SIGN		Treat for SEVERE PNEUMONIA or VERY SEVERE DISEASE (Admit/refer)		
WHEEZE AND FAST BREATHING		Treat for Pneumonia Give oral salbutamol		
WHEEZE BUT NO FAST BREATHING		Treat as COUGH OR COLD (NO PNEUMONIA) Give oral salbutamol		
RAPID ACTING BRONCHODILATOR		ORAL SALBUTAMOL • 3 times daily for 5 days		
		Age OR weight	2 mg tablet	4 mg tablet
Subcutaneous Epinephrine (adrenaline) (1:1000 = 0.1%)	0.01 ml/kg body weight	2 months up to 12 months (10 kg)	½	¼*
Salbutamol inhaler in a spacer 750 ml–1000 mls	2 puffs per dose. 1 dose in 10min.	12 months up to 5 yrs (10–19 kg)	1	
Nebulised salbutamol 5 mg/ml				
Under 1 yr	0.5 ml salbutamol in 2.0 ml sterile water			
>1 yr	1.0 ml salbutamol in 2.0 ml sterile water			

Acute attack

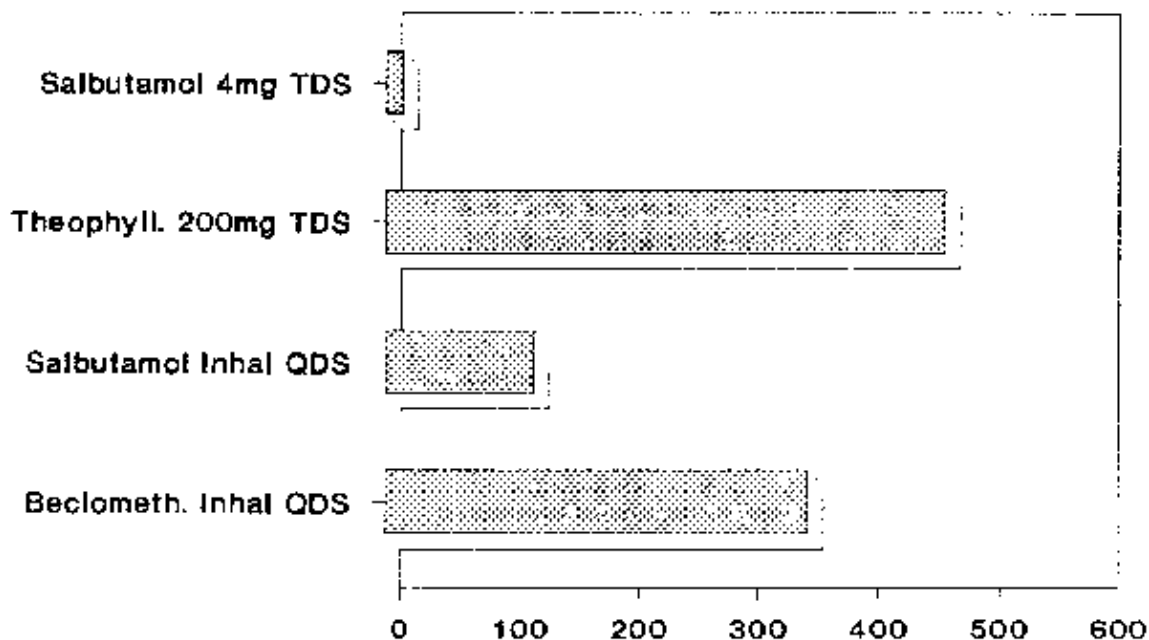
- Mild cases can be treated on out-patient basis:
 - give subcutaneous adrenaline 0.01 ml/kg. This dose can be repeated at intervals of 30 minutes 3 times, total 3 doses **OR**
 - salbutamol inhaler in spacer (VOL 750–1000 ML) – 2 puffs/dose over 10 minutes give one dose)
- Nebulised salbutamol <1 yr 0.5 ml. >1 yr 1 ml salbutamol in 2 mls sterile water
- Moderate and severe cases:
 - IV aminophylline 3–5 mg/kg STAT in 15 minutes
 - IV hydrocortisone 10 mg/kg QDS
 - IV aminophylline drip in HSD 0.9 mg/kg/hr
 - oxygen PRN.
- When the patient stabilizes put on oral salbutamol 0.1 mg/kg TDS.

RECURRENT WHEEZING (ASTHMA)

Recurrent episodes of wheezing suggest asthma. Asthma is an allergic, non-infectious condition, attacks can be triggered by respiratory infections, ingestion of some allergens, weather changes, emotional stress etc.

A child with asthma may have only a recurrent cough (often worse at night). On examination an audible wheeze or difficulty in breathing out may not be present. Consider this possibility when evaluating a child with chronic cough.

Response to a rapidly-acting bronchodilator is an important part of the assessment of a child with recurrent wheezing to determine whether the child can be managed at home or should be admitted for more intensive treatment.



Based on KEMSA and
RDF Nyamira Prices (2002)

Monthly Cost of Some Asthma Preparation – Cost for 30 Days (Kshs.)

STATUS ASTHMATICUS

This is a clinical diagnosis defined as increasingly severe asthma not responsive to usual drugs.

• Admit:

- keep propped up in bed
- administer oxygen by intranasal catheter continuously at 2–3 litres per minute
- treat as per acute attack (see above)
- look for and correct dehydration
- prevent metabolic acidosis by IV sodium bicarbonate 1–3 mg/kg even 4 to 6 hrs
- give hydrocortisone 10 mg/kg every 6 hrs till the child is better, also start oral prednisone 2 mg/kg/day in 3 divided doses, tailing off and terminating rapidly
- avoid antibiotics unless specifically indicated.

In both acute attack and status asthmaticus, signs of improvement are:

- Less respiratory distress (easier breathing)
- Less chest indrawing
- Improved air entry.

With improvement, the wheezing sound may decrease or actually increase, if the child was moving little air previously.

Admit

- Children with cyanosis or who are not able to drink
- Children who continue to have respirators' distress after bronchodilator treatment as out-patient
- Children who improve in out-patient and then deteriorate rapidly.

21.13. BRONCHIAL ASTHMA (Adults)

A clinical syndrome characterised by increased responsiveness of the tracheobronchial tree to a variety of stimuli resulting in airway obstruction which varies in severity either spontaneously or as a result of treatment.

Clinical Features

Patients present with: Breathlessness, Wheezing, Cough with tenacious sputum.

Examination shows:

- **Mild attack** Wheezing, pulse less than 100/min, BP normal, RR less than 20/min.
- **Moderate** Wheezing with cough, sweating, pulse 100–120, RR 20–30/min and BP is normal.
- **Severe** Cyanosis, pulse 120/min, RR 30/min, pulsus paradoxicus, respiratory distress in upright position and may have a silent chest.
- **Chronic** Mild attack (see above) all the time.
- **Status Asthmaticus** Moderate or severe attack not responding to conventional therapy or it persists for more than 12 hours.

Investigations

- Chest X-ray: PA, Erect.

Management

MILD

- SC adrenaline 1:1000 0.5 ml STAT, repeat after 20–30 minutes if there is **no** response (up to a total of 3 doses). If there is response, discharge on salbutamol 4 mg TDS for 1 week OR theophylline 200–250 mg BD or TDS.

MODERATE

- Adrenaline as above up to 3 doses or salbutamol inhalation 2 puffs every 20 minutes till response or patient gets tremors. If no response IV aminophylline 6 mg/kg slowly over 15 minutes, and then 0.9 mg/kg/hr. If there is good response, discharge on salbutamol 4 mg TDS for 1 week OR theophylline. If no response, treat as severe.

Admit

SEVERE ASTHMA

- Give oxygen 3–5 L/min if cyanosed
- IV aminophylline 0.9 mg/kg/hr in N/Saline drip after a loading dose if not already given. IV hydrocortisone 200 mg STAT or methylprednisolone 1 gm IV STAT or dexamethasone 2–4 mg IV/IM STAT
- Give oral prednisone 10–15 mg TDS on admission, tail off in 7–10 days
- Give amoxicillin or cotrimoxazole or tetracycline.

Refer If

- There is no response or condition deteriorates.

CHRONIC

- Salbutamol 4 mg TDS orally or salbutamol inhaler. If poor response oral theophylline 100–200 mg TDS. If response is still poor refer to Physician.

STATUS ASTHMATICUS

- Treat as severe
- Consult Physician as soon as possible.

Precaution

Always exclude cardiac asthma causes.

Patient Education

Avoid precipitating factors such as:

- Smoking, allergens, aspirin, stress, etc

21.14. CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Clinical syndrome of chronic dyspnoea and cough with expiratory air way obstruction produced by either chronic bronchitis and/or emphysema.

Clinical Features

Chronic productive cough for many years with slowly progressive breathlessness that develops with reducing exercise tolerance. Tachypnea, purse–lip breathing, use of accessory muscles of respiration. Chest hyper–resonance, breath sound decreased, wheezes with or without rhonchi. Cyanosis may be present. **Note** Absence of clubbing.

In acute exacerbations, symptoms worsen and the sputum becomes yellow or may increase in quantity.

Investigations

- Chest X-ray: Note flattened diaphragms, hyperlucency, diminished vascular markings with or without bullae. Look for pneumothorax
- Haemogram: Especially polycythaemia, eosinophilia, WBC (to suggest infection).

Management

Acute exacerbations

- Bronchodilators: Salbutamol 4 mg TDS or inhalation 2 puffs 6–8 hourly or theophylline 250 mg BD or TDS
- Chest physiotherapy
- Amoxicillin 250–500 mg TDS or cotrimoxazole or tetracycline for 5 days.

Admit If

- Cyanosis is present
- Hypotension or respiratory failure is present
- Chest X-ray shows features of pneumothorax, chest infection or bullous lesions
- Cor pulmonale present.

Patient Education

- Stop smoking and avoid dusty and smoky environments
- Relatives should seek medical help if hypersomnolence and/or agitation occurs.

22. SIGNS & SYMPTOMS

22.1. COMA

Coma is a state in which the patient is unarousable and unresponsive to external stimulation. In profound coma, brain stem and rayotatic reflexes may be absent.

Aetiology

Infections (malaria, meningitis, encephalitis) trauma, tumours, cerebro-vascular accidents, diseases– (diabetes, epilepsy, liver failure), drugs (alcohol, methylalcohol, barbiturates, morphine, heroin), chemicals and poisons (see **1.9. poisoning**).

History

Detailed history from relative or observer to establish the cause if known or witnessed:–the circumstances and temporal profile of the onset of symptoms. Use of drugs and preexisting diseases are important.

Examination

- Secure a patent airway.
- Determine if cardiac output is adequate (BP, pulse rate)
- Evaluate and monitor according to Glasgow Coma Scale (see **1.6. head injury**).
- Temperature, pulse, respirator) rate and their pattern

Leads to possible causes

- Hypothermia – occurs in alcohol, barbiturates and sedative poisoning, hypoglycaemia and hypothyroidism.
- Hypotension – occurs in internal haemorrhage, myocardial infarction septicaemia and alcohol or barbiturate poisoning.
- Hyperventilation with a change in pulse rate may signify increased intracranial pressure
- Hypertension may signify hypertensive encephalopathy or a cerebrovascular accident.
- Fever – systemic infection with meningitis or encephalitis
- Neck stiffness – could signify meningitis, subarachnoid haemorrhage, cerebral malaria.

Determine the muscle tone and deep tendon reflexes. Note any asymmetry.

Investigations

Vary according to findings but generally:–

- Blood slide for malaria parasites
- Blood sugar
- U&E
- Liver function tests
- Lumbar puncture (after fundoscopy)
- Skull X-ray (if there is evidence of trauma)
- CT scan where available.

Management

- Maintain adequate airway – nasal, oral or endotracheal intubation
- Ensure adequate circulation – always fix a large IV canula immediately in anticipation of drug administration
- Turn patient 2 hourly to avoid pressure sores
- Condom Catheters in males (uricondom)
- Urethral Catheters in females. Change regularly and repeat urine and catheter tip cultures at least fortnightly.
- Prevent contractures by regular daily passive exercises (physiotherapy)

Management – Specific

- Identity and treat cause appropriately
- Correct hypertension, hypoxia, hypercapnia, hypoglycaemia, hypothermia rapidly and assiduously
- 50 mls of 50% dextrose IV if blood glucose is low (<3.5 mmol/l)
- Therapy for meningitis immediately if suspected
- Treatment for malaria if confirmed or suspected.
- Give thiamine with glucose to malnourished patients to avoid encephalopathy.

22.2. FEVER

An elevation of core body temperature above the normal circadian (daily) range. Normal body temperature in adults 18–40 years is $36.8^{\circ}\text{C} \pm 0.4^{\circ}\text{C}$. Substances that cause fever are called pyrogens.

Fever accompanies a wide variety of illnesses and need not always be treated on its own. In general the cause should be ascertained before therapy as far as possible.

Management – General

- Conditions which merit lowering the temperature on its own: Precipitation of heart failure, delirium/confusion, convulsions, coma, malignant hyperpyrexia or heat stroke, patient extremely uncomfortable.
- Spraying with water at 20–25°C or tepid sponging:
 - stop shivering (hence further heat generation) by chlorpromazine 10–25 mg IM
- Treat cause
- Acetylsalicylic acid injection or tablets **OR** paracetamol tablets.

Management – Paediatrics

- Fever is not high (38–39°C); advise mother to give more fluids
- Fever is high (>39°C); give paracetamol
- Fever very high or rapid rise; tepid sponging (water 20–25°C)
- In falciparum malarious areas; treat with antimalarial [see **12.2. malaria**]
- Fever for more than 5 days; thorough assessment, admit if no cause found
- Paediatric paracetamol doses, every 6 hours as shown below:

Age	Weight (kg)	500 mg tablet	120mg/5ml syrup
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2 months up to 12 months	6–9	¼	2½ – 5ml
12 months up to 3 years	10–14	¼	5 – 10 ml
3 years up to 5 years	15–19	½	10ml

Fever alone is not a reason to give antibiotic except in a young infant (age less than 2 months)

22.3. FEVER OF UNKNOWN ORIGIN

Fever of more than 3 weeks duration, the cause of which is not apparent after at least one week of intensive investigations. Assessment should include observation of the fever pattern, detailed history and physical examination, laboratory tests and non-invasive and invasive procedures.

This definition will exclude common short self-limiting infections and those which have been investigated and diagnosed within 3 weeks.

COMMON DISEASES TO BE CONSIDERED

- Note that:
 - most cases of prolonged obscure fever are instances of well known diseases presenting atypically
 - actual pattern of graphic record, despite emphasis in traditional books, is so variable as not to be practically helpful
 - aggressive diagnostic effort is justified as cure is possible in some cases.

INFECTIONS (accounts for 50% being due to viral infection)

- **Tuberculosis** This is the commonest cause of pyrexia of unknown origin in Kenya. The lesions of miliary TB may not be visible easily on X-rays until disease is well advanced. Sites like kidneys and tubo-ovarian region raise diagnostic difficulties
- Specific bacterial infections without distinctive localising signs. The commonest here are **salmonellosis** and **brucellosis**
- **Deep seated bacterial** abscesses e.g. subphrenic or periphrenic abscess, purulent infections of large bowel or female pelvic organs. Reactivated old osteomyelitis should be considered as well
- **Infective endocarditis** especially due to atypical organisms e.g. Q-fever, aspergillus
- **Anicteric hepatitis** virus infection
- **Slow-viruses:** commonest is human immunodeficiency virus (HIV).

NEOPLASMS (10–20% in children)

- **Lymphomas** These are the commonest among the neoplastic causes of PUO. Diagnosis may be difficult if lesions are deep seated retroperitoneal nodes
- **Leukaemia** Contrary to common belief, it is extremely rare for leukaemia to present with fever only.
- **Solid Tumours** The commonest among solid tumours is hypernephroma with pancreatic carcinoma and sarcomas coming next although presentation with fever alone is rare.

IMMUNOGENIC DISEASES

These diseases may present with fever only for several months. The common ones are: **Rheumatoid arthritis, systemic lupus erythematosus, polyarthritis nodosa, rheumatic fever, cranial arteritis/polymyalgia in the old.**

OTHER CAUSES

- Chronic granulomatous hepatitis – steroids would be useful
- Recurrent small pulmonary thromboembolism
- Drug fever
- Liver Cirrhosis
- Habitual hyperthermia. Usually young adult female with imperfect thermoregulation
- Cause may remain unknown in 10–20% of the children

Temperature rarely exceeds 37.6°C. It is mentioned because no action need be taken.

Investigations

The routine investigations listed below should be done before a diagnosis of PUO is made:

- Blood count
- Blood C&S
- Urinalysis
- CXR
- Urea and electrolytes
- LFTS.

Do the following

- Repeated history taking and examination may detect:
 - new clinical features that give a clue
 - old clinical signs previously missed or overlooked
- New tests:
 - immunological: rheumatoid factor (Rh. factor), antinuclear antibody (ANA), anti-streptolysin O titre (ASOT)
 - most PUO's have abdominal involvement hence, do: barium studies of GIT; intravenous urography; scan liver, spleen, kidneys either computerised axial tomography or ultrasound
 - withhold drugs for a few days. Fever disappears in drug fevers
 - ECG may detect right heart strain in embolism (see above)

- Invasive procedures:
 - liver biopsy
 - finally diagnostic laparotomy may be justified;
- NB** Very experienced surgeon required.

Refer If

- Patient deteriorates rapidly
- New tests described above are not available in your centre
- Invasive procedure is required.

Prognosis: 10–20% causes remain unknown. 5–10% mortality rate.

