ACKNOWLEDGEMENTS

The first edition of the Nigerian Standard Treatment Guidelines is a product of the support, recommendations and contributions of the following:

**Federal Ministry Of Health**
- Prof. Eyitayo Lambo
- Prof. Adenike Grange
- Mr. R.K. Omotayo mni
- Mr. J.E. B. Adagadzu

**World Health Organization**
- Dr Peter Eriki
- Dr Mohammed Belhocine
- Dr. Olaokun Soyinka
- Dr Ogori Taylor

**European Commission**
- For funding the programme

**International Network for Rational Use of Drugs (INRUD) - Nigerian Core Group**
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FOREWORD

I am indeed very pleased to write the foreword to this maiden edition of the Standard Treatment Guidelines (STG) for the Nigerian health care system. I am aware that the process of its production began in 2005 involving contributions and recommendations of various experts and stakeholders in the health care sector.

The STG is an important tool for the attainment of comprehensive and effective health care delivery services thereby achieving the goals of the National Drug Policy, which inter alia are: the availability of safe, efficacious and affordable medicines to satisfy the healthcare needs of the majority of the population and ensure the rational use of drugs. The fulfillment of the above mentioned goals is part of the strategic thrust of the Health Sector Reform Programme aimed at the reduction of disease burden and the improvement of access to quality health services. It is expected that the STG will become a major reference document for all health workers both in the public and private sectors.

It is instructive to note that the development of the STG followed due process with wide consultations and meetings involving various stakeholders and interest groups. The document that has come out of this process is a reflection of the quality of the inputs that went into its development. In my opinion, this maiden edition of the STG has been produced and serialized in such a way as to assist health care providers especially doctors in the effective discharge of their duties as prescribers. It will also ensure discipline as only those medicines recommended will be prescribed for patients within a given health facility.

I commend all those who worked tirelessly towards the completion of this maiden edition STG. Special mention and gratitude must go to the World Health Organization (WHO) for sponsoring and providing sustained technical support to the committee. Without this support, this STG would not have seen the light of the day.

Finally, let me quickly add that this STG must be widely circulated and disseminated. Everything possible must be done to ensure that practitioners maximize the benefit of such a useful document. If it has worked in other parts of the world, it should also work in Nigeria. It must also be subjected to regular reviews in view of the dynamic nature of health care management.

Dr. Hassan Muhammed Lawal, CON
Supervising Minister of Health
PREFACE

This first edition of Standard Treatment Guidelines (STG) for the Nigerian health practitioner is coming relatively later than those of many other countries. It is indeed a welcome development.

The standard of medical practice and the wage bill of health services are usually remarkably improved by health personnel putting to use STG. This among other benefits can only lead to improved health of the community.

In Nigeria our health indices are among the worst in the world. Our country Nigeria does not lack the manpower or the necessary infrastructure to turn things around. What appears to be lacking is the organization of health services required to put both to optimal use. Efforts such as the actualization of our own national STG and the various health reforms currently in progress will definitely improve our situation.

It is therefore my pleasure and privilege to write the preface to this maiden edition of the STG. This is the outcome of a long journey that started several years ago. The previous chairmen of the National Formulary and Essential Drugs Review Committees made efforts to start the project but were unsuccessful due to lack of funds.

The current committee had the luck of being assisted by the country office of the World Health Organization (WHO) in not only this endeavor but in the preparation and printing of the last edition of the Nigerian Essential Medicines List. The desk officer, Dr Ogori Taylor showed great commitment to the project and the country owes a debt of gratitude to WHO.

In preparing this document every effort was made to ensure that the stakeholders own the project so that it is not seen as an imposition. Accordingly, the major contributions came from various practitioners and their associations as well as from many practitioners whose input were judged crucial to the success of the project. We also adopted the acceptable practices in the field that were in use by special health projects such as HIV/AIDS, Malaria, TB/Leprosy programmes etc. The academia was also involved. There were several fora where the contributions were discussed openly with the stakeholders and consensus arrived at.

It is my hope therefore that this document will be widely used by Nigerian health practitioners. I salute the contributors and those that helped in one way or the other. The committee of course accepts responsibility for any lapses but also hopes that these would be brought to our attention for correction in subsequent editions.

Professor Ibrahim Abdu-Aguye, MBBS; FMCP; SFIAM; FIICA; D. Sc (Hon)
Chairman, National Formulary and Essential Drugs Review Committee.

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Consult a surgeon.

**Asymptomatic cyst carriers**

Treat cyst carrier if patient is a food handler:

- Diloxanide furoate
  - **Adult:** 500 mg every 8 hours for 10 days
  - **Child:** over 25 kg: 20 mg/kg orally every 8 hours for 10 days

**Notable adverse drug reactions**, caution

- Metronidazole is contraindicated in pregnancy.
- Avoid alcohol during treatment and at least 48 hours after treatment.

**Prevention**

- Provision of safe drinking water
  - Sanitary disposal of faeces
- Regular examination of food handlers and appropriate treatment where necessary.

**BACILLARY DYSENTERY**

**Introduction**

An important cause of colonic diarrhoea in developing countries, caused by pathogenic species of *Shigella* A-D (dysenteriae, flexneri, boydii and sonnei).

**Clinical features**

- Mucoid bloody diarrhoea associated with severe central and lower abdominal pain
- Tenesmus
- Moderate-grade pyrexia
- Sometimes only a mild, self-limiting diarrhoea lasting 2-3 days
- Articular features occasionally
- Septicaemic spread with multi-system involvement occasionally.

**Differential diagnoses**

- Amoebic dysentery
- Idiopathic enterocolitis (ulcerative)
- Campylobacter jejuni infection
- Colorectal cancer

**Complications**

- Septicaemia/bacteraemia
- Severe necrotising fasciitis
- Intestinal perforation
- Reiter's syndrome

**Investigations**

- Stool microscopy for cysts and motile organisms
- Full Blood Count
- Chest radiograph (in amoebic liver abscess)
- Abdominal Ultrasound Scan

**Treatment objectives**

- Rehydrate adequately
- Eradicate the protozoa

**Drug treatment**

- **Amoxicillin:** 2 g in 3 divided doses for 5 days
- **Sulfamethoxazole-trimethoprim (Co-trimoxazole):**
  - **Adult:** 1.6 g in 3 divided doses for 5 days
  - **Child:** 24 mg/kg in 3 divided doses for 5 days

**Non-drug treatment**

- Parenteral hydration therapy (see rehydration under diarrhoea)
- Antibacterial drugs are not usually necessary; even diarrhoeas resulting from bacterial infection are usually self-limiting. Appropriate systemic antibiotics are however required when systemic infections occur.
  - **Ampicillin:** 2 g in 3 divided doses for 5 days
  - **Cefotaxime:** 1 g in 3 divided doses for 5 days
  - **Azithromycin:** 1 g in 3 divided doses for 5 days

**Notable adverse drug reactions**

- Ciprofloxacin may induce tendinitis especially in children.

**Precaution**

- Ciprofloxacin is not recommended for use in children less than 18 years.
- Antidiarrhoeal medicines are not advised.

**CHOLERA**

**Introduction**

An acute severe diarrhoeal illness of worldwide importance; endemic in many developing countries. Caused by *Vibrio cholerae* El Tor strains.

**Clinical features**

- Mild watery diarrhoea
- Severe life-threatening diarrhoea leading to hypovolaemic shock if untreated
- Occasionally, vomiting

**Complications**

- Hypovolaemic shock with multiple end organ failure leading to death
- Hypoglycaemia
- Paralytic ileus

**Investigations**

- Stool microscopy, culture and sensitivity
- Full Blood Count
- Urea, Electrolytes and Creatinine

**Treatment objectives**

- Rehydrate adequately and rapidly
- Eradicate the infective organism
- Prevent spread of the infection

**Drug treatment**

- **Intravenous Ringer's lactate/Darrow's solutions**
- **Antibiotic therapy**
  - **Tetracycline:**
    - **Adult:** 500 mg orally every 6 hours for 5 days

**Supportive measures**

- Monitor fluid intake and output (vomitus, urine and stool)
- Provide access to safe drinking water
- Food hygiene
- Safe disposal of human waste
- Cholera vaccine

**CONSTITUTION**

**Introduction**

A disease characterized by frequent bowel opening and/ or passage of hard stools.

**Aetiology**

- Inadequate fibre in diet (simple constipation)
- Drugs e.g. antidepressants, narcotic analgesics, etc
- Diseases of the anus, rectum and colon e.g. fissures, haemorrhoids, cancers
- Functional: irritable bowel syndrome
- Metabolic diseases e.g. hypothyroidism, hypercalcaemia

**Clinical features**

- Stools are often hard
- Abdominal bloating
- Excessive flatulence
- Relevant associated history to determine aetiology should be vigorously pursued

**Physical examination should be thorough, and must include a rectal examination**

**Complications**

- Megacolon
- Anal fissures/tears
- Haemorrhoids
- Rectal bleeding

**Investigations**

- Stool examination including microscopy
- Proctoscopy/sigmoidoscopy
Clinical features
- Watery diarrhoea of varying volumes, sometimes with vomiting: this is the commonest presentation, and suggests pathology in the small intestine.
- Bloody mucoid stools: suggests disease in the colon
- Fever, abdominal pain and dehydration
- Fast and small volume pulse with low blood pressure: indicates significant fluid loss

Complications
- Hypovolaemic shock with multiple organ failure
- Septicaemia
- Intestinal perforation
- Paralytic ileus

Differential diagnoses
- Non-infectious diarrhoea e.g. drug-induced
- Gut allergy (e.g. gluten)
- Psychogenic stress
- Metabolic and endocrine causes (e.g. thryotoxicosis, uraemia, diabetes mellitus)

Investigations
- Stool examination including microscopy, culture and sensitivity
- Full Blood Count
- Urea, Electrolytes and Creatinine
- Serology (e.g. Widal test)

Drug treatment
- Oral Rehydration Therapy - ORT (low osmolality) for mild to moderate dehydration
- 500 mL orally over 2 - 3 hours, 3 - 4 times daily
- Intravenous sodium chloride 0.9%
- 1 litre 2 - 6 hours for moderate-to-severe dehydration
- Alternate with Darrow’s solution depending on serum potassium

Children:
- Use of zinc supplementation
- 20 mg per day for 10 - 14 days
- Under 6 months old: 10 mg per day
- Specific anti-infective agents for infectious diarrhoeas e.g. metronidazole for amoebiasis, giardiasis

Supportive measures
- Monitor fluid intake/output

Notable adverse drug reactions
- Heart failure: from overhydration
- Initial increase in diarrhoea with ORT: this is self-limiting

Hyperkalaemia: from excessive use of potassium-containing fluids
- Presso: Provide access to safe drinking water
- Sanitary disposal of human waste

Barium enema
- Serum hormonal levels e.g. thyroxine, triiodotyronine, thyroid stimulating hormone to exclude hypothyroidism

Treatment objectives
- Identify and eliminate cause(s)
- Evacuate hard faecal matter
- Indications for use of laxatives
- Situations where straining will exacerbate pre-existing medical/surgical conditions
- Angina
- Risk of rectal bleeding
- Increased risk of anal tear
- Other indications
- Drug-induced constipation
- To clear the alimentary tract before surgery or radiological procedures

Non-drug treatment
- Avoid precipitants
- High fibre diet (including fruits and vegetables)
- Adequate fluid intake
- Megacolon:
  - Saline enema
  - Surgical: resection of large bowel

Differential diagnoses
- Septicaemia
- Intestinal perforation
- Paralytic ileus

Complications
- Acute gastritis: haemorrhage
- Chronic gastritis: peptic ulcer disease; gastric cancer

Intestinal diagnosis
- Peptic ulcer disease (acute gastritis)

Investigations
- Endoscopy (macroscopic diagnosis)
- Histology of gastric biopsy for definitive diagnosis

Treatment objectives
- Eliminate pain (acute gastritis)
- Prevent progression to peptic ulcer disease or gastric cancer
- Re-establish normal histology

Drug treatment
- Acute Gastritis:
  - Antacids
  - Magnesium trisilicate 1 - 2 tablets or suspension 10 mL orally three times daily or as required
  - Or: H₂ receptor antagonist
  - Ranitidine 150 mg orally once daily as required
  - Or: Proton Pump Inhibitors
  - Omeprazole 20 mg orally once daily as required

Type A gastritis:
- Endoscopic surveillance every 2 - 3 years for early detection of cancer

Type B gastritis:
- Eradication of H. pylori using triple therapy with
  - Clarithromycin 500 mg orally twice daily for 7 days
  - Plav: Amoxicillin 1g orally every 12 hours for 7 days

Prevention
- Avoid risk factors (NSAIDs, alcohol, etc)

GIARDIASIS

Introduction
- A parasitic infection caused by Giardia lamblia.
- Worldwide in distribution but more common in developing countries.
- Spread by the faeco-oral route.

Pathogenesis
- Invasion of the upper small intestine by the parasite evokes inflammation, leading to progressive villous atrophy.

Clinical features
- Acute disease: watery diarrhoea with abdominal bloating
- Chronic disease: diarrhoea, steatorrhoea and weight loss from malabsorption syndrome- with lactose intolerance, xylose malabsorption and vitamin B₁₂ deficiency

Complications
- Diseases related to Vitamin B₁₂ deficiency

Differential diagnoses
- Other causes of upper gastrointestinal malabsorption such as coeliac disease and tropical sprue

Investigations
- Full blood count
- Stool microscopy and faccal fat assessment
- Jejunel biopsy

Drug treatment
- Metronidazole
- 2 g orally daily for 3 days or 400 mg 8 hourly for 5 days
- Children: 1 - 3 years 500 mg orally daily; 3 - 7 years 500 - 800 mg daily; 7 - 10 years 1 g daily for 3 days
- Tinidazole
- 40 mg/kg orally as a single dose; repeat after 1 week
- Children: 50 to 75 mg/kg as a single dose; repeat after 1 week

Supportive
- Vitamin B₁₂ supplementation
- Avoidance of milk

Prevention
- Omeprazole 20 mg orally every 12 hours for 7 days
- Or: Metronidazole 400 mg orally every 8 hours for 7 days
- Plav: Amoxicillin 500 mg orally every 8 hours for 7 days
- Omeprazole 20 mg orally every 12 hours for 7 days

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Personal hygiene: hand-washing, care in food-handling
Acute pancreatitis:
Epigastric pain: may radiate to the back in over 50% of cases
Nausea, vomiting, abdominal distension
Severe abdominal tenderness with features of hypovolaemia in severe cases

Differential diagnoses
Peptic ulcer disease
Cholecystitis

Investigations
Serum amylase: raised in 80% of acute cases
Serum lipase: if raised is more specific than serum amylase
Alanine aminotransferase: a rise above 3-fold suggests pancreatitis of gallstone origin
CT scan
Abdominal ultrasound: least useful in acute pancreatitis

Complications
Hypovolaemic shock
Acute renal and respiratory failure
Phlegmon
Gastrointestinal bleeding
Electrolyte imbalance (hypo & hypercalcaemia)
Pancreatic pseudocysts

Treatment objectives
Relieve pain
Prevent complications

Non-drug treatment
Renal failure: haemodialysis
Respiratory failure: mechanical ventilation
Gallstones: Endoscopic Retrograde Cholangio Pancreatography (ERCP) with sphincterotomy

Drug treatment
Analgesics
Treat specific complications

Supportive measures
Bed rest
Monitor vital signs; fluid intake/output

H. pylori eradication
Triple therapy with:
- Metronidazole 400 mg orally every 8 hours for 7 days
  Plus:
- Amoxicillin 500 mg orally every 8 hours for 7 days
Or:
- Clarithromycin 500 mg orally every 12 hours for 7 days
  Plus:
- Omeprazole 20 mg orally every 12 hours for 7 days

Adjuvant therapy
Magnesium trisilicate suspension 15 mL orally three times daily as required
Supportive therapy
Regular meals
Avoidance of provocative factors (NSAIDs, alcohol, spicy foods etc.)

Notable adverse drug reactions
Metabolic taste and vomiting from metronidazole

PEPTIC ULCER DISEASE
Introduction
Caused by peptic ulceration that involves the stomach, duodenum and lower oesophagus.
An increasingly common problem in developing countries.
Most ulcers are duodenal

Aetiology/Predisposing factors
H. pylori gut infection
Use of NSAIDs
Smoking

Clinical features
Recurrent epigastric pain
- Often radiating to the back
- Worse at night
- Improved by antacids
- May be made worse by some food types (generally better with bland diet)

Complications
Upper gastrointestinal bleeding
Perforation
Penetration
Gastric outlet obstruction
Gastric cancer

Investigations
Full Blood Count
Liver Function Tests
Urea, Electrolytes and Creatinine
Occult blood test
Stool microscopy
Endoscopy
Double contrast barium meal
Direct/indirect detection of H. pylori (by CLO test or by CO, breath test)

Differential diagnoses
Gastritis
Duodenitis
Non-Ulcer Dyspepsia
Gastro-duodenal malignancy
Oesophagitis
Gall bladder diseases

Treatment objectives
Relieve pain
Promote healing of ulcers
Eradicate H. pylori
Prevent/reduce recurrence

UPPER GASTROINTESTINAL BLEEDING
Introduction
Bleeding from the lower oesophagus, stomach or duodenum up to the level of ligament of Treitz.
Occurs worldwide and is responsible for significant mortality and morbidity.
Major causes include bleeding from:
- Peptic ulcer disease
- Oesophageal and gastric varices
- Mallory-Weiss tear
- NSAID-related mucosal bleeding
- Neoplasia
Bleeding is either from rupture of engorged varices or from disruption of the oesophageal or gastro-duodenal

Chapter 1: Alimentary Tract
Standard Treatment Guidelines for Nigeria 2008

Drug treatment
Symptomatic treatment with antacids may be used prior to confirming the diagnosis of peptic ulcer disease

Prognosis
Clinical course varies with the subject.

PEPTIC ULCER DISEASE
Aetiology
Varied, but most important are:
Gallstones
Alcohol ingestion
Abdominal trauma
Infections
Idiopathic in as many as 20-30% cases
Occurrence is worldwide, but commoner in areas of the world where gallstones and alcohol ingestion are common.

Pathophysiology
Autoysis of pancreatic tissue by pancreatic enzymes as a result of “secretory block” in the pancreatic bed (often caused by stones).

Clinical features
Acute pancreatitis:
- Decrease pancreatic inflammation
- Prevent, identify and treat complications

Caution
Avoid narcotic analgesics which may cause spasm of the sphincter of Oddi and worsen pancreatitis

Nasogastric tube suctioning
Every 8 hours

Investigations
Full Blood Count including blood film

Non-drug treatment
Control alcohol ingestion
Control gut infection

Supportive measures
Rest the gut

Investigations
Full Blood Count
Liver Function Tests
Urea, Electrolytes and Creatinine
Occult blood test
Stool microscopy
Endoscopy

Upper gastrointestinal bleeding
Perforation
Penetration
Gastric outlet obstruction
Gastric cancer

Interventional endoscopic treatment
Blood transfusion
Surgery

Supportive therapy
Regular meals
Avoidance of provocative factors (NSAIDs, alcohol, spicy foods etc.)

Notable adverse drug reactions
Metallic taste and vomiting from metronidazole

H. pylori eradication
Triple therapy with:
- Metronidazole 400 mg orally every 8 hours for 7 days
  Plus:
- Amoxicillin 500 mg orally every 8 hours for 7 days
Or:
- Clarithromycin 500 mg orally every 12 hours for 7 days
  Plus:
- Omeprazole 20 mg orally every 12 hours for 7 days

Acute pancreatitis:
- Enlarged or varicose veins of the tissues at the anus or rectal outlet.
- May be external or internal.
- May become thrombosed and protrude into the anal canal.
- Fibrosed external haemorrhoids present as anal tags

Differential diagnoses
Internal haemorrhoids: typically painless but present with bright red rectal bleeding
May become thrombosed and protrude into the anal canal
External haemorrhoids when thromosed cause acute perineal pain with or without necrosis and bleeding
Fibrosed external haemorrhoids present as anal tags

Complications
Bleeding, necrosis, perineal sepsis, mucus discharge

Investigations
Anoscopy
Full blood count including blood film

Non-drug treatment
Increase fibre in foods
Increase fluid intake
Avoid foods that cause constipation
Stool softeners
Regular exercise

Drug treatment
Suppositories/ointments of preparations containing hydrocortisone acetate with or without lidocaine hydrochloride plus astringent(s)

Surgery
Elastic band ligation
Sclerosis, photocoagulant, cryosurgery, excisional haemorrhoidectomy

Caution
Each drug treatment course should not exceed 7 days

PANCREATITIS
Introduction
A state of inflammation of the pancreas, which can be
Clinical features
Depends on whether the bleeding is acute or chronic, mild or severe
Various presentations
- Haematemesis
- Melaena
- Haematochezia
- Hypovolaemia
- Iron-deficiency anaemia (with its associated symptoms)

Differential diagnoses
Black stools from ingestion of iron tablets
Haematemesis/melaena from previously swallowed blood (from the upper respiratory tract and oral cavity)

Investigations
- Upper gastrointestinal endoscopy: picks up lesions in 90% of cases
- Upper gastrointestinal barium radiography: 80% detection rate
- Selective mesenteric arteriography
- Radio isotope scanning
- Full Blood Count

Treatment objectives
- Restore and maintain haemodynamic status
- Control bleeding
- Prevent recurrence of bleeding

Non-drug treatment
- Carefully monitor vital signs (pulse, blood pressure, respiration and temperature) as frequently as necessitated by the patient’s condition
- Insert a nasogastric tube to aspirate gastric contents and/or to introduce agents to constrict the blood vessels
- Blood transfusion: whole blood (acute bleeding) or packed cells (chronic) bleeding. Up to 5 - 6 pints of blood may be needed in severe cases
- Plasma expanders in the absence of blood
- Continuous Central Venous Pressure (CVP) monitoring

Drug treatment
- Bleeding peptic ulcers/erosions
  - Proton Pump Inhibitors
  - Omeprazole 20 mg orally once daily for 4 weeks

Drug treatment
- Omeprazole 40 mg by slow intravenous injection over 5 minutes once daily until patient can take orally

Anti Helicobacter pylori therapy set above.