22.4. HEPATOSPLENOMEGALY

Enlargement of the liver to more than 3 cm below the costal margin and the spleen to more than “just palpable”. The liver size should be described as centimetres below costal margin and below xiphisternum. Since splenomegaly is an extremely common sign and commonly related to malaria, probably splenomegaly smaller than grade 3 Hackett will not cause major concern.

Causes

	Hepatomegaly	Splenomegaly
INFECTIONS	Malaria Kala Azar Schistosomiasis Infectious hepatitis Amoebic hepatitis/abscess Brucellosis	Malaria/tropical splenomegaly HIV Kala Azar Schistosomiasis Infectious hepatitis Brucellosis Other infections; like SBE, typhoid fever, infectious mononucleosis
BLOOD	Haemolytic anaemia Leukaemia	Haemolytic anaemia e.g. sickle cell anaemia in child <3 years autoimmune haemolytic anaemia Leukaemia
NUTRITION	Kwashiorkor	Iron deficiency
CONGESTION	Cardiac failure	Portal vein thrombosis
OTHER	Liver tumour Displaced rather than enlarged liver	Liver cirrhosis Rheumatoid arthritis (Felty's syndrome) SLE

Management

- No other symptoms, seen as outpatient:
 - exclude Schistosomiasis (stool x 3), rectal snip, blood diseases (Hb, WBC, sickle cell test), Brucellosis (Brucella test blood), malaria (malaria slide). If tests normal, treat as idiopathic splenomegaly syndrome, proguanil 50 mg daily below 3 yrs, 100 mg in older children for ½ yr or until spleen is definitely smaller.

Admit

- If patient is anaemic
- If patient is febrile
- For invasive diagnostic tests e.g bone marrow, liver biopsy.

22.5. JAUNDICE

Yellow colouration of skin and mucous membranes due to excess bilirubin. Serum bilirubin >2 mg% (34.2 $\mu\text{mol/L}$). In general terms, hyperbilirubinaemia may be **pre–hepatic**, **hepatic** and **post–hepatic**.

Pre–hepatic; excess intravascular release (i.e. haemolysis)

Hepatic; hepatocyte dysfunction (faulty uptake, metabolism or excretion of bilirubin)

Post–hepatic; removal of bilirubin from biliary system is impaired (e.g. common bile duct obstruction, intrahepatic cholestasis)

Common causes include, viral hepatitis, haemolytic anaemia (e.g. sickle cell, malaria), cirrhosis, biliary obstruction, hepatoma, drug induced (e.g. alcohol, isoniazid).

Clinical Features

Meticulous history and physical examination are important before ordering investigations. **History** should include: exposure to hepatotoxic drugs; known haematological disorder; history of anorexia, nausea and aversion to smoking suggestive of viral hepatitis; history of dark urine, pale stool and pruritus suggest obstructive jaundice. **Physical examination** should include observation for presence of spider naevi, gynaecomastia, loss of axillary hair, parotid gland enlargement and ascites suggestive of cirrhosis; splenomegaly indicative parenchymal liver disease or haemolytic jaundice.

Investigations

- Blood slide for malaria parasites. **Jaundice in a patient with malaria is a medical emergency.**
- Urine – **Bilirubin**:
 - absence of bilirubin in a patient suggests haemolytic anaemia.
 - presence of bilirubin suggests hepatobiliary jaundice
- Urine – **Urobilinogen**:
 - excessive urobilinogen suggests haemolysis. Urobilinogen is absent in obstructive jaundice
- Liver function tests:
 - Gamma Globin Transaminase – elevated levels suggest alcohol abuse
 - Alkaline phosphatase – elevated levels suggest obstruction
 - SGOT (AST) – elevated levels suggest hepatocellular damage
 - SGPT (ALT) – elevated levels suggest hepatocellular damage
- Serum Proteins:

Albumin – low levels in chronic liver disease such as cirrhosis

Globulins – Hyperglobulinaemia is found in chronic active hepatitis, cirrhosis

- Full Haemoglobin – polymorphonuclear leukocytosis is found in leptospirosis. Sickle cells may be seen in the peripheral blood smear
- Reticulocyte count – Increased reticulocyte count indicates a haemolytic anaemia.
- If above investigations are not diagnostic consider:
 - HBs Ag, HAV – Ab. TORCHES in young infants
 - Ultrasound: useful in obstructive jaundice, gall stones, differentiating between abscess and tumour
 - Alpha–foetoproteins: substantial elevations of alpha–foetoproteins are found in hepatocellular carcinoma
 - Paracentesis of ascitic fluid: Protein content <3 gm% is found in cirrhosis. Protein content >3 gm% is found in tuberculosis, peritoneal tumours, peritoneal infection or hepatic venous obstruction. Blood stained ascites usually indicates a malignant disease – cytology is mandatory.
 - Liver Biopsy is important in diagnosis of chronic hepatitis and cirrhosis and hepatocellular carcinoma.

Management

- Patients with history and physical findings suggestive of viral hepatitis can be managed as out–patients requiring advice on bed rest, avoidance of alcohol. Prescribe multivitamin tablets.

Admit For

- Diagnostic evaluation if cause not apparent.

Consider hepatic encephalopathy in any patient who has jaundice and mental complain. Early treatment of hepatic encephalopathy may reduce mortality.

22.6. OBSTRUCTIVE JAUNDICE

This refers to jaundice caused by obstruction of bile in the biliary tree (post–hepatic jaundice).

Clinical Features

- It presents as painless jaundice, pruritus which can be severe, and the jaundice progresses steadily
- Distended gall bladder is present in 60% of Ca. Head pancreas
- Anorexia is usually present
- Diarrhoea is present and trouble–some with foul smelling – pale stool
- Dark urine, history of flatulence, dyspepsia in fat females point to gall stones.

Causes

- Intraluminal (within the lumen) include gallstones which dislodge from the gallbladder and are impacted in common bile duct (CBD), helminthiasis (ascaris and liver flukes)
- Mural (within the wall of ducts) – benign and malignant tumours of bile duct wall e.g. cholangiocarcinoma, cholangitis. etc.
- Extramural (outside the walls) include choledochal cysts enlarged lymph nodes of any cause, and carcinoma of the pancreas
- Other causes include congenital biliary atresia, iatrogenic trauma to the ducts during surgery (especially cholecystectomy), and strictures after cholangitis and cholecystitis.

Investigations

- Hb, WBC, ESR
- Liver function tests
- Prothrombin time index
- Plain abdominal X-rays
- Abdominal ultrasound and CT scan

Management

- Refer: for adequate investigations and surgical management.

22.7. LYMPHADENOPATHY

An abnormal increase in size or altered consistency of lymph nodes. It is manifestation of regional or systemic disease.

Common diseases associated with lymph node enlargement:

• Infectious diseases

- viral diseases; HIV
- bacterial infections; pyogenic. tuberculosis

• Malignant diseases

- haematological; Hodgkin's and non-Hodgkin's lymphoma
- metastatic tumours to lymph nodes; head and neck, breast, prostate

• Immunological disease

- connective tissue disorders.

Clinical Features

Clinical features depend on underlying cause.

Investigations

Careful clinical examination is vital before ordering investigations, e.g. axillary lymph nodes in presence of a breast mass points to cancer of the breast.

- Full haemogram
- Chest X-ray
- Blood for HIV test
- Bone marrow
- Lymph node biopsy.

About 25% of patients will have non-diagnostic results from the biopsy. Repeat biopsy should be performed if enlarged lymph nodes and symptoms persist.

Management

Further diagnostic evaluation depends on the initial results e.g. thorough ENT work-up if biopsy indicates a secondary from the post-nasal space. Specific management depends on the specific cause of lymphadenopathy.

23. SKIN DISEASES

ECZEMA

23.1. ATOPIC ECZEMA

An acute, subacute but usually chronic pruritic inflammation of the epidermis and dermis often occurring in association with a personal or family history of hay fever, asthma, allergic rhinitis or atopic dermatitis. Onset usually in the first 2–3 months of life and usually occurs in first year in 60% of patients.

It commonly presents with the following skin lesions—erythema, papules, scaling, excoriations and crusting.

Pruritus is the cardinal feature of eczema and the constant scratching leads to a vicious cycle of itch–scratch–rash–itch. subsequently the skin becomes thickened (Lichenified) presenting mainly on cheeks and extensor surfaces of an infant, it later localises on the flexural areas in both older children and adults. The natural history is that the disease clears with age in majority of children.

Management

- Parents should be educated on the disease and its natural history and be advised to avoid any precipitating factors eg
 - Avoid synthetic clothing
 - Avoid any food substance that seriously aggravates the eczema
 - Avoid letting the skin to dry excessively e.g by using harsh soaps like bar soaps, sunlight, ushindi, etc.

NB: One should use the normal toilet soaps. No need to use medicated soaps

– Avoid any of the petroleum jelly products on those who react (Vaseline, ballet, valon, ideal etc.)

- Chlorpheniramine maleate can be used to alleviate itch.
- Steroids; topical steroids are the mainstay treatment. Use of the mildest steroid that controls the problem is advocated.

NB If the body surface area involved is wide (e.g 50% and over) or the disease is very severe, one would advise referral to a specialist who may even choose to use systemic steroid.

The main complications of infection need prompt treatment e.g bacterial, fungal and viral.

As with other atopic conditions stress may aggravate eczema and thus older children should be encouraged to avoid stress.

23.2. CONTACT DERMATITIS

Acute or chronic inflammation produced by substances contacting the skin and causing toxic (irritant) or allergic reactions.

Primary irritants include acids, alkalis, soap, detergents, acetone, etc.

Allergic contact dermatitis

Topical drugs, plants, shoes, clothing, metal compounds, dyes and cosmetics.

Sensitivity to latex in gloves is a particular problem for many health worker and sensitivity to latex condoms may preclude their use by some men.

Lesions may be acute vesicles or weeping **subacute erythema**, dry scaly with papules or **chronic** – lichenified (thickened) excoriated and hyper pigmented.

The lesions may take the shape of offending item – shoes, watch, gloves, etc but may be asymmetric or oddly shaped.

Management

- Identify and remove causative agent
- Drain large blisters but do not remove tops (roofs)
- Apply gauze or thin cloths dipped in water or normal saline
- Topical 1% hydrocortisone ointment for dry lesions and cream for wet lesions.

BACTERIAL INFECTIONS

23.3. IMPETIGO CONTAGIOSUM

A contagious intradennal infection caused by streptococcus or staphylococcus. Commonly associated with poor hygiene, crowded living conditions and neglected minor trauma. Frequently complicates scabies, purpura urticaria, insect bites. Presents as bullous lesions which rupture and crust on the face, arms, legs and buttocks.

Management

- Local treatment: cleaning with normal saline
- Topical antibiotics: Fucidic acid and bacitracin or silver sulphadiazine
- Systemic antibiotics: Only for extensive lesions (ampicillin/cloxacillin. erythromycin)

23.4. BULLOUS IMPETIGO

Common in neonates (pemphigus neonatorum) although any age can be affected. Caused by staphylococcal infection. Affects mainly axilla and groin.

Causes large bullae containing pus and clear serum, which rupture easily leaving raw-areas. Does not form crusts as in impetigo contagiosum. Treatment as above.

Admit If

- Patient is toxic with suspected of septicaemia

Patient Education

- Spreads easily in schools
- Isolate and treat infected individuals
- Separate towels and bath facilities.

23.5. STAPHYLOCOCCAL SCALDED SKIN SYNDROME (SSSS) – RITTER'S DISEASE

Toxin-mediated epidermolytic disease leading to detachment of superficial epidermal layers to resemble scalding.

Mainly occurs in children under 2 years of age. Severity varies from localised form (bullous impetigo) to generalised form of epidermolysis. Also found in immuno-compromised adults and in renal failure.

Clinical Features

- Vesicles which are flaccid, gentle lateral pressure causes shearing off leaving raw areas
- Focus of infection may be found in the nose, umbilical stump, purulent conjunctivitis, otitis media, nasopharyngeal infection

Investigations

- Pus swab for C&S is essential.

Management

- Admit
- Parenteral cloxacillin or flucloxacillin preferred. Change antibiotics according to culture and sensitivity results
- Skin care:

- topical care baths with normal saline
- if widespread and weeping lesions are present treat like burns [see 1.4. burns]

Do not give corticosteroids

- Detect carriers to prevent nursery epidemics

Refer

- Severe cases unresponsive to available treatment.

23.6. SUPERFICIAL FUNGAL INFECTIONS

The dermatophyte infections are caused by fungi (genus microsporum, trichophyton and epidermophyton) which thrive on non-viable keratinised tissue of the skin (stratum, comeum hair nails). Sources of infection include other persons, animals such as puppies or kittens and more rarely the soil.

Nomenclature is “tinea” followed by the Latin name of the appropriate part.

Tinea pedis (athletes foot) Scaling or maceration between toes particularly the fourth interspace. Causative organism is *T. rubrum* and/or *T. interdigitalae*. Hot humid weather and occlusive footwear are predisposing factors.

Tinea cruris An erythematous and scaly rash with distinct margin extending from groin to upper thighs or scrotum. Itching may be severe. Common in males.

Tinea corporis (body ringworm) Characteristically annular plaque with raised edge and central clearing scaling and itching variable.

Tinea capitis (scalp ringworm) Mainly disease of children and spontaneous recovery at puberty normal. Scaling, itching, loss of hair is common – “Mashillingi”. Scarring, alopecia may result.

Tinea unguium Involves the nails and presents with nail discolouration and subungual hyperkeratosis (friable debris)

Investigations

- Direct microscopy of skin scale in 20% potassium hydroxide mounted on a slide to demonstrate hyphae.

Management

- For wet lesions (in skin folds) apply gentian violet 0.5% paint daily and when the lesions dry apply Whitfield's ointment BD until 1 week after lesions have healed
- Griseofulvin 500 mg daily with food as single dose for 1 month (in children 10 mg/kg).

PARASITIC INFESTATIONS

23.7. SCABIES

Scabies is caused by the human itch mite (*sarcoptes scabiei*) and spread through intimate personal contact, facilitated by overcrowding, poor hygiene and sexual promiscuity. Transmission via beddings or clothing is infrequent (the mites do not survive for a day without host contact)

Clinical Features

- Intense itching worse at night or after hot shower
- Burrows occur predominantly on the finger webs, the wrists flexor surfaces, elbow and axillary folds, and around the areolar of the breasts in females, the genitals especially male, along the belt line and buttocks.

NB: The burrow is a fine, wavy scaly line (0.5–1 cm long) with a small papule/vesicle at the end

- Secondary infection causes urticarial papules, crusts and pustules

Diagnosis

- Demonstration of typical burrows – may be difficult
- Microscopy of skin scrapings (avoid KOH) and demonstrate the mite, ova or faecal pellets.

Management

- 25% Benzyl benzoate emulsion (use 12.5% in children) apply entire skin (neck down), day one, repeat day two. Day three bathe and apply
- Other drugs: 5–10% sulfur ointment
- Nonspecific:
 - personal hygiene
 - antihistamines for pruritus
 - treat the whole family and personal contacts
- Treat secondary bacterial infection – cloxacillin in severe cases.

23.8. PELLAGRA (NIACIN DEFICIENCY)

Occurs in dietary deficiency (starvation, alcoholism or deranged absorption or utilisation) and in isoniazid therapy, diarrhoeas and liver cirrhosis. An increasing number of patients now seen amongst prisoners in Kenya.

Clinical Features

Presents with characteristic dermatitis, diarrhoea, dementia and death if not treated.

Weight loss, anorexia, fatigue, malaise, pruritus burning, dysphagia, nausea diarrhoea vomiting, impaired memory, confusion and paranoid psychosis.

Skin lesions limited to exposed areas of the face, neck, hands and feet. Mucous membranes – scarlet stomatitis and scarlet red tongue.

Management

- High protein diet
- Multivitamin tablets or syrup
- Niacinamide 100–300 mg in 3 divided doses daily.

23.9. SEBORRHOEIC DERMATITIS

An inflammatory scaling disease of the scalp, face and occasionally other areas with high density of oil glands (axilla, upper chest, anogenital areas).

Clinical Features

Symptoms develop gradually as:

- Dry or greasy diffuse scaling of scalp (dandruff) with pruritus
- Yellow– red scaling papules in severe cases found along the hairline, external auditory canal, the eye brows, conjunctivitis and in naso–labial folds. Does not cause hair loss.
- Cradle cap (thick yellow crusted scalp) in newborns.

NB: Severe seborrheic dermatitis is found in neurologic disorders (Parkinson's disease) and HIV infection.

Management

- Control scaling by 2% salicylic acid in olive oil
- Shampoos containing selenium sulfide, sulfur and salicylic acid, or tar shampoos daily till dandruff is controlled (more recently ketoconazole shampoo is excellent)
- Topical steroids – use mild lotion (e.g. 0.01% fluocinalone acetate)
- Treat superimposed bacterial, fungal or viral infections – which are prevalent in HIV patients

Refer

- Patients who do not respond to treatment.

DERMATOLOGICAL EMERGENCIES

23.10. ERYTHEMA MULTI FORME SYNDROME

A common problem due to increased prevalence of HIV/AIDS. It is an infiltration into the dermo–epidermal junction by mono–nuclear cells leading to vesicle, generally found in the extremities, palms and soles in the mild form of disease.

In severe forms widespread mucosal involvement occurs (Steven's–Johnson syndrome) which may last 1–2 months with a high mortality.

Causes

- idiopathic (50% no known causes)
- Drugs e.g. sulphanamides, phenytoin, barbiturates, penicillins, thiacetazone etc
- Infections: viral (herpes simplex), streptococcal and mycoplasma
- Underlying malignancies

Clinical Features

- In severe form the mucous membranes are always involved, with extensive bullae formation and systemic symptoms of fever, prostration
- Cheilitis and stomatitis interfere with feeding vulvitis in females and balanitis – leading to difficulties in micturition
- Keratitis as a result of conjunctivitis
- Epidermal necrolysis: This is a life threatening condition.

Management

Admit all cases.

- Stop offending factor – minimise drug therapy intravenous corticosteroids are the current therapy in Steven's–Johnson syndrome
- Skin care – clean with normal saline
- Eye care – 1 % tetracycline eye ointment. Refer to ophthalmologist
- Mouth care – antiseptic wash
- Keep patient warm
- Cradle nursing.

Refer urgently to specialised centres
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23.11. EXFOLIATIVE DERMATITIS

Synonyms: Exfoliative Erythroderma Syndrome, Erythroderma.

Serious, life threatening reaction pattern of the skin characterised by generalised and confluent redness with scaling associated systemic toxicity, generalised lymphadenopathy and fever. 2 stages – acute and chronic >50% patients have history of pre-existing dermatosis commonly Eczematous dermatitis (atopic, contact)

Psoriasis, drug reaction, leukaemia, lymphoma and others.

Up to 10–20% no possible cause identified.

Constitutional symptoms – fatigue, weakness, anorexia, weight loss, malaise, feeling cold (shivering) clinically skin is red, thickened and scaly, commonly without any recognizable borders. Oedema of lower legs and ankles may occur. Palms and soles involvement – thickening and fissuring.

Hair – alopecia (Not uniform).

Nails – shedding of nails.

Prognosis: Guarded and therefore a medical problem that should be dealt with using modern inpatient dermatology facility and personnel. It has many multi–systemic complications.

Management

Bath soaking

- Bland emollients: Liquid paraffin, Emulsifying ointment
- Nursing care – single room, keep warm etc.
- Systemic, etc
 - Supportive – fluid, electrolyte, protein replacement
 - Systemic steroid used under specialist care are prednisone or prednisolone 0.5 mg/kg/day in 2 divided doses
- Confirm primary skin disorder by skin biopsy

Note: Erythroderma may be purely secondary to HIV infection.

23.12. JIGGERS/TUNGA PENETRANS

Diagnosis not a problem but education to the community on treatment is mandatory.

- Extraction of the jiggers with clean pin advocated
- Suffocation of jiggers by soaking feet in Liquid paraffin or Kerosene
- Give Tetanus Toxoid.
- Dusting of the earthen floors with insecticide powders is highly recommended.

24. SURGERY

24.1. CARE OF THE SURGICAL PATIENT

PRE-OPERATIVE EVALUATION

A patient for elective surgery needs thorough evaluation not only for suitability of general anaesthesia but also for possible complications related to the operation (e.g. a toxic goitre) or that may affect the outcome of the operation (e.g. a chronic cough in a hernia patient).

History

i) A thorough history must be taken (this should include a history of chronic illnesses, a drug history and history of previous surgical encounters).

Examination

i) A thorough physical examination and in particular check for:

- anaemia

- jaundice
- level of hydration
- fever
- lymph node enlargement.

Vital signs must be taken and recorded. For any major operation a check chart need be kept for at least 24 hours before surgery.

Specific charts are available for certain disease conditions e.g. diabetes, hypertension, asthma etc.

Investigations

A set of basic investigations is necessary:

- Urinalysis
- Haemogram (Hb, WBC, PCV)
- Urea and electrolytes
- A chest X-ray is useful in some cases.

To this may be added any investigation relevant to the diseased system:

- Urine for C&S
- An intravenous urography in most urological operations
- Liver function tests and prothrombin time index (PTI) in hepatobiliary disease
- Creatinine clearance in renal patients
- Electrocardiogram (ECG) in hypertensive, and known heart patients
- A thyroid profile may be necessary before thyroid surgery.

Management – Supportive before surgery

Correction of conditions that are identified in the evaluation is necessary and critical:

- Correction of volume and electrolyte imbalance
- Control of blood pressure
- Control of thyrotoxicosis
- Control of diabetes mellitus (and any other metabolic disease)
- Correction of anaemia and malnutrition
- Prophylactic antibiotics where indicated [see **appropriate section for details**].

USE OF BLOOD TRANSFUSION IN SURGERY

- Avoid “topping–up” anaemic patients prior to surgery

- Use blood intra-operatively for Hb <8.0 g/dl AND blood loss of 10% of blood volume or more
- **Autologous transfusion** is frequently used in patients for elective surgery. A pint of blood is removed every 7 days prior to surgery and is re-transfused at the time of surgery. Blood can safely be stored for 21 days. It is important to liaise with the blood donor bank to ensure that the patient gets his own blood
- Do not correct post-operative anaemia with transfusion if there is no active bleeding or shock.

ANTIMICROBIAL PROPHYLAXIS IN SURGERY

Antimicrobial prophylaxis can decrease the incidence of infection particularly wound infections after certain operations but this benefit must be weighed against cost, risks of toxic and allergic reactions and emergence of resistant bacteria. The administration of antibiotic agents to prevent infection cannot be substituted for either sound surgical judgement or strict aseptic technique. Surgical wounds may be designated as clean, contaminated, dirty.

- **Clean wounds** – Chemoprophylaxis has no place in clean operative procedures.
- **Contaminated wounds** – e.g. operations involving interior of respiratory, urinary or gastrointestinal tracts, chemoprophylaxis may be useful.
- **Dirty wounds** – Most traumatic wounds are highly contaminated and apart from chemoprophylaxis a thorough surgical toileting is necessary. Other highly contaminated wounds involve operations on the large intestines and severe burns.

Other high risk factors include:

- Development of infection because of malnutrition, impoverished blood supply, obesity, old age and immunodeficiency states
- Treatment-specific factors such as use of steroids, anticancer agents and radiotherapy
- Operative procedures of long duration such as cardiac and vascular procedures, orthopaedic and in neurosurgery
- Insertion of a prosthesis or graft.

Management

- Prophylactic use of antibiotics should be distinguished in dosage and duration from their therapeutic use.
- A single dose of parenteral antimicrobial given with induction of anaesthesia **before** an operation usually provides adequate tissue concentrations for several hours.
OR 3 dose cover of same antibiotic for 24 hours
OR 5 day cover if need be.

Choice of prophylactic antibiotic

NATURE OF OPERATION Likely Pathogen	Recommended Drugs	Alternate Drugs
APPENDICECTOMY		

Enterobacteriaceae (Klebsiella, Escherichia, Proteus & Enterobacteria, E. Coli Anaerobes	Gentamicin & Metronidazole & Penicillin	Clindamycin OR Piperacillin OR Amoxicillin–clavulanate
BILIARY TRACT		
Enterobacteriaceae	Penicillin & Gentamicin & Metronidazole	Piperacillin OR Amoxicillin–clavulanate
BURNS		
Group A Streptococcus Achromobacter Acinetobacter Pseudomonas	Penicillin G & Gentamicin Silver sulphadiazine cream (topical)	Amikacin
CARDIOVASCULAR		
Staphylococcus aureus Staphylococcus epidermidis Corynebacterium Enterobacteriaceae	Cefazolin OR Cefuroxime	Amikacin
COLORECTAL		
Enterobacteriaceae Anaerobes (Bacteroid)	Penicillin & Metronidazole & Gentamicin	Clindamycin OR Piperacillin OR Amoxicillin–clavulanate & Cefuroxime
GASTRODUODENAL		
Enterobacteriaceae Gram +ve cocci	Gentamicin + Ampicillin	Amikacin
GYNAECOLOGICAL		
Enterobacteriaceae Anaerobes Enterococci Group B Streptococci	Gentamicin + Ampicillin + Metronidazole	Clindamycin Amoxicillin–clavulanate Augmentin Piperacillin
HEAD & NECK (entering oral cavity or pharynx)		
S. aureus Streptococci Oral anaerobes	Amoxicillin–clavulanate OR Clindamycin	Piperacillin
NEUROSURGERY		
S. aureus S. epidermidis	Cefazolin OR Cefuroxime OR Penicillin & Chloramphenicol	Amikacin OR Vancomycin OR Ceftriaxone
ORTHOPAEDIC		
S. aureus S. epidermidis	Flucloxacillin OR	Amikacin OR

	Cefuroxime	Vancomycin
OCULAR		
S. aureus S. epidermidis	Gentamicin OR Cefazolin	Amikacin
RUPTURED VISCERA		
Enterobacteriaceae Anaerobes Enterococci	Penicillin & Gentamicin & Metronidazole	Clindamycin OR Piperacillin OR Amoxycillin–clavulanate OR Cefuroxime & Metronidazole
SKIN & SOFT TISSUE		
Group A Streptococcus S. aureus	NONE	Cefuroxime Cloxacillin
TRAUMATIC WOUNDS		
S. aureus Group A Streptococcus Clostridia	Penicillin & Gentamicin OR Cloxacillin OR Flucloxacilin	Penicillin + Vancomycin OR Amikacin

POST-OPERATIVE CARE

This is the care given in the post-operative period to:

- Keep the patient comfortable and give adequate analgesia
- Offer supportive feeding and
- Restore normal health and independence.

To achieve the above, the surgeon must give legible, concise and clear post-operative instructions.

Immediate post-operative recovery phase

- Usually in a recovery ward in theatre for about 1–2 hrs where facilities allow
- The patient is kept in semiprone position with extended neck and flexed limbs
- Maintain clear airway using oropharyngeal airway
- BP TPR ½ hrly
- Keep till awake (arousable).

Transit from theatre to ward

- Keep airway clear to avoid upper airway obstruction and aspiration pneumonitis.

Post-operative care in first 24 hours

- Continue observation BP TPR 4 hourly or as often as individual case demands
- Relieve pain with analgesia e.g. pethidine 50–100 mg every 6 hrs for adults and in children 1 mg/kg in divided doses
- Transfuse if necessary
- If not feeding, give IV fluids, Hartmann's/Normal saline 5%, or 10% dextrose, about 4 litres in 24 hours for a 70 kg adult. Titrate against state of hydration
- Watch for airway obstruction, reactionary bleeding, etc.
- Attend to drains if in-situ and make sure they are draining
- Maintain input and output chart (urine output 1–2 ml/kg/hour)
- Offer general nursing care e.g. turn in bed and change wet linen to avoid bed sores
- Wound care as appropriate.

Post-operative period 72 hrs–7 days

- Mobilise out of bed about 18–72 hrs to avoid static pneumonia and deep vein thrombosis
- Encourage independence e.g. self feeding, attention to calls of nature
- Can have oral medication
- Observe at 6 hrly or BD
- Wound care as appropriate.

24.2. ABDOMINAL CONDITIONS

ACUTE ABDOMEN

A clinical term used to describe a syndrome that usually incorporates symptoms and signs in the abdomen. Central in the syndrome is a severe acute abdominal pain. The term acute abdomen is a symptomatic diagnosis and not definitive. It is critical in these patients that a variety of diagnosis be suspected and diagnosed or clearly excluded before definitive management.

Common causes of abdominal pain are; medications (NSAIDs), gastroenteritis, peptic ulcer disease, acute erosive gastritis, appendicitis, acute cholecystitis, acute pancreatitis, acute intestinal obstruction, renal colic, diverticulitis, ectopic pregnancy, ruptured/twisted ovarian cyst, mittelschmerz, urinary tract infection, pelvic inflammatory disease.

Clinical Features

Meticulous history and physical examination is very important in establishing diagnosis.

Abdominal pain, distension, guarding, rigidity, altered bowel sounds, alteration of bowel habits.

Search for signs and symptoms of GIT disease, genitourinary, hepatobiliary, respiratory diseases as well as metabolic disorders (diabetes mellitus, porphyrias), CNS diseases (neuropathies), haematologic diseases (thrombotic crisis in sickle cell disease, etc) and cardiovascular disease.

Investigations

- Hb, WBC, PCV
- Urea and electrolytes
- Urinalysis
- Plain abdominal X–ray (erect and dorsal decubitus), chest X–ray
- Other investigations as condition dictates e.g. ultrasound in suspected cholecystitis, liver abscess or pancreatitis.

Management

- **Supportive** Nil by mouth, correct fluid and electrolyte imbalance by IV fluids
- **Specific** Treat underlying cause e.g surgery for perforation, peritonitis, ruptured, ectopic pregnancy etc.
- Group and cross match blood for all laparotomies

INTESTINAL OBSTRUCTION

Clinical Features

In infants suspect bowel obstruction if; No meconium is evacuated within the first 24 hrs of birth, green or bilious vomiting, abdominal distension. **In adults** suspect bowel obstruction if, there is constipation, abdominal distension, fever (if advanced obstruction is present), features of dehydration exist, altered bowel sounds, abdominal pain, vomiting.

Investigations

- Hb, WBC, PCV
- Urinalysis
- Urea and electrolytes
- X–ray abdomen (erect AP and dorsal decubitus)
 - multiple air–fluid levels, gaseous distension of gut, double bubble sign in children, etc.

Management

- Correct fluid and electrolyte imbalance
- Group and cross match blood
- Deflate the distended stomach with nasogastric suction. This is more effective for small bowel than in large bowel obstruction
- High enema may be effective for faecal impaction only
- Remove the cause of the obstruction usually by surgery.

NB Obstruction due to adhesions from previous surgery may open under conservative management.

- Emergency large bowel surgical resection usually involves creation of a de–functioning colostomy rather than performing primary resection and anastomosis if strangulation has

taken place (Hartmann's procedure).

PERITONITIS

This is inflammation of the peritoneum. Note that peritonitis could be due to tuberculosis and could also be aseptic. The aseptic type is usually due to chemical irritants like bile, gastric juices, etc. Peritonitis usually ends up producing adhesions that may cause future bowel obstructions of varying degrees.

Clinical Features

Presentation is with an acute tender abdomen, abdominal distension, altered bowel sounds, guarding, rigidity, rebound tenderness and fever.

Investigations

- Abdominal X-ray (erect AP and dorsal decubitus) – may show air fluid levels or air under the diaphragm in case of perforated viscera.
- Total white cell count and differential

Management – General

- Correct fluid and electrolyte imbalance. These are usually disturbed by movement of fluid and electrolytes into the third space. The disturbance could arise or be made worse by vomiting and/or diarrhoea
- Nasogastric suction is usually necessary because of organ hypotonia and dilatation
- Antibiotics to cover a broad spectrum of bacteria should be used. Combinations advised in order to get the appropriate cover (crystalline penicillin 2 mega units QDS, gentamicin 80 mg TDS + metronidazole 500 mg TDS).
- Pain has to be alleviated by once a diagnosis has been made – analgesics

Management – Specific

- Exploratory laparotomy is a must in secondary peritonitis in order to repair or remove the diseased organ
- Laparotomy also facilitates peritoneal lavage of the necrotic debris and pus.
- Send pus for C&S

APPENDICITIS

Clinical Features

Starts classically with diffuse abdominal pain felt most prominently in the peri-umbilical area. There is anorexia and nausea. Vomiting may follow. Pain then settles in the right lower quadrant and is localised at McBurney's point. Anorexia is present in adults and children. The pain may be relieved briefly after perforation but is accentuated by the ensuing diffuse peritonitis. There is localised tenderness in the right lower quadrant. There is rebound tenderness, muscle guarding, cutaneous hyperaesthesia: Pelvic tenderness in the right iliac fossa on rectal examination. Rovsing's sign may be positive. The temperature may be elevated.

Investigations

- Laboratory examinations are not critical for diagnosis. There is leucocytosis with neutrophilia. Normal values do not rule out appendicitis.

Management

- Once diagnosis is made, give analgesics whilst preparing for surgery
- Starve the patient before surgery
- Give premedication when there is time (atropine and pethidine)

Appendectomy, is the treatment of choice, once a diagnosis is made.

INGUINAL HERNIA

Clinical Features

Usually diagnosed on a good physical examination after a history of a protrusion is given. There may be a nagging or painful sensation in the groin. Examination should include: ' Observation of the bulge with the patient standing and coughing, doing the same manoeuvre with a finger invaginated into the external ring, repeating the above process with the patient lying down, differentiate inguinal from femoral hernia by checking which side of the inguinal ligament the impulse originates from. There is no great advantage of differentiating indirect from direct inguinal hernia, pre-operatively.

Admit For

- Emergency surgery if obstructed or incarcerated.
- Urgent surgery for children under 1 year

Refer For

- Elective surgery
- Emergency surgery after resuscitation (if emergency surgery not possible at the hospital).

Management

- Surgical repair is necessary for all inguinal hernias
- In strangulation, with obstruction of viscus, especially bowel the usual resuscitative measures are carried out before and after surgery.
- Umbilical, incisional, lumbar herniae require similar treatment as above.

Complications

- **Obstruction** This occurs when a hollow viscus goes through a ring of variable size and cannot be reduced. The other term used is incarceration (when non-hollow organ is held e.g. omentum) of the hernia.
- **Strangulation** is a process whereby blood flow into the obstructed viscus is compromised. This if not corrected culminates in ischaemia of the viscus supplied by the involved blood vessels. Pain and tenderness over the hernial area are ominous signs. Sudden change from reducible to irreducible status especially if discolouration of tissues over the area is present is an ominous sign.

24.3. ABSCESSSES

Clinical Features

An abscess formation is the culmination of an uncontrolled localised infection. There is tissue necrosis with liquefaction (pus formation).

Management

- Treatment involves incision and drainage
- Indications that an abscess needs incision and drainage include; incomplete pus discharge, throbbing pain, a localised swelling that is tender, hot, usually with a shiny skin and with fluctuation. Fluctuation may be absent in deep abscess.