Endoscopic treatment for actively bleeding ulcer or visible non-bleeding vessel
- Injection therapy with 98% alcohol (total volume less than 1 mL)

Or:
- Injection therapy with epinephrine (1:10,000) up to 1 mL
- Thermal coagulation with heat probe
- Laser therapy
- Bleeding varices
  - Intravenous vasopressin 20 units over 20 minutes bolus
  - Intravenous nitroglycerin 40 microgram/min (titrated upward to maintain systolic blood pressure above 90 mmHg)

Endoscopic treatment
- Injection sclerotherapy: equal volume mixture of 3% sodium tetradecyl sulfate, 98% ethanol, sodium chloride (9.9% injection (2-5 mL/site; maximum 50 mL)
- Variceal band ligation
- Radiologic therapy
- Venous embolization
- Transjugular Intrahepatic Portosystemic Shunt (TIPS)
- Oesophageal transection and devascularization
- Liver transplant
- Peptic ulcers/erosions/tumours
  - Surgical repair or resection as appropriate

Supportive
- Monitor vital signs and urine output to detect early features of hypovolaemic shock
- Look out for features of hepatic encephalopathy

Notable adverse drug reactions
- Vasopressin can cause abdominal cramps. It lowers blood pressure drastically and could worsen ischaemic heart disease
- Prevention
- Peptic ulcers/erosions related upper gastrointestinal bleeding
  - Avoid NSAIDs,
  - Treat H. pylori infection
  - Oesophageal varices
  - β blockers (propranolol 40 mg orally 12 hourly and titrate up to 160 mg depending on the heart rate)
  - Maintenance sclerotherapy

Hepatitis A
- Self-limiting disease. No specific drug treatment

Hepatitis B
- Acute:
  - Self-limiting to fulminant
- Treatment is supportive
- Chronic:
  - Interferon alfa -2b: 10 million units subcutaneously three times weekly for 4 months
  - Lamivudine: 100 mg orally daily for 1 year
  - Liver transplant
  - Chronic Hepatitis C:
    - Interferon alfa -2b
    - 3 million units subcutaneously 3 times weekly for 4 months
  - Ribavirin
    - 400 mg orally twice daily for adults with body weight less than 65 kg; 400 mg in the morning and 600 mg in the evening for adults weighing 65-85 kg; 600 mg twice daily for adults weighing over 85 kg

Hepatitis D
- Interferon alfa -2b: 3 million units subcutaneously 3 times weekly for 4 months

Hepatitis E
- Largely supportive

Notable adverse drug reactions
- Interferon alfa 2b and Ribavirin haematopoietic toxicity
- Flu-like illness
- Leucopenia
- Psychiatric-like symptoms

Development of early resistance if therapy exceeds 1 year

Prevention
- Prevention of faecal contamination of food and water
- Screen blood and blood products for hepatotropic viruses
- Immunization against hepatitis A, B
- Reduction of drug misuse/abuse
- Pre-exposure prophylaxis (as for NPI/EPI)
- Post-exposure prophylaxis

Hepatitisencephalopathy
Introduction
A state of disturbed central nervous system function as a result of hepatic insufficiency
- Characterized by changes in personality, cognition, motor function, level of consciousness
- One-year survival rate is 40%
- Nitrogenous substances, particularly ammonia, reach the brain via portosystemic shunts leading to alteration of neurotransmission

Predispousing factors
- Reduced blood supply to the liver
- Infection of the liver
- Bleeding into the gut
- Electrolyte imbalance (hypokalaemia and hypomagnesaemia)
- Poor bowel evacuation

Clinical features
- Cognitive abnormalities: may be mild and recognizable only with psychometric testing but may be severe with frank confusion, altered level of consciousness and coma
- Hyper-reflexia
- Feter hepaticus
- Insomnia
- Flapping tremor (asterixis)

Differential diagnoses
- Intracranial lesions (haemorrhage, tumour, abscess etc.)
Investigations
As appropriate to identify possible precipitating factors
- Full Blood Count
- Urea, Electrolytes and Creatinine,
- Blood sugar
Microscopy and culture of the stool and blood

Treatment objectives
- Reverse neuropsychiatric symptoms
- Minimize nitrogeneous substances
- Treat precipitating factors

- Lactulose syrup (10 g/15 mL) - Initially 30 - 45 mL orally three times daily titrated to either the resolution of symptoms or production of three soft stools per day
- As rectal retention enema 300 mL in 1 litre water retained for 1 hour; duration usually for days or weeks

Or: Metronidazole 800 mg orally 12 hourly
- Treat underlying cause(s) e.g. hypokalaemia, anaemia, infection

Supportive measures
- High carbohydrate, low protein diet
- Adequate hydration
- Rectal wash out

Notable adverse drug reactions
- Lactose: excess gas, diarrhoea
- Metronidazole: peripheral neuropathy, dysgeusia

Prevention
- Avoid precipitating factors

CNS infections (encephalitis, meningitis)
Other metabolic encephalopathies (uraemia, hyper/hypoglycaemia etc.)
Hypertensive encephalopathy
Alcohol intoxication
Drug toxicity e.g. sedatives, heavy metals

Investigations
LFTs: determine levels and nature of bilirubin, liver enzymes (AST, ALT, Alkaline phosphotase)
Abdominal ultrasound scan: look out for canicular dilatation and stones

Treatment objectives
- Treat underlying cause
- Prevent complications

Drug treatment
Specific treatment depends on the identified cause
- Microsurgery
- 3 - 6 g orally 6 hourly in severe obstructive jaundice
- Phenobarbital in neonatal jaundice
- 5 - 8 mg/kg orally daily

Notable adverse drug reactions
- Colestyramine: diarrhoea
- Phenobarbital may cause dose-dependent respiratory depression

Surgical treatment
Obstructive jaundice
- ERCP sphincterotomy with stone removal
- Stent insertion
- Pancreatic head/duodenal head realignment

Supportive measures
- Reassurance and monitoring
- Phototherapy in neonatal jaundice

LIVER CIRRHOSIS
Introduction
- An advanced stage of chronic liver disease associated with permanent distortion of the liver architecture and replacement of some destroyed hepatocytes with fibrous tissue
- Accompanied by some loss of liver function leading to certain recognized symptoms and signs

Aetiology
- Similar to some causes of acute liver diseases
- No known aetiology in up to 30% of cases

Clinical features
- Varies with the extent of liver damage:
  - Fatigue
  - Ascites
  - pedal oedema
  - Haematemesis
  - Liver may be shrunken or enlarged below the costal margin; it is typically firm

Differential diagnoses
- Granulomatous lesion of the liver
- Primary or secondary neoplasms of the liver

Complications
- Intractable oedema
- Upper gastrointestinal tract bleeding
- Coagulopathy
- Hepatic encephalopathy

Nutritional disorders
Kwashiorkor and Marasmus
Introduction
Adequate nutrition is the intake and utilization of energy-giving and body building foods and nutrients, to maintain well-being, and productivity.

“Malnutrition” includes generalized malnutrition that manifests as stunting, underweight, wasting (kwashiorkor and marasmus), obesity as well as deficiencies of micronutrients.

Kwashiorkor is protein-energy malnutrition.
Marasmus is malnutrition resulting from inadequate calorie intake.

Obesity is a commonly nutritional disorder (results from excessive intake of calories).

Epidemiology

High percentages in under-developed countries, especially sub-Saharan Africa

Clinical features
Kwashiorkor:
- Growth retardation
- Muscle wasting
- Anaemia
- Apathy
- Moon face
- Lack-luster skin
- Easily plucked hair
- Pedal oedema
- Hypo-pigmented skin patches
- Exfoliation,
- Diarrhoea
- Marasmus:
  - Thin; protruding bones
  - Hungry-looking
  - ‘old-looking face’
  - Whimpering cry

Investigations
- Full Blood Count, ESR
- Stool microscopy
- Urinalysis
- Serum proteins
- Chest radiograph
- Mantoux test

Non-drug treatment
Nutritional counselling
- Adequate nutrient intake: may require assistance and special preparations e.g. nasogastric feeding, etc.
- Periodic growth monitoring

Drug treatment
May be indicated where there are specific infections/infestations

Micronutrient deficiencies
Definition
Deficiencies of minerals (iron, iodine, zinc, calcium, phosphorus, magnesium, copper, potassium, sodium, chloride, fluoride etc); folic acid and vitamins

Aetiology
- Inadequate dietary intake
- Increased requirements
- Increased loss (e.g. worm infestation)

Epidemiology
- Global; high percentages in under-developed countries, especially sub-Saharan Africa

Clinical features
Iron: anaemia
- Iodine: goitre
- Zinc, copper: manifestations of enzyme and insulin deficiencies
- Calcium: rickets, osteomalacia
- Phosphorus and fluoride: teeth and bone abnormalities

Kwashiorkor:
- Nutritional deficiency disorder
- More common in infants and young children
- Results from dietary deficiency

Marasmus:
- Nutritional deficiency disorder
- More common in infants and young children
- Results from dietary deficiency

Common clinical state of varying aetiologies
Classified as haemolytic, hepatic or obstructive
Clinical jaundice occurs when the level of serum bilirubin exceeds 2.5 mg/dL
- The bilirubin may be conjugated, unconjugated or mixed

Important causes
- Diseases of the liver and the biliary tract
- Conditions that cause excessive red cells haemolysis: infections, haemoglobinopathies

Clinical features
Discolouration of the sclerae and other mucus membranes
- With or without pruritus (especially with cholestatic jaundice)
Anaemia is a reduction in the haemoglobin concentration in the peripheral blood below the normal range expected for the age and sex of an individual. The determination of haemoglobin concentration should always take the state of hydration and altitude of residence of the individual into consideration. It can be classified on the basis of red cell morphology and aetiology/pathogenesis.

Investigations

- Analysis of blood, urine, and stool tests.
- Other investigations as appropriate.

Treatment objectives

- Correct nutrient deficiencies.
- Ensure adequate intake.
- Prevent complications.

Treatment

- Administration of specific nutrients (as concentrates in foods).
- Food supplementation.
- Treat underlying diseases.

Prevention

- Nutritional counselling.
- Optimal breastfeeding and appropriate weaning practices.
- Adequate intake of locally available, nutritious foods.
- Personal/food/water hygiene.
- Prophylactic therapies for malaria.

OBESITY

Introduction

A major component of the metabolic syndrome. Being overweight or obese significantly increases the risk of morbidity and mortality from Type 2 diabetes and its co-morbidities. Successful weight reduction has a positive impact on morbidity and mortality outcomes.

- Constitutional obesity is a result largely of diet and lifestyle.
- Measurements for evaluation

  - Body mass index (BMI): calculation for overall obesity
  - Waist circumference: determination of central fat distribution

- BMI is calculated as follows

  \[ \text{BMI} = \frac{\text{weight in kg}}{\text{height in m}^2} \]

- Classification of BMI

  - Underweight: <18.5 kg/m\(^2\)
  - Normal weight: 18.5 - 24.9 kg/m\(^2\)
  - Overweight: 25 - 29.9 kg/m\(^2\)
  - Obesity (Class 1): 30 - 34.9 kg/m\(^2\)
  - Obesity (Class 2): 35 - 39.9 kg/m\(^2\)
  - Extreme obesity (Class 3): >40 kg/m\(^2\)

  - BMI represents overall adiposity.

- The pattern of distribution of fat in the body (whether mostly peripheral or central) is assessed by the use of the waist/hip ratio (WHR).

  \[ \text{WHR} = \frac{\text{Waist circumference (in cm)}}{\text{Hip circumference (in cm)}} \]

- Waist circumference: measure midway between the lower rib margin and the iliac crests.

- Hip circumference: the largest circumference of the hip.

- Waist circumference better depicts central or upper body obesity than waist/hip ratio.

- Upper limits: 102 cm and 88 cm in men and women respectively.

Investigations

- Non-specific.
- Always bear in mind the possibility of an underlying cause; although these may not be common, specific therapy may be available.
- Clinical presentation may therefore require specific investigations to exclude conditions such as:

  - Hypothyroidism.
  - Hypercortisolism.
  - Male hypogonadism.
  - Insulinoma.
  - CNS disease that affects hypothalamic function.

Complications

- Cardiovascular:
  - Coronary disease.
  - Stroke.
- Congestive heart failure.
- Pulmonary:
  - Obstructive sleep apnoea.
  - Obesity hypoventilation syndrome.
- Endocrine:
  - Insulin resistance and type 2 diabetes mellitus.
- Hepatobiliary:
  - Gallstones.
- Reproductive:
  - Male hypogonadism.
  - Menstrual abnormalities.
- Infertility.
- Cancers:
  - In males, higher mortality from cancer of the colon, rectum and prostate.
  - In females, higher mortality from cancer of the gall bladder, bile ducts, breasts, endometrium, cervix and ovaries.
- Bone, joint and cutaneous disease:
  - Osteoarthritis.
  - Gout.
- Acanthosis nigricans.
- Increased risk of fungal and yeast infections.
- Venous stasis.

Treatment objectives

- To educate patient and care givers.
- Achieve an ideal body weight.

Prevent complications

Management

- Assess dietary intake, level of physical activity, BMI (total body fat) and waist circumference (abdominal fat) on presentation and at regular monitoring.
- Assess efficacy of weight loss measures.
- Integrate weight control measures into the overall management of diabetes mellitus and co-morbidities if:
  - BMI is >25.
  - Waist circumference is more than 102 cm and 88 cm in men and women respectively.
- Educate patients and other family members.
- Set realistic goals.
- Use a multi-disciplinary approach to weight control.
- Maintain records of goals, instructions and weight progress charts.
- Surgical intervention may be required in extreme cases.

Classification based on aetiology and pathogenesis

- Blood Loss:
  - Acute.
  - Chronic (leads to iron deficiency).
- Increased red cell destruction (haemolytic anaemias):
  - Coats up:
    - Corpuscular defects (intracorpuscular or intrinsic abnormality).
    - Disorders of the membrane e.g. elliptocytosis, spheroctosis.
- Disorders of metabolism e.g. Glucose-6-Phosphate Dehydrogenase deficiency.
- Haemoglobinopathy e.g. sickle cell disease.
- Paroxysmal Nocturnal Haemoglobinuria.
- Abnormal haemolytic mechanisms (extra-corpuscular or intrinsic abnormality):
  - Autoimmune.
  - Rhesus-incompatibility, mismatched transfusion.
  - Hypersplenism.
- Infections e.g. malaria, Clostridium welchii.
- Drugs and toxins.

Vitamins:

- A: keratomalacia, corneal xerosis, night blindness.
- B, (riboflavin): scrotal and vulval dermatoses, angular stomatitis, scars, magenta tongue, cheilosis.
- B, (niacin): scarlet and dry tongue, pellagra.
- Ascorbic acid: scurvy, petechiae and musculo-skeletal haemorrhages.
- D: rickets, epiphyseal enlargement, muscle wasting, bossing of skull bone, ‘thoracic rosary’, persistently open anterior fontanelle, genu valgum or varum.

Investigations

- Blood, urine and stool tests.
- Other investigations as appropriate.

Prevention

- Nutritional counselling.
- Optimal breastfeeding and appropriate weaning practices.
- Personal/food/water hygiene.
- Prophylactic therapies for malaria.

**OBESITY**

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- Extreme obesity (Class 3): >40 kg/m\(^2\)

BMI represents overall adiposity.
Chapter 2: Blood and Blood-Forming Organs

Blood Transfusion

Introduction
Blood transfusion is the administration of blood for therapy. It is potentially hazardous: blood should be given only if the dangers of not transfusing outweigh those of transfusion. Indications must be clearly established. Transfusion of whole blood or red cell concentrates is important in the treatment of acute blood loss and of anaemia.

Transfusion of whole blood as a therapeutic agent has been almost completely replaced by the use of blood fractions.

Types of blood transfusion

- Autologous blood transfusion:
  - Transfusion of the patient's own blood to him/her
- Pre-deposit autologous transfusion
- Immediate pre-operative phlebotomy with haemodilution
- Intra-operative blood salvage

Exchange transfusion:
To remove deleterious material from the blood, for example, in severe jaundice resulting from haemolytic disease of the newborn.

Alternatives to red cell transfusion:
Perfluorochemicals such as Fluosol-DA
Polymerised haemoglobin solutions with good intravascular recovery

Indications for blood transfusion
- Symptomatic anaemias:
  - Recurrent haemorrhage
  - Haemolysis
  - Bone stem cell failure
  - Pure red cell aplasia
  - Severe anaemia of chronic disorders
  - Haematological malignancies (e.g. leukaemia, lymphoma)
  - Chemotherapy complicated by anaemia
In neonates:
- Severe acute haemorrhage
- Haemolytic disease of the newborn
- Septicaemia
- Prematurity
Bleeding disorders:
- Congenital e.g. haemophilia
- Acquired e.g. disseminated intravascular coagulopathy
- Prevention or treatment of shock:
- Clinical situations in which there is need to restore and/or maintain circulatory volume e.g. trauma, haemorrhage
To maintain the circulation (as in extracorporeal or cardiac by-pass shunts)
Whole blood preparations

Standard Treatment Guidelines for Nigeria 2008

- Not necessary unless there is intolerance to oral iron
- Indications for parenteral iron:
  - Anaemia diagnosed in late pregnancy
  - Correction of anaemia just before an operative procedure
  - Haemorrhage expected to continue unabated
  - Iron dextran given as "total dose" infusion
  - Dose in mL (of 50 mg/mL preparations) = [Patient's wt. in kg X (14 Hb in g/dL)] = 10

Notable adverse drug reactions, caution

Oral iron preparations:
- Nausea, epigastric pain, diarrhoea, constipation, skin eruptions
- Reduce dosage and frequency of administration to reduce these effects

Parenteral iron:
- Local reactions: phlebitis and lymphadenopathy
- Systemic reactions: may be early or late - headache, fever, vomiting; general aches and pains, backache, chest pain, dyspnoea, syncope; death from anaphylaxis
- A test dose should be administered: 25 mg intramuscularly or by intravenous infusion over 5 to 10 minutes
- Total-dose infusion should be avoided in patients with history of allergy

Prevention
- Response to therapy is satisfactory if administered dose is limited to the minimal daily requirement
- Treatment with vitamin B<sub>12</sub> (cobalamin) to replace body stores
- Six-1000 micrograms intramuscular injections of hydroxocobalamin given at 3-7 day intervals

Maintenance therapy: patients will need to take vitamin B<sub>12</sub> for life
- 1000 micrograms hydroxocobalamin intramuscularly once every 3 months

Notable adverse drug reactions, caution

- Toxic reactions are very rare and are usually not due to cobalamin itself
- Pharmacologic doses of folic acid produce haematological response in vitamin B<sub>12</sub>-deficient patients but worsen the neurological complications
- Large doses of vitamin B<sub>12</sub> also give haematological response in folate-deficient patients

Prevention
- Balanced diet
- Prompt treatment of all illnesses

BLOOD TRANSFUSION

Introduction
Blood transfusion is the administration of blood for therapy.

- It is potentially hazardous: blood should be given only if the dangers of not transfusing outweigh those of transfusion.

Indications must be clearly established.

- Transfusion of whole blood or red cell concentrates is important in the treatment of acute blood loss and of anaemia.
- Red cells can be stored at 4°C for 5 weeks in media that are specially designed to maintain the physical and biochemical integrity of the erythrocytes and which maintain their viability after transfusion.
- Citrate Phosphate Dextrose with Adenine (CPDA) is commonly used for collections of whole blood.

The use of whole blood as a therapeutic agent has been almost completely replaced by the use of blood fractions.