Technique involves:

- Preparing the area by cleaning and draping
- If not under general anaesthesia, spraying the area with spray anaesthetic (ethyl chloride)
- Test needle aspirate if not already done
- Incision into the soft part of abscess. Break all the loculi of pus (pockets) to leave a common cavity for drainage. Leave a wick of gauze (Vaseline) to facilitate drainage
- Breast abscess may require counter incisions leaving in a corrugated drain for about 24 hours
- Leave the wounds to heal by granulation
- Hands and feet abscesses will require multiple incisions with counter incisions in some areas and elevation of the limbs
- Peri-anal and ischio-rectal abscesses (together with hand abscesses) require general anaesthesia. They require days to weeks of sitz baths before they heal. Ask the patients to add 1 to 2 teaspoons of salt into the water
- Recurrent peri-anal and ischio-rectal abscesses necessitate procto-sigmoidoscopy to rule out anal fissures or fistulae. They are also common in patients with immune suppression, TB, inflammatory bowel diseases and homosexuals.
- Antibiotics are indicated in the hand abscesses. Other abscesses may or may not need antibiotics depending on the presence or absence of local cellulitis.
- Face abscesses require antibiotic cover
- Always send specimen of pus (and where possible abscess wall) for C&S (and histological exam)

24.4. ANORECTAL CONDITIONS

Clinical Features

Pain Usually on defaecation that prevents proper sitting and causes immobility (commonly due to abscess, thrombosed haemorrhoids or acute fissure-in-ano). **Bleeding** Painless bleeding is commonly due to haemorrhoids but may be due to colorectal carcinoma.

Perianal mass The patient complains of feeling a mass (usually prolapsed haemorrhoids or anal tags).

Discharge Anal discharge is associated with tumours, proctitis and helminthic infestation.

Anal discharge is common in obese people. Perineal discharge commonly due to fistulae. Discharge may be associated with itching.

ANAL INCONTINENCE

Causes Congenital abnormalities. Trauma (obstetric, operative, accidental), the sphincters and anorectal ring are injured. Neurological (due to spinal cord disease). Anorectal disease (rectal prolapse, third degree haemorrhoids and anorectal cancer). Thoroughly examine the patient locally. Do a rectal examination using a proctoscope if available.

Management

- Is that of predisposing condition.

RECTAL PROLAPSE

Prolapse may be partial (mucosal) or complete (whole thickness of rectal wall). Common in children and elderly (especially females 85% of adults) but may occur at any age.

Clinical Features

Clinically three types of prolapse are recognized:

- 1° – prolapse with spontaneous reduction
- 2° – prolapse with manual reduction
- 3° – prolapse which is irreducible

Most patients will present with reducible prolapse, otherwise: prolapse during defaecation associated with discomfort, bleeding and mucus discharge. Prolapse caused by mild exertion (cough or walking). Incontinence of flatus and faeces. Incontinence of urine if uterine prolapse compounds rectal prolapse.

Other associated conditions include: benign prostatic hypertrophy BPH, constipation, malnutrition, old age, homosexuality.

Ask the patient to bear down and strain; prolapse will usually occur

Check for Patulous anus. Poor sphincter tone (digital).

Management

- May be conservative or operative depending on the patient. Refer to surgical text book.
- 1° and 2° – conservative management with stool softeners
- 3° – refer for definitive surgery.

Complications

Irreducibility with ulceration, bleeding, gangrene with rupture of bowel.

PRURITUS ANI

Common condition (especially in males). **Causal** factors includes skin conditions (psoriasis, lichen planus, contact eczema), infective conditions (candidiasis, threadworms), anal–rectal conditions (piles, fissures, fistula, proctitis, polyps), neoplastic disease, anal warts, GIT conditions (irritable bowel syndrome, ulcerative

colitis, etc), drugs (quinidine, colchicine), obesity, and other conditions.

Management

- Treatment is that of the cause.

FISSURE-IN-ANO

An elongated longitudinal ulcer of the lower anal canal.

The commonest site is the midline posteriorly followed by midline anteriorly.

Clinical Features

More common in females in their midlife, and uncommon in the elderly. Can occur in children.

- Pain during defaecation, often intense and may last for an hour or more; and subsides till next defaecation. The patient tends to become constipated (to avoid the pain).
- Stool frequently **streaked** with fresh blood
- Discharge – a slight discharge is found in chronic cases
- Sentinel tag is usually demonstrated, with a tightly closed puckered anus. Digital examination and proctoscopy is painful, and can be performed after application of 5% xylocaine gel.

Differential diagnosis

Carcinoma of anus, easily simulates fissure, anal chancre, tuberculous ulcer (whose edges are undermined) and proctalgia fugax must be ruled out.

If doubt exists, excise ulcer for histology

Management

- Anaesthetic ointments (xyloproct, proctoglyvenol, etc) or suppositories may be tried
- Some heal spontaneously
- Stool softeners, diet, saline sitz baths
- Operative treatment is recommended for cases refractory to conservative treatment.

HAEMORRHOIDS

Varicosities of the haemorrhoidal plexus often complicated by inflammation, thrombosis and bleeding. Commonly associated with pregnancy

Clinical Features

Painless bleeding. Prolapse (especially at defaecation). Mucous discharge. Assessment is done at digital examination and proctoscopy (use good light).

Management

- Conservative or “medical” treatment with ointments and suppositories is of little value
- A high residue diet or bulk laxative to prevent constipation

- Specific treatment includes:
 - rubber–band ligation for 2°–3° haemorrhoids
 - manual anal dilatations
 - injection sclerotherapy
 - haemorrhoidectomy (for 2°–3° piles) and where other methods have failed.

Complications

- Thrombosis
- Infection
- Profuse bleeding

These complications require surgical intervention. Please refer.

ANORECTAL ABSCESSSES

There are four types of abscesses: **Submucosal, subcutaneous (perianal), ischiorectal, high intermuscular**. Usually there is no apparent cause but certain underlying diseases such as Crohn's disease, ulcerative colitis, rectal cancer, HIV disease, diabetes mellitus and active tuberculosis may be present.

Clinical Features

Acute painful swelling, fluctuation not always obvious. Painful defaecation. Anal discharge (which has pus and blood).

Management

- Incision and drainage under general anaesthesia (deroof by making a cruciate incision and excising the four triangles of skin).
- Take a pus swab for culture and sensitivity).
- Saline sitz baths and stool softeners.

Complications

Fistula formation. Recurrence. Sinus formation.

RECTAL TRAUMA

Aetiology:

- Assault
- Road accidents
- Birth trauma
- Sexual assault/homosexuality

Clinical Features

Patients present with pain, bleeding and purulent rectal discharge. Clinical findings include anal laceration, features of peritonitis, fever with or without foreign bodies in the rectum.

Management

Conservative – antibiotics, saline sitz baths and analgesics

Severe cases require surgical interventions (please refer for management).

LOWER GIT BLEEDING

This may be frank bleeding depending on the cause.

Common causes

- Haemorrhoids
- Anal fistulae and fissures
- Tumours: – benign (leiomyoma, fibromas, polyps) or malignant
- Trauma
- Angiodysplasia
- Bleeding disorders

Investigations

- HB, WBC, PCV & ESR
- Stool for microscopy, C&S
- Barium Enema (double contrast)
- Proctoscopy/Sigmoidoscopy and biopsy

Management

- Blood group cross match and transfuse if necessary
- Treat the cause
- Refer suspected malignancies.

FISTULA-IN-ANO

May complicate anorectal abscesses, Crohn's disease, ulcerative colitis, tuberculosis, colloid carcinoma of the rectum, LGV and HIV infections. Types are subcutaneous (anus to skin), submucous, low anal (open below the anorectal ring), high anal, pelvirectal.

Clinical Features

Persistent seropurulent discharge, periodic pain, pouting openings in the neighbourhood of anal verge. Anal internal opening is palpated for a nodule on digital examination – (confirmed at proctoscopy).

Management

This condition requires specialised treatment and should be referred to a surgeon.

Anorectal carcinomas should always be suspected with ulcers, indurations or masses in this area

24.5. BREAST DISEASES

Breast disease presents as: lumps, breast pain, nipple discharge and breast ulcers or eczema.

BREAST ABSCESS

This condition is common:

- During lactation, especially second week of puerperium
- During pregnancy
- Rarely other times.

Clinical Features

Severe breast pain. Fever. There may be an area of induration. Aspirate with a big bore needle to confirm presence of pus.

Management

- DO NOT DELAY INCISION AND DEPENDENT DRAINAGE (if no pus take a biopsy)
- DO NOT WAIT FOR FLUCTUATION OR ABSCESS TO POINT
- DO NOT STOP BREAST-FEEDING (Unless nipple is cracked or discharging pus. In this case continue to express milk).

Give antibiotics early. Most infections are due to **Staphylococcus aureus** and cloxacillin 500 mg QDS for 1 week is appropriate.

BREAST LUMPS

Cystic

- Breast abscess
- Fibrocystic Disease
- Cystsarcoma Phylloides (serocystic disease)
- Galactocele
- Hydatid cysts.

Solid

- Developing Breast abscess
- Antibioma
- Fibroadenoma
- Giant Fibroadenoma

- Intraductal papilloma
- Tuberculosis
- Lymphoma
- Neurofibroma
- Carcinoma of breast

Investigations

- Full haemogram, ESR
- Bilateral mammography
- Fine Needle aspirate and cytology (FNAC) where facility available
- Ultrasound
- Excisional Biopsy only in absence of FNAC

Management

Treat each case accordingly.

All suspected malignancies – refer for specialised surgical care

24.6. CENTRAL NERVOUS SYSTEM CONDITIONS

Conditions affecting the central nervous system (CNS) which may require surgical intervention may be classified as follows:

- Congenital disorders (hydrocephalus, microcephaly, encephaloceles, etc)
- Degenerative disorders
- Vascular disorders
- Infections (e.g. brain abscesses)
- Neoplasms
- Trauma
- **[see neurosurgical text books for details].**

Clinical Features

Generalised: headache, vomiting, alterations in level of consciousness. **Localised:** paralysis and/or sensory defect of a part of the body. Diplopia, blurred vision or loss of vision are significant signs Detailed history and careful examination (FUNDOSCOPY IS MANDATORY)

Investigations

- Full haemogram (severe anaemia should arouse suspicion of metastatic disease and polycythaemia of cerebellar haemangio blastomas)

- Plain radiography (will for example show metastatic disease of the skull, expansion of sutures in children, eroded clinoid processes, vascular markings and hyperostosis in meningiomas, etc)
- Contrast radiology (ventriculography, angiography, etc)

Computerised axial tomography (CT Scan) is the main diagnostic tool today for intracranial lesions.

INCREASED INTRACRANIAL PRESSURE

Usually caused by increases in mass content (e.g. tumour, haemorrhage, oedema or CSF).

Clinical Features

Principal symptoms are headache, vomiting and visual disturbance. Papilloedema may be detected. Weight loss, anorexia may be present especially with tumours. Bradycardia, mild hypertension and intellectual deterioration are common in later stages. Diagnosis is made on basis of clinical history, neurologic examination (papilloedema) and X-ray examination (plain skull X-rays and CT scan).

Lumbar puncture must not be done before a mass lesion is ruled out. Fundoscopy is a must!!

Management – General

- Clear airway with endotracheal intubation if patient is in coma
- Minimum daily fluid requirement should be given in form of **isotonic** solution (e.g. Ringer's solution or normal saline).
- Maintain blood pressure at normal or above normal range
- Administer mannitol, 1 gm/kg IV with Frusemide 0.7 mg/kg (15 minutes after mannitol). (DO NOT GIVE MANNITOL IN HEART OR RENAL FAILURE, HYPOTENSIVE PATIENT OR IN ACUTE INTRACRANIAL BLEEDS)
- Steroids (e.g. dexamethasone 4 mg 8 hourly IV) reduce brain oedema in tumours.
- Refer patients for:
 - Confirmation of diagnosis
 - Definitive treatment.

BRAIN TUMOURS

About 50% of intracranial tumours are metastatic (from lung, breast, thyroid, kidney and prostate). The remaining arise from: **Meninges** (e.g. meningioma – of brain tumours). **Skull** (e.g. osteomas, histiocytosis, multiple myeloma, etc). **Pituitary and parapituitary adenomas** – (chromophobe, eosinophilic, basophilic and prolactinomas) and **craniopharyngiomas**. These will present with headaches, disturbed vision and some form of endocrine change (e.g. Cushing's syndrome, galactorrhoea, diabetic insipidus, etc). **Intracerebral tumours** Gliomas e.g. astrocytomas and oligodendrogliomas. Ependymomas. Medulloblastomas. Diagnosis is made on basis of clinical history and findings, CT scanning, angiography and tumour biopsy.

Refer

- All suspected cases for diagnosis and management.

INTRACRANIAL INFECTIONS

These include **Skull osteomyelitis** Commonly complicating penetrating injuries. Post– craniotomy infections, may also follow **otitis media, mastoiditis, paranasal sinusitis** and scalp infections.

Conditions that may arise from infections are skull osteomyelitis, extradural abscess, subdural empyema, cerebral abscess, meningitis.

Clinical Features

Clinical features will vary depending on the site and spread of infection but will include: local tenderness, focal neurological signs, etc, disordered consciousness, epilepsy, signs of meningitis. Diagnosis is made on the basis of clinical history, physical and neurological examination. Plain X–ray of skull may show opaque air sinuses, air bubbles in brain, etc).

Angiography or CT scan confirms the diagnosis.

Management

- Adequate dose of appropriate antibiotics
- Drainage (multiple Burr holes, craniotomy, etc)
- Excision of infected bone
- Drainage of infected sinuses or mastoid air cells
- Anticonvulsant therapy.

Refer

- For appropriate investigations and management.

24.7. CHEST

EMPYEMA THORACIS

Presence of pus in the pleural space. Classified as acute, sub–acute and chronic. Causes Post–pneumonic, post–chest drainage under unsterile conditions, post–thoracostomy. Following oesophageal perforation and procedures and penetrating chest injuries. Tuberculous empyema is also referred to as empyema thoracis necessitans.

NB: Immunosuppression is commonly associated with chest diseases (investigate in suspicious cases).

Clinical Features

Symptoms of underlying condition. Shortness of breath. Fever and sweating. Diaphoresis. Tachypnoea and tachycardia. Dullness to percussion with reduced air entry on the affected side. Weight loss.

Investigations

- Chest X–ray shows fluid in the affected side
- Haemogram (leucocytosis, anaemia if chronic)
- Thoracocentesis (pus for C&S).

Management – General

- Improve general condition of the patient e.g. nutritional status.

Management – Specific

- Antibiotics, crystalline penicillin, Gentamicin and metronidazole for at least 2 weeks (take pus for culture and sensitivity and AAFB studies)
- Acute: tube thoracostomy drainage (under water seal drainage)
- Sub–acute: tube thoracostomy drainage
- Chronic: tube drainage; thoracotomy and decortication
- Anti–TB therapy where indicated

Admit For

- Under water seal drainage

Refer for

- Thoracotomy and decortication

Complications

Broncho pleural fistula, chronic sinuses and lung fibrosis.

NB Remember iatrogenic causes lead to very severe morbidity. Observe sterility at all times during procedures.

SIMPLE RIB FRACTURES

A break in the continuity of a rib(s). Could be traumatic or pathological. Types Crack fracture(s), fracture with fragment displacement, segmental fracture(s). Multiple rib segmental fractures (flail chest).

Clinical Features

History of trauma. Pain on breathing or movement. Evidence of chest trauma. Crepitus at the fracture site or tenderness. May have signs of associated haemo–pneumothorax.

May be associated with splenic or liver injury.

Investigations

- Chest X–ray, oblique views may be necessary.

Management

- Flail chest will require fluid restriction and diuresis to prevent adult respiratory distress syndrome (dyspnoea due to flail chest requires positive pressure ventilation) – **splint the “flail” immediately and refer**
- Analgesia which may include pethidine and 2% lidocaine 2–5 mls directly into fracture site, repeat once daily or after 3 days
- Antibiotics because of the associated atelectasis

Mucolytic drugs

- Chest physiotherapy.

Admit

- All patients for observation.

Refer If

- Flail chest causes respiratory distress, splint with pad and bandage then refer.

24.8. FLUID & ELECTROLYTE BALANCE

Total body water constitutes 50–70% of the total body weight. This water is in two main compartments: intracellular and extracellular (intravascular and extravascular/interstitial). Fluid moves from one compartment to another depending on the osmotic pressure.

WATER AND ELECTROLYTE EXCHANGE.

- Daily fluid consumption is 2000 to 2500 ml in 24 hours, 1500 ml by mouth and 500 ml to 1000 ml in solid food
- Loss is through urine (800–1500 ml), stool (250 mls), insensible loss (600 mls through skin and lungs). Insensible loss will be affected by hyperventilation, fever and high environmental temperatures.
- Daily salt intake is 50–90 mEq (3–5 g) of sodium chloride, potassium is approximately 50–100 mEq daily. There will be a deficiency of salts if there is reduced intake (post operative patients) or extra loss such as excess sweating or GIT losses (diarrhoea and vomiting).

DISORDERS OF FLUID AND ELECTROLYTES

Disorders may occur in the volume, concentration, composition and distribution of fluid and electrolytes. The main disorders that are likely to cause loss in fluid and electrolyte are:

- Diarrhoea and vomiting
- Nasogastric drainage
- Faecal drainage (especially high output fistulae)
- Peritonitis
- Haemorrhage
- Intestinal obstruction
- Paralytic ileus
- Burns
- Sequestration after muscle trauma
- Iatrogenic overload
- Major organ failure (Renal, Liver and Cardiac).

Mild to moderate degrees of fluid loss will lead to varying degrees of dehydration and severe loss will lead to

shock.

FLUID AND ELECTROLYTE THERAPY

- Administer daily fluid and electrolytes requirements in a patient who is not feeding
- **3,000 ml** of fluid is adequate for an average size adult. One third should be isotonic solution (normal saline)
- Administer daily requirements and replace fluid loss according to the degree of dehydration
- In hyperventilation and sweating replacement should be with water (dextrose solutions)
- In diarrhoea and vomiting, paralytic ileus, etc; replacement must be with isotonic solution especially potassium containing solutions e.g. Hartmann's or darrow's solution.
- Where there has been blood loss and patient is not in shock, volume replacement is with isotonic saline solution 0.5–1 litre in first hour not exceeding 2–3 litres in 4 hours
- Blood loss exceeding 10% of blood volume will require replacement.
- In severe burns, fluid replacement with isotonic crystalloid solutions is recommended. Blood must not be given until early haemoconcentration is overcome and there is definite anaemia
- It is advisable to administer isotonic solutions in patients undergoing aspiration of fluid in the non–functioning compartments (ascites, pleural effusion and chronically distended urinary bladder) as redistribution of intravascular fluid will result in a fall of blood pressure.

24.9. GENITOURINARY SYSTEM

Infections of urogenital system are characterised by the following symptoms: dysuria, urgency in micturition, colic pain in either flanks or the loins, pain on the lower abdomen due to inflammation of the urinary bladder (cystitis), poor urinary stream, dribbling and hesitancy, nocturia, urinary incontinence, urinary retention, haematuria and renal failure.

These symptoms overlap over many specific conditions hence a thorough examination is required:

- Ask and check for urethral discharge
- Palpate the urethra for areas of induration (stricture)
- Palpate the lower abdomen for tenderness, masses in the urinary bladder
- Bimanually palpate the kidney for masses or tenderness
- Do rectal or vaginal examination:
 - manually palpate the urinary bladder for masses
 - feel for the prostate in a man (size, consistency, nodularity, tenderness, fixation of rectal mucosa to it, etc).

URINARY RETENTION

Inability to pass urine while the urinary bladder is full. There is an urge to micturate and if not relieved, there is severe pain with straining.

Common Causes

Children Meatal Stenosis; Phimosis or paraphimosis; Posterior urethra valves; Ruptured urethra after trauma, constipation.

Adult – 20–50 years Urethral stricture; Calculi (bladder and urethral stones); Bladder tumours; Ruptured urethra (trauma); Post-operative (any perineal operation); Clot retention.

After 50 years Prostatism (Benign prostatic enlargement Ca. prostate, prostatitis, prostatic fibrosis); calculi; urethral strictures; bladder tumours; ruptured urethra (trauma); clot retention.

Females Bladder tumours; calculi; pelvic tumours (Cancer cervix, etc); urethral stenosis; clot retention (severe haematuria).

NB Cord compression with paraplegia/quadriplegia will result in urinary retention.

Management

- Relieve Acute retention
 - pass a size 16FG foley's catheter in adults or 8FG in children, if it passes and bladder is emptied retain it.
- If catheterisation fails, do a Suprapubic puncture 2–3 cm above pubic crest
 - after urine is drained, the anteverted bladder returns to normal position. Try catheterization again if fails use cystofix or suprapubic cystostomy and refer.

NB All catheters must be well lubricated with gel (Xylocaine, K-Y gel, etc).

Management – Definitive

- Do circumcision for phimosis or paraphimosis [see circumcision].

Refer If

- Prostatectomy and urethroplasty are indicated.

URETHRAL STRICTURE

Causes Congenital, traumatic (usually follows fracture of pelvis); inflammatory (follows gonorrhoea infection usually earlier in life); instrumentation: Indwelling catheter following endoscopy; post-operative following prostatectomy; after amputation of penis.

Clinical Features

Usually younger patient (below 50 years). Early symptoms: Passage of flakes in urine with early morning urethral discharge, later; difficulties in micturition (narrow prolonged stream, dribbling, straining). Urine retention with a distended urinary bladder.

Ask for any history of urethral discharge in the past, history of pelvic injury, history of instrumentation. Palpate urethra for induration. Do a rectal examination in all patients.

Investigations

- Urinalysis and C&S
- Urea and electrolytes
- Micturating cystourethrogram (MCU) and ascending urethrogram.

Management

- Suprapubic cystostomy or insert cystofix if there is retention of urine
- Basic investigations as above and treat for urethral discharge before any further treatment

Refer Patient for definitive surgical treatment.

URETHRAL INJURIES

May result from:

- A fall astride a projecting object
- A loose manhole cover
- Cycling accident
- Fracture of pelvis in road traffic accident
- Penetrating wounds (bullet wounds, etc)
- Iatrogenic.

Clinical Features

Urethral bleeding. Retention of urine. Perineal haematoma. Signs of fractured pelvis.

Management – Preliminary

- **Do not catheterize the patient per urethra**
- Give morphine or pethidine
- Empty bladder if full through a suprapubic cystostomy, but if the patient has passed urine “leave him alone”
- Start antibiotics
- Group and cross–match blood
- Do plain pelvic X–ray.

Definitive treatment will depend on which part of the urethra is ruptured, **anterior** (bulbous) or **posterior** (membranous). This is specialised treatment for which the patient should be referred to a surgeon. As this may not always be possible, the alternative is to do a suprapubic cystotomy and insert a catheter and refer.

Procedure for Suprapubic Cystotomy

This is done under strict aseptic precondition.

- Clean the abdomen and hypogastrium well with an antiseptic and drape with sterile towels
- Feel for the **distended bladder** and 2–3 cm above the upper pubic margin, infiltrate local anaesthetic
- Make a 2 cm transverse incision and dissect the tissues with a haemostat

- Open the bladder under direct vision and introduce a 16F Foley's catheter
- Close the layers around the catheter with stitches
- Balloon the catheter and leave it to drain for 14 days (in the meantime refer the patient)

Admit For

- Resuscitation and suprapubic catheterization.

Complications of Ruptured Urethra

Subcutaneous extravasation of urine and urethra stricture. This is made worse by infection or iatrogenically by inadvertent attempts to catheterize or do urethrography and urethroscopy, early.

RUPTURE OF BLADDER

This usually follows:

- A blow, kick or fall on a distended bladder
- Gunshot wounds/stab wound
- Passage of instruments
- Endoscopic resection of prostate or bladder tumour
- Diathermy coagulation of bladder tumour
- Operative procedures in the pelvis (e.g. C/S, tubal ligation, hysterectomy).

Clinical Features

The bladder may be injured intraperitoneally or extraperitoneally. **Intraperitoneal Rupture** Sudden agonizing pain in the hypogastrium. Severe shock, abdomen is rigid and distends slowly. Patient passes no urine. Rectal examination reveals a bulge in the pouch of Douglas. **Extraperitoneal Rupture** Similar symptoms like in rupture of **posterior** urethra described above.

Investigations

- Blood stained urine
- Plain erect X-ray of the abdomen show "ground glass" appearance of fluid in the lower abdomen
- Intravenous urography will demonstrate a leak from the bladder
- If there is no fracture pelvis, pass a 14F Foley's catheter and a little blood stained urine will drain out.

Management

- Laparotomy is done after resuscitative measures are taken
- The rupture in the bladder is repaired in two layers of catgut

A catheter is left in situ for ten to fourteen days.

Complications

Severe peritonitis if not attended to within 12 hours. If left unattended the mortality rate is 100%.

CIRCUMCISION

This is excision of the prepuce (fore skin of penis).

indications includes ritual (religious, traditional, personal), phimosis, paraphimosis, recurrent herpes genitalis restricted to the prepuce, recurrent balanitis (inflammation of prepuce), balanoposthitis (inflammation of prepuce and glans penis), tight frenulum, long and adherent prepuce.

Method:

- Clean and drape the perineum
- Local anaesthesia is used
- Dilate the prepucial meatus with artery forceps
- Retract foreskin and clean with warm saline
- Make circular incision on inner skin ~ 3 cm from the corona taking care not to injure the urethra and the glans penis
- Pull foreskin over glans penis and make incision with surgical knife over the coronal sulcus. Leave adequate penile skin
- Complete circumcision with scissors
- Control all bleeders with Bipolar Diathermy or ligatures.
- Suture incision with 4/0 plain catgut.

Use of Plastibel in circumcision of neonates is not recommended due to frequent urethral injuries and is best left for experienced surgeons.

Methods for infants, adolescent and adults is as described above. It can be safely performed under local anaesthetic. **DO NOT USE ADRENALINE.**

24.10. SKIN ULCERS & TUMOURS OF THE SKIN

SKIN ULCERS

Aetiology

- Infections:
 - Bacterial e.g TB, Leprosy, syphilis, anthrax
 - Fungal e.g histoplasmosis, etc
 - Parasitic e.g. leishmaniasis
- Tumours e.g squamous cell ca., Basal cell ca., melanoma, Kaposi's sarcoma
- Vascular e.g ischaemic (arterial), venous, varicose veins, sickle cell disease, diabetes, thromboangitis.

- Trauma
- Tropical ulcers.

Clinical Features

Ulcers are mainly found in the lower limbs but may occur on any part of the body. Examination should be thorough and systematic; the following are, with brief examples, the characteristics to note:

- **Site:** e.g. 95% of rodent ulcers (BCC) occur on upper part of the face; carcinoma typically to lower lip while syphilitic chancre affects upper lip
- **Size:** Carcinoma spreads more rapidly than inflammatory ulcer
- **Shape:** Rodent ulcers are usually circular, straight edges are found in dermatitis
- **Edge:** Undermined in TB, rolled in basal cell ca. (Rodent); everted in squamous cell ca. (SCC), vertically punched out in syphilis; slopping in venous and traumatic ulcers
- **Base:** Palpably indurated in SCC
- **Floor:** As is seen – granulomatous as in TB
- **Discharge:** Purulent indicates active infection, greenish discharge is seen in *pseudomonas* infection
- Lymph nodes: Enlarged mainly in malignant tumours
- Pain: Generally malignant and trophic ulcers are painless. Pain is found in TB, and anal ulcers.

Investigations

This will depend on the causative factor:

- Haemogram
- Pus for C/S
- Blood sugar
- VDRL
- Arteriography
- Biopsy for histology
- Mantoux test
- HIV screen
- Relevant X-rays to rule out bone involvement and/or infections.

Management

This will depend on the cause of the ulcer:

- Antibiotics

- Regular cleaning and dressing with antiseptic
- Wound excision/Skin graft

Malignant and varicose ulcers may need amputation and stripping of the varicose veins respectively.

Refer

- Wound that has not healed after two weeks of conservative management
- Any malignant ulcers.

25. Genito–urinary Diseases: Urinary Tract & Renal Conditions

25.1. Urinary Tract Infections

Main causes include: Normal GIT bacteria: *E. coli* (75%), *strep faecalis*, *klebsiella*. Organisms causing UTI particularly where there is congenital malformations of the urinary tract: *Proteus vulgaris*, *pseudomonas sp.*, Rarely: *staphylococcus*.

Predisposing Factors Obstruction in the urinary tract due to prostatic enlargement, pregnant uterus, calculi (stones), vesicoureteric reflux, cervical prolapse, cystocele, tumours. Diabetes mellitus. Catheterisation of bladder.

Investigations

- Urinalysis: >10 WBC/cubic mm in uncentrifuged urine midstream or catheter specimen
- Bacterial colony count: Most reliable providing urine has been plated within 1 hour of voiding. Interpret results as follows:
 - <10,000 – nonspecific contaminants
 - 10,000–100,000; doubtful significance. Repeat cultures and evaluate clinical symptoms
 - > 100,000 diagnostic of UTI
- Intravenous urography.

LOWER URINARY TRACT INFECTION

Infection of urinary bladder (cystitis), urethra, prostate or ureters.

Clinical Features – Adults

Painful micturition (dysuria). Painful desire to pass urine though the bladder is empty (strangury). Frequency. Cloudy and sometimes foul smelling urine.

Clinical Features ~ Children

Neonates Boys are affected more than girls due to higher incidence of congenital urinary malformation, Non–specific symptoms; Irritability, poor feeding, vomiting. **Early infancy** Girls are affected more than boys due to short urethra, failure to thrive, anorexia, vomiting, fever (with upper UTI). **Older children** Abdominal pain, frequency, dysuria, enuresis.

Investigations

- Urinalysis – pus cells, haematuria, casts
- Urine C&S for recurrent infections
- Further evaluation, including intravenous urography in young men with first infection and women with more than 3 infections in one year.

Management

- Encourage a lot of oral fluid
- Single dose regimens (uncomplicated lower UTI):
 - amoxicillin 3 gm PO STAT
 - OR**
 - cotrimoxazole 4 tabs PO STAT
- Short course of antibiotics:
 - cotrimoxazole;
 - Adult – 2 tabs BD for 7–14 days
 - Children – 48 mg/kg/day in 2 divided doses
 - OR**
 - amoxicillin;
 - Adult – 500 mg TDS for 7–14 days
 - Children – 50 mg/kg/day in 3–4 divided doses
 - OR**
 - nitrofurantoin;
 - Adult – 100 mg TDS for 7–14 days
 - children – 5–7 mg/kg/day in 3–4 divided doses

Refer If

- Patient is an infant
- Evaluation reveals underlying urinary tract abnormality.

UPPER URINARY TRACT INFECTION (ACUTE PYELONEPHRITIS)

Acute inflammation of the parenchyma and pelvis of the kidney.

Clinical Features

Loin (lumbar) pain and tenderness. Dysuria. Strangury. Frequency. Cloudy urine. Fever (temperature 38°–40°C). Vomiting.

Investigations

- Urinalysis: Microscopy for pus cells organisms and casts
- Culture of midstream specimen of urine
- Full blood counts
- Urea and electrolytes
- Intravenous urography
- U/S for perinephric abscess.

The urine specimen should reach the laboratory within 2 hours of voiding or be refrigerated at 4°C for a period not exceeding 24 hours

Management

- A lot of fluids orally or IV, if vomiting
- Cotrimoxazole;
 - adult – 2 tabs BD for 10–14 days
 - children – 48 mg/kg/day in 2 divided doses
 - OR**
 - amoxicillin;
 - adult – 500 mg TDS for 10–14 days
 - children – 50 mg/kg/day in 3–4 divided doses
- Paracetamol 1 gm PO QDS as needed for fever or pain
- If admitted give IV gentamicin (adjust according to urea/creatinine) + IV ampicillin.

Admit If

- Temperature is greater than 38°C
- Kidney is palpable
- Costovertebral tenderness (MAY SUGGEST RENAL OR PERINEPHRIC ABSCESS)
- Patient is vomiting
- Compliance of patient is doubtful.

Refer If

- There is No response in 48 hrs
- Bacteria not cleared at end of treatment
- There is suspicion of renal abscess
- Recurrent attacks occur – more than 3 in one year.

25.2. Renal Disease Signs & Symptoms

HAEMATURIA

Causes include infections (urinary tract infection, tuberculosis, schistosomiasis), acute glomerulonephritis, trauma, meatal ulcers, blood disorders (bleeding disorders, leukaemia, purpura, scurvy, sickle cell disease), tumours, congenital abnormalities. Haematuria is a serious sign of disease and should be aggressively investigated. Refer urgently.

PYURIA

The finding of more than 10 white blood cells per high–power field on a urine specimen is suggestive of urinary tract inflammation. Pyuria as an isolated finding is almost commonly associated with bacterial urinary tract infection. When associated with haematuria or proteinuria, pyuria is suggestive of parenchymal renal disease such as glomerulonephritis or interstitial nephritis. Sterile pyuria is often due to TB – do cultures for TB.

AZOTAEMIA

This is the accumulation of nitrogenous waste products such as urea and creatinine due to loss of the excretory functions of the kidney.

ABDOMINALLY PALPABLE RENAL MASSES

Causes include nephroblastoma, polycystic kidneys, horse–shoe kidneys, neuroblastoma, hydronephrosis.
Always refer.

25.3. Acute Glomerulonephritis

This is an inflammatory renal disease commonly following streptococcal infection of skin and tonsils.

Clinical Features

Smoky haematuria or tea coloured urine. Oedema, puffiness of the eyes more noticeable in the morning. The oedema is seldom severe or generalised. Back pain. Hypertension commonly presenting as headaches visual disturbances, vomiting occasionally pulmonary oedema with dyspnea; convulsions and coma due to encephalopathy. Evidence of primary streptococcus infection, most often as an acute follicular tonsillitis with cervical adenitis and less often as skin sepsis. Altered urine output; occasionally there will be oliguria followed by diuresis (oliguric & diuretic phases).

Investigations

- Urinalysis: RBC, RBC casts and WBC. Granular & hyaline casts, mild to moderate proteinuria
- Blood urea: Moderately high in oliguric phase; otherwise normal
- Antistreptolysin O titre: Increased except in those with a skin primary cause where it remains normal
- Throat & skin swab where indicated. Streptococcus may be cultured.

Management

- Amoxycillin 500 mg TDS for 10 days • Restricted fluid input in oliguric phase
- Low salt protein diet in oliguric phase
- Frusemide 20–140 mg in oliguric phase
- Daily weight
- Treat hypertension if present [see hypertension].

Refer If

- In acute renal failure.

25.4. Acute Renal Failure

Acute or subacute decline in the glomerular filtration rate and/or tubular function characterised by rapid accumulation of nitrogenous waste products e.g. urea and creatinine.

Aetiologies of acute renal failure

TYPE	EXAMPLES
<ul style="list-style-type: none"> • Pre-renal acute renal failure • Diseases of renal arteries and veins • Intrinsic renal <ul style="list-style-type: none"> – glomerulonephritis – acute interstitial nephritis 	Vomiting, diarrhoea, burns, diuretic treatment, peritonitis, pancreatitis, heart failure, liver disease with ascites. Direct trauma to renal vessels, dissecting aortic aneurism. Post-infective glomerulonephritis Related to drugs e.g. methicillin, ibuprofen, gentamicin, etc
<ul style="list-style-type: none"> – acute tubular necrosis – intratubular obstruction 	Following volume depletion and due to toxins Following volume depletion and due to toxins, rhabdomyolysis, multiple myeloma, uric acid nephropathy
<ul style="list-style-type: none"> • Obstruction of collection system 	Bladder outlet obstruction, bilateral ureteral obstruction, ureteral obstruction in a single kidney

Clinical Features

Low or no urine output (sometimes may be normal). Oedema. Heart failure. Hypertension. Hyperkalaemia. Acidosis. Rising blood urea and creatinine.