Types of blood transfusion

- Autologous blood transfusion:
  - Transfusion of the patient’s own blood to him/her
- Pre-deposit autologous transfusion
- Immediate pre-operative phlebotomy with haemodilution
- Intra-operative blood salvage

Exchange transfusion:
- To remove deleterious material from the blood, for example, in severe jaundice resulting from haemolytic disease of the newborn.
- Alternatives to red cell transfusion:
  - Perfluorochemicals such as Fluosol-DA
  - Polymerised haemoglobin solutions with good intravascular recovery

Indications for blood transfusion
- Symptomatic anaemias:
  - Recurrent haemorrhage
  - Haemolysis
  - Bone stem cell failure
  - Pure red cell aplasia
  - Severe anaemia of chronic disorders
  - Haematological malignancies (e.g. leukaemia, lymphoma)
  - Chemotherapy complicated by anaemia
In neonates:
- Severe acute haemorrhage
- Haemolytic disease of the newborn
- Septicaemia
- Prematurity
Bleeding disorders:
- Congenital e.g. haemophilia
- Acquired e.g. disseminated intravascular coagulopathy
- Prevention or treatment of shock:
- Clinical situations in which there is need to restore and/or maintain circulatory volume e.g. trauma, haemorrhage
- To maintain the circulation (as in extracorporeal or cardiac by-pass shunts)
Whole blood preparations

Others e.g. burns
- Decreased red cell production:
  - Nutritional (due to deficiencies of substances essential for erythropoiesis)
  - Iron
  - Folate
  - Vitamin B<sub>12</sub>
  - Various deficiencies e.g. protein, ascorbic acid

Bone marrow stem cell failure:
- Primary (idiopathic):
  - Aplastic anaemia
  - Pure red cell aplasia
- Secondary:
  - Drugs (phenylbutazone, cytotoxic agents, etc)
  - Chemicals
  - Irradiation

Anaemias associated with systemic disorders:
- Infection
- Liver disease
- Renal disease
- Connective tissue disease
- Cancer (including leukaemia)
- Marrow infiltration
- Thyroid or pituitary disease

Clinical features
- Depend on the degree of anaemia, severity of the causative disorder and age of the patient
- The clinical effects of anaemia are due to anaemia itself and the disorder(s) causing it

Common:
- Tiredness
- Lassitude
- Weakness
- Dyspnoea on exertion
- Palpitations
- Pallor

Less common:
- Angina of effort
- Fainting
- Giddiness
- Headache
- Ringing in the ears
- High output state

Consecutive cardiac failure

Differential diagnoses
- Cardiac failure
- Respiratory failure

Complications
- Congestive cardiac failure
- Death

Investigations
- Haematologic:
  - Haematocrit; haemoglobin concentration
  - Red cell indices
  - Reticulocyte count
  - Total leucocyte and differential counts
- Platelet count
- Erythrocyte sedimentation rate
- Blood film examination for morphology of cells
- Thick and thin films for malaria parasites
- Urine analysis:
  - Colour, pH, clarity, specific gravity
  - Microscopic examination of fresh urine specimen
  - Protein
  - Glucose
  - Occult blood
  - Stool:
    - Colour, consistency
    - Examination for ova and parasites
  - Occult blood
- Plasma:
  - Blood Urea Nitrogen (BUN)
  - Total protein and albumin
  - Bilirubin
  - Creatinine (if BUN is abnormal)
- Others:
  - Coombs test for the presence of antibodies to red cells
  - Ham's test (acidified serum test)
  - Bone marrow aspiration and trephine biopsy
  - Haemoglobin electrophoresis
  - Sickness test (metabisulphite and solubility)
  - Family studies

Treatment objectives
- Restore haemoglobin concentration to normal levels
- Prevent/treat complications

Supportive measures
- Bed rest in severe cases: initially necessary, especially when cardiovascular symptoms are prominent
- Treat cardiac failure by standard measures
- Balanced diet with adequate protein and vitamins
- Correct dietary deficiencies (e.g. iron, folic acid)
- Blood transfusion: a very important measure in the treatment of anaemia, but should not be used as a substitute for investigation, or specific treatment of the cause
- Arrest blood loss
- Treat any underlying systemic disorder
- Remove any toxic chemical agent or drug
- Correct anatomical gastro-intestinal abnormalities

Drug treatment
- Haematinsics e.g. iron, vitamin B<sub>12</sub>, folic acid
- The specific haematinic indicated should be given alone
- Response to adequate treatment is important in confirming diagnosis
- Iron deficiency
  - Oral iron therapy:
    - Ferrous sulfate 200 mg (containing 65 mg of iron) 1 tablet 2-3 times daily
    - Treat for 3-6 months to correct deficits in haemoglobin and iron stores
  - Parenteral therapy:
Clinical features
- General symptoms of anaemia
- Bleeding
- Infections
- Anorexia
- Weight loss

Lymphadenopathy (not common in AML except in the monocytic variant)
- Skin: Macules, papules, vesicles
- Pyoderma gangrenosum
- Neutrophilic dermatitis
- Leukaemic cutis
- Granulocytic sarcoma

Differential diagnoses
- Septicaemia
- Military tuberculosis
- Malignant histiocytosis

Complications
- Worsening ill-health
- Investigations
  - Full blood count with ESR, reticulocyte count
  - Coomb's test
  - Bone marrow examination
  - Biochemical tests: serum electrolytes, urea, creatinine, uric acid
  - Liver function tests
  - Prothrombin time, partial thromboplastin time
  - Thromboplastin time, partial thromboplasmin time
  - Human Leucocyte Antigen typing
  - HIV I and II
  - Cytochemical tests
  - Peroxidase
  - Sudan Black B
  - Non-specific esterase reaction e.g. alpha napthyl acetate esterase
  - Fresh Blood
  - Bone marrow cultures
  - Electron microscopy
  - Immunological classification
  - Terminal deoxynucleotidyl transferase demonstration
  - Abdominal ultrasound/CT scans

Treatment objectives
- Induce remission to achieve complete remission
- Maintain disease-free state

Non-drug treatment
- Appropriate nutrition
- Adequate hydration
- Maintenance of hydration (at least 3 litres/24 hours)
- Erythrocyte transfusion as required
- Platelet concentrate transfusion as required
- Maintain electrolyte balance

Epidermal growth factor receptor signaling
- Growth factor signaling includes autocrine and paracrine signaling
- Growth factors bind to receptors on the cell surface
- Act cytoplasmic MAP-kinases and RAS
- Produces the VEGF, VEGF receptor-2
- Produces the VEGF, VEGF receptor-2

VEGF
- Vascular endothelial growth factor
- Produces the VEGF, VEGF receptor-2
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VEGF receptor-2
- Produces the VEGF, VEGF receptor-2
- Produces the VEGF, VEGF receptor-2

VEGF
- Vascular endothelial growth factor
- Produces the VEGF, VEGF receptor-2
- Produces the VEGF, VEGF receptor-2

VEGF receptor-2
- Produces the VEGF, VEGF receptor-2
- Produces the VEGF, VEGF receptor-2

VEGF
**Drug treatment**

**Acute lymphoblastic leukaemia**
Allopurinol 300 mg daily orally

**DVP Regime**
Daunorubicin 30 mg/m² intravenously on days 8, 15, 22 and 29
Vincristine 1.4 mg/m² to a maximum of 2 mg intravenously on days 8, 15, 22 and 29
Prednisolone 60 mg orally once daily from day 1 - 28
L-asparaginase 1000 IU/m² intravenously on days 12, 15, 18, 21, 24, 27, 30 and 33

**Maintenance**
COAP every 6 weeks for 2 years
Intrathecal treatment as for ALL if there is CNS disease of the monocytic type

**Chronic Myeloid Leukaemia (CML)**
- Also Chronic Myelogenous Leukaemia; Chronic Granulocytic Leukaemia (CGL)
- A clonal disease that results from acquired genetic change in a pluri-potential haematopoietic stem cell
- Altered stem cell proliferation generates a population of differentiated cells, and a greatly expanded total myeloid mass

**Classification**
- Majority of patients have relatively homogenous disease characterized by:
  - Splenomegaly
  - Leucocytosis
  - Presence of Philadelphia (Ph) chromosome in all leukaemia cells
- Minority of patients have less typical disease (atypical CML)
  - These variants lack Ph chromosome. Examples:
    - Chronic myelomonocytic leukaemia
    - Chronic neutrophilic leukaemia
    - Juvenile chronic myeloid leukaemia

**Epidemiology, aetiology and natural history**
Rare below the age of 20 years but occurs in all age groups
Increased risk of developing CML with exposure to high doses of irradiation
A biphasic or triphasic disease, usually diagnosed in the initial "chronic" or stable phase

**Distinguishing features between phases of CGL**

**Chronic phase**
- Untreated patient:
  - <12% blast cells in blood or marrow
- Treated patient:
  - Normal or near-normal blood count without immature granulocytes in peripheral blood

**Accelerated phase**
Rising leucocyte count despite treatment
Rapid leucocyte doubling time
Immature granulocytes in blood
Blast cells >5% but <30% in marrow
Anemia (Hb <10 g/dL) not attributable to treatment
Thrombocytosis (>1000 x 10⁹/L)
Acquisition of specific new cytogenetic abnormalities
Increasing marrow fibrosis

**Blastic transformation**
- More than 30% blasts
- Blasts plus promyelocytes in blood or bone marrow

**Treatment objectives**
- Induce remission to achieve complete remission
- Maintain disease-free state
- Achieve absence of Philadelphia chromosome

**Non-drug treatment**
- Appropriate nutrition
- Adequate hydration
- Electrolyte balance

**Drug treatment**
- Hydroxyurea (hydroxyurea)
  - Adult: 20-30 mg/kg orally daily or 80 mg/kg every third day
  - Child: Not recommended
- Interferon alpha
  - Adult: 9 million units subcutaneously or intravenously thrice weekly for 6 - 12 months
- Imatinib mesylate
  - 400 mg orally daily
- To be used strictly under specialist supervision

**Notable adverse drug reactions, caution**
The above drugs (except the steroids) all cause profound myelosuppression
Peripheral neurotoxicity

**Secondary malignancies**
- Steroids: Cushing’s syndrome, hypertension, diabetes mellitus, immunosuppression, infections
- Vincristine: neurotoxicity
- Cylophosphamide: alopecia, haemorrhagic cystitis
- Daunorubicin: myelosuppression, alopecia, cardiotoxicity

**All are contraindicated in patients with history of hypersensitivity reactions to the respective medicines**

**Prevention**
- Avoid exposure to ionizing radiation
- Early detection and treatment

**Chronic Lymphocytic Leukaemia**
- Neoplastic proliferations of mature lymphocytes
- The diseases involve the blood bone marrow and other tissues
- Characterized by accumulation of small mature-looking CD5+ B lymphocytes in the blood, marrow and lymphoid tissues
- B-cell disorders are more common
- B-cell CLL is more common in males than females
- Accounts for 60% of cases
- Rarely diagnosed below the age of 40 years

**Clinical features**
- Asymptomatic (30% of cases)
- Symptoms of anaemia
- Lymph node enlargement (painless)
- Rare: pyrexia, sweating or weight loss
- Severe chest infection/pneumonia
- Splenomegaly (50% of cases)
- Hepatomegaly (not frequent)

**Differential diagnoses**
- Low grade non-Hodgkin’s lymphomas with frequent blood and bone marrow involvement (leukaemia / lymphoma syndromes)
- Tuberculosis
- Viral infections
- Toxoplasmosis

**Complications**
- Richter transformation
- Progression of disease

**Investigations**
- Cell morphology:
  - Size
  - Nuclear: cytoplasmic (N:C) ratio
  - Regularity or irregularity of the nuclear outline
  - Characteristics of the cytoplasm (presence and length or absence of azurophil granules)
  - Degree of nuclear chromatin condensation and its pattern
  - Prominence, frequency and localization of the nucleolus

**Investigations**
- As for anaemia and other leukaemias

**Treatment objectives**
- Induce remission to achieve complete remission
- Maintain disease-free state

**Non-drug treatment**
- Appropriate nutrition
- Adequate hydration
- Maintenance of electrolyte balance
- Bone marrow transplant
Red cell and platelet concentrate transfusion as required

**Drug treatment**

**Chronic Lymphocytic Leukaemia**
- Allopurinol 100 mg orally every 8 hours
- Chlorambucil 5 mg/m² orally on days 1 to 3
- Prednisolone 75 mg orally on day 1; 50 mg orally on day 2 and 25 mg orally on day 3
  - Repeat every 2 weeks

**Investigations**
- Full Blood Count (i.e. haemoglobin, haematocrit, leucocyte and differential counts; red cell indices, reticulocyte count)
- Erythrocyte sedimentation rate
- Coombs test
- Bone marrow aspiration and needle biopsy
- Serum Urea, Electrolytes
- Serum Uric acid
- Liver Function Tests: transaminases-ALT, AST, ALP, bilirubin; serum proteins
- HIV screening
- Immunoglobulins
- Chest X-ray

**Optional**
- Examination of post-nasal space
- Serum copper level
- Neutrophil alkaline phosphatase
- CT scans of chest and abdomen
- Supplementary node biopsy

**Supportive measures**
- Appropriate nutrition
- Adequate hydration

**Pathophysiology**
- Vary widely according to histological subtype, stage and bulk of disease

**Clinical features**
- Vaso-occlusive crises
- Pain (vaso-occlusive) crisis
- Abnormalities in coagulation, leucocytes, vascular endothelium, and damage to the membranes of red cells contribute to sickling
- The course of the disease is punctuated by episodes of pain

**Supportive measures**
- Appropriate nutrition
- Adequate hydration

**Sickle cell reactions, caution**
- Haemolytic anaemia and vasculopathy are the result of the various pathophysiologic processes
- Impotence can occur from prolonged priapism
- High foetal loss in pregnancy
- Menarche occurs at a mean age of 15.5 years (range 12 - 20 years) compared to non-sicklers (mean 13.2 years)
- Patients have acute symptoms/signs attributable directly to sickle cell disease

**Sickle cell disease**
- Haemolytic anaemia and vasculopathy are the result of the various pathophysiologic processes
- Impotence can occur from prolonged priapism
- High foetal loss in pregnancy

**Sickle cell trait**
- Inheritance of one normal gene controlling formation of β Haemoglobin (HbA), and a sickle gene (HbS)
- Total haemoglobin A is more than haemoglobin S

**Sicklemia**
- Inheritance of two abnormal allelic genes controlling formation of β chains of haemoglobin, at least one of which is the sickle gene
- Polymerization of the sickle haemoglobin may lead to vaso-occlusion

**Pathophysiology**
- Vary widely from one patient to another:
  - Persistent anaemia/pallor
  - Growth retardation (variable)
  - Jaundice (variable)
  - Bone pains (recurrent)
  - Prognosis depends on bone marrow activity

**Clinical features**
- Vary widely from one patient to another:
  - Persistent anaemia/pallor
  - Growth retardation (variable)
  - Jaundice (variable)
  - Bone pains (recurrent)
  - Prognosis depends on bone marrow activity

**Non-drug treatment**
- Appropriate nutrition
- Adequate hydration
- Red cell and platelet concentrate transfusions as required

**Drug treatment**
- Malaria prophylaxis: proguanil 200 mg orally daily
- Antibiotics as indicated
- Chloramphenicol 300 mg orally daily (when uric acid is high)

**Non-Hodgkin’s lymphomas**
- CHOP (3 weekly):
  - Cyclophosphamide 750 mg/m² intravenously on day 1
  - Doxorubicin 50 mg/m² intravenously on day 1
  - Vincristine 1.4 mg/m² (maximum of 2 mg) intravenously on day 1
  - Prednisolone 100 mg orally on days 1 - 5

**Sickle cell-ß+thalassaemia. Type III (Sß+thal. Type III)**
- Inheritance of one gene controlling formation of β Haemoglobin (Hbβ), and a sickle gene (HbS)
- Normal haemoglobin F

**Sickle cell-ß+thalassaemia. Type II (Sß+thal. Type II)**
- Inheritance of two abnormal genes controlling formation of β chains of haemoglobin, at least one of which is the sickle gene
- Polymerization of the sickle haemoglobin may lead to vaso-occlusion

**Pathophysiology**
- Vary widely from one patient to another:
  - Persistent anaemia/pallor
  - Growth retardation (variable)
  - Jaundice (variable)
  - Bone pains (recurrent)
  - Prognosis depends on bone marrow activity

**Clinical features**
- Vary widely from one patient to another:
  - Persistent anaemia/pallor
  - Growth retardation (variable)
  - Jaundice (variable)
  - Bone pains (recurrent)
  - Prognosis depends on bone marrow activity
**Supportive measures**

**Antimalarials**
- Artemisinin-based combination therapy (see section on malaria)

**Adjunct treatment**
- Folic acid 5 mg orally daily

**Drug treatment**
- Proguanil
  - Adult: 200 mg orally daily
  - Child: under 1 year 25 mg daily; 1 - 4 years 50 mg; 5 - 8 years 100 mg; 9 - 14 years 150 mg orally daily
- Paracetamol
  - Adult: 1 g, every 4 - 6 hours to a maximum of 4 g daily
  - Child: 1 - 5 years 120 - 250 mg; 6 - 12 years 250 - 500 mg; 12 - 18 years 500 mg every 4 - 6 hours (maximum 4 doses in 24 hours)
  - Or: Aspirin (acetylsalicylic acid) 600 mg orally every 8 hours daily
  - Or: Ibuprofen 200 mg every 8 hours daily (or other non-steroidal anti-inflammatory drugs)
  - Not recommended for children under 16 years
  - Moderate-to-severe painful crises

**Parenteral therapy:**
- Diclofenac sodium
  - Adult: 75 mg or 100 mg intramuscularly (as necessary)
  - Not recommended for children

**Treatment strategies**
- Counselling and health education
- Providing infection prophylaxis (antimalarial; anti-pneumococcal, hepatitis B virus vaccines)
- Providing folate supplementation
- Advising pain-inducing conditions
- Advising on contraception
- Supervising pregnancy/Labour
- Providing regular health checks
- Limiting family size

**Non-drug treatment**
- Balanced diet
- Adequate fluid intake (at least 3 litres/24 hours)
- Avoidance of pain-inducing conditions
  - Strenuous physical exertion or stress
  - Dehydration
  - Sudden exposure to extremes of temperature
  - Infections e.g. malaria

**Prevention**
- Advice on the risks involved in marriages between carriers, and between sicklers
- Anti-pneumococcal vaccine
CHAPTER 3: CARDIOVASCULAR SYSTEM

ANGINA PECTORIS

Introduction
A symptom complex characterised by chest pain or discomfort caused by transient myocardial ischaemia usually due to coronary heart disease. Less common in this environment though current studies show increasing prevalence. In 90% (or more) of cases there is a hereditary factor.

Major risk factors:
- Hypertension
- Diabetes mellitus
- Hypercholesterolaemia
- Smoking
- Obesity
- Male sex
- Age

Clinical features
- Stable angina (chest discomfort on exertion and relieved by rest)
- Unstable angina (discomfort on exertion and at rest)
- Myocardial infarction (chest pain or discomfort that lasts more than 30 minutes; may be associated with symptoms of cardiac failure, shock, arrhythmias)

Differential diagnoses
- Myalgia
- Pericarditis
- Aortic dissection
- Pleurisy

Complications
- Cardiac failure
- Arrhythmias
- Sudden death

Investigations
- Full Blood Count and differentials
- Urea, Electrolytes and Creatinine
- Fasting blood glucose
- Urinalysis; urine microscopy
- Electrocardiograph: resting, treadmill exercise
- Echocardiography (resting/exercise)
- Radio nuclide studies
- Cardiac enzymes (CK-MB)
- Coronary angiography

Treatment objectives
- Relieve discomfort
- Improve quality of life
- Prevent complications
- Relieve the obstruction
- Address the risk factors present

Non-drug treatment
- Dietary manipulation (low salt, low cholesterol diet)
- Exercise
- Stop smoking
- Reduce alcohol consumption

Drug treatment
- β blockers
  - Atenolol 50 - 100 mg daily
- Nitrates
  - Glyceryl trinitrate 0.3 - 1 mg sublingually, repeated as required
  - Isoosorbide dinitrate 30 - 120 mg orally daily (up to 240 mg)
- Calcium channel antagonists
  - Verapamil 80 - 120 mg orally 8 hourly
- Anti-platelets
  - Aspirin (acetylsalicylic acid) 75 mg orally daily

Treatment as for acute myocardial infarction

Non-drug treatment
- Pacemaker insertion
- Ablation (electrophysiology)
- Cardioresion: acute arrhythmias

Drug treatment
- Depends on the type of arrhythmia
- Refer to a specialist for appropriate management

Supportive measures
- Patient education
- Efficient systems to facilitate patient recovery

Notable adverse drug reactions
- All-antiarrhythmics pro-arrhythmics themselves
- Cardiac failure (all antiarrhythmics)
- Blindness (amiodarone)

Prevention
- Prevention of conditions such as hypertension, rheumatic heart disease, diabetes mellitus, ischaemic heart disease, congenital heart diseases etc

DEEP VENOUS THROMBOSIS

Introduction
Formation of blood clot(s) in the deep veins of the calf muscles or pelvis. It has the potential of being dislodged to the lungs, causing pulmonary embolism. Brought about by:
- Hyper-coagulable states
- Long periods of immobilization e.g. cardiac failure, following surgery, long-distance travel, etc
- Malignancies

Clinical features
- Could be asymptomatic
- Pain and swelling of the leg (calf muscles)

Differential diagnoses
- Cellulitis
- Infarctive crisis in sicklers
- Abscess (myositis)

Complications
- Pulmonary embolism

Investigations
- Full Blood Count and differentials
- Prothrombin time
- KCCT
- Doppler of the leg/pelvic vessels (veins)

Cardiac failure
- All antiarrhythmics

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Differential diagnoses
- Sinus arrhythmias
- Anxiety

Complications
- Cardiac failure
- Stroke
- Peripheral embolic phenomena
- Sudden death

Investigations
- Electrocardiograph (resting, 24 hour Holter, 1 month Holter monitoring)
- Urea, Electrolytes and Creatinine
- Echo-cardiography
- Electrophysiology

Treatment objectives
- Abolish the arrhythmias
- Treat complications
- Prevent further arrhythmias

Non-drug treatment
- Low salt diet

Drug treatment
- Treatment of cardiac failure if present
- Digoxin, diuretics and potassium supplements

Supportive measures
- Oxygen
- Counselling

Prevention
- Pre-conception nutrition education
- Antenatal care
- Genetic counselling
**HEART FAILURE**

**Introduction**
A clinical state (syndrome) in which the heart is unable to generate enough cardiac output to meet up with the metabolic demands of the body

**Other causes** include dilated cardiomyopathy and rheumatic heart disease

**Cardiac failure can be classified as:**
- Left or right-sided
- Congestive
- Acute
- Chronic - Chronic cardiac failure is the commonest syndrome encountered in our setting

**Clinical features**
- Difficulty with breathing on exertion
- Paroxysmal nocturnal dyspnoea
- Orthopnoea
- Cough productive of frothy sputum
- Leg swelling
- Abdominal swelling

The prominence of particular symptoms will depend on which side is affected

**Signs include:**
- Oedema
- Tachycardia (about 100 beats per minute)
- Raised jugular venous pressure
- Displaced apex
- S3 or S4 or both (With or without murmurs)

**Treatment objectives**
- Lyse the clot
- Prevent clot from being dislodged
- Relieve inflammation

**Non-drug treatment**
- Avoid stasis

**Drug treatment**
- Achieve APTT of 1.5 to 2.5 of control
  - Heparin 5000 - 10,000 units by intravenous injection followed by subcutaneous injection of 15,000 units every 12 hours or intravenous infusion at 15 - 25 units/kg/hour, with close laboratory monitoring
  - Warfarin 1 - 5 mg orally daily for 6 - 12 weeks

**Notable adverse drug reactions**
- Bleeding from heparin, warfarin
- Osteoporosis (heparin)

**Prevention**
- Low molecular weight heparin 5000 units subcutaneously every 12 hours
- Early mobilization

**Echocardiography**

**Electrocardiography**

**Venography (pelvic or calf veins)**

**Treatment objectives**
- Chronic obstructive airways disease (COAD)
- Renal failure
- Liver failure

**Supportive measures**
- Pacemakers for arrhythmias
- Ventricular assist devices

**Notable adverse drug reactions**
- Potassium-sparing drugs: hyperkalaemia

**PREVENTION**

**Adequate treatment of hypertension and diabetes mellitus**
- Good sanitation and personal hygiene (to prevent rheumatic fever)

**HYPERLIPIDAEMIA**

**Introduction**
A clinical syndrome in which there are high lipid levels: cholesterol, or its fractions, or triglyceridaemia

**Can be primary (hereditary) or secondary - as a result of other diseases**

**Incidence in Nigeria is thought to be low but recent studies show increasing incidence in association with diabetes mellitus and hypertension**

**A major risk factor for ischemia heart disease**

**Clinical features**

**Patients present with complications of hypertension, ischaemic heart disease or the cause of secondary hyperlipidaemia**