Diagnostic Work-up History and Physical examination, including:

- Careful review of medical records and medications (e.g. gentamicin,
- Presence of swelling and oedema of muscles may indicate rhabdomyolysis
- Abdomen or flank pain may indicate obstruction to urine flow or inflammation of the kidneys.

Investigations

- Full blood counts
- Urinalysis and urine culture and sensitivity
- Urea and electrolytes
- Serum creatinine.

Management

- Replace fluid as completely as possible in patients who have vomiting, diarrhoea or burns
- Do not give drugs that may further damage the kidneys e.g. gentamicin, tetracycline, sulfonamides, non-steroidal anti-inflammatory drugs, nitrofurantoin
- Try to elevate the blood pressure with intravenous fluids to over 140/90 mmg Hg
- If the blood pressure is normal or high and the patient is not dehydrated give intravenous frusemide (Lasix) in a dose of 1–5 mg/kg
- Most important of all, transfer the patient to a centre with facilities for dialysis as soon as possible after the initial measures.

Refer If

- Anuria is present for more than 24 hours OR oliguria of more than 48 hours.

25.5. Chronic Renal Failure

The term chronic renal failure describes the existence of irreversibly advanced and usually progressive renal failure. **Causes** include chronic glomerulopathies, hypertension, chronic interstitial nephritis, diabetes mellitus.

Important manifestations of chronic renal failure

- Biochemical: Acidosis, hyperkalaemia. elevated blood urea, elevated serum creatinine
- Cardiovascular: Pulmonary oedema, hypertension, pericarditis and cardiac tamponade, heart failure
- Skeletal: Bone pain and fractures (rare)
- Nervous system: Encephalopathy (confusion, convulsions), peripheral neuropathy
- Haematological system: Anaemia, excessive bleeding e.g. from gums, skin, nose
- Skin: Scratching (pruritus), darkening of skin.

Suspect chronic renal failure if

- Previous history of renal disease e.g. acute nephritis, nephrotic syndrome is present
- There is known history of hypertension
- There is known history of diabetes mellitus
- High blood urea and serum creatinine
- Some of the systemic manifestation listed above presence.

Management

- Monitor urine output
- Reduce salt intake
- Reduce protein intake
- Treat hypertension
- Do not transfuse blood or infuse fluids if the urine output is low or if there is evidence of fluid overload such as hypertension, heart failure, peripheral or pulmonary oedema.

Refer If

- Chronic renal failure is diagnosed – for further management.

HYPERKALAEMIA

Serum potassium levels persistently above 5.5 mmol/L. Usually, there are no clinical consequences until the levels rise to 6 mmol/L and above. **Causes** include acute renal failure, severe chronic renal failure, and use of potassium retaining drugs (e.g. spironolactone, triamterene, ACE inhibitors). **Consequences include** muscular weakness, abdominal distension, tingling of the face, hands and feet, irregular pulse, heart block, increased amplitude of the T-wave on the ECG.

Investigations

- Urea and electrolytes
- ECG.

Management

- IV 10 ml 10% calcium gluconate to be injected over 5–10 minutes
- 50 ml of 50% solution of glucose and 5–10 units soluble insulin should be injected intravenously and repeated if hyperkalaemia recur
- Transfer to a centre with facilities for dialysis if the cause of hyperkalaemia is likely to be persistent.

25.6. Hypokalaemia

Serum potassium levels persistently below 3.5 mmol/L. **Causes** include inadequate dietary intake (rare), gastrointestinal fluid loss (vomiting, diarrhoea, fistulae, paralytic ileus), renal loss (diuretics, uncontrolled diabetes mellitus), systemic metabolic alkalosis, and dialysis.

Clinical Features

- Muscular weakness
- Tetany
- Fatigability
- Thirst
- Polyuria
- Paralytic ileus
- Cardiac arrhythmias
- Low Serum potassium
- Elevated serum bicarbonate
- Low Serum chloride
- ST segment depression and appearance of V waves on ECG.

Investigations

- Urea and electrolytes
- ECG.

Management

- Treat cause where possible
- If necessary give oral potassium (Slow K), 80–100 mmol daily or intravenous (at a rate of infusion not to exceed 25 mmol/hr).

**Care must be taken in patients with renal failure to avoid hyperkalaemia
NEVER give potassium IV as a bolus. The patient will have a cardiac arrest**

25.7. Nephrotic Syndrome

A pre-school and school age renal disease characterised by generalised oedema, proteinuria and hypo-albuminaemia. **Causes** include idiopathic/unknown in majority of cases. Congenital in rare cases. Secondary, due to post acute glomerulonephritis, plasmodium malaria, allergy e.g. bee stings, heavy metal poisoning (e.g. mercury & lead), urinary tract infection.

Clinical Features

Oedema; marked to massive oedema. Ascites & pleural effusion may occur.

Proteinuria; marked proteinuria. **Hypoproteinaemia** low serum albumin in blood.

Hyperlipidaemia.

Investigations

- Urinalysis
- 24 hour urine for protein
- Serum protein
- Urea and electrolytes
- Serum cholesterol.

Management

- High protein if urea is normal, low salt diet
- Frusemide administered carefully to induce diuresis 1.5 litres/day
- Prednisone 2 mg/kg/day (maximum 60 mg) for 6 weeks. Gradually tapered off after the first 4 weeks. Prednisone should be started after diuresis has been induced
- Antibiotics are used if there are clinical signs of/or suspected infections. Possibility of urinary tract infection should always be considered.

Refer Patients

- With persistent haematuria
- With hypertension
- With uraemia
- Who relapse or do not respond.

25.8. Urinary Fistula

Abnormal communication between urinary system and skin or internal hollow viscus. Persistence of skin fistula implies distal obstruction or chronic infection e.g. TB or foreign body like stone or non-absorbable ligature.

Types

- Congenital:
 - ectopic vesicae, patent urachus and urachal cyst
 - anorectal malformations

- Traumatic:
 - penetrating wounds
 - iatrogenic (bladder, prostate, urethral surgery)

- Vesico–vagino–fistula [see 18.8. abscesses and fistulae].

**Management of these conditions is complex.
Refer to appropriate specialists**

Annexes

A. Reference Ranges of Common Laboratory Tests

BIOCHEMISTRY

TEST	INTERNATIONAL UNITS	PREVIOUS UNITS
Blood sugar	3.3–6.7 mmol/L	60–120 mg/100 ml
Urea	2.5–6.5 mmol/L	15–40 mg/100 ml
Uric acid	0.1–0.5 mmol/L	2.4–8.5 mg/100 ml
Calcium	2.20–2.60 mmol/L	8.8–10.4 mg/100 ml
Acid phosphatase (Prostatic)	0.2–0.8 IU/L	
Cholesterol	3.5–7.5 mmol(L)	135–290 mg/100 ml
Total protein	60–80 g/L	6–8 g/100 ml
Albumin	32–52 g/L	3.2–5.2 mg/100 ml
Sodium	135–146 mmol/L	135–146 mg/L
Potassium	3.5–5.0 mmol/L	3.5–5.0 mg/L
Chloride	95–105 mmol/L	95–105 mg/L

Bilirubin (Total)	5–20 Fmol/L	0.3–1.2 mg/100 ml
Bilirubin (Direct)	1–6 Fmol/L	0.1–0.4 mg/100 ml
Bilirubin (Indirect)	2–13 Fmol/L	0.2–0.7 mg/100 ml
Alkaline phosphatase	80–210 IU/L	
S.G.O.T.	8–28 IU/L	
S.G.P.T.	8–40 IU/L	
Serum creatine	45–105 Fmol/L	0.3–1.2 mg/100 ml)
Urine creatine	9–18 mmol/24hrs	1.0–2.0 g/24hrs

HAEMATOLOGY

<p>HAEMOGLOBIN: P Men.....11.5–18.0 g/dl P Women.....10.5–16.5 g/dl P Newborn (Full term).....12.5–19.5 g/dl P Children;</p> <p>– 3 months old.....9.5–13.5 g/dl – 1 yr old 10.5–13.5 g/dl – others.....10.5–14.5 g/dl</p>
<p>MEAN CELL VOLUME (MCV): P Adults (male & female)...82–97 fl</p>
<p>PCV: P Male.....38–52 P Female.....36–46</p>
<p>RED CELL COUNT P Male.....4.5–6.3 x 10¹²/L P Female.....4.2–5.4 x 10¹²/L</p>

B. Paediatric Drug Dosages

DRUG	DAILY DOSAGE, FREQUENCY
Cotrimoxazole	48 mg/kg/day (8 mg TMP + 40 mg SMX) BD
Lincomycin	30 mg/kg/day PO, IM, IV 10–20 mg/kg/day TDS
Ampicillin	
Oral	50–100 mg/kg/day QDS
IV/IM	75 mg/kg/day (over 15 minutes) QDS
Septicaemia	100–200 mg/kg/day QDS
Chloramphenicol	
Premature & newborn	25 mg/kg/day BD
Older infants & children	50–100 mg/kg/day QDS
Erythromycin stearate	

	Oral	30–50 mg/kg/day QDS
	IV	15–20 mg/kg/day QDS
Gentamicin		
	Premature and full term infants	5 mg/kg/day BD
	>1 week	5–7.5 mg/kg/day TDS
Isoniazid (oral)		
		10 mg/kg/day (Max. 300 mg daily) OD
Kanamycin (IM)		
	Preterm	15 mg/kg/day BD
	Newborn	20 mg/kg/day BD
	Older infants & children	30 mg/kg/day TDS
Neomycin (oral)		
	Premature and newborn	50 mg/kg/day QDS
	Older children	100 mg/kg/day QDS
Nitrofurantoin (oral)		
		6–10 mg/kg/day TDS
Cloxacillin (Oral)		
		50–100 mg/kg/day QDS
Penicillin G. Crystalline		
		50,000–100,000 IU/kg/day QDS
Benzathine penicillin (Rheumatic fever prophylaxis) (IM)		
		1.2 mega IU monthly
Ampicillin–cloxacillin neonatal Drops		
		0.6 ml every 4 hrs
Amoxycillin		
		20–50 mg/kg/day TDS
Carbenicillin		
	Preterm	225 mg/kg/day/IV TDS
	Newborn	300 mg/kg/day/IV QDS
	Older infants & children	400–600 mg/kg/day/IV QDS
Fucidate Sodium		
		20–50 mg/kg/day TDS
Streptomycin (IM)		
	Tuberculosis	20 mg/kg/day OD
	Others	20 mg/kg/day BD
Sulphadiazine		
		75–150 mg/kg/day QDS
Amikacin		
		15 mg/kg/day BD
(Cefotaxime)		
	Neonates	50–100 mg/kg/day BD
	Children	100–150 mg/kg/day BD
(Ceftriaxone)		
	Neonates	20–50 mg/kg/day OD
	Children	20–80 mg/kg/day OD

Meningitis:		
Ampicillin		25–50 mg/kg/day QDS
Amoxicillin:		
	Initial dose	2.5 mg/kg/IM
	Maintenance	5–7.5 mg/kg/day TDS
Chloramphenicol succinate		
	Initial dose;	
	– <1 month	25 mg/kg STAT
	– >1 month	50 mg/kg STAT
	Maintenance;	
	– <1 month	50 mg/kg/day QDS
	– >1 month	100–150 mg/kg/day QDS
Sodium Penicillin:		
	Initial dose;	
	– <1 yr	100,000 IU/kg STAT
	– 1–6 yrs	1.2 mega units STAT
	Maintenance;	
	– < 1 yr	250,000 IU/kg/day QDS
	– 1–6 yrs	150,000–250,000 units/kg/day QDS
Cloxacillin		200–300 mg/kg/day QDS
Kanamycin		30 mg/kg/day BD
WORMS		
<i>Ascaris hookworms, threadworm, whipworm, pinworm;</i>		
Thiabendazole		25 mg/kg/day OD x 3 days
Mebendazole		100 mg BD x 3 days
Albendazole		400 mg STAT
Levamisole		2.5 mg/kg STAT
	Children 1 –4 yrs	40 mg STAT
	Children 5–15 yrs	80 mg STAT
<i>Tapeworm:</i>		
Niclosamide		
	Children	30 mg/kg STAT
	Adults	2 gm STAT
Praziquantel		40 mg/kg STAT
Antiprotozoal		

Chloroquine	10 mg/kg STAT 5 mg/kg 6, 24, 48 hrs
Sulfadoxine/pyrimethamine	25 mg/kg (of sulph.) STAT
Metronidazole (Amoebiasis)	30–50 mg/kg/day TDS
Quinine	10 mg/kg IV slowly in infusion TDS
Oral	10 mg/kg TDS
Analgesics & antipyretics	
<i>Non-narcotic & antipyretic;</i>	
Aspirin (analgesic)	50 mg/kg/day QDS
Aspirin (Rheumatic fever)	75–100 mg/kg QDS
Paracetamol	40 mg/kg/day QDS
<i>Narcotic:</i>	
Pethidine	1–2 mg/kg
Morphine -- (SC)	0.1–0.2 mg/kg/dose (max. 15 mg)
Naloxone (Pethidine antagonist)	0.01 mg/kg
Antihistamines	
Chlorpheniramine	0.4 mg/kg/day (tab= 4 mg) BD
Promethazine	0.5 mg/kg/dose (tab=25 mg) BD
Ketotifen – syrup	5 ml=1 mg (children <3 yrs – 0.5 mg BD)
Antispasmodic	
Atropine sulphate	0.01 mg/kg/dose – max. 0.3–0.4 mg/kg/dose
Tranquilizers, anticonvulsants, sedatives	
Diazepam (Ampoules – 10 mg/2 ml):	0.1–0.25 mg/kg PRN
<i>Acute anticonvulsant (status epilepticus)</i>	Slow IV infusion (1 mg/minute – max. 5 mg infants, 15 mg older children)
<i>Sedative & chronic anticonvulsant</i>	
Ethosuximide	
Phenytoin Sodium	
Phenobarbitone:	20–40 mg/kg/day BD
<i>Status epilepticus;</i>	4–7 mg/kg OD
Loading dose	3–6 mg/kg/day OD
Maintenance	10 mg/kg/IV at 25 mg/minute OR 6 mg/kg/IM 1–5 mg/kg/day/IV/PO/IM
Anti-asthmatics (Bronchodilators):	
<i>In Asthma:</i>	
Adrenaline (Epinephrine) 1 in 1000 SC;	0.01 ml/kg
Aminophylline IV	6 mg/kg slowly over 15 minutes then 0.9 mg/kg/hr

Salbutamol		
	Syrup (2 mg/5 ml);	2.5–5.0 ml TDS
	– 2–6 yrs	5 ml TDS
	– 6–12 yrs	5–10 ml TDS
	– over 12 yrs	
	Tablets; see equivalent dose in syrup (1 tab=2 mg)	8 mcg/kg/SC
	Injection;	
Cardiovascular drugs:		
<i>Digoxin:</i>		
Oral total digitilising dose (TDD);		0.03–0.06 mg/kg 2 TDD STAT then 3 after 8 hrs then 3 after 16 hrs
Frusemide		1 –3 mg/kg
Hydroflumethiazide		0.5–1.0 mg/kg/dose PO OD
Methyldopa		10 mg/kg/day TDS
Haematinics:		
Elemental iron		6 mg/kg/day TDS
Ferrous sulphate tabs (60 mg elemental iron)		30 mg/kg/day TDS
Mist Ferrous sulphate contains 60 mg/FeSO ₄ in teaspoons of 5 mls (6 mg iron)		30 mg/kg/day
Iron Dextran IM contains 50 mg Iron		Total amount of Iron in mg = wt. in kg x 0.6% of Hb deficit in gm%.
Blood transfusion;		No more than 2 ml by deep IM inj. Whole blood 20 ml/kg
Folic acid tabs=5 mg;		Packed cells 10 ml/kg
	< 2 yrs	2.5 mg alternative day
	2–5 yrs	2.5 mg/day
	5 yrs	5 mg/day
Miscellaneous:		
Atropine sulphate		0.01 mg/kg/dose
<i>Organophosphate poisoning;</i> Atropine sulphate for organophosphate poisoning 0.05 mg/kg/IV. Repeat every 15–20 min. until acetylcholine effect subsides or signs of atropine toxicity appear.		
Pralidoxamine		
Sodium bicarbonate IV		15–30 mg/kg/IV in 5–10 minutes 1.0 ml of 8.4% solution of NaHCO ₃ contains 1 mEq OR 0.3 x body wt (kg) x Base excess = dose