**Signs include:**
- Xanthomata, xanthelasmata, and corneal arcas

**Differential diagnoses**
- Primary hyperlipidaemia
- Secondary hyperlipidaemia: diabetes mellitus, nephrotic syndrome

**Complications**
- Ischaemic heart disease
- Peripheral vascular disease
- Stroke, hypertension

**Investigations**
- Urea, Electrolytes and Creatinine
- Fasting blood glucose
- Lipid profile
- Urine proteins

**Potassium supplements**
- Potassium chloride 600 mg orally once, every 8 - 12 hours

**Notable adverse drug reactions, caution and contraindications**
- Caution in patients with history of liver disease, high alcohol intake
- Hypothyroidism should be adequately managed before starting treatment with a statin
- Liver function tests mandatory before and within 1 - 3 months of starting treatment; thereafter at intervals of 6 months for 1 year
- Statins may cause reversible myositis, headache, diarrhoea, nausea, vomiting, constipation, flatulence, abdominal pain; insomnia

**Prevention**
- Dietary manipulation
- Early identification of individuals at risk

**HYPERTENSION**

**Introduction**
A persistent elevation of the blood pressure above normal values (taken three times on at least two different occasions with intervals of at least 24 hours)

**Blood pressure ≥ 140/90 mmHg irrespective of age is regarded as hypertension**

**The commonest non-communicable disease in Nigeria**

**The commonest cause of cardiac failure and stroke**

**Hypertension may be:**
- Diastolic and systolic
- Diastolic alone
- Isolated systolic

**Clinical features**
- Largely is asymptomatic until complicated ("silent killer")
- Non-specific symptoms: headache, dizziness, palpitations etc
- Other symptoms and signs depending on the target organs affected e.g. cardiac or renal failure, stroke etc

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**Serum proteins (total and differential)**

**Treatment objectives**
- Lower lipid levels
- Prevent complications
- Treat complications
- Non-drug treatment
- Stop smoking
- Reduce weight
- Exercise moderately and regularly

**Potassium-sparing drugs: hyperkalaemia**

**ACEIs: hypotension, hyperkalaemia**

**Do not combine potassium supplements with potassium-sparing drugs**

**Precautions**

**Statins may cause reversible myositis, headache, diarrhoea, nausea, vomiting, constipation, flatulence, abdominal pain; insomnia**

**Prevention**

**Differential diagnoses**

**Complications**
- Difficulty with breathing on exertion
- Paroxysmal nocturnal dyspnoea
- Orthopnoea
- Cough productive of frothy sputum
- Leg swelling
- Abdominal swelling

The prominence of particular symptoms will depend on which side is affected

**Signs include:**
- Oedema
- Tachycardia (about 100 beats per minute)
- Raised jugular venous pressure
- Displaced apex
- S3 or S4 or both (With or without murmurs)
**Differential diagnoses**
- White coat hypertension
- Anxiety/fright/stress

**Complications**
- Heart failure, ischaemic heart disease
- Stroke (ischaemic, hemorrhagic)
- Hypertensive retinopathy
- Kidney:
  - Renal failure
  - Large arteries:
  - Aortic aneurysm

**Investigations**
- Full Blood Count
- Urinalysis, urine microscopy
- Urea, Electrolytes and Creatinine
- Urine acid
- Fasting blood glucose
- Lipid profile
- Chest radiograph
- Electrocardiography
- Echocardiography (not in all cases)
- Abdominal ultrasound
- Renal angiography (not in all cases)

**Supportive measures**
- Patient/care giver education

**Drug treatment**

**Diuretics:**
- Thiazides
- Bendroflumethiazide 2.5 - 10 mg orally daily
- Hydrochlorothiazide 12.5 - 50 mg orally daily
- Hydrochlorothiazide/amiloride 25/2.5 mg daily

**Loop diuretics:**
- Furosemide 40 - 80 mg orally daily
- β-blockers:
- Propranolol 40 - 80 mg orally every 8 - 12 hours
- Atenolol 25 - 100 mg orally daily

**Calcium channel antagonists:**
- Nifedipine retard 20 - 40 mg orally once or twice daily
- Or:
  - Amlodipine 2.5 - 10 mg orally once daily
  - Angiotensin converting enzyme inhibitors:
    - Captopril 6.25 - 50 mg orally once daily
  - Lisinopril 2.5 - 20 mg orally once daily
  - Angiotensin receptor blockers:
    - Losartan 50 - 100 mg orally daily

**Other vasodilators:**
- Hydralazine 25 - 100 mg orally once or every 12 hours
- Praosin 0.5 - 1 mg orally daily
- Centrally acting drugs:
  - Alpha methyldopa 250 - 500 mg orally twice, three or four times daily
  - Fixed combinations:
    - Reserpine plus dihydroergocristine plus clopamide
    - 0.25/0.5/5 mg one-two tablets orally daily
  - Or:
    - Lisinopril plus hydrochlorothiazide 20/12.5 mg daily

**Hypertensive emergencies**
- Treatment should be done by the experts
- Involves the administration of antihypertensives by the parenteral route (usually intravenous hydralazine or sodium nitroprusside)

**Complications**
- Heart failure, ischaemic heart disease
- Stroke (ischaemic, hemorrhagic)
- Systemic embolism (could be infective)

**Investigations**
- Full Blood Count
- Urinalysis; urine microscopy
- Blood cultures
- X 3 (the yield is higher at the time of pyrexia)
- Echocardiography
- Establish the diagnosis
- Treat cardiac failure
- Bed rest
- Acute:
  - Heart failure, ischaemic heart disease
  - Hypertensive retinopathy
- Chronic:
  - Systemic embolism (could be infective)
  - RHEART failure

**Treatment objectives**
- Stop the infection
- Treat cardiac failure
- Prevent coagulation disorders
- Rehabilitation

**Prevention**
- Weight reduction
- Exercise moderately and regularly
- Public education
- Individual approach
- Population approach

**Infective endocarditis**

**Introduction**
- A microbial infection of the endocardium and the valves of the heart
- May be acute or sub-acute
- Some acute cases occur in normal valves or may be part of systemic illness

**Clinical features**
- Acute:
  - High fever with rigors
  - Delirium
  - Shock
  - Development of new murmurs
- Severe cardiac failure
- Abscesses may form in many parts of the body (e.g. brain)

**Subacute**
- Low-grade fever
- Signs of carditis
- Finger clubbing
- Arthralgia
- Splenomegaly
- Osler's nodules
- Janeway lesions
- Roth spots

**Notable adverse drug reactions**
- Penicillin: rashes, anaphylaxis
- Gentamicin: nephropathy

**Prevention**
- Prophylactic antibiotics for patients at risk who are undergoing:
- **1. Dental procedures**
- Under local or no anaesthesia, for those who have NOT had endocarditis, and have NOT received more than a single dose of a penicillin in the last one month:
  - Amoxicillin
  - Adult: 3 g orally 1 hour before procedure
- **Child under 5 years**: 750 mg orally 1 hour before procedure; 5 - 10 years: 1.5 g
- For penicillin-allergic patients or patients who have received more than a single dose of a penicillin in the previous one month:
  - Azithromycin
  - Adult: 500 mg orally one hour before procedure
- **Child under 5 years**: 200 mg orally; 5 - 10 years: 300 mg
  - Patients who have had endocarditis:
    - Amoxicillin plus gentamicin intravenously as follows:
      - **Dental procedures under general anaesthesia** (see below)
    - **Dental procedures under general anaesthesia, and no special risk**:
      - Amoxicillin
      - **Adult**: 1 g intravenously at induction of anaesthesia; 500 mg orally 6 hours later
- **Child under 5 years**: a quarter of adult dose; 5 - 10 years: half/adult dose
- **Special risk**: e.g. previous infective endocarditis, or patients with prosthetic valves:
  - Amoxicillin plus gentamicin intravenously
  - **Adult**: 1 g amoxicillin plus 120 mg gentamicin at induction
  - **Then oral amoxicillin 500 mg 6 hours after procedure**
- **Child under 5 years**: a quarter of adult dose of amoxicillin plus 2 mg/kg gentamicin intravenously at induction
  - 5 - 10 years: half adult dose for amoxicillin; 2 mg/kg gentamicin
- Patients who are penicillin-allergic or have received more than a single dose of a penicillin in the last one month:
  - Vancomycin
Chapter 3: Cardiovascular System

MYOCARDIAL INFARCTION

Introduction
Occurs when an area of heart muscle is necrosed or permanently damaged because of an inadequate supply of oxygen (heart attack)

Reported to be uncommon in Nigeria, although recent reports suggest a rising incidence

Clinical features
- Precordial pain: discomfort, heaviness, tightening lasting 30 minutes or more
- Shortness of breath
- Palpitations
- Signs of right or left-sided cardiac failure and shock

Differential diagnoses
- Pulmonary embolism
- Aortic dissection

Complications
- Cardiac failure
- Ventricular aneurysm
- Arrhythmias: heart block, ventricular tachycardia, ventricular fibrillation, atrial fibrillation

Investigations
- Full Blood Count and differentials
- Urea, Electrolytes and Creatinine
- Lipid profile
- Enzyme assays: AST, CK-MB, and LDH
- Electrocardiograph monitoring throughout admission
- Coronary angiography (in case of secondary angioplasty)

Treatment objectives
- Relieve pain (discomfort)
- Relieve obstruction
- Treat complications
- Prevent future episodes

Non-drug treatment
- Bed rest

Adult: 1 g intravenously over at least 100 minutes
- Gentamicin

Adult: 120 mg intravenously
- Given at induction or 15 minutes before procedure

Child under 10 years: Vancomycin 20 mg/kg; gentamicin 2 mg/kg

2. Genito-urinary tract manipulation
- As for special risk patients undergoing dental procedures under general anaesthesia

3. Obstetric, gynaecological and gastrointestinal procedures
- As for genitourinary tract manipulation

Dietary control (low cholesterol)
- Exercise (later)
- Weight reduction (later)
- Stop smoking

Drug treatment
- Aspirin: dyspepsia
- Thrombolytics
- Heparin or streptokinase: bleeding
- Gentamicin: nephrotoxicity

Non-drug treatment
- Aspirin (acetylsalicylic acid) 150 - 300 mg orally stat,
- then 75 - 150 mg daily

Chapter 3: Cardiovascular System

MYOCARDITIS

Introduction
- Inflammatory process affecting the myocardium
- A common disorder; usually occurs in association with endocarditis and pericarditis
- Possible causes:
  - Infections: viral, bacterial, protozoal
  - Toxins e.g. scorpion sting
  - Drugs e.g. chloroquine
  - Allergy e.g. to penicillin
  - Deficiencies e.g. thiamine
  - Physical agents e.g. radiation

Clinical features
- Largely asymptomatic
- A few may present with palpitations; symptoms of cardiac failure

Physical examination:
- Arrhythmias
- Tachycardia
- Raised JVP

Investigations
- Full Blood Count and differentials
- Urea, Electrolytes and Creatinine
- Electrocardiography
- Echocardiography

Treatment objectives
- Eliminate/withdraw the offending agent(s)

Notable adverse drug reactions, caution
- Heparin or streptokinase: bleeding
- Gentamicin: renal failure, nephrotoxicity
- Thrombolytics: bleeding
- Aspirin: dyspepsia

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Treat the effect on the heart
- Treat complications

Drug treatment
- Treat underlying cause(s)
- Anti-arrhythmics (depends on the type of arrhythmias)
- Anticoagulant: warfarin
- Steroids: prednisolone (not in all cases)
- Multivitamins
- Anti-oxidants: ascorbic acid (vitamin C), vitamin E

Notable adverse drug reactions
- Antiarrhythmics may be pro-arrhythmic
- Steroids: fluid retention, dyspepsia
- Diuretics: dehydration, electrolyte imbalance

Prevention
- Prevent exposure to toxins
- Nutrition education

PAEDIATRIC CARDIAC DISORDERS (Refer for Specialist Care)

PERICARDITIS

Introduction
- An inflammation of the pericardium which may arise from viral, bacterial, fungal or protozoal infections
- Other causes: metabolic, malignancy, connective tissue disease, radiation, trauma etc
- May be acute or chronic

Clinical features
- Acute pericarditis:
  - Chest pain
  - Retrosternal
  - Sharp
  - Radiating to the left shoulder
  - Made worse by breathing or coughing
  - Relieved by the upright position
  - Low grade fever
- Pericardial friction rub
- Chronic pericarditis:
  - Insidious onset
  - There may be:
    - Dyspnoea on exertion
    - Leg and abdominal swelling

Investigations
- Urea, Electrolytes and Creatinine
- Electrocardiography
- Echocardiography
- Myocardial biopsy
- Full Blood Count and differentials
- Secondary or rescue PTCA

Supportive measures
- Coronary artery bypass graft (CABG)
- Maintenance anti-anginal therapy

Complications
- Pericardial tamponade
- Cardiac failure
- Arrhythmias
- Thrombus formation

Investigations
- Full Blood Count and differentials
- Secondary or rescue PTCA
Chapter 3: Cardiovascular System

Constrictive pericarditis

**Investigations**
- Electrocardiography
- Full Blood Count and differentials
- Chest radiograph
- Echocardiography

**Treatment objectives**
- Relieve distress from pain and tamponade
- Relieve constriction
- Treat the effect on the heart
- Treat complications
- Eradicate the organism (if cause is infection)

**Non-drug treatment**
- Bed rest

**Drug treatment**
- NSAIDs
  - Ibuprofen
  - Indomethacin
  - Aspirin
- Steroids

**Differential diagnoses**
- Lobar pneumonia
- Myalgia
- Pleuritis

**Complications**
- Right-sided cardiac failure
- Haemorrhagic pleural effusion

**Investigations**
- Full Blood Count and differentials
- Electrocardiograph
- Sinus tachycardia
- Notch atrial fibrillation/flutter
- S wave in lead 1, Q wave in lead 3 and an inverted T wave in lead 3
- QRS axis > 90º, quite often
- Chest radiograph
- Blood gases (arterial)
- Ventilation/perfusion lung scanning
- Pulmonary artery angiogram

**Treatment objectives**
- Relieve discomfort
- Relieve the obstruction(s)
- Prevent complications
- Prevent further episodes

**Non-drug treatment**
- Bed rest
- Mobilization

**Drug treatment**
- Heparin
- 5000 - 10,000 units intravenously stat, followed by 1000 - 2000 units per hour (APTT or INR 1.5 - 2.5 greater than normal)
  - Or:
    - Enoxaparin
    - 1.5 mg/kg (150 units/kg) subcutaneously every 24 hours, usually for at least 5 days (and until adequate oral anticoagulation is established)
  - Or:
    - Warfarin 1 - 5 mg (INR 1.5 - 2) for 6 - 12 weeks (as maintainance after initial parenteral anticoagulation)

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**Streptokinase**
- 250,000 units over 30 minutes, then 100,000 units every hour for 24 - 72 hours
  - Or:
    - Reombinant plasminogen activator (alteplase)
    - 10 mg intravenously over 1 - 2 minutes, followed by intravenous infusion of 90 mg over 2 hours
  - To be used by a specialist physician

**Notable adverse drug reactions**
- Heparin, warfarin or streptokinase: bleeding

**Risk of bleeding in:**
- Recent stroke
- Diabetic retinopathy
- Brain tumours
- Peptic ulcer disease
- Surgery

**Prevention**
- Low molecular weight heparin for immobilized patients
- Early mobilization of patients

**PULMONARY OEDEMA**

**Introduction**
- Occurs when there is congestion of the lungs with fluid, usually in a scenario of left-sided cardiac failure
- Results in stiffness of the lungs and flooding of the alveoli, with difficulty in breathing
- May also follow inflammatory processes
- May be acute or chronic

**Clinical features**
- Difficulty in breathing, with a sensation of drowning
- Cough productive of frothy (sometimes pink) sputum
- Central cyanosis
- Sweating, agitation etc
- Other symptoms of left-sided cardiac failure

**Examination:**
- Wide-spread crepitations
- Rhonchi (in severe cases)
- Other signs of left-sided cardiac failure

**Differential diagnoses**
- Pulmonary embolism
- Pneumonia

**Complications**
- Hypoxaemia
- Coma

**Investigations**
- Blood gases
- Urea, Electrolytes and Creatinine
- Echocardiography
- Chest radiograph
- Electrocardiography

**Treatment objectives**
- Relieve oedema
- Relieve discomfort
- Treat underlying cause

**Non-drug treatment**
- Bed rest
- Sit on bed with legs hanging down

**Drug treatment**
- Oxygen 3 - 5L/min
- Morphine 10 mg stat
- Loop diuretics
- Furosemide 40 - 120 mg intravenously stat; maintenance with 40 - 500 mg daily in single or divided doses
- Prednisolone 30 mg orally every 8 hours and tapered by a blood clot, fat, air, or clumped tumour cells
- The most common form is thrombo-embolism; occurs when
  - A blood clot (generally a venous thrombus) becomes dislodged from its site of formation and embolizes to the arterial blood supply of one of the lungs
  - The calf veins (deep vein thrombosis) and right ventricle are sources of embolism

**PULMONARY EMBOLISM**

**Introduction**
- Blockage of the pulmonary artery or one of its branches by a blood clot, fat, air, or clumped tumour cells
- The most common form is thrombo-embolism; occurs when
  - A blood clot (generally a venous thrombus) becomes dislodged from its site of formation and embolizes to the arterial blood supply of one of the lungs
  - The calf veins (deep vein thrombosis) and right ventricle are sources of embolism

**Some predisposing factors:**
- Congestive cardiac failure
- Trauma
- Surgery
- Prolonged immobilization
- Malignancies
- Stroke

**Clinical features**
- Depend on how massive the embolism is:
  - No symptoms
  - Moderate-to-severe cases: Difficulty in breathing

**Prevention**
- Nursing care (e.g. nurse in cardiac position)

**Notable adverse drug reactions**
- Aminophylline, digoxin: arrhythmias
- Diuretics, ACEIs: hypotension

**Prevention**
- Treat cause(s) of cardiac failure or fluid overload (e.g. renal failure)
- Judicious administration of blood and intravenous fluids

**RHEUMATIC FEVER**

**Introduction**
- A result of abnormal reaction of antibodies developed against antigens of group Aß-haemolytic streptococci
- Infection is usually of the throat; occasionally the skin in a sensitized individual
- Antibiotics damage the heart (endocardium, myocardium and pericardium)
- Commonest streptococcal scars in Africa are C and G

**Clinical features**
- Fever
- Arthralgia
- Abnormal movements of the hands (upper hands)
- Diagnosis: Duckett-Jones’ diagnostic criteria
- Major:
  - Carditis
  - Sydenham’s chorea
  - Erythema marginatum
  - Subacaceous nodules
  - Arthritis (migratory polyarthritis)
- Minor:
  - Fever
  - Leucocytosis
  - Arthralgia
  - Raised ESR
  - Raised ASO titre (> 200 IU)

**Previous history of rheumatic fever**
- Diagnosis
  - 2 major criteria
  - Or:
    - 1 major plus 2 (or more) minor criteria
Differential diagnoses
- Malaria
- Viral infection
- Pyrexia of undetermined origin
- Connective tissue disease

Complications
- Rheumatic heart disease
- Arrhythmias
- Cardiac failure

Investigations
- Full Blood Count and differentials
- ASO titre
- ESR
- Electrocardiograph
- Echocardiography
- Chest radiograph

Non-drug treatment
- Bed rest
- Drug treatment
  - Antibiotics: Penicillin V
    - Adult: 500 mg orally every 6 hours, increased up to 1 g 6 hourly in severe infections
    - Child: 1 month - 1 year: 125 mg orally every 6 hours increased in severe infection to ensure at least 12.5 mg/kg/dose
    - 6 - 12 years: 250 mg every 6 hours increased in severe infection to ensure at least 12.5 mg/kg/dose
    - 12 - 18 years: 500 mg every 6 hours increased in severe infection up to 1 g/dose
  - Erythromycin
    - Adult and child over 8 years: 250 - 500 mg orally every 6 hours or 500 mg - 1 g every 12 hours; up to 4 g daily in severe infections
    - Child: up to 2 years, 125 orally every 6 hours; 2 - 6 years 250 mg every 6 hours; doses doubled for severe infections
  - Salicylates: Aspirin (acetylsalicylic acid)
    - Adult: 300 mg - 1 g orally every 4 hours after food; maximum dose in acute conditions 8 g daily
    - Child: not recommended for use
  - Prednisolone
  - Steroids (if salicylates are ineffective)

Treatment objectives
- Relieve symptoms
  - Penicillin: anaphylactic reaction
  - Salicylates; steroids: peptic ulceration
  - Cushingoid effects are increasingly likely with doses of prednisolone above 7.5 mg daily

Prevention
- Good sanitation.
- School surveys - identify carriers of streptococcus and treat

Drug treatment
- Bed rest
- Low salt diet

Diet treatment
- Treat for heart failure if present
- Use anticoagulants if necessary

RHEUMATIC HEART DISEASE

Introduction
- A complication of rheumatic fever
- A common cause of cardiac failure in Nigeria
- In Africa manifests later compared to Caucasians
- The mitral valve is most affected, followed by the aortic, then the tricuspid
- The lesions can occur in various combinations of stenosis and regurgitation

Clinical features
- Shortness of breath on exertion
- Paroxysmal nocturnal dyspnoea
- Orthopnoea
- Leg and abdominal swelling
- Cough with production of frothy sputum
- Pedal and sacral oedema
- Small volume pulse which may be irregular
- With or without tachycardia
- With or without hypotension
- Raised JVP
- Displaced apex
- Left ventricular hypertrophy
- Right ventricular hypertrophy
- Thrills
- Palpable P2
- Soft S1; loud P2
- S3 or S4
- Systolic/diastolic murmurs

Differential diagnoses
- Constrictive pericarditis
- Endomyocardial fibrosis
- Dilated cardiomyopathy

Complications
- Arrhythmias e.g. atrial fibrillation, heart block
- Cardiac failure
- Embolic phenomena
- Endocarditis

Investigations
- Electrocardiography (resting/exercise)
- Lipid profile
- Echocardiography
- Chest radiography
- Coronary angiography

Treatment objectives
- Relieve symptoms
- Prevent recurrence of rheumatic attack
- Repair and replace affected valves

Non-drug treatment
- Treat for heart failure if present
- Use anticoagulants if necessary

Prevention
- Personal hygiene and good sanitation to prevent recurrence of rheumatic fever
- Treat the bacterial throat infection
- Reduce or abolish inflammatory process

CHAPTER 4: CENTRAL NERVOUS SYSTEM

NON-PSYCHIATRIC DISORDERS

DIZZINESS

Introduction
- Simply means 'light-headedness'
- Usually due to impaired supply of blood, oxygen and glucose to the brain
- May suggest some form of unsteadiness, or could precede a fainting spell

Causes:
- Side effects of medications, notably anti-hypertensives and sedatives
- Anaemia
- Arrhythmias
- Fever
- Hypoglycaemia
- Brain stem lesions
- Alcohol overdose
- Excessive blood loss
- Prolonged standing
- Autonomic neuropathy (especially in diabetic patients)
- May be accompanied by vertigo (giddiness) in some individuals
- May culminate in loss of consciousness

Clinical features
- Light-headedness
- Feeling faint especially on attempting to stand or after squatting
- Weakness

Differential diagnoses
- Benign positional vertigo
- Labyrinthine disorders
- Hystera
- Premonitory symptoms of epilepsy
- Migraine aura
- Warning symptom of posterior circulation stroke
- (posterior inferior cerebellar artery)
- Cervical spondylosis with compression of vertebral artery
- Brain tumour (acoustic neuroma)

Complications
- Falls with injury
- Stroke
- If due to intracranial tumour: raised intracranial pressure with coning
- If due to other intracranial pathology: cranial nerve palsies

Investigations
- Full Blood Count and differentials
- Electrocardiography
- Echocardiography
- Random blood glucose
- X-ray sinuses
Complications
- Septicaemia with meningism
- Cranial nerve palsies
- Subdural pus collection (empyema)
- Stroke
- Epilepsy
- Heat stroke
- Syndroma of Inappropriate Anti-Diuretic Hormone secretion (SIADH)

Investigations
- Lumbar puncture for CSF analysis
- Full Blood Count and differentials
- Blood culture
- Erythrocyte sedimentation rate
- Random blood glucose
- Electrolytes, Urea and Creatinine
- Chest radiograph
- Mantoux test (if tuberculosis is suspected)
- HIV screening

Management
- Prevention
  - Avoid precipitants
    - These must be identified early for effective prevention
  - Lumbar puncture for CSF analysis
  - antibiotics for infections like meningitis, sinusitis
  - Steroids for vasculitis

Differential diagnoses
- Meningitis
  - Hysteria
  - Refractive error
  - Cervical spondylosis
  - Brain tumour
  - Haemorrhagic stroke

Complications
- Depend on the cause and type
- Some are benign with no sequelae
- Coning (depending on cause)
- Blindness (following temporal arteritis, unrelied
  raised intracranial pressure)

Investigations
- Neuro-imaging: skull X-ray, computerized
tomographic scan, MRI
- Electroencephalography
- Cerebrospinal fluid examination for pressure, cells
  and chemistry
- Erythrocyte sedimentation rate

Treatment objectives
- Eliminate the organism
- Prevent recurrence
- Treat the precipitating factor or disease

Non-drug treatment
- Tension type
  - May be: Primary (idiopathic)
  - Secondary
    - Tension type
    - Migraine with or without aura
    - Cluster headache
- Secondary causes
  - Intracranial space-occupying lesions like brain
    tumours, subdural haematoma
  - Vascular lesions; strokes
  - Infections
  - Following generalized convulsions
  - Metabolic derangements
  - Alcohol hangover
  - Drugs
  - Irritation of sensory cranial nerves
  - Inflammation or diseases of structures/organs in the
    head region: eyes, nose, sinuses, ears, cervical
    vertebrae
- Atypical headache
  - Sleep disorders (hypoxia)
  - Brain stem malformations
  - HIV infection

Clinical features
- Headache
- Vomiting
- Photophobia
- Alteration in level of consciousness
- Neck stiffness and positive Kernig's sign

Other presentations:
- Fever of unknown origin: chronic meningitis
- Mass lesion with focal neurological deficits:
  tuberculosis, empyema

Meningitis
Introduction
- An infection of the meninges with presence of pus
  and inflammatory cells in the cerebrospinal fluid

A medical emergency, and associated with
considerable morbidity and mortality

May be bacterial (pneumococcus, meningococcus,
tubercle bacilli, Haemophilus, viral, fungal,
protozoal, neoplastic or chemical)

Organism may vary with age of the patient

Epidemic meningitis is usually due to Neisseria
meningitidis

Clinical features
- Fever
- Headache
- Vomiting
- Photophobia
- Alteration in level of consciousness
- Neck stiffness and positive Kernig's sign

Prevent recurrence
- Treat the precipitating factor or disease

Non-drug treatment
- Psychotherapy
- Physiotherapy/biofeedback

Drug treatment
- Initial therapy will depend on the age of the patient
  (and causative agent)

Bacterial infections- third generation
cephalosporins:
- Ceftriaxone is the drug of first choice

- 2 - 4 g daily by intravenous injection or by
  intravenous infusion over 2 - 4 minutes

Or:
- Penicillin V 2 - 4 g by slow intravenous injection
every 4 hours

Or:
- Chloramphenicol 100 mg/kg intravenously every 6 hours

- May be useful for H. influenzae infection

Tuberculosis:
- Standard anti-tuberculous drugs (including
  pyrazinamide and isoniazid for their good
  penetration of the blood-brain barrier)

- Atypical pyretics:
  - Aspirin (acetylsalicylic acid)
**Introduction**

Reduce stress levels as much as possible

**Prevention**

Immunize against communicable diseases

**Vascular diseases:**

- Carbon monoxide
- Manganese
- Cyanide

**Notable adverse drug reactions, caution and contraindications**

Aspirin and other NSAIDs: use with caution in patients with cardiac symptoms

**Complications**

- Stroke
- Epilepsy
- Blindness

**Investigations**

- Neuro-imaging
- Computerized tomographic scan
- MRI
- Electroencephalography

**Treatment objectives**

- Eliminate pain
- Prevent recurrence

**Non-drug treatment**

- Manage in a quiet (and dark) room
- Psychotherapy
- Physiotherapy/biofeedback

**Drug treatment**

- Acute attack
  - Aspirin (acetylsalicylic acid) tablets 300 - 900 mg every 4 - 6 hours when necessary
  - Maximum dose in acute conditions 8 g daily

**Clinical features**

- Common migraine (or migraine without aura)
- Throbbing pain usually affecting one side of the head around the temples, associated nausea and vomiting
- Dislike of light and noise

**Vasculitic headaches**

- Basilar artery migraine - predominantly brain stem symptoms
- Dysarthria

**Rest tremors:**

- Coarse, distal tremors described as walking

**Visual hallucinations**

- With an anti-emetic agent (e.g. metoclopramide), or other non-steroidal anti-inflammatory agents plus metoclopramide

**Ergotamine preparations (useful only during the aura phase)**

- 1 - 2 mg orally at first sign of attack; maximum 4 mg in 24 hours
- Do not repeat at intervals of less than 4 days; maximum 8 mg in any one week
- Not to be used more than twice in any one month

**Chemoprophylaxis**

**Consider for patients who:**

- Suffer at least 2 attacks a month
- Suffer an increasing frequency of headaches

**Available options are:**

- Propanolol
- 40 mg orally every 8 - 12 hours

**Tricyclic antidepressants, notably amitryptiline**

- 10 mg orally at night, increased to a maintenance dose of 50 - 75 mg at night

**Sodium valproate**

- Initially 300 mg orally every 12 hours, increased if necessary to 1.2 g daily in 2 divided doses

**In refractory cases:**

- Ciproheptadine
- An antihistamine with serotonin-antagonist and calcium channel-blocking properties
  - 4 mg orally; a further 4 mg if necessary; maintenance 4 mg every 4 - 6 hours

**Standard Treatment Guidelines for Nigeria 2008**

**Chapter 4: Central Nervous System**

**Thrombophlebitis**

- Contraindicated in congestive cardiac failure and pulmonary oedema

**Common migraine (or migraine without aura)**

**Aspirin**

- For seizure prophylaxis
- For migraine prophylaxis

**Diazepam**

- Benzodiazepine with anti-convulsant properties
- May be given intravenously in acute attacks

**Rifampicin**

- A rifamycin antibiotic

**PARKINSONISM**

**Introduction**

**Synonyms:** 'shaking palsy'; 'paralysis agitans'; 'akinetic-rigid syndrome'

**A common neuro degenerative disease that results from deficiency of dopamine in the striato-nigral pathway**

**Causes:**

- Drugs:
  - Antipsychotics e.g. phenothiazines
  - Antihypertensives: alpha methyl dopa, reserpine

**Infections:**

- Encephalitis
- Typhoid fever

**Vascular diseases:**

- Arteriosclerosis
- Diabetes mellitus

**Neurotoxins**

- Carbon monoxide
- Manganese

**Antihypertensives:**

- alpha methyl dopa, reserpine

**Chemoprophylaxis**

- May cause aplastic anaemia
- May cause chills and fever
- Extravasation causes inflammation and

**Clinical features**

- Common migraine (or migraine without aura)
- Throbbing pain usually affecting one side of the head around the temples, associated nausea and vomiting
- Dislike of light and noise

**Vasculitic headaches**

- Basilar artery migraine - predominantly brain stem symptoms
- Dysarthria

**Rest tremors:**

- Coarse, distal tremors described as walking

**Visual hallucinations**

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**Sodium valproate**

- Initially 300 mg orally every 12 hours, increased if necessary to 1.2 g daily in 2 divided doses

**In refractory cases:**

- Ciproheptadine
- An antihistamine with serotonin-antagonist and calcium channel-blocking properties
  - 4 mg orally; a further 4 mg if necessary; maintenance 4 mg every 4 - 6 hours
Postural instability with frequent falls
Gait changes; shuffling gait with flexed posturing
Parkinsonism may occur in association with other neurodegenerative diseases

Differential diagnoses
- Multi-infant dementia
- Alzheimer’s disease
- Normal pressure hydrocephalus
- Brain tumour
- Benign essential tremor
- Depression
- Creutfeldt-Jakob disease

Complications
- Recurrent falls with attendant complications e.g. subdural haematoma
- Dementia
- Depression

Investigations
- Diagnosis is essentially clinical
- Neuro-imaging: CT scan/MRI for exclusion of possible differentials

Treatment objectives
- Replace dopamine
- Ensure mobility and avoidance of falls

Drug treatment
- L-dopa/carbidopa (dose expressed as levodopa) 50 mg orally every 6 - 8 hours increased by 100 mg once or twice weekly depending on response
- Anti-cholinergic drugs for tremors
  - Trihexyphenidyl (benzhexol) 1 mg orally daily, increased gradually (usually 5 - 15 mg in 3 - 4 divided doses up to a maximum of 20 mg)
- Dopamine receptor agonists
  - Bromocriptine 1 - 1.25 mg orally nocte in the first week; 2 - 2.25 mg nocte in the 2nd week; 2.5 mg twice daily in the 3rd week, 2.5 mg three times daily in the 4th week, increasing by 2.5 mg every 1 - 2 weeks according to response (usual range is 10 - 40 mg daily)
- Ropinirole 1 - 3 mg orally once daily (in resistant cases)

Supportive measures
- Physiotherapy for postural adjustments
- Antidepressants
- Amitriptyline for pain (which could be quite incapacitating) especially with dopamine-replacement drugs

Notable adverse drug reactions, caution and contraindications
- Dopamine replacement drugs: dyskinesia, pain
- Advisable to start with small doses and gradually increase
- There is need for dosage and timing adjustments when side effects manifest
- Dop-a-agonists: postural hypotension; may cause vomiting

SEIZURES/EPILEPSIES
Introduction
A seizure results from abnormal excessive electrical discharge of brain cells
- Epilepsy is a condition characterized by recurrent (≥ 2) seizures unprovoked by any immediate identifiable cause
May be idiopathic or could follow:
- Cerebral infections
- Metabolic derangements (glucose, electrolytes, fluids)
- Stroke
- Tumours
- Head trauma
- Birth injury/asyphyxia
- Drug abuse

Clinical features
- Classical attack with sudden loss of consciousness, convulsions (tonic and/or clonic)
- Abnormal sensation or perception
- Autonomic disturbances: epigastic discomfort, sphincter incontinence
- Semi-purposive actions (automatisms)
- Aura
- Loss of postural tone (sudden falls without convulsions)

Limb paralysis (Todd's paralysis) usually after attacks

Differential diagnoses
- Migraine headache
- Syncope
- Narcolepsy
- Panic attacks
- Catatonic schizophrenia
- Transient ischaemic attacks
- Hysteria
- Méniné's disease

Complications
- Status epilepticus
- Cardiac arrhythmias
- Renal failure from myoglobinuria
- Cerebral hypoxia/anoxia resulting in brain damage
- Sudden death

Investigations
- Electroencephalography
- Neuro-imaging: CT scan, MRI
- Random blood glucose
- Urea, Electrolytes and Creatinine

Treatment objectives
- Arrest convulsions/attacks
- Treat underlying cause if identified
- Improve quality of life

Drug treatment
- Parenteral drugs are recommended for acute attack/status epilepticus
  - Diazepam
    - Adult: 10 - 20 mg by slow intravenous injection; repeat if necessary in 30 - 60 minutes
    - Child: 200 - 300 micrograms/kg or 1 mg per year of age
- Could be given per rectum as rectal solution in restless patients
  - 500 micrograms/kg (up to a maximum of 30 mg) in adults and children over 10 kg
  - Phenytin
    - Adult: initially 15 mg/kg by slow intravenous injection or infusion (with blood pressure and Electrocardiograph monitoring) at a rate not more than 50 mg/minute; then 100 mg every 6 - 8 hours
    - Child: neonate - 12 years: initial loading dose 20 mg/kg by slow intravenous injection, then 2 - 4 mg/kg orally every 12 hours, adjusted according to response (usual maximum dose 7.5 mg/kg every 12 hours)
  - 1 month - 12 years: initially 5 - 7.5 mg/kg every 12 hours; maintenance 12.5 - 15 mg/kg every 12 hours
  - Sodium valproate
    - Adult: 600 mg daily in 2 divided doses
    - Child: neonate, initially 20 mg/kg orally or per rectum once daily; usual maintenance dose 10 mg/kg twice daily
  - 1 month - 12 years: initially 5 - 7.5 mg/kg every 12 hours; maintenance 12.5 - 15 mg/kg every 12 hours

Absence attacks
Thi西oximide
- Adult: 500 mg daily initially; increase by 250 mg at intervals of 4 - 7 days to doses of 1 - 1.5 g daily

Non-drug treatment
- Psychotherapy
- Health education to patients, relations and public
- Discourage harmful cultural practices e.g. burning, mutilation

Notable adverse drug reactions, caution and contraindications
- Fetal damage if used in pregnancy
- Serial measurements of alpha-fetoprotein and ultrasound studies are necessary with close monitoring by an obstetrician

Phenytin: gingival hypertrophy; may not be the first choice in young children

Phenobarbital: sedation and mental dullness and may affect school performance in children
**Brain abscess**
- Meningitis/encephalitis
- Cerebral malaria
- Migraine headache
- Multiple sclerosis
- Metabolic derangements e.g. hypoglycaemia, hyperosmolar non-ketotic coma

**Complications**
- Tentorial herniation with coning and death
- Cardiac arrhythmias
- Depression
- Epilepsy
- Dementia
- Parkinsonism
- Hyperglycaemia

**Investigations**
- Neuro-imaging with CT scan/MRI to determine stroke type and choice of management
- Lumbar puncture for CSF analysis in suspected subarachnoid haemorrhage
- Electrocardiography
- Echo-cardiography
- Carotid Doppler ultrasound study
- Cerebral angiography
- Full Blood Count with differentials
- Random blood glucose
- Urea, Electrolytes and Creatinine
- Chest radiograph
- HIV screening

**Treatment objectives**
- Restore cerebral circulation
- Limit disability
- Treat identified risk/predisposing factors
- Reduce raised intracranial pressure
- Treat complications (if any)

**Non-drug treatment**
- Attention to calories, fluid balance
- Physiotherapy for passive muscle exercises
- Nursing care (frequent turning and bladder care) to prevent decubitus ulcers and urinary tract infection

**Rehabilitation**
- Cerebral decompression if there is evidence of raised intracranial pressure
- Furosemide 40 mg every 8 hours by slow intravenous injection for 6 doses
- And/Or: 20% mannitol 250 mL repeated every 12 hours for 4-6 doses

**Drug treatment**
- Treat underlying conditions such as diabetes mellitus, hypertension, and thrombosis

**Notable adverse drug reactions, caution**
- Rebound cerebral oedema when mannitol is discontinued
- Thrombolytic agents: bleeding tendencies
- Diazepam by the intravenous route must be administered slowly to avoid respiratory depression and laryngeal spasm

**Prevention**
- Treat/control known risk factors
  - Hypertension
  - Diabetes mellitus
  - Cardiac diseases
  - Hyperlipidaemia
  - Obesity
  - Smoking
  - Excessive alcohol consumption
- Give low dose aspirin (acetylsalicylic acid) to patients at risk if tolerated

**SYNCOPE**

**Introduction**
- Loss of consciousness and postural tone as a result of diminished cerebral blood flow
- May be due to:
  - Vaso-vagal attack
  - Cardiac causes
  - Prolonged standing
  - Severe emotional disturbance

**Investigations**
- Electrocardiography
- Vaso-vagal attack
- Cardiac causes
- Prolonged standing
- Severe emotional disturbance

**The more severe form is associated with various heart diseases:**
- Arrhythmias (especially complete heart block)
- Hypertrophic cardiomyopathy
- ‘Heart attack’ (myocardial infarction)
- Atrial myxoma
- Aortic stenosis
- Dissecting aneurysm
- Other causes:
  - Pulmonary embolism
  - Vertebro-basilar insufficiency
  - Subclavian steal syndrome
  - Carotid sinus pressure
  - Migraine headache

**Clinical features**
- Sudden loss of consciousness
- Cold extremities
- Bluish discoloration of extremities (cyanosis)
- Pulse irregularities (or pulselessness)
- Hypotension (or unrecordable blood pressure)
- Fainting induced by pressure on the neck
- Fainting induced by coughing, micturition

**Differential diagnoses**
- Epilepsy
- Myocardial infarction
- Stroke
- Aortic dissection
- Hypertension

**Complications**
- Cerebral hypoxia/anoxia resulting in brain damage
- Stroke
- Sudden death

**STROKE**

**Introduction**
- A condition resulting from disruption of blood supply to brain cells with disability lasting more than 24 hours or resulting in death
- Could result from:
  - Occlusion (ischaemic)
  - Rupture of blood vessels with bleeding into the brain substance or into the subarachnoid space (haemorrhagic)

**Clinical features**
- Classical stroke:
  - Sudden motor weakness, with/without speech, visual and sensory impairment
- Subarachnoid haemorrhage:
  - Severe headache, neck stiffness and positive Kernig’s sign
- Stroke-in-evolution:
  - Gradual onset of deficit with progression
- Mass lesion:
  - Sudden rise in intracranial pressure
  - Loss of consciousness, respiratory changes, pupillary changes
- Subdural haematoma:
  - Severe headache, neck stiffness and positive Kernig’s sign
- Stroke-by-stroke:
  - Arises from small, recurrent strokes resulting in cognitive impairment and functional dependence

**Differential diagnoses**
- Brain tumour
- Subdural haematoma

**Investigations**
- Electrocardiography
- Echocardiography
- Neuro-imaging: CT scan, MRI, carotid Doppler
- Random blood sugar

**Management**
- Depends on the cause(s)

**Treatment objectives**
- Restore circulation and ensure brain perfusion
- Identify cause and treat accordingly

**Prevention**
- Avoid prolonged standing
- Treat underlying cardiac disease
- Avoid dehydration or excessive fluid loss
- Give aspirin tablets as anti-platelet agent

**THE UNCONSCIOUS PATIENT**

**Introduction**
- An unresponsive patient who may also have breathing and circulatory problems
- May be neurological or may result from other systemic diseases
- An easy way of finding the cause is to think in terms of the vowels

**A**: Apoplexy (stroke)
**E**: Epilepsy
**I**: Infections e.g. meningitis-encephalitis
**O**: Overdosing with drugs, alcohol intoxication, toxins
**U**: Uraemia and other metabolic disorders

**Other causes include:**
- Head injury
- Brain tumours (with complications)

**Clinical features**
- Varying levels of impaired consciousness:
  - Comatose: no response to stimulus, however painful
  - Semi-comatose: some response to pain
  - Stuporose: a state deeper than sleep; vigorous stimulation required to stimulate response

**Other features:**
- Cessation of respiration or abnormal ventilatory patterns: Cheyne-Stokes, atactic, apneustic, gasping etc
- Unresponsiveness or variable response to painful stimuli
Chapter 4: Central Nervous System

- Features of the underlying cause(s)
- Stroke: may present with hemiparesis, facial asymmetry, crossed-eye defects, speech defects etc
- Epilepsy: foaming or tongue biting; abrasions of the extremities; positive past history
- Infections: may present with fever, neck stiffness
- Drug overdose/toxic: pin-point pupils; respiratory problems; suggestive history
- Urinary: characteristic febr; skin rashes; oedema; severe dehydration
- Head trauma: haematomas; subconjunctival haemorrhages
- Bleeding from orifices (if coma is due to trauma or bleeding diathesis)

Features of raised intracranial pressure:
- Slow pulse (Cushing's reflex)
- Rising blood pressure
- Papilloedema

Differential diagnoses
- Stroke
- Post-epilepsy state
- Syncope
- Myocardial infarction
- Hysteria
- Substance abuse

Complication
- Cerebral hypoxia/anoxia resulting in brain damage

Investigations
- Neuro-imaging: CT scan, MRI
- Random blood glucose
- Urea, Electrolytes and Creatinine
- Electroencephalography
- Drug levels/toxicology screen
- Full Blood Count
- Blood culture

Treatment objectives
- Clear airway and restore breathing
- Maintain circulation
- Eliminate the cause
- Prevent complications: decubitus ulcers, atelectasis, contractures etc
- Correct metabolic derangements

Non-drug treatment
- Physiotherapy to prevent contractures/deep vein thrombosis, and for passive muscle exercises
- Nursing care (frequent turning and bladder care) to prevent decubitus ulcers and infections

Drug treatment
- Infections: appropriate antibacterial agent
- Epilepsy: use effective parenteral anticonvulsant drugs; diazepam (see Epilepsy)
- Renal failure: dialysis

Appropriate treatment of other metabolic causes

Supportive measures
- Subcutaneous Low Molecular Weight heparin to prevent deep vein thrombosis (see Pulmonary Embolism)