Potassium chloride (KCL) – 1 ml of 20% solution contains 2.6 mEq/ml	in mEq
Fluid requirement:	
1st day to 3rd day	60 ml/kg/day
4th to 7th day	add 20 ml/kg/day to above,
on 7th day	and thereafter 140 ml/kg/day
7th day to First 6 months	140 ml/kg/day
6 months to 1 year	100 ml/kg/day
Over 1 year	Go by age rather than weight ie., 1000 mls + (100 x Age in yrs) = Amount fluids e.g. 7 yrs age; 1000 + 700= 1700 mls
Up to 15 years (Adults)	1000+1500 = 2,500 mls
Fluid loss: Calculate weight loss in kg = Fluid loss in litres Similar calculations for: Mild dehydration = 22–5% weight loss Moderate dehydration = 5–10% weight loss Severe dehydration over 10% weight loss Jelliffer's formula may be applied up to 4–5 yrs of age P Basic requirement = 140 ml/kg/day P Mild dehydration = 180 ml/kg/day P Moderate dehydration = 220 ml/kg/day P Severe dehydration = 260 ml/kg/day	
Insulins: Soluble.....short acting Isophane (NPH).....medium acting Lente.....long acting Human insulin to replace animal insulin soon	
Neonates <i>Fluids;</i> Day 1.....60 ml/kg/day – 10% dextrose Day 2.....80 ml/kg/day Day 3.....100 ml/kg/day Day 4.....120 ml/kg/day Day 5.....140 ml/kg/day Day 6.....160 ml/kg/day Day 7.....180 ml/kg/day Day 8.....200 ml/kg/day	
Drug dosage for neonates:	
Aminophylline	5 mg/kg STAT then 5 mg/kg in divided doses over 24 hrs (25% solution – 5 mg = 0.2 ml)
20% NaHCO ₃	1–3 ml/kg/dose
10% Calcium gluconate	1–3 ml/kg/dose
Folic acid	1 mg/kg/24 hrs
Iron	6 mg/kg/day
Ferrous sulphate	30 mg/kg/day
Multi–vitamin	2.5 ml daily

Oral indomethacin	0.3 mg/kg x 3 days
Frusemide	2 mg/kg STAT
10% Dextrose	5 ml/kg STAT for hypoglycaemia
Phenobarbitone	10 mg/kg STAT maintenance 5 mg/kg/day
Sodium Valpoate	20 mg/kg/day divided in 3 doses
Diazepam	0.25 mg/kg STAT
Phenytoin Sodium	10 mg/kg STAT maintenance 8 mg/kg/day
Multivitamin drops	0.6 ml once a day
Caloreen	6 mg/kg/day
Antibiotics: Crystalline penicillin	50,000–100,000 units/kg/day BD
Gentamicin	5 mg/kg/day BD
Chloramphenicol	25 mg/kg/day (50 mg/kg/day Meningitis) BD 15 mg/kg/day BD
Amikacin	15 mg/kg/day BD
Metronidazole	50–100 mg/kg/day BD
Ampicillin	50–100 mg/kg/day BD
Cloxacillin	50 mg/kg/day BD
Cefotaxime	
DISCHARGE PRETERM BABIES ON FOLIC ACID, FERROUS SULPHATE AND MULTI-VITAMINS	

C. Kenya Essential Drugs List (October, 2002)

NRH = National Referral Hospitals (KNH = Kenyatta National Hospital MTRH = Moi Teaching Referral Hospital). PGH = Provincial General Hospital. DH = District Hospital. SDH = Subdistrict Hospital, HC = Health Centre, DISP = Dispensary, CHW = Community Health Worker

THERAPEUTIC CLASS ITEM DESCRIPTION	UNIT OF PACK	LEVEL OF CARE						
		NRH	PGH	DH	SDH	HC	DISP	CHW
1. ANAESTHETICS								
1.1. GENERAL ANAESTHETICS & THEATRE AGENTS								
D Tubocurarine Chloride Inj 10 mg/ml	Amps	X	X	X	X			
Diazepam Inj 5mg/ml	Amps	X	X	X	X	X	X	
Gallamine Triethiodide Inj 40mg/ml	Amps	X	X	X	X			
Halothane 250ml	Bolts	X	X	X	X			
Ketamine HCl Inj 200mg/20ml	Vials	X	X	X	X			
Neostigmine Methylsulphate Inj 2.5mg/ml	Amps	X	X	X	X			
Nitrous Oxide Inhalation	Cyl	X	X	X	X			

Oxygen Inhalation	Cyl	X	X	X	X	X	X	
Pancuronium Bromide Inj 2mg ml	Amps	X	X					
Suxamethonium Chloride Inj 50mg/ml	Amps	X	X	X	X			
Thiopentone Sodium Inj 500mg	Amps	X	X	X	X			
1.2. LOCAL ANAESTHETICS								
Lignocaine Hcl 2%. Dental Cartridge with Adrenaline	Cart	X	X	X	X			
Lignocaine HCl Inj 2% (50ml))	Bolts	X	X	X	X	X	X	
Bupivacaine 0.5% Inj. (4 ml)	Amps	X	X					
Ethyl Chloride Spray	Bolts	X	X	X	X	X	X	X
2. ANALGESICS. ANTIPYRETICS AND NON-STEROIDAI. ANTI-INFLAMMATORY DRUGS (NSAIDS)								
2.1. NON-OPIOIDS and NSAIDS								
Allopurinol Tabs 100mg	1000	X	X	X	X			
Aspirin Tabs 300mg	1000	X	X	X	X	X	X	X
Colchicine Tabs 0.5mg	1000	X	X	X	X			
Indomethacin Caps 25mg.	1000	X	X	X	X	X	X	
Paracetamol Paediatrics Oral Susp 120mg/5ml	Bolls	X	X	X	X	X	X	X
Paracetamol Suppository, 100 mg	Packs	X	X	X	X	X	X	
Paracetamol Tabs 500mg	1000	X	X	X	X	X	X	X
Ibuprofen Tabs 200 mg	1000	X	X	X	X	X		
Probenecid Tabs 500mg	1000	X	X	X	X	X	X	
Ibuprofen syrup 100 mg/5ml	Bolts	X	X	X	X	X		
2.2. OPIOID ANALGESICS								
Dihydrocodeine Tartrate Tabs 30mg	1000	X	X	X	X			
Morphine Powder for Oral Solution 10mg/5ml	Bolls	X	X	X				
Morphine Sulphate Inj 10mg/ml	Amp	X	X	X				
Morphine Sulphate Tabs 10mg	1000	X	X	X				
Pethidine Hydrochloride Inj 100mg/2ml	Amps	X	X	X	X			
Pethidine Hydrochloride Inj 50mg/ml	Amps	X	X	X	X			
3. ANTI-ALLERGICS & DRUGS USED IN ANAPHYLAXIS								
Adrenaline Tart Inj 1mg/1ml	Amps	X	X	X	X	X	X	
Chlorpheniramine Maleate Inj 10mg/ml	Amps	X	X	X	X	X	X	
Chlorpheniramine Maleate Syr 2mg 5ml	5Lt	X	X	X	X	X	X	
Chlorpheniramine Maleate Tabs 4mg	1000	X	X	X	X	X	X	

Hydrocortisone Sodium Succinate Inj 100mg Base	Vials	X	X	X	X	X		
Prednisolone Tabs 5mg	1000	X	X	X	X			
4. ANTIDOTES & OTHER SUBSTANCES USED IN POISONING								
4.1. NON-SPECIFIC								
Charcoal Activated Powder 100g	Packs	X	X	X	X	X	X	X
Charcoal Tabs 1 25 mg	1000	X	X	X	X	X	X	X
Ipecacuanha Syrup (Ipecacuanha Alkaloids 0.14%)	Packs	X	X	X	X			
4.2. SPECIFIC								
Atropine Sulphate Inj 1mg/ml (IV & IM)	Amps	X	X	X	X	X		
Dimercaprol Inj in oil 50mg/ml in 2ml (BAL)	Amps	X	X	X				
Methylthioninium Cl Inj 10mg/ml in 10ml (methylene blue)	Amps	X	X					
Naloxone HCl 0,4mg/ml	Amps	X	X	X	X			
Pralidoxime Mesylate Inj 200mg/ml (PAM)	Amps	X	X	X	X			
Sodium Calcium Edetate Inj 20mg/ml in 5ml	Amps	X	X	X	X			
Ethanol 10% IV(100ml)	Vials	X	X	X	X			
Sodium Nitrite Inj 30mg/ml in 10ml	Amps	X	X					
Sodium Thiosulfate Inj 250mg/ml in 50 ml	Amps	X	X					
Desferrioxamine Mesylate Inj 500mg/vial	Vials	X	X	X	X			
Protamine Sulphate Inj 10mg/ml (5ml)	Amps	X	X	X				
5 ANTIPILEPTICS ANTICONVULSANTS								
Carbamazepine Oral Susp 100mg/5ml	Bolts	X	X	X	X			
Carbamazepine Tabs 200mg	1000	X	X	X	X			
Diazepam Inj 10mg/2ml (IV& IM)	Amps	X	X	X	X	X	X	
Ethosuximide 250mg/5ml (250ml)	Bolls	X	X	X	X			
Ethosuximide Tabs 250mg	1000	X	X	X	X			
Phenobarbitone Tabs 30mg	1000	X	X	X	X	X	X	
Phenytoin Sodium Caps tabs 100mg	1000	X	X	X	X			
Phenytoin Sodium Caps tubs 50mg	1000	X	X	X	X			
Phenytoin Sodium Inj 5mg/ml (5ml)	Amps	X	X	X	X			
Clonazepam Tabs 2mg	1000	X	X					
Sodium Valproate Tabs 200mg	1000	X	X					
6. ANTI-INFECTIVE DRUGS								
6.1. ANTHELMINTHICS								

Diethylcarbamazine Citrate Tabs 50mg	1000	X	X	X				
Mebendazole Susp 100mg/5ml	Bolts	X	X	X	X	X	X	X
Mebendazole Tabs 100mg	1000	X	X	X	X	X	X	X
Niclosamide Tabs 500mg	1000	X	X	X	X	X	X	
Albendazole chewable Tabs 400mg	1000	X	X	X	X	X	X	
Albendazole Syrup 400mg/10ml	Botts	X	X	X	X	X	X	
Levamisole Hydrochloride Tabs 40mg	1000	X	X	X	X	X	X	
Levamisole Hydrochloride Syrup 40mg/5 ml	Bolls	X	X	X	X	X	X	
Praziquantel Tabs 600mg	1000	X	X	X	X	X		
6.2.a. ANTIBACTERIALS -- Oral Liquids								
Amoxicillin Susp 125mg/5ml (100ml)	Botts	X	X	X	X	X	X	
Amoxicillin + Clavulanic Acid Syrup 156mg (125mg + 31mg) (100ml)	Botts	X	X	X	X			
Amoxicillin + Clavulanic Acid Syrup 228mg (200mg + 28mg) (100ml)	Botts	X	X	X	X			
Clindamycin Oral Susp 75mg/5ml (80ml)	Botts	X	X	X				
Cloxacillin Syrup 125mg/5ml (100ml)	Botts	X	X	X	X			
Co-trimoxazole Susp 200:40/5ml (50ml)	Botts	X	X	X	X	X	X	
Erythromycin Ethyl Succ. Syr 200mg base/5ml (100ml)	Botts	X	X	X	X	X		
Cephalexin syrup 125mg/5ml (100ml)	Botts	X	X	X	X			
Ampicillin/Cloxacillin Neonatal drops 60mg/30mg (10ml)	Botts	X	X	X	X	X		
6.2.b. ANTIBACTERIALS - Oral Tabs/Caps								
Cephalexin 250 mg CAPS	1000	X	X	X	X			
Amoxicillin Caps 250mg	1000	X	X	X	X	X	X	
Amoxicillin 250mg+Clavulanic Acid 125mg Tabs	1000	X	X	X	X	X		
Amoxicillin 500mg+Clavulanic Acid 125mg Tabs	1000	X	X	X	X	X		
Chloramphenicol Caps 250mg	1000	X	X	X		X	X	
Clindamycin HCl Caps 150mg	1000	X	X	X				
Co-trimoxazole Tabs 400:80	1000	X	X	X	X	X	X	
Doxycycline HCl Caps 100mg	1000	X	X	X	X	X	X	
Erythromycin Stearate Tabs Film coated 250mg	1000	X	X	X	X			
Norfloxacin 400 mg tablets	1000	X	X	X	X			
Nitrofurantoin Sodium Tabs 100mg	1000	X	X	X	X	X		
Nalidixic acid Tabs 500mg	1000	X	X	X	X	X		

Flucloxacillin Caps 250mg	1000	X	X	X	X			
Ciprofloxacin tabs 250mg	1000	X	X	X				
Tetracycline Caps 250mg	1000	X	X	X	X	X		
Cloxacillin CaEs 250mg	1000	X	X	X	X			
6.2.c ANTIBACTERIALS -- Injectables								
Cefotaxime Inj 500mg	Vials	X	X	X				
Amikacin Sulphate Inj 100mg	Vials	X	X					
Kanamycine Inj 1gm	Vials	X	X					
Ceftazidime Pentahydrate 500mg	Vials	X	X					
Amikacin Sulphate Inj 500mg	Vials	X	X					
Amoxycillin Inj 500mg	Vials	X	X	X	X			
Benzathine Penicillin Inj 2.4 IV	Vials	X	X	X	X	X	X	
Benzyl Penicillin Inj 1MU	Vials	X	X	X	X	X	X	
Benzyl Penicillin Inj 5MU	Vials	X	X	X	X			
Chloramphenicol Sodium Succ Inj 1gm	Vials	X	X	X	X			
Clindamycin Hydrochloride Inj 300mg/2ml	Vials	X	X	X				
Fortified Procaine Penicillin Inj 4.0 MU	Vials	X	X	X	X	X	X	
Gentamicin Inj 80mg/2ml	Amps	X	X	X	X			
Gentamicin Inj 20mg/2ml	Amps	X	X	X	X			
Piperacillin Inj 2g	Vials	X	X					
Piperacillin Inj 4g	Vials	X	X					
Flucloxacillin Inj 250mg/vial	Vials	X	X	X	X			
Spectinomycin HCl Inj 2gm with Diluent	Vials	X	X	X	X	X		
Ceftriaxone Inj 500mg, 250mg	Vials	X	X	X	X	X		
Triple Penicillin Inj 6:3:3	Vials	X	X	X	X	X	X	
6.2.d. ANTILEPROSY/ANTITUBERCULOSIS DRUGS								
Clofazimine Caps 100mg	1000	X	X	X	X			
Clofazimine Caps 50mg	1000	X	X	X	X			
Dapsone Tabs 100mg	1000	X	X	X	X			
Dapsone Tabs 50mg	1000	X	X	X	X			
Ethambutol HCl Tabs 400mg	1000	X	X	X	X			
Isoniazid INH Tabs 100mg	1000	X	X	X	X			
Pyrazinamide Tabs 500mg	1000	X	X	X	X			
Rifampicin Caps 150mg	1000	X	X	X	X			
Rifampicin Caps 300mg	1000	X	X	X	X			

Streptomycin Sulphate Inj 1g	Vials	X	X	X	X			
Isoniazid + Ethambutol Tabs (150mg + 400mg)	1000	X	X	X	X			
Rifampicin + Isoniazid Tabs (150mg + 75mg)	1000	X	X	X	X			
Rifampicin + Isoniazid + Ethambutol Tabs (150mg + 75mg + 275mg)	1000	X	X	X	X			
Rifampicin + Isoniazid + Pyrazinamide Tabs (120mg + 50mg + 300mg) OR (150mg + 75mg + 400mg)	1000	X	X	X	X			
Rifampicin + Isoniazid + Pyrazinamide + Ethambutol Tabs (150mg + 75mg + 400mg +275mg)	1000	X	X	X	X			
6.3. ANTIFUNGALS								
Clotrimazole Cream 1% 15gms	Tube	X	X	X	X	X		
Clotrimazole Vaginal Pess 100mg	Pack x6	X	X	X	X	X		
Clotrimazole ear drops 1% 20ml	Botts	X	X	X	X	X		
Benzoic acid 6% + Salicylic acid 3% Oint.	Tube	X	X	X	X	X	X	
Nystatin Oral Susp 100,000 Units/ml (24ml)	Botts	X	X	X	X	X		
Nystatin Ointment	Tube	X	X	X	X	X		
Griseofulvin Tabs 125mg	1000	X	X	X	X			
Griseofulvin Tabs 500mg	1000	X	X	X	X			
Ketoconazole Tabs 200mg	1000	X	X	X	X			
Miconazole Nitrate 2% Oral Gel 40gm	Tube	X	X	X	X			
Fluconazole Caps 50mg, 150gm, 200mg	1000	X	X	X	X			
6.4. ANTIPROTOZOAL DRUGS								
Metronidazole Inj 500mg/100ml	Vials	X	X	X	X			
Metronidazole Susp. 200mg/5ml (100ml)	Botts	X	X	X	X			
Metronidazole Tabs 200mg	1000	X	X	X	X	X	X	
Tinidazole Tabs 500mg	1000	X	X	X	X			
Proguanil Tabs 100mg	1000	X	X	X	X			
Quinine Bisulphate Tabs 300mg	1000	X	X	X	X			
Quinine Sulphate Tabs 200mg	1000	X	X	X	X			
Quinine Dihydrochloride Inj 300mg/ml	Amps	X	X	X	X			
Amodiaquine 200 mg tabs	1000	X	X	X	X	X	X	
Amodiaquine susp 50mg/5ml	Botts	X	X	X	X	X	X	
Sodium Stibogluconate 100mg/ml (100ml)	Botts	X	X	X	X			
Dihydroartemisinin Tabs 60mg	1000	X	X	X	X			
Dihydroartemisinin Powder 10mg/sachet	Sach	X	X	X	X			
Dihydroartemisinin Syrup 10mg/5ml	Botts	X	X	X	X			