Notable adverse drug reactions
- Diazepam, if required, should be administered slowly intravenously to avoid respiratory depression

Prevention
- Accessible, efficient and effective health care service delivery
- Early reporting/detection of ill-health
- Adherence to medications and non-drug measures in managing disease states
- Public Health Education
- Promote awareness on avoidance of risk factors

PSYCHIATRIC DISORDERS

ALCOHOLISM (Alcohol dependence)

Introduction
- A disorder characterized by a wide spectrum of problems
- Central feature is the use of alcohol which takes an increasingly dominant place in the user's life in spite of experience of harm related to drinking
- Social and genetic factors are thought to be important in pathogenesis
- A lifetime prevalence of about 0.2 - 0.5% in Nigerian adult males

Clinical features
- Tolerance
- Withdrawal episodes
- Compulsive desire to use alcohol
- Cerebrospinal fluid analysis
- Associated physical, social, or occupational impairments

Differential diagnoses
- Dependence on (and withdrawal from) other substances
- Complications
- Liver cirrhosis
- Damage to other organs (including the brain)
- Accidents
- Delirium tremens
- Increased mortality (reduce life expectancy)
- Family, social and occupational disability

Investigations
- Full Blood Count and differentials
- Liver function tests
- Other investigations as indicated for medical/physical complications

Treatment objectives
- Reduction in alcohol consumption as an interim measure
- Abstinence as the desired goal
- Rehabilitation
- Prevention of relapse

ANXIETY DISORDER

Introduction
- Generalized anxiety disorder (GAD) is characterized by exaggerated worry and tension, even when there is little or no cause for anxiety
- A chronic disorder affecting about 2 - 3% of the population

Clinical features
- Pre-occupations: often of diverse nature
- Poor concentration
- Muscle aches and headaches
- Irritability
- Sweating
- Fatigue
- Insomnia
- Shortness of breath

Differential diagnoses
- Medical causes of suggestive symptoms and signs
- (e.g. hyperthyroidism)

Complications
- Chronicity
- Co-morbid depression
- Medical morbidity (e.g. hypertension)

Investigations
- To exclude medical/physical cause(s)

Treatment objectives
- Achieve remission of symptoms
- Prevent relapse

Non-drug treatment
- Cognitive-behavioural therapy

Drug treatment
- Diazepam 10 - 20 mg orally daily
- Imipramine 50 - 150 mg orally daily
- Fluoxetine 20 - 60 mg orally daily

Supportive measures
- Relaxation techniques
- Exercise
- Psychotherapy

Complications
- Increased risk of morbidity (reduce life expectancy)
- (e.g. trauma and accidents)

BIPOLAR DISORDERS

Introduction
- A type of mood disorder in which there is (typically) alternation of a depressive phase and a manic or hypomanic phase
- Experienced by about 1% of the adult population at some point in their lifetime
- About equal incidence between male and females
- May be precipitated by psychosocial stress; strong genetic vulnerability often present

Clinical features
- Depressive phase:
  - Low mood
  - Impaired appetite and sleep
  - Ideas of worthlessness or hopelessness
  - Suicidal ideation
  - Other depressive symptoms and signs
- Manic or hypomanic phase:
  - Elation
  - Euphoria
  - Irritability
  - Expansive mood
  - Disturbed sleep
  - Grandiosity
  - Disinhibition

Differential diagnoses
- Schizo-affective disorder
- Schizophrenia
- Organic mood/affective disorder (including effects of drug abuse)

Complications
- Social and personal consequences of inappropriate behaviour (e.g. unplanned pregnancy, sexually-transmitted infections, etc)
- Suicide

Prevention
- Avoid of undue and extreme stress
- Avoid psycho-active substances
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Increased mortality

Investigations
- Investigations as indicated to rule out organic/medical causes
Full Blood Count and renal function tests (to determine suitability of mood stabilizers)

Treatment objectives
- Reduce risk to self and others
- Normalize mood
- Return to full functional status
- Prevent recurrence

Drug treatment
- Cognitive-behavioural therapy as sole treatment in mild cases, and adjunct in all others
- Electroconvulsive therapy (ECT)
- An effective and essentially safe treatment for severe and acute presentations
- A course of 8-12 treatments are usually needed

Drug treatment
- Treat underlying causes
- Lithium
  - 1”line drug following established diagnosis
    - Adult: initially 1 - 1.5 g daily
    - Child: not recommended
  - Measure serum lithium concentration regularly (every three months on established regimens)
  - Adjust dosage to achieve serum levels of 0.6 - 1.2 mEq/L
- Sodium valproate
  - Adult: 750 mg - 2 g orally/day
  - Child: neonate, initially 20 mg/kg orally once daily; usual maintenance dose 10 mg/kg every 12 hours daily
  - 1 month - 12 years: initially 5 - 7.5 mg/kg every 12 hours, usual maintenance dose 12.5 - 15 mg/kg every 12 hours (up to 30 mg/kg twice daily)
  - 12 - 18 years: initially 300 mg every 12 hours, increased in steps of 200 mg daily at 3-day intervals; usual maintenance dose 0.5 - 1 g twice daily (maximum 1.5 g daily)
- Carbamazepine
  - Adult: 600 - 1,800 mg orally daily
  - Child: 1 month - 12 years: initially 5 mg/kg orally at night or 2.5 mg/kg twice daily, increased as necessary by 2.5 - 5 mg/kg every 3 - 7 days
  - Maintenance dose 5 mg/kg 2 - 3 times daily, increased slowly to usual maintenance of 400 - 600mg 2 - 3 times daily

Antidepressants
- TCAs or SSRIs may be indicated in depressive phase
- Antipsychotics
  - Haloperidol 1.5 to 3 mg orally 2 - 3 times daily (may be indicated in acute manic phase)
  - Child 2 - 12 years: initially 12.5 - 25 micrograms/kg orally twice daily, adjusted according to response to maximum 10 mg daily
  - 12 - 18 years: initially 0.5 - 3 mg daily, adjusted according to response to lowest effective maintenance dose (as low as 5 - 10 mg daily)

Supportive measures
- More likely with doses above recommended upper limits
- Lithium
- Gastrointestinal disturbances
- Tremors
- Confusion
- Myoclonic twitches

Investigations
- Carbamazepine: hypersensitivity reactions
- Transient memory impairment is common following ECT

Prevention
- No primary preventive measures are clearly delineated
- Adherence to therapy with mood stabilizers until discontinuation is considered prudent (this is individually determined)

DELIRIUM
Introduction
- A transient disorder of brain function
- Manifests as a global cognitive impairment and behavioural disturbance
- More common at the extremes of life though it can occur at any age
- Incidence up to 15% has been reported among general medical inpatients; up to 40% among acutely ill geriatric patients
- Post-identification and mis-diagnosis are common

Common causes are:
- Trauma
- Infections
- Metabolic derangements
- Side effects of drugs

Clinical features
- Disturbance of consciousness
- Disorientation
- Memory deficits
- Language disturbances
- Perceptual disturbances
- Rapid fluctuations
- Disruption of sleep-wake cycle
- Psychomotor hyperactivity
- Mood alterations

Differential diagnoses
- Dementia
- Acute (idiopathic) psychotic disorders

Complications
- Usually transient but may be associated with increased morbidity (e.g. from falls) and mortality

Investigations
- Determined by any causal or contributing medical conditions

Treatment objectives
- Identify and ameliorate any causal or contributing medical conditions
- Improve cognition
- Normalize behaviour
- Reduce risk to self and others
- Prevent suicide attempts
- Return to active life
- Prevent recurrence
- Cognitive-behavioural treatment
- Inter-personal psychotherapy

Drug treatment
- Tryptic antidepressants (TCAs)
  - Amitriptyline in increasing doses up to 150 mg orally/day
  - Fluoxetine 20 - 80 mg orally/day

Supportive measures
- Supportive psychotherapy for patients and family/caregivers

Differential diagnoses
- Negative mood reactions, caution
- Tricyclic antidepressants:
  - Dryness of the mouth
  - Urinary retention
  - Constipation
  - Blurring of vision
- Selective Serotonin Reuptake Inhibitors (SSRIs)
- Sleep disturbance
- Sexual dysfunction
- Serotonin syndrome
- Cardiac toxicity, especially in overdose with TCAs and SSRIs

Increased suicidal ideation in adolescents
Non-drug treatment
Psycho-social interventions as indicated (including social and occupational therapy)
Psycho-education for patient and relatives / caregivers
Supportive psychotherapy
ECT (especially for catatonic forms)

Drug treatment
Chlorpromazine
Adult: initially 25 mg orally every 8 hours (or 75 mg at night), adjusted according to response to usual maintenance dose of 75 - 300 mg daily
- Elderly: a third to half adult doses
By deep intramuscular injection: 25 - 50 mg every 6 - 8 hours
Child: 1 - 5 years: 500 micrograms/kg orally every 6 - 8 hourly (maximum 40 mg daily); 6 - 12 years: a third to half adult dose (maximum 75 mg daily)
Haloperidol
Adult: initially 1.5 - 3 mg every 8 - 12 hours or 3 - 5mg every 8 - 12 hours in severely affected or resistant patients
- In resistant schizophrenia, up to 30 mg daily may be needed, adjusted according to response to the lowest effective maintenance dose (as low as 5 - 10 mg daily)
Elderly, initially half adult dose
Child: initially 25 - 50 micrograms/kg daily in 2 divided doses (maximum 10 mg)
Fluphenazine
Adult: initially 2 - 10 mg every 8 - 12 hours, adjusted according to response to 20 mg daily
- Doses above 20 mg daily (10 mg in elderly) only with special precaution
Or: 25 - 100 mg intramuscularly fortnightly to monthly
Child: not recommended

Supportive measures
Social and occupational therapy
Cognitive therapy (as adjunct in the treatment of persisting psychotic experience)
Rehabilitation

Notable adverse drug reactions
Extrapyramidal and Parkinsonian symptoms (may require anticholinergic medication)
Tardive dyskinesia
Weight gain
Agranulocytosis (monitor blood counts in patients on clozapine)

Prevention
No clear/specific scope for primary prevention at present
- Secondary and tertiary:
  - Early and effective treatment
  - Rehabilitation to reduce disability
Follow-up treatment
Rehabilitation of the mouth
Once the acute phase has subsided, oral hygiene should be brought to as high a standard as possible to lessen the risk of recurrence
Sequestrectomy

Notable adverse drug reactions, caution
Metronidazole: nausea, vomiting, unpleasant taste; disulfiram-like effect with alcohol.

ACUTE PERIAPICAL ABSCESSES
Definition
A localized collection of pus in the periapical region of a tooth
Aetiology
May develop either directly from acute periapical periodontitis or more usually from a chronic periapical granuloma
Generally the result of a mixed bacterial infection
Culture of the pus yields a wide range of different organisms
- Strict anaerobes (e.g. Prevotella, Porphyromonas) usually predominates, but facultative anaerobes may be found.

Clinical features
Painful swelling at the root of tooth
Sinus (may be present)
Tooth is tender to biting or percussion
Tooth mobility

Differential diagnoses
Inflammatory radicular cyst
Osteomyelitis
Periodontal abscesses

Investigations
Radiographs (periapical)

Treatment objectives
Prevent spread of infection
Non-drug treatment
Extraction (or endodontic treatment) i.e. root canal therapy

Drug treatment
Metronidazole

Adult: 200 mg orally 8 hours for 3 days
Child: 1 - 3 years: 50 mg orally every 8 hours for 3 days; 3 - 7 years: 100 mg every 12 hours; 7 - 10 years: half adult dose

Supportive therapy
Ascorbic acid
Adults: not less than 250 mg orally daily (in divided doses)
Child: 1 month - 4 years: 125 - 250 mg in 1 - 2 divided doses
4 - 12 years: 250 - 500 mg daily in 1 - 2 divided doses; 12 - 18 years: 500 mg - 1 g daily in 1 - 2 divided doses

Ferrous sulfate
Adult: 200 mg orally three times daily taken before food
Child: 6 - 12 years: half adult dose
**GINGIVITIS**

**Introduction**
- An inflammatory response of the gingivae to plaque bacteria
- The most common type is chronic gingivitis

**Clinical features**
- Chronic gingivitis is asymptomatic, low grade inflammation of the gingivae
- Gums become red and slightly swollen

**Non-drug treatment**
- Oral hygiene instructions

**Pathogenesis/aetiology**
- Immunosupression results in the Candida albicans (a normal oral commensal) becoming virulent
  - It invades and proliferates in superficial epithelium
  - Results in a thick plaque which is oedematous and not easily rubbed off

**Clinical features**
- A creamy/whitish, soft and friable slough located on the soft tissues of the oral cavity: tongue, palate, cheek, pharynx

**PERIODONTITIS**

**Introduction**
- An inflammatory condition of the periodontium: periodontal ligament, cementum, alveolar bone, gingivae

**Classification**
- Acute periodontitis
- Chronic periodontitis
- Juvenile periodontitis
- Other sub-classifications
Acute periodontitis
- Relatively uncommon
- Of short duration; may be due to trauma, abscess or ulceration
- Characterized by pain
- May be associated with bleeding, fever, swelling and redness of the mucosa, unpleasant taste in the mouth

Chronic periodontitis
- A sequel of chronic gingivitis
- Symptoms are the same as in the acute type, but with less pain and longer history

Clinical features
- Inflammation
- Destruction of the periodontal membrane fibres
- Resorption of the alveolar bone
- Migration of the epithelial attachment along root towards the apex
- Pocket formation around the tooth

Juvenile periodontitis
- An uncommon disease characterized by periodontal destruction, often in the absence of overt gingival inflammation

Epidemiology
- Prevalence 1:1000; male = female
- Onset at puberty or earlier

Clinical features
- Affects the first permanent molar and incisors
- Actinobacillus, Actinomyces comitans has been isolated from the affected sites

Investigation
- Radiology may reveal marked bone loss interdentally, inter-radicularly and apically

Complications
- Tooth loss
- Malocclusion
- Temporo-Mandibular Joint (TMJ) dysfunction syndrome

Non-drug treatment
- Control of plaque bacteria by use of antiseptic solution
- Establishing a healthy gingival and periodontal attachment
- Oral hygiene instruction and motivation
- Regular scaling and polishing
- Root planing
- Splinting of mobile teeth
- Periodontal surgery
- Bone regenerative techniques e.g using Polytetrafluoroethylene (PTFE) membranes, Bio-Oss, Bio-membrane

Drug treatment
- Metronidazole
  - Adult: 200 mg orally every 8 hours for 5 days
  - Child 1 - 3 years: 50 mg orally every 8 hours; 3 - 7 years: 100 mg every 12 hours; 7 - 10 years: 100 mg every 8 hours; 10 - 18 years: 200 mg every 8 hours

Precaution
- Tetracyclines should not be given to children under 12 years

PULPITIS
Introduction
- Inflammation of the dental pulp
- The single most important disease process affecting the dental pulp
- Accounts for virtually all pulpal disease of any clinical significance

Clinical features
- Pain which is difficult to localize
- May radiate to the adjacent jaw and occasionally to the face, ear or neck
- May be triggered by:
  - Cold or hot stimulants
  - A recumbent position
  - Occasionally by mastication when food particles get into a carious cavity

Important to determine whether pulpitis is reversible or irreversible

Reversible pulpitis:
- The pulp can recover with removal of stimulus
- Pain lasts for only a few moments after removal of the initiating stimulus

Irreversible pulpitis:
- The pulp cannot recover even after removal of stimulus
- Characterized by pain which lingers for at least one minute after removal of stimulus

May be spontaneous

Complications
- The sequelae of untreated pulpitis (in the order in which they occur) are:
  - Reversible pulpitis
  - Irreversible pulpitis
  - Pulpal necrosis
  - Apical periodontitis
  - Periapical abscess
  - Cellulitis

Investigations
- Of primary importance is the use of a pulp tester to test the vitality of the pulp
- The following can be used:
  - Electric pulp tester
  - Cold or hot water bath
  - Ethyl chloride spray
  - Hot gutta percha sticks
  - Ice sticks

Treatment objectives
- To exclude the pulp from the stimulus (or stimuli) in reversible pulpitis
- To remove the pulp in irreversible pulpitis

Non-drug treatment
- Reversible:
  - Indirect pulp capping
  - Direct pulp capping
  - Conventional filling using amalgam, composite or GIC
  - Desensitization with strontium chloride
- Irreversible:
  - Root canal therapy
  - Extraction

Drug treatment
- Paracetamol
  - Adult: 500 mg - 1 g orally every 4 - 6 hours (to a maximum of 4 g) for 5 - 7 days
  - Child over 50 kg: same as adult dosing
  - 6 - 12 years: 250 - 500 mg; 1 - 5 years: 125 - 250 mg; 3 months - 1 year: 125 - 250 mg for 5 - 7 days
- NSAIDs may be required in some patients

Notable adverse drug reactions
- Reversible:
  - Paracetamol:
    - Gastrointestinal haemorrhage, allergic reactions
    - Do not prescribe for patients with peptic ulcer disease
    - May exacerbate symptoms in asthmatics
- Aspirin is contraindicated in children less than 16 years affecting the aspirin sensitivity

Prevention
- Prevent dental caries (the most important cause of pulpitis)
- Seek prompt dental attention

SALIVARY GLAND DISEASES
Introduction
- A wide spectrum of disorders
- Diseases due to obstruction
  - Salivary calculi
  - Parotid papilla and duct strictures
  - Salivary fistulas
  - Mucoceles and cysts
  - Ranula
- Sialadenitis
  - Diseases which result from inflammation of the salivary glands
    - Mumps
    - Suppurative parotitis
    - Chronic sialadenitis
- Xerostomia
  - Dry mouth
  It can be caused by the following:
    - Sjogren's syndrome
    - Irradiation
    - Dehydration
    - Psychogenic
    - Drugs

NEOPLASMS OF THE SALIVARY GLAND
- The next most common neoplasms of the mouth after squamous cell carcinomas
- Above 70% develop in the parotid gland
- Over three-quarters are benign
- Women are slightly more frequently affected

Classification
- The modified WHO classification (1972) includes:
  - Epithelial tumours
  - Adenomas:
    - Pleomorphic adenoma (‘mixed tumour’)
    - Monomorphic adenomas
  - Warthin's tumour, oxyphilic adenoma
  - Carcinomas:
    - Mucoepidermoid carcinoma
    - Acinic cell carcinoma
    - Adenocarcinoma
    - Epidermoid carcinoma
    - Undifferentiated carcinoma
    - Malignant mixed tumour
  - Non-epithelial tumours:
    - Lymphomas
    - Sarcomas

Clinical features
- Benign tumours are generally asymptomatic enlargements
- Malignant varieties are painful, irregular, ulcerative and metastatic

Investigations
- Sialography
- Postero-anterior view of the skull
- Oblique lateral view of the jaws

Management
- Benign and malignant lesions: surgical excision
- Malignant lesions: radiotherapy and chemotherapy in addition to excision
- Secondary bacterial infections: treat with antibiotics e.g. ampicillin/ cloxacillin 250/250 mg every 6 hours for 5 - 7 days
- Adjust doses as appropriate for children

TEMPORO-MANDIBULAR JOINT DISORDERS
Introduction
- These disorders can be grouped under the following conditions:
  - Temporo-Mandibular Joint (TMJ) pain-dysfunction syndrome
  - Osteoarthritis
  - Rheumatoid arthritis

SJOGREN'S SYNDROME
- Presents with dryness of the eyes and mouth (primary type)
- In the secondary type, dryness occurs in association with rheumatoid arthritis or other connective tissue disease
Trauma
Developmental defects
Ankylosis
Infection
Neoplasia

**TMJ pain dysfunction syndrome**
The most common problem in or around the TMJ

**Clinical features**
Equal frequency between genders, but five times as many females seek treatment
Patients are usually between 15 and 40 years
Unilateral or bilateral dull pain within the TMJ and/or surrounding muscles, sometimes on waking or during eating or speech
TMJ may lock in the open or closed positions, occasionally
TMJ sounds such as clicking, crunching or grating are often described
Associated headache is usually located in the temporal region
Pain is cyclical and usually resolves, but may recur
May be associated with psychological stress

**Differential diagnoses**
Migraine
Psychogenic depression

**Treatment objectives**
Most symptoms are self-limiting and do not require treatment
Treatment should be conservative and reversible

**Non-drug treatment**
Educate patient about the condition, emphasizing its frequency and self-limiting nature
Soft diet
Apply moist heat to painful muscles
Physiotherapy

**Drug treatment**
- Analgesics as appropriate
- Anxiolytics
  - Diazepam 5 mg orally 1 hour before sleep, then 2 mg every 12 hours, for up to 10 days (maximum)

**Supportive measures**
- Occlusal splints
- Rheumatoid arthritis
  - Rare
  - Increasing incidence after 50 years
  - Joint crepitus denotes degenerative joint disease
  - May be accompanied by pre-auricular pain, but not involving the masticatory muscles
- Radiographs (e.g. panoramic, trans-pharyngeal, trans-cranial, oblique, lateral, open and closed) show degenerative joint disease
- Rheumatoid arthritis
  - A disease of unknown aetiology
  - Autoimmune mechanisms and immune complex formation have been implicated

**Usually begins in early adult life and affects females more frequently**
Patients rarely complain of pain from TMJ but clinical examination shows TMJ involvement in 50% of cases
Limitation of mouth opening; softness, crepitus, referred pain, and tenderness on biting
Severe disability is unusual

**Trauma**
Clinical features include:
- Condyle fracture or trauma arthritis
- Pain and trismus of traumatic arthritis resolve after one week
- Micro-trauma from parafunction may result in chronic symptoms
- Dislocation is usually a result of trauma and is rare; very rarely it occurs after yawning

**Developmental defects**
Aplasia of the condyle is extremely rare and may be unilateral or bilateral
- Hypoplasia of the condyle may be congenital or acquired
- Cause of congenital hypoplasia is not known; either one or both condyles may be involved
- Acquired hypoplasia may be secondary to trauma, infection or radiation
- Hyperplasia of the mandibular condyle is rare and self-limiting
- Cause is unknown. It is generally unilateral with resultant facial asymmetry, deviation of mandible to the opposite side and malocclusion

**Ankylosis**
Follows trauma, infection or other inflammatory condition

**Infection**
Follows penetrating trauma to joint or spread from middle ear

**Neoplasia**
Primary neoplasms arising from the structures of the TMJ are extremely rare
Benign tumours such as chondromas and osteomas are more frequent than sarcomas arising from bone or synovial tissues
Others are secondary carcinomas

**CHAPTER 6: DERMATOLOGY**

**BACTERIAL INFECTIONS**

**CELLULITIS**

**Introduction**
A supplicative bacterial infection of the skin and soft tissue, often with involvement of underlying structures:
- Fascia, muscles and tendons
- Most often due to β-haemolytic streptococci or *Staphylococcus aureus*
- Usually (but not always) follows some discernible wound
- Often a complication of immunosuppression like diabetes and HIV/AIDS

**Clinical features**
- Areas of oedema; rapidly spreading
- Erythema (rapidly becomes intense and spreads)
- Tenderness and warmth
- Often accompanied by fever, lymphangitis, regional lymphadenitis
- Systemic signs of toxicity
- Area becomes infiltrated and pits on pressure
- Sometimes the central part becomes nodular and surrounded by a vesicle that ruptures and discharges pus and necrotic material

**Differential diagnoses**
- Erysipelas
  - Deep vein thrombosis
  - Complications
  - Unusual in immunocompetent adults; children and newborns
  - Associated with local oedema, lymphangitis, regional lymphadenopathy and fever
  - May be iatrogenic

**Drug treatment**
- Ciprofloxacin
- Adult: 500 mg - 1 g orally every 6 hours for 5 - 7 days
- Child: see note on caution
- Ceftriaxone
- Adult: 1 g intravenously or intramuscularly daily for 3 days
- Child: neonate, 20 - 50 mg/kg by intravenous infusion over 60 minutes; 1 month - 12 years, body weight less than 50 kg: 50 mg/kg by deep intramuscular injection or intravenous injection over 2 - 4 minutes, or by intravenous infusion
- Intramuscular injections over 1 g should be divided over more than 1 site
- Doses of 50 mg/kg and more should be given by intravenous infusion only
- Use only when there is significant resistance to other drugs

**Surgical treatment**
- May need incision and drainage or debridement

**Prevention**
- Treat any wound promptly

**FURUNCULOSIS (Boils)**

**Introduction**
Infection of a hair follicle by staphylococcal organisms, that leads to an inflammatory nodule, with a pus filled centre
- A carbuncle is merely two or more confluent furuncles, with separate heads
- Recalcitrant cases may occur with a background of immunosuppression
- Alcoholism:
- Malnutrition:
- Blood dyscrasias:
- Disorders of neutrophil function:
- Diabetes:
- AIDS:
- May occur in patients with atopic dermatitis
- May be iatrogenic

**Clinical features**
- Can be found on any body site where hairs are present
- Starts with a small, yellow creamy pustule that rapidly evolves into a red nodule, often with a central yellow plug
- As the lesion expands, it becomes:
  - Painful and tense
  - Associated with local oedema, lymphangitis, regional lymphadenopathy and fever
- Eventually, the central part of the nodule becomes soft
and drains spontaneously
Healing occurs after about 1 - 2 weeks with scar formation

**Diffuseal diagnoses**
- Folliculitis
- Cutaneous myiasis
- Acne inversa in the axilla or groin

**Complications**
- Cellulitis
- Septicaemia
- Carvenous sinus thrombosis when the lesions are on the head and neck

**Investigations**
- Wound swab for bacteriology and sensitivity
- Full Blood Count with differentials
- Fasting blood glucose
- HIV screening
- Urinalysis

**Treatment objectives**
- Treat infection
- Correct predisposing factors
- Prevent complications
- **Drug treatment**
  - Topical antibiotics
  - Gentamicin 0.3% cream
  - Resistance may set in with prolonged use
  - Systemic antibiotics
    - Usually unnecessary except for head and neck lesions, or when the boil is accompanied by fever, chills, regional lymphadenopathy, or a feeling of being unwell
    - **Co-trimoxazole**
      - **Adult:** 960 mg orally every 12 hours for 5 - 10 days
      - **Child:** 6 weeks - 5 months: 120 mg; 6 months - 5 years: 240 mg; 6 - 12 years: 480 mg taken orally every 12 hours for 5 - 10 days
      - **Erythromycin**

  - **Adult and child over 8 years:** 250 - 500 mg orally every 6 hours - 1 g 12 hourly for 5-10 days
  - **Child:** up to 2 years: 125 mg orally every 6 hours; 2 - 8 years: 250 mg every 6 hours for 5 - 10 days
  - **Erythromycin**

**Surgical treatment**
- A small puncture wound often gives less of a scar than allowing spontaneous rupture; it also reduces the pain
- Should be under antibiotic cover to prevent septicaemia

**IMPETIGO CONTAGIOSA**
**Introduction**
A superficial, highly contagious, bullous skin disorder caused by coagulase positive staphylococci and occasionally β-haemolytic streptococci
- **Clinical features**
  - Children are more commonly affected
  - Initial lesions are superficial vesicles, or bullae found around orifices: eyes, nose and ears

**Supportive measures**
- Debride crusted lesions: Dislodging antibacterial agent
- Avoid auto-inoculation e.g. with fingers, shaving brushes, handkerchiefs, or pillow cases

**Investigations**
- **RAST or skin tests:** may suggest dust mite allergy
- **Blinded food challenges:** for diagnosing food allergy
- **Eosinophilia and increased serum IgE levels:** may be present but are nonspecific

**Dermatitis and eczema**
**Clinical features**
- Atopic dermatitis looks different at different ages and in people of different races
- Essential features are:
  - Pruritic, exudative, or lichenified eruptions on face, neck, upper trunk, wrists and hands, and in the antecubital and popliteal folds
  - Personal or family history (in about 70% of cases)
  - Many children show a significant improvement by the age of 5 years
  - Most will have only occasional flare-ups by the time they are teenagers
  - A few continue to have troublesome eczema in adult life, especially those children that suffer from hay fever
  - There is no "cure" for atopic eczema

**Differential diagnoses**
- Seborrhoeic dermatitis (especially in the infant)
- Irritant or allergic contact dermatitis
- Nummular dermatitis
- Psoriasis (especially palmo-plantar)

**Complications**
- Bacterial infections of the skin
- Eczema herpeticum
- Complications of treatment with steroids

**Investigations**
- RAST or skin tests may suggest dust mite allergy
- Eosinophilia and increased serum IgE levels may be present but are nonspecific
- Blinded food challenges: for diagnosing food allergy

**Treatment objectives**

**Standard Treatment Guidelines for Nigeria 2008**

- **Suppress inflammation**
- **Reduce itching**
- **Prevent complications**

**Drug treatment**
- Topical:
  - Hydrocortisone 1% or betamethasone valerate 0.1% - Apply twice a day until the skin improves then decrease to once a day or less frequently as needed
- **Systemic therapy**
  - Steroids (only to control acute exacerbations)
  - **Prednisolone**
    - **Adult:** initially up to 10 - 20 mg orally daily
    - **Child:** 250 - 500 mg orally every 6 hours - 1 g1 2 hourly for 5-10 days
    - **Erythromycin**
      - **Adult and child over 8 years:** 250 - 500 mg orally every 6 hours - 1 g 12 hourly for 5-10 days
      - **Child:** up to 2 years: 125 mg orally every 6 hours; 2 - 8 years: 250 mg every 6 hours for 5 - 10days

**Investigations**
- **Full Blood Count with differentials**
- **Fasting blood glucose**
- **HIV screening**
- **Urinalysis**
- **Drug treatment**
  - **Topical antibiotics**
  - **Gentamicin 0.3% cream**
  - **Resistance may set in with prolonged use**
  - **Systemic antibiotics**
    - **Usually unnecessary except for head and neck lesions, or when the boil is accompanied by fever, chills, regional lymphadenopathy, or a feeling of being unwell**
    - **Co-trimoxazole**
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PARASITIC DERMATOSES

CUTANEOUS LARVA MIGRANS (Creeping eruption)

Introduction
An infection of the skin by various nematode larvae which migrate, but never reach internal organs or complete their life cycles.

Victims are usually:
- People who go barefoot at the beaches
- Children playing in sandboxes and crawling on the bare ground
- Gardeners
- The most common causes are cat and dog hookworm
  - Anclylostoma braziliense
  - Anclylostoma caninum
  - Necator americans
  - Gnathostoma spinigerum
  - Strongyloides stercoralis

Clinical features
- Shortly after entering the skin:
  - The larvae elicit intense pruritus
  - Tiny papules and even papulovesicles develop

As the larvae begin to migrate:
- Intermittent stinging pain occurs
- Thin red, tortuous and minimally elevated lines are formed in the skin
- Rate of migration varies with the species
- Pruritus and excoriation promote secondary bacterial infections
- Intestinal infections with Strongyloides stercoralis may be associated with perianal larva migrans syndrome called 'larva currens' because of the rapidity of larval migration (up to 10 cm/hr)
- Larva currens is an autoinfection caused by penetration of the perianal skin by Strongyloides stercoralis

Differentiation
- Ringworm
- Complications
  - Secondary bacterial infection
  - Fatal Strongyloides stercoralis hyperinfection in immunocompromised patients

Investigation
- None useful to management

Treatment objectives
- Eradicate the larvae
- Eradicate gut Strongyloides
- Treat impetigination
- Prevent re-infection

Drug treatment
- Ivermectin

Adult: 150 microgram/kg orally as a single dose
Child over 5 years old: 200 micrograms/kg orally daily
**GUINEAWORM DISEASE (Dracunculiasis)**

**Introduction**
- An infection by a very long nematode, *Dracunculus medinensis*
- Contracted through drinking water contaminated with water fleas (cyclops) infected with *Dracunculus*
- Except for remote villages in the Rajasthan desert of India and Yemen the disease is now only seen in Africa, between the Sahara and Equator
- Nigeria is one of the few countries with reports of >1,000 new cases a year
- Efforts are currently going on to eradicate the disease in Nigeria

**Pathophysiology**
- In the stomach, the larvae penetrate into the mesentry, where they mature sexually in 10 weeks
- The female worm burrows to the cutaneous surface to deposit her larvae, causing specific skin manifestations
- When the parasite comes in contact with water, the worm rapidly discharges its larvae, which are ingested by the cyclops

**Clinical features**
- As the worm approaches the surface it may feel as a cordlike thickening
- It forms an indurated cutaneous papule
- Several hours before the head appears at the skin surface there is (at the point of emergence)
  - Local erythema
  - Burning sensation
  - Pruritus
  - Tenderness
- Soon after, the papule blisters and a painful ulcer develops, usually on the leg
- Ulcer may occur on other parts of the body e.g. the genitalia, buttocks, or arms

**Differential diagnoses**
- Sickle cell ulcer
- Stasis ulcer

**Complications**

**Infection**
- Nil

**Treatment objectives**
- Extract the maggot
- Treat or prevent bacterial infection
- Non-drug treatment
- Apply petroleum: the maggot crawls out to avoid asphyxiation
- Oedema (face and limbs)
- Fever, pruritus, lymphadenitis, malaise, hypotension
- Should not be used in the presence of concurrent *L. loa* infection: risk of encephalopathic reactions to dying *L. loa* microfilariae
- Should not be used in patients with central nervous system diseases (e.g. meningitis): increased penetration of ivermectin into the CNS

**Prevention**
- Provide universal access to safe and portable water
- In hyperendemic areas, treat the whole population twice yearly with ivermectin

**Drug treatment**

**Osteomyelitis**
- Arthritis
- Tetanus

**Investigations**
- Radiograph of the affected area
- If osteomyelitis and arthritis (or calcified worms) are suspected

**Treatment objectives**
- Resolve local inflammation to permit easier removal of the worm
- Extract the worm
- Prevent and treat complications

**Drug treatment**

**Mycosis**
- Invasion of mammalian tissue by fly larvae

**Investigations**
- Invasion of mammalian tissue by fly larvae

**Treatment objectives**

**Drug treatment**

**ONCHOCERCIASIS (River blindness)**

**Introduction**
- A common chronic filarial disease in tropical regions which frequency cause pruritus and blindness
- Causative organism is *Onchocerca volvulus*
- The microfilariae are transmitted by female *Simulium*, tiny blackflies which breed along small, rapidly moving streams
- Female worms release motile microfilariae into the skin, subcutaneous issues, lymphatics, and eyes

**Drug treatment**

**Clinical features**
- Interval from exposure to onset of symptoms can be as long as 1 - 3 years
- Skin lesions
  - May be localized or cover large areas
  - Intense pruritus
  - A cardinal symptom; may occur in the absence of the skin lesions
- Dermatitis
  - Skin eventually becomes lichenified from chronic scratching
  - Post inflammatory confetti-like depigmentation on the skin (“leopard skins”) may occur in late onchodermatitis
- Onchocercomata
- Subcutaneous nodules which develop on various sites of the body and contain myriad adult worms which can live for up to 14 years.
- Firm, non-tender lymphadenopathy is a common finding in patients with chronically infected onchocerciasis
- “Hanging groin” describes the pendulous, atrophic skin sac that contains these large nodules
- *Microfilariae* in the eye may lead to visual impairment and blindness

**Differential diagnoses**

**Scabies**

**Pediculosis**

**Papular urticaria**

**Papulonecrotic tuberculids**

**Pruritic papular eruption of HIV**

**Other causes of generalized pruritus without a rash**

**Other causes of subcutaneous nodules e.g.**

**Kratonosis**

**Paragonimiasis**

**Gnathostomiasis**

**Echinococcosis**

**Complication**

**Blindness**

**Investigations**
- Skin snips or punch biopsy for microfilariae
- Excise nodule for adult worms
- Mazzotti test reaction
- Slit lamp eye examination

**Treatment objectives**
- Kill the microfilariae
- Eliminate source of microfilarial release
- Prevent blindness

**Drug treatment**
- Ivermectin
  - As a single oral dose of 150 microgram/kg in adults and children over 5 years
  - Repeat every 6 months for 2 years and yearly for 12 - 15 years or longer
- Eye involvement
  - Prednisolone 1 mg/kg orally should be started several
days before treatment with ivermectin

**Surgical**

Excise individual nodules (nodulectomy)

**Notable adverse drug reactions, caution and contraindications**

No food or alcohol should be taken for at least 2 hours before or after dosage

Pregnant women should not receive ivermectin until after delivery

Breastfeeding mothers should not be treated until the infant is at least 1 week old

**Prevention**

Use biodegradable insecticides to kill flies

Netting and repellents remain crucial.

Provide access to safe and portable water

In hyperendemic areas, treat the whole population twice yearly with ivermectin

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**PEDICULOSIS (Lice)**

**Introduction**

Diseases due to blood sucking lice

Can be divided into three conditions:

- Pediculosis capitis (head lice):
  - Caused by *Pediculus humanus var. capitis*
- Pediculosis corporis (body lice):
  - Caused by *P. humanus var. corporis*
- Pediculosis pubis (pubic lice):
  - Caused by *Pthirius pubis*

The arthropods are transmitted from human to human via:

- Direct contact
- Sharing of combs, brushes, towels (P. capitis)
- Sharing underwear
- Sexual intercourse or any intimate personal contact (P. pubis)

**Clinical features**

**Oral Pediculosis capitis:**

Generally the only complaint is pruritus:

- Nits can easily be seen at the base of the hairs; careful inspection may reveal the adult louse
- Secondary impetiginization is common because of the itching
- Cervical nodes may become enlarged

Children and individuals with long hair are more likely to be affected

- Homeless people and refugees are also vulnerable
- No age or economic stratum is immune
- School children who share school caps, hair brushes and combs, pillow cases are particularly vulnerable

**Pediculosis corporis:**

- Pruritus may be the only symptom in some patients
- Chronic scratching may result in characteristic hemorrhagic puncta and linear excoriations

Patient eventually develops intensely pruritic papules

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**SCABIES**

**Introduction**

An intensely pruritic infestation caused by human mite *Sarcoptes scabiei*

Contracted by close contact and rarely via fomites

Occurs commonly in children and inmates of overcrowded institutions such as prisons and boarding houses

- Infection of households is common
- Sexual intercourse is also another possible method of spread among adults
- Sharing a bed or using the same underwear will also suffice to contact the disease

**Clinical features**

Severe pruritus worse at night is characteristic

The typical lesion is the burrow

- It is hardly seen because of the marked excoriations and secondary infection on the skin
- Papulo-pustular eruptions with excoriation and impetiginization. Characteristic sites of predilection:
  - Anterior axilliary area
  - Anterior groins
  - Anterior axilliary area
  - Nipples

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**SCABIES**

**Clinical features**

- The cream is lathered through the hair, left on for 10 minutes and thoroughly rinsed out. A fine-tooth comb should be used to remove adherent nits
- Repeat treatment after a week

**P. corporis:**

- Treat dermatis with antipruritics or corticosteroids
- Treat secondary infection with oral antibiotics

**Supportive measures**

- All contact individuals should be examined and treated as necessary
- Pillow cases should be disinfested as for clothing.

P. pubis:

- Treatment is the same as for pediculosis capitis, with the exception that pediculosis of the eyelashes should be treated with an oclusive ophthalmic ointment applied to the eyelids margins for 10 days
- Affected persons' sexual contact(s) should be treated simultaneously

**Notable adverse drug reactions, caution**

As stated under scabies

**Prevention**

Improve personal hygiene

Do not share hair combs, brushes, clothing, pants and pillows

**SCABIES**

**Introduction**

An intensely pruritic infestation caused by human mite *Sarcoptes scabiei*

Contracted by close contact and rarely via fomites

- Scabies
- Atopic dermatitis
- All pruritic dermatoses

- Seborrhoic dermatitis
- Pityriasis amiantacea
- Peripilar keratin
- Hair casts
- Piedra
- P. corporis:
  - Sebaceous
  - Atopic dermatitis
  - All pruritic dermatoses
- P. pubis:
  - Sebaceous
  - Atopic dermatitis
  - All pruritic dermatoses

**Complications**

Secondary bacterial infections

- The body louse serves as a vector for diseases:
  - Epidemic typhus (*Rickettsia prowazekii*)
  - Trench fever (*Bartonella quintana*)
  - Relapsing fever (*Borrelia recurrentis*)

**Investigations**

- P. capitis and pubis:
  - Examine loose or the nits on epilated hair strands (especially from behind the ears) under the microscope
- P. corporis:
  - Examine the seams of clothing for nits and lice

**Treatment objectives**

Eradicate the lice

Prevent re-infection

Treat complications

**Drug treatment**

- P. capitis:
  - 1% permethrin cream rinse
- P. corporis:
  - Ivermectin:
    - Single 200 microgram/kg oral dose for crusted scabies
    - Ivermectin:
      - Child: Benzyl benzoate 25% in emulsion
      - Adult: apply over the whole body and wash off after 8-12 hours
      - Child: supervision required with application and rinsing
      - Adult: apply over the whole body; repeat without bathing the next day and wash off 24 hours later
      - Benzyl benzoate 25% in emulsion
      - Ivermectin:
        - Adult: apply over the whole body; repeat without bathing

**SCABIES**

**Introduction**

An intensely pruritic infestation caused by human mite *Sarcoptes scabiei*

- Scabies
- Candidiasis
- In the axillae trichomycosis axillaris

**Complications**

Secondary bacterial infections

- The body louse serves as a vector for diseases:
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**PAPULOSQUAMOUS DISORDERS**

**LICHEN PLANUS**

**Introduction**

A chronic, pruritic, papular skin disease

The three cardinal features are:

- Skin lesions
- Mucosal lesions
- Histopathologic features of band-like infiltration of lymphocytes and melanophages in the upper dermis

Some of the drugs known to cause lichen planus (LP):

- Chloroquine
- Quinacrine
- Quinidine
- Gold
- Streptomycin
- Tetacycline
- NSAIDs
- Phenothiazines
- Hydrochlorothiazide

**Clinical features**

- LP has been found in children, young and middle-aged adults
- The skin lesions are flat-topped polygonal papules with a characteristic colour
- Violaceous in fair skinned people but slate-grey on black skin
- Itching is mild-to-severe
- Like psoriasis, lesions often occur on sites of trauma and scratch marks (Koebner's or isomorphic phenomenon)

**Lickham's striae** are fine white streaks present on the tops of papules

- The lesions are distributed mainly on:
  - Flexor surfaces of the wrist
  - Lumbar area
  - The penis, tongue, buccal and vaginal mucous membranes

- On the buccal mucous membrane it may present as white reticulate pattern or plaque which may after several years transgress into squamous cell carcinoma
- The nails are also affected with:
  - Pitting, roughening and splitting (trachyonychia)
  - Thickening (pachyonychia)

**Complications**

- 20-nail dystrophy
- Squamous cell carcinoma of oral and hypertrophic lichen planus

**Investigations**

- Histopathology
- Hepatitis C antigen

**Treatment objectives**

- Relieve itching
- Clear lesions
- Suppress inflammation

**Drug treatment**

**Topical corticosteroids:**

- Beclometasone dipropionate 0.1% cream
  - Apply 1 - 2 times daily
- Not licensed for use in children under one year
- Bethamethasone valerate 0.1% cream and ointment
  - Apply 1 - 2 times daily

**Systemic corticosteroids**

- Prednisolone
  - Adult: 20 - 40 mg orally daily for several weeks with reduction of dosage or switch to alternate-day therapy as soon as improvement is seen
- Child: not recommended for children for this indication

Or:

- Triamcinolone acetonide 40 mg intramuscularly once or twice (at a 6-week interval)

**Notable adverse drug reactions**

- Prevention
  - Avoid precipitating drugs

**PITYRIASIS ROSEA**

**Introduction**

A common, mild, inflammatory exanthem

- More common during the fall, winter and spring in temperate countries
- In Nigeria more common during the early part of the rainy season (though cases are seen throughout the year)

**Clinical features**

- The initial lesion in 20 - 80% of cases (“herald patch”)
- Often found on the trunk, but may appear on the face or extremities
- Oval with a collarette of scales
- May be diagnosed as “ringworm” before the other lesions appear

**Complications**

- Lichen planus
- Guttate psoriasis

**Prevention**

- To relieve symptoms (if any)

**Drug treatment**

- Topical:
  - Urea cream
    - Useful as a hydrating agent: apply twice daily
- Systemic:
  - Oral antihistamine
  - If pruritus is bothersome (see Urticaria)