Sulfadoxine + Pyrimethamine Susp (250mg + 12.5mg)	Botts	X	X	X	X	X	X	X	X
Sulfadoxine 500mg + Pyrimethamine 25mg Tabs	1000	X	X	X	X	X	X	X	X
Sulphametopyrazine + Pyrimethamine Drops 10mg + 0.5mg (10ml)	Botts	X	X	X	X	X	X	X	X
6.5. ANTIRETROVIRALS									
6.5.a. NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTI)									
Didanosine (ddl) Tabs 25mg, 100mg	1000	X	X	X					
Lamivudine (3TC) Tabs 150mg	1000	X	X	X					
Lamivudine (3TC) Oral Solution 50mg/5ml	Botts	X	X	X					
Stavudine (d4T) Caps 30mg, 40mg	1000	X	X	X					
Stavudine (d4T) Syrup 5mg/5ml	Botts	X	X	X					
Zidovudine (AZT) Caps 100mg, 300mg	1000	X	X	X					
Zidovudine (AZT) Syrup 50mg/5ml	Botts	X	X	X					
6.5.b. NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NNRTI)									
Efavirenz (EFZ) Caps 200mg	1000	X	X	X					
Nevirapine (NVP) Tabs 200mg	1000	X	X	X					
Nevirapine (NVP) Syrup 50mg/5ml	Botts	X	X	X					
6.5.c. PROTEASE INHIBITORS									
Indinavir Sulfate (IDV) Caps 400mg	1000	X	X	X					
Nelfinavir Mesylate (NFV) Tabs 250mg	1000	X	X	X					
Nelfinavir Powder 50mg/gm	gm	X	X	X					
Saquinavir (SQV) Caps 200mg	1000	X	X	X					
Lopinavir + Ritonavir (LPV/r) caps (133.3mg + 33.3mg)	1000	X	X	X					
Lopinavir + Ritonavir (LPV/r) Oral Solution (400mg/5ml + 100mg/5ml)	Botts	X	X	X					
Ritonavir (RTV, r) caps 100mg	1000	X	X	X					
Ritonavir (RTV, r) Oral Solution 400mg/5ml	Botts	X	X	X					
6.6. ANTIVIRALS (Other than ARVs)									
Acyclovir Tabs 200mg	1000	X	X	X					
Acyclovir Inj 250mg/vial	Vials	X	X	X					
Acyclovir Cream 5gm, 10gm	Tube	X	X	X					
7. ANTIMIGRAINE DRUGS									
Aspirin Tabs 300mg	1000	X	X	X	X	X	X	X	X
Paracetamol Tabs 500mg	1000	X	X	X	X	X	X	X	X

Ergotamine tartrate 1 mg tablets	1000	X	X	X	X			
8. ANTINEOPLASTIC & IMMUNOSUPPRESSIVE DRUGS								
Actinomycin-D Inj USP 500mcg	Vials	X	X					
Busulphan Tabs 2mg	1000	X	X					
Cyclophosphamide Inj 200mg	Vials	X	X					
Cyclophosphamide Inj 500mg	Vials	X	X					
Cyclophosphamide Tabs 50mg	1000	X	X					
Cytosine Arabinoside (Cytarabine HCl) Inj Diluent	Vials	X	X					
Doxorubicin Hydrochloride Inj 50mg	Vials	X	X					
Flurouracil Inj 250mg	Vials	X	X					
Folinic Acid Tabs 15mg	1000	X	X					
Methotrexate Inj 50mg	Vials	X	X					
Vincristine Sulphate Inj 1mg	Vials	X	X					
Azathioprine Tabs 50mg	1000	X	X					
9. ANTIPARKINSONISM DRUGS								
Benzhexol Hydrochloride Tabs 5mg	1000	X	X	X	X			
Biperiden Hcl Tabs 2mg	1000	X	X	X	X			
10. DRUGS AFFECTING THE BLOOD								
Heparin Inj 25.000 Units/5ml	Vials	X	X	X	X			
Phytomenadione Inj 10mg/ml	Amps	X	X	X	X			
Protamine Sulphate Inj 10mg/ml	Amps	X	X	X	X			
Vit B12 Cyanocobalamine Inj 1mg/ml	Amps	X	X	X	X			
Warfarin Sodium Tabs 5mg	1000	X	X	X	X			
11. BLOOD PRODUCTS & BLOOD SUBSTITUTES								
Dextran 70 Inj 6% (in Saline)	Botts	X	X	X				
12. CARDIOVASCULAR DRUGS								
12.1. ANTIANGINAL DRUGS								
Glyceryl Trinitrate Tabs 0.5mg	1000	X	X					
Nifedipine Caps 10mg	1000	X	X	X				
Propranolol HCl Tabs 40mg	1000	X	X	X	X			
12.2. ANTIARRHYTHMIC DRUGS								
Atenolol Tabs 50 mg	1000	X	X	X	X			
Veranamil hydrochloride tablets 40 mg	1000	X	X	X	X			
12.3. ANTIHYPERTENSIVE DRUGS								

Hydralazine Inj 20mg/ml	Vials	X	X	X	X			
Hydralazine Tabs 25mg	1000	X	X	X	X			
Hydrochlorthiazide Tabs 50mg	1000	X	X	X	X			
Methyldopa Tabs 250mg	1000	X	X	X	X			
Propranolol HCl Tabs 40mg	1000	X	X	X	X			
Captopril Tabs 25mg	1000	X	X	X				
Digoxin Inj 0.5mg/2ml	Amps	X	X					
Digoxin Paediatric Elixir 0.05mg/2ml	Botts	X	X					
Digoxin Tabs 0.25mg	1000	X	X	X	X			
Frusemide Tabs 40mg	1000	X	X	X	X			
Frusemide Inj 20 mg/2ml	Amp	X	X	X	X			
Nifedipine Tabs 20mg	1000	X	X	X	X			
Enalapril Tabs 5mg	1000	X	X	X				
Sodium Nitroprusside Inj 10mg/ml (5ml)	Amps	X	X					
13. DERMATOLOGICAL DRUGS								
Benzyl Benzoate Emulsion 25%	Botts	X	X	X	X	X	X	X
Betamethasone Valerate Oint 0.1%	Tube	X	X	X	X			
Clotrimazole Cream/ointment 1% 15gm	Tube	X	X	X	X			
Compound Benzoic acid 6% + salicylic acid 3%	Tube	X	X	X	X	X	X	X
Calamine lotion	Botts	X	X	X	X	X	X	X
Podophyllotoxin 0.15%	Botts	X	X	X	X			
Gentian Violet Crystals Powder 10gms	Packs	X	X	X	X	X	X	X
Hydrocortisone Skin Oint 1% 10g	Tube	X	X	X	X	X	X	
Silver Sulphadiazine Cream 500gm	Jar	X	X	X	X			
14. DIAGNOSTICS AGENTS (RADIOLOGICALS)								
Barium Sulfate Powder	Kg	X	X	X				
Iodipamide Meglumine Inj 30% (25ml)	Amps	X	X	X				
Meglumine Iothalamate Inj 60% (20mls)	Amps	X	X	X				
Sodium & Meglumine Diatrizoate Inj 60% 1:6:6	Amps	X	X	X				
15. DISINFECTANTS & ANTISEPTICS								
Activated Glutaraldehyde 2%	5L1	X	X	X	X			
Cetrimide 15% + Chlorhexidine Gluconate 1.5%	5Lt	X	X	X	X	X	X	
Chlorhexidine Gluconate solution 5%	5Lt	X	X	X	X	X	X	
Lysol (Cresol BP)	5Lt	X	X	X	X	X	X	
Methylated Spirit	5Lt	X	X	X	X	X	X	
Hydrogen Peroxide 6% (20 Vols)	5Lt	X	X	X	X	X	X	

Povidone–Iodine 10%	5Lt	X	X	X	X			
Sodium Dichloroisocyanurate Tabs 2.5g	1000	X	X	X	X			
Sodium Hypochlorite Sol. 4–6%	5Lt	X	X	X	X	X	X	
16. DIURETICS								
Frusemide Inj 20mg/ml.	Amps	X	X	X	X			
Frusemide Tabs 40mg	1000	X	X	X	X			
Hydrochlorothiazide Tabs 50mg	1000	X	X	X	X			
Mannitol Inj 20% (500ml)	Bottle	X	X	X	X			
Spirolactone Tabs 25mg	1000	X	X	X	X			
17. GASTROINTESTINAL DRUGS								
Bisacodyl Tabs 5mg (Enteric Coated)	1000	X	X	X	X			
Cimetidine Tabs 400mg	1000	X	X	X	X			
Compound Magnesium Trisilicate Tabs	1000	X	X	X	X	X	X	X
Hyoscine N–Butylbromide Inj 20mg/ml	Amps	X	X	X	X			
Hyoscine N–Butylbromide Tabs 10mg	1000	X	X	X	X			
Metoclopramide HCl Inj 5mg/ml	Amps	X	X	X	X			
Metoclopramide HO Tabs 10mg	1000	X	X	X	X			
Oral Rehydration Salts Powder (WHO Formulation)	Satch	X	X	X	X	X	X	X
Ranitidine Tabs 150mg	1000	X	X	X				
Omeprazole Caps 20mg	1000	X	X	X				
Loperamide Caps 2mg	1000	X	X	X	X			
18. HORMONES, ENDOCRINE DRUGS & CONTRACEPTIVES								
18.1. ADRENAL HORMONES & SUBSTITUTES								
Dexamethasone Tabs 0.5mg	1000	X	X	X				
Dexamethasone Sodium Phosphate Inj 4mg/ml	Vials	X	X	X				
Hydrocortisone Sodium Succ Inj 100mg Base	Amps	X	X	X	X	X		
18.2. ANDROGENS								
Testosterone Inj 200mg/ml	Amps	X	X	X				
18.3. HORMONAL CONTRACEPTIVES								
Ethinylestradiol + Levonorgestrel Tabs (30 mcg + 150 mcg)	28's	X	X	X	X	X	X	X
Ethinylestradiol + Norethisterone Tabs (35mcg + 1.0mg)	28's	X	X	X	X	X	X	X
Levonorgestrel Tabs 750 mcg	2's	X	X	X				
Medroxyprogesterone Acetate Inj (DMPA) 150mg/ml	Amps	X	X	X				

Sub-dermal Levonorgestrel 36mg implant	6's	X	X	X	X			
18.4. ESTROGENS								
Stilboestrol Tabs 5mg	1000	X	X	X				
18.5. INSULINS & ANTIDIABETIC AGENTS								
Chlorpropamide Tabs 250mg	1000	X	X	X	X			
Glibenclamide Tabs 5mg	1000	X	X	X	X			
Soluble insulin Inj 100 Units 10ml (beef/pork)	Vials	X	X	X	X			
Insulin Zinc Susp 100 Units 10ml (beef/pork)	Vials	X	X	X	X			
Soluble insulin Inj 100 Units 10ml (human)	Vials	X	X	X	X			
Insulin Zinc Susp 100 Units 10ml (human)	Vials	X	X	X	X			
Metformin Tabs 500mg/850mg	1000	X	X	X	X			
18.6. OVULATION INDUCERS, THYROID HORMONES & ANTI-THYROID DRUGS								
Carbimazole Tabs 5mg	1000	X	X	X				
Clomiphene citrate 50 mg tablet	1000	X	X	X				
Levothyroxine Sodium Tabs 0.1mg	1000	X	X	X				
Norethisterone Tabs 5mg	1000	X	X	X				
19. IMMUNOLOGICALS (VACCINES)								
Antisnake venom polyvalent Inj	Vials	X	X	X	X			
Anti-D (Rh ₀) Immunoglobulin (Human) 250mcg	Amps	X	X	X				
BCG Vaccine Dried Powder	Vials	X	X	X	X	X	X	
Diphtheria-Pertussis-Tetanus Vaccine	Vials	X	X	X	X	X	X	
Hepatitis B vaccine	Vials	X	X	X	X	X	X	
Haemophilus Influenza type b	Vials	X	X	X	X	X	X	
Measles Vaccine	Vials	X	X	X	X	X	X	
Poliomyelitis Oral Vaccine	Vials	X	X	X	X	X	X	
Rabies Vaccine	Vials	X	X	X	X	X	X	
Tetanus Toxoid Vaccine	Vials	X	X	X	X	X	X	
Tuberculin (PPD) Inj 10 IU	Amps	X	X	X	X			
Human Rabies Immunoglobulin	Vials	X	X	X	X			
Yellow Fever Vaccine	Amps	X	X	X	X			
Pentavalent Vaccine	Vials	X	X	X	X	X	X	
20. MUSCLE RELAXANTS –								
See ANAESTHETICS & THEATRE DRUGS								
21. OPHTHALMOLOGICALS & ENT PREPARATIONS								
Acetazolamide Tabs 250mg	1000	X	X					

Atropine 1% Eye Drops (5ml)	Botts	X	X	X				
Chloramphenicol Ear Drops 5%	Botts	X	X	X	X			
Chloramphenicol Eye Drops 0.5%	Botts	X	X	X	X			
Fluorescein impregnated strips	1000	X	X	X				
Gentamicin Eye/Ear Drops (10ml)	Botts	X	X	X				
Hydrocortisone Eye Drops 1%	Tube	X	X	X	X			
Oxytetracycline 3% Base + Hydrocortisone 1% Eye/Ear Susp.	Tube	X	X	X				
Pilocarpine Hydrochloride Eye Drops 2%	Botts	X	X	X				
Tetracaine Hcl eye drops 0.5%	Botts	X	X					
Tetracycline Eye Oint 1% 3.5g	Tube	X	X	X	X	X	X	
Zinc Sulphate 0.25% Eye Drops	Botts	X	X	X	X	X		
22. OXYTOCICS & ANTIOXYTOCICS								
Ergometrine Maleate Inj 500mcg/ml	Amps	X	X	X	X	X	X	
Oxytocin Inj 5 IU/ml	Amps	X	X	X	X			
23. PERITONEAL DIALYSIS SOLUTIONS								
Intraperitoneal Dialysis Solution I	Botts	X	X					
Intraperitoneal Dialysis Solution II	Botts	X	X					
24. PSYCHOTHERAPEUTIC DRUGS								
Amitriptylline Hydrochloride Tabs 25mg	1000	X	X	X	X			
Benzhexol Hydrochloride Tabs 5mg	1000	X	X	X	X			
Chlorpromazine HCl Inj 50mg/2ml	Amps	X	X	X	X	X		
Chlorpromazine HCl Tabs 100mg	1000	X	X	X	X	X		
Chlorpromazine HCl Tabs 25mg	1000	X	X	X	X	X		
Diazepam Tabs 5mg	1000	X	X	X	X			
Fluphenazine Decanoate Inj 25mg/ml (10ml)	Vials	X	X	X	X			
Haloperidol Depot Inj 50mg/ml (5ml)	Amps	X	X	X	X			
Haloperidol Tabs 5mg	1000	X	X	X	X			
Imipramine Hydrochloride Tabs 25mg	1000	X	X	X	X			
Lithium Carbonate Tabs 300mg	1000	X	X					
Trifluoperazine HCl Tabs 5mg	1000	X	X	X				
25. RESPIRATORY TRACT DRUGS								
Aminophylline Inj 25mg/ml IV (10ml)	Vials	X	X	X	X	X		
Beclomethasone Inhaler 0.05mg/dose	Packs	X	X	X	X			
Salbutamol Inhaler 0.1 mg/dose	Packs	X	X	X	X			
Salbutamol Inj 0.5mg/ml	Amps	X	X	X				

Salbutamol Syr 2mg/5ml (100mls)	Botts	X	X	X	X	X	X	
Salbutamol Tabs 2mg	1000	X	X	X	X	X	X	
Salbutamol Nebulizer 5 mg/ml	Botts	X	X	X	X			
Ipratropium Bromide 20 mcg/dose Inhaler	Packs	X	X	X	X			
Salbutamol Tabs 4mg	1000	X	X	X	X	X	X	
26. SOLUTIONS FOR WATER, ELECTROLYTE & ACID-BASE DISTURBANCE								
Calcium Gluconate Inj 10% (10ml)	Amps	X	X	X				
Darrows Solution 1/2 Strength (500ml)	Botts	X	X	X	X	X		
Dextrose Inj 50% W/V (50ml)	Botts	X	X	X	X	X		
Dextrose Inj 10% W/V (500ml)	Botts	X	X	X	X	X		
Dextrose Inj 5% W/V (500ml)	Botts	X	X	X	X	X		
Hartmann's Solution (500ml)	Botts	X	X	X	X			
Normal Saline Inj 0.9% (500ml)	Botts	X	X	X	X	X		
Parenteral Amino Acid Preparations 10%	Botts	X	X					
Potassium Chloride Inj 15% (10ml)	Botts	X	X	X	X			
Sodium Bicarbonate Inj 8.4% IV (10ml)	Amps	X	X	X	X			
Water for Inj (10ml)	Botts	X	X	X	X	X	X	
27. VITAMINS & MINERALS								
Calcium Lactate Tabs 300mg	1000	X	X	X	X			
Ferrous Sulphate Tabs 200mg	1000	X	X	X	X	X	X	X
Folic Acid Tabs 5mg	1000	X	X	X	X	X	X	X
Hydroxycholecalciferol 250 Nanograms Caps	1000	X	X	X				
Iron Dextran Inj 50mg/ml (2ml)	Amps	X	X	X				
Parenteral Vitamin B Complex+ C Inj I & II	Amps	X	X	X				
Vitamin A Caps (100,000 IU)	1000	X	X	X	X			
Vitamin B ₆ Tabs 25mg	1000	X	X	X	X			
Vitamin B Complex Tabs	1000	X	X	X	X	X	X	
Multivitamin Tabs	1000	X	X	X	X	X	X	X
Multivitamin Syrup 100ml	Botts	X	X	X	X	X	X	X
28. MISCELLANEOUS								
Hydroxyethyl Cellulose Lubricating Gel. 40g	Tube	X	X	X	X			
Lactose Free Baby Feeds	Tins	X	X	X	X			
Soda Lime 4.5kg	Tins	X	X	X	X			
Sterile Medicated (Antimicrobial) Paraffin Gauze 10cm x 10cm	Packs	X	X	X	X	X	X	
	Packs	X	X	X	X	X	X	

Sterile Medicated (Antimicrobial) Paraffin Gauze 15cm x 20cm								
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