**Systemic corticosteroids**

- If complicated by ampicillin exanthematic eruption

**Triamcinolone acetonide 40 mg intramuscularly as a single dose**

**Antibiotics:**

- If lesions are impetiginized

**Erythromycin 500 mg orally every 6 hours for 14 days**

**Notable adverse drug reactions**

- Caution

**Prevention**

- Urticaria

**PITYRIASIS LICHENIFORMIS**

**Introduction**
A chronic inflammatory skin disease which is characterized by:
- Increased epidermal proliferation
- Epidermal thickening
- Erythematous lesions with silvery white scales
- Affects people of all ages in all countries
- Disease remains largely unknown but it has been variously attributed to genetic, climatic, nutritional, ecological and immunological factors

Triggers include:
- Streptococcal or viral infections
- Emotional crises
- Pregnancy and delivery
- Trauma (Köebner phenomenon)
- Diet
- Alcohol
- Cigarette smoking
- Hypocalcemia
- Stress
- Infections e.g. streptococcal pharyngitis

May occasionally be provoked or exacerbated by drugs:
- ACE inhibitors
- Calcium channel blockers
- β-adrenoceptor antagonists
- Chloroquine
- Lithium
- Non-Steroidal Anti-inflammatory Drugs (NSAIDs)
- Terbinafine
- Lipid lowering drugs

Clinical features
Lesions are characterized by:
- Sharp borders
- Increased scales
- When scratched, scales fall off as tiny flakes that resemble scrapings from a candle (Candle sign)

If the scales are removed (exposing the dermal papillae) punctate bleeding from the enlarged capillaries occur (Auspitz sign)

Eruptive lesions may be intensely or mildly pruritic, or may be asymptomatic

All lesions begin as small scaly macules but may take divergent paths as they spread centrifugally

Patterns seen may be:
- Guttate
- Follicular
- Nummular
- Palmar
- Plantar
- Pustular
- Pustular pustuloid
- Raw, eczematous
- Vascular

Investigations
Histopathology

Treatment objectives
To retard epidermal proliferation
Reduce inflammation
Prevent complications

Drug treatment
Choice of treatment depends on the site, severity and duration of the disease, previous treatment, and the age of the patient

Topical treatment:
- Corticosteroid ointment
- Hydrocortisone for the face and flexures
- Betamethasone or clobetasol for the scalp, hands and feet

Application is followed by an occlusive dressing of a polyethylene film, which may remain in place for 12-24 hours to augment effectiveness

Dithranol ointment 0.1% - 2% (for moderately severe psoriasis)
- Initiate under medical supervision
- Start with 0.1%; carefully apply to lesions only, leave in contact for 30 minutes, then wash off thoroughly
- Repeat application daily, gradually increasing strength to 2% and contact time to 60 minutes at weekly intervals

Cause remains thoroughly after use
- Avoid contact with eyes and healthy skin

Coal tar solution (for chronic psoriasis)

Coal tar bath

Fluocinolone acetonide 0.01% in oil
- Apply 1-4 times daily, preferably starting with a lower strength preparation

Small lesions and nail psoriasis

Coal tar bath

Fluocinolone acetonide 0.01% in oil
- Suitable for childhood psoriasis

Combination therapy with calcipotriol and high-potency (Class I) steroids may provide:

Effects, and steroidsparing, allowing a shift to a less potent topical steroid or less frequent use of a Class I steroid

Salicylic acid 3 - 5% in cold cream or hydrophilic ointment (for thick scaling)
- For psoriasis involving more than 30% of the body surface

Ultraviolet light (UVL)

290 - 320 nm ultraviolet B (UVB) three times weekly for 18 - 24 treatments

Lubricating the skin surface with mineral oil or petroleum jelly before UVL produces uniform penetration by reducing the reflection of light from the disrupted skin surface

Tazarotene 0.05% and 0.1% gels

Adult:
- For psoriasis in the flexures, face and penis, when potent steroids cannot be used and other agents are poorly tolerated

Child:
- For patients who have not responded to standard UVB treatment

Severe psoriasis unresponsive to outpatient UVL, may be treated in a day care centre with the Goeckerman regimen:

Use of crude coal tar for many hours and exposure to UVB light

Systemic therapy:
- Antibiotics to eliminate streptococcal pharyngitis

Adult:
- Initially 25 - 30 mg orally daily for 2 - 4 weeks; adjusted according to response. Usual range 25 - 50 mg daily (maximum 75 mg)

Child:
- Severe extensive psoriasis resistant to other forms of therapy, palmo-plantar pustular psoriasis

1 month - 12 years: 500 micrograms/kg orally once daily with food or milk; occasionally up to 1 mg/kg/day

To be administered under expert supervision in both adults and children

Methotrexate

Adult: 20 mg orally once weekly

Child: not licensed for this indication

Indicated for:
- Psoriatic erythroderma
- Moderate-to-severe psoriatic arthritis
- Acute pustular psoriasis (von Zumbusch type)
- Involvement of more than 20% total body surface
- Localized pustular psoriasis that causes functional impairment (e.g. hands)
- Lack of response to phototherapy, PUVA, or retinoids

Induction therapy is 2.5 - 3.0 mg/kg given in a divided dose twice daily

Can be increased to 5.0 mg/kg/day until a clinical response is noted. The dose is then tapered

On discontinuation a severe flare-up may occur, suggesting that an alternative treatment (e.g.
**Chapter 6: Dermatology**

**Should be administered only by experienced dermatologists**

**Methotrexate:**
- May cause blood disorders (bone marrow suppression), liver damage, pulmonary toxicity, GIT disturbances
- If stomatitis and diarrhoea occur, stop treatment
- Renal failure, skin reactions, alopecia, ophthorosia, arthralgia, myalgia, ocular irritation, may also occur
- May precipitate diabetes
- Monitor before and throughout treatment: blood counts and hepatic and renal function tests
- Contraception during and for at least 6 months after treatment for both males and females
- Contraindicated in pregnancy and breast feeding.

**Folic acid** may be given to reduce toxicity

**Cyclosporin:**
- Other side effects: hypertrichosis, hyperuricaemia, dyslipidaemia

**Tacrolimus:**
- Adjuvant therapy

**Efalizumab:**
- Monitor platelet count during initial therapy, then every 3 months
- Notable adverse drug reactions, caution and contraindications
- Contraindicated in immunodeficiency, severe infection, or use of phototherapy or acitretin
- Not recommended for children and adolescents

**DERMATOPHYTE INFECTIONS (Tinea)**

**Introduction**

Superficial fungal infection that affects keratinized tissues

Fungi that usually cause only superficial infections on the skin are called dermatophyte-classified in three groups:

- **Microsporum**, **Trichophyton** and **Epidermophyton**

**Can be acquired from humans, animals, soil or vegetable matter**

**PITYRIASIS VERSICOLOR (Tinea versicolor)**

**Introduction**

Superficial yeast infection of the skin caused by **Malassezia furfur** species (normal commensals on the skin)

Common in warm humid climates

**Predisposing factors:**
- Occlusion of the skin with pomades and greases

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**Drug treatment**

**Topical**
- Ketocanazole
- Miconazole
- Fluconazole

**Systemic**
- Fluconazole: numerous drug interactions

**Prevention**

- Do not share combs, hair brushes, school caps, shoes, socks or underwear
- Keep the feet dry; avoid tight-fitting covered shoes
- Aerate the feet as often as possible

**Note:**

**Tinea capitis (scalp)**

**Tinea barbae (beard)**

**Tinea faciei (face)**

**Tinea corporis (trunk)**

**Tinea cruris (groin)**

**Tinea manus (hand)**

**Tinea pedis (feet)**

**Tinea unguium or onychomycosis (nail)**

**Clinical features**

**Varied:** depending on the site of the body involved

**Pruritis:** a notable symptom

**Tinea capitis:**
- Scalp involvement is seen predominantly in children
- Lesions are varied in appearance; usually scaly, dry and annular, with or without alopecia
- Some appear diffuse and scaly and may involve the whole of the scalp
- Inflamed, purulent lesions (kerion) may develop when infection is from animal to man
- Pruritus usually leads to excoriation of lesions and secondary bacterial infection
- Hyper-sensitivity to the presence of the fungal elements may occur at distant sites ("Id" reaction)

**Tinea barbae:**
- Ringworm of the beard is not a common disease
- Occurs chiefly among those in agricultural pursuits, especially those in contact with farm animals
- Lesions present as severe, deep folliculitis with erythema, nodular infiltrates, scales and pustules
- Marked regional lymphadenopathy is the rule

**Tinea faciei:**
- Fungal infection of the face (apart from the beard)
- Frequently misdiagnosed, since the typical ringworm not commonly seen on the face
- Erythematous, slightly scaling, indistinct borders are usually seen
- People who use corticosteroids such as cosmetic bleaching creams are prone to T. faciei
- The steroid effect makes the lesions atypical hence, T. incognito

**Tinea corporis:**
- One or more circular, sharply circumscribed, slightly erythematous, dry, scaly patches
- Lesions may be slightly elevated, particularly at the borders, where they are more inflamed and scaly than at the central part
- Progressive central clearing produces annular outlines that give them the name "ringworm"

In the presence of immune suppression from underlying illness, or chronic use of topical steroid creams lesions may be very extensive and atypical in appearance

**Tinea cruris:**
- Occurs more commonly in adult men
- Leads to severe itching in the groin (crotch)
- Presents as slowly spreading erythematous patches with scaly borders on the upper inner aspects of the thighs

**Treatment objectives**

To clear lesions and prevent recurrence

**References**

- [Tinea](https://www.medscape.com/viewarticle/854589)
- [Dermatophyte infections](https://www.medscape.com/viewarticle/854589)
- [Pityriasis versicolor](https://www.medscape.com/viewarticle/854589)
**Introduction**

A second infection with varicella-zoster virus (VZV), usually in adults and limited to a dermatome

**Synonyms:**
- Zoster, from the Greek “zostrix”, meaning belt
- Shingles, from the Latin “cingulus”, also meaning belt

**Clinical features**

- Vesicles arranged in one or more dermatomes
- Unilaterally
- Initial pruritus, pain and paraesthesia
- Multidermatomal and disseminated forms may occur
- Notable adverse drug reactions, caution

**Differential diagnosis**

- Chicken pox

**Complications**

- Pain may persist long after rash has healed (post-herpetic neuralgia)
- Dissemination of infection in the immunocompromised
- Hemorrhagic and necrotic lesions
- Ramsay-Hunt syndrome (Herpes zoster of the ear resulting in severe ear pain, hearing loss and vertigo)
- Visual impairment due to corneal ulcers (Zoster opthalmicus-V1)
- Invasive
- HIV screening for all patients
- Full Blood Count with differentials
- ESR
- Exclude Hodgkin’s disease and leukaemia

**Treatment objectives**

- Provide symptomatic relief
- Treat secondary infection
- Treat any identified predisposing factor

**Drug treatment**

- Topical:
  - Selenium sulphide shampoo
  - - Apply on affected areas daily, leave on for 10 - 30 minutes minutes and wash off
  - - Continue for 3 weeks
  - Ketoconazole shampoo
  - - Use as above
  - Miconazole cream
  - - For limited areas
  - - Apply twice daily for 3 weeks

- Supportive measures:
  - Deal with underlying predisposing factor(s)
  - Avoid hot, humid environments or clothes that promote perspiration
  - Take a cold shower after perspiration
  - Use any of the above shampoo washes once a month if predisposed

**VIRAL INFECTIONS**

**HERPES ZOSTER**

**Introduction**

Adolescent: apply 3 - 4 times daily

Child: may not be suitable for children because of its irritant properties

- Topical local anaesthetics
- - Helpful in some patients
- Notable adverse drug reactions, caution
- Aciclovir
- - Ensure adequate hydration
- - Caution in pregnancy and breastfeeding
- - May cause nausea, vomiting, dizziness
- - Fatigue pruritus and photosensitivity

**MOLLUSCUM CONTAGIOSUM**

**Introduction**

A common infection caused by a large epidermotropic pox virus

**Clinical features**

- Individual lesions are smooth-surfaced, firm, dome-shaped, pearly papules; average diameter 3-5 mm
- Some “giant” lesions may be up to 1.5 cm in diameter
- Characteristic central umbilication
- Spontaneous resolution is expected
- Host response plays an important role
- May be generalized in the immuno-compromised

**Drug treatment**

- Aciclovir
- - Ensure adequate hydration
- - Caution in pregnancy and breastfeeding
- - May cause nausea, vomiting, dizziness
- - Fatigue pruritus and photosensitivity

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**VARICELLA (Chickenpox)**

**Introduction**

Varicella Zoster virus is Human Herpes Virus 3

Transmission is by direct contact with the lesions and by the respiratory route

Initial replication occurs in the nasopharynx and conjunctiva

After the primary infection, the virus remains dormant in nervous tissue

- Reactivation later in life is typically manifested as Herpes zoster

**Clinical features**

- Incubation period is 10 - 21 days
- Vesicular eruptions consist of delicate “teardrop” vesicles on an erythematous base

The eruption starts with faint macules that develop rapidly into vesicles within 24 hours

Successive fresh crops of vesicles appear for a few days, mainly on the trunk, face, and oral mucosa

New lesions usually stop appearing by the fifth day; the majority is crusted by the sixth day

- Most disappear in less than 20 days without a scar, except larger and secondarily infected lesions
- Low grade fever
- Malaise
- Headaches

The severity of the disease is age-dependent

- Adults have more severe disease and a greater risk of visceral disease

**Differential diagnoses**

- Variola minor
- Disseminated zoster in immunosuppressed patients
- Widespread papular urticaria
- Coccidio and ECHO viruses eruption

**Complications**

- Secondary bacterial infection
- Pneumonia
- Cerebellar ataxia and encephalitis
- Reye’s syndrome

**Investigations**

- Tzanck smear
- Direct fluorescent antibody (DFA) staining
- Polymerase Cham. Reaction (PCR)

**Treatment objectives**

- Relieve itching and treat secondary bacterial infection
- Reduce severity and scarring

**Drug treatment**

- Aciclovir
  - Adult: 10 mg/kg intravenously three times daily for 7 days in immunocompromised patients
  - Child: see Herpes zoster

- Antihistamine for pruritus
- Co-trimoxazole or erythromycin for secondary infection

**Notable adverse drug reactions, caution**

Aciclovir
- Ensure adequate hydration
- Caution in pregnancy and breastfeeding
- May cause nausea, vomiting, dizziness, fatigue pruritus and photosensitivity

**Prevention**
- Isolate patients from non-immune persons

**VIRAL WARTS (Verrucae)**

**Introduction**
Infections caused by human papilloma viruses (HPV); include more than 80 types
- Transferred between humans, or from animals to humans
- Cause cutaneous tumours which tend to regress spontaneously but may rarely progress into cutaneous malignancies

**Clinical features**
- Infection may be clinical, subclinical, or latent
- Clinical lesions are visible by gross inspection
- Subclinical lesions may be seen only by aided examination (e.g. the use of acetic acid soaking)
- Latent infection:
  - HPV virus or viral genome is present in apparently normal skin
  - Thought to be common, especially in genital warts, and explains in part the failure of destructive methods to eradicate warts
- Incubation period is highly variable; from weeks to years
- Auto-inoculation is the rule
- Lesions may also occur on scratches (Koebner phenomenon)

**Lesions are classified according to their positions and shape:**

**Common warts**
- Small, flat papules; most frequently on the face

**Genital warts**
- Occur most often on warm, moist surfaces of the body
- In men, usual sites are the end and shaft of the penis, and below the foreskin (if uncircumcised)
- In women, lesions occur on the vulva, vaginal wall, cervix, and skin surrounding the vaginal area
- Especially in homosexual men, and in women who engage in anal sex
- Usually appear 1 - 6 months after infection as soft erythematous papules, which may be greyish if hyperkeratotic
- New lesions develop rapidly and all coalesce, producing a cauliflower-like picture
- May grow rapidly in pregnant women, and immunocompromised patients

**Differential diagnoses**

**Common warts**
- Keratoacanthoma
- Squamous cell carcinoma
- Seborrhoeic keratosis
- Hyperkeratotic lichen planus
- Tuberculosis verrucosa cutis
- Palmoplantar keratoderma
- Arsenical keratoses

**Plane warts**
- Epidermodysplasia verruciformis
- Syringomas
- Dermatosis papulosa nigra
- Lichen planus
- Lichen nitidus

**Genital warts**
- Common genital warts
- Filiform warts
- Plantar warts

**Complications**
- Squamous cell carcinoma of the perianal skin
- Cervical carcinoma from anogenital warts
- Obstructive laryngeal papillomatosis in babies infected through maternal birth canal

**Investigations**
- Histopathology if in doubt

**Management**
- Treatment depends on their location, type, and severity, as well as duration of lesions

**Treatment objectives**
- Eradicate the skin lesions
- Prevent complications

**Non-drug treatment**
- Liquid nitrogen freeze
- Electro-desiccation
- Laser surgery

**Drug treatment**
- Salicylic acid with lactic acid plaster
  - Apply carefully to wart; rub wart surface gently with file or pumice stone once weekly
  - May need to treat for as long as 3 months
- Podophyllum resin
  - Apply weekly under supervision e.g. in genitourinary clinic
  - Imiquimod 5% cream
  - Apply thinly once daily on 3 alternate days per week until lesions resolve (maximum 16 weeks)

**Notable adverse drug reactions, caution and contraindications**
- Salicylic acid plaster
  - Avoid broken skin
  - Not suitable for anogenital region or large areas
- Podophyllum
  - Avoid normal skin and open wounds
  - Keep away from face
  - Should not stay on treated skin for more than 6 hours before washing

**Prevention**
- Women with genital HPV infection should have routine cervical cytologic screening: Pappnicolaou (PAP) smear to detect cervical dysplasia
- Almost every individual has some degree of acne during puberty, with spontaneous resolution occurring in early adult life
- Occasionally, the disease persists into the fourth decade, or even remains a lifelong problem
- Favoured sites are the face, upper back and upper chest and shoulders
- There may be mild soreness, pain, or itching
- May present differently in different age groups
- Pre-teens often present with comedones as their first lesions
- Teenage acne is invariably inflammatory and the lesions include firm red papules, pustules, abscesses, indurated nodules, cysts and rarely interconnecting draining sinus tracts
- Inflammatory acne can be classified as mild, moderate, or severe
- Mild acne:
  - Few-to-several inflammatory papules and pustules, but no nodules
  - Moderate acne:
    - Several-to-many papules, pustules, and a few to several nodules
  - Severe acne (acne conglobata):
    - Numerous fistulated comedones; extensive inflammatory papules; pustules; many cysts, abscesses, nodules, and draining sinuses
    - The lesions may be generalized, involving even the buttocks
    - Excoriation of acne papules and microcomedones are common, and scarring may result
    - Usually, multiple shallow erosions or crusts are found

**Differential diagnoses**
- Acne rosacea
- Dermatosis papulosa nigra
- Steatocystoma multiplex
- Syringoma
- Trichoepithelioma
- Warts
- Angiofibromas of tuberous sclerosis
- Molluscum contagiosum
- Steroid acne from the use of systemic steroids or topical fluorinated steroids on the face (often as cosmetic skin lightening creams)
- Some drugs may produce acniform eruptions
  - Androgens
  - Adrenocorticotropic hormone (ACTH)
  - Glucocorticoids
  - Hydantoins
  - Isoniazid
  - Halogens

**Complications**
- Psychosocial problems from cosmetic disfigurement
- Post-inflammatory pigmentedary changes
  - Pitted scars
  - Keloids
Acne fulminans (acute febrile ulcerative acne conglobata with polyarthritis and leukemoid reaction)

**Investigations**
- Usually, none required
- In the presence of unusual acne, hirsutism, premature pubarche, or androgenic alopecia (especially when associated with obesity and/or menstrual irregularities): Screen for hyperandrogenism
- Blood levels of free testosterone, dehydroepiandrosterone, and androstenedione
- If raised, test response of the hormones and cortisol to dexamethasone suppression

**Treatment objectives**
- Reduce severity of acne
- Prevent complications

**Drug treatment**

**Comedonal acne**

**Topical treatment only:**
- Tretinoin cream
  - Adults: 0.025% or 0.05% or 0.1% cream or gel applied nightly
  - Children: apply thinly 1-2 times daily
  - Or: Benzoyl peroxide
    - Adults: 2.5% or 5% water-based or alcohol-based gels, applied twice daily
    - Child 12-18 years: apply 1-2 times daily preferably after washing with soap and water
    - Start with lower strength preparations

**Infantile acne:**
- Child 1 month to 2 years; neonate: apply 1-2 times daily
- Start with lower strength preparations
- Or: Clindamycin or erythromycin gel or solution twice daily
- Adult and child: apply twice daily

**Adult and child:**
- Azelaic acid 20% cream
- Apply to 3 times daily
- Suitable for acne patients with atopic dermatitis
- Salicylic acid solution 2%
- Adult and child: apply up to 3 times daily
- Tretinoin may be used at night and benzoyl peroxide or topical antibiotics in the morning because they have different modes of action and are complementary
- It may take 8-12 weeks before observable improvement occurs

**Mild inflammatory acne**
- Prednisolone 1.0 mg/kg/day for 7-10 days then taper off rapidly as isotretinoin is started
- Success has been reported with dapsone but only in toxic doses (100 mg three or four times daily)

**Adjunct measures**
- Non-irritating cleansing agents to reduce facial sheen and bacterial flora
- Emotional support

**Comedonal acne**

**Adult and child over 12 years:**
- Doxycycline
  - 100 mg orally every 12 hours
  - Or: Minocycline
    - Adult and child over 12 years: 50-100 mg orally every 12 hours
  - Or: Erythromycin
    - Adult and child over 12 years: 500 mg - 1g every 12 hours
- Infants requiring oral therapy: 250 mg once daily or 125 mg every 12 hours
- Or: Clarithromycin 250-500 mg orally every 12 hours
  - In patients who do not tolerate any of the tetracyclines or who fail to improve
  - Review patient in 6 weeks and 3-4 months later
  - If there is marked improvement, taper the dose by 250 mg for tetracycline every 6-8 weeks while treating with topicalicals to arrive at the lowest systemic dose needed to maintain clearing

**Antibiotic-resistant acne**
- Oral contraceptives containing a non-antidergenic progestin
  - Co-cyprindiol:
    - A mixture of cyproterone acetate and ethinylenesradiol
    - 2000 parts to 35 parts
    - 1 tablet orally daily for 21 days starting on day 1 of menstrual cycle and repeated after a 7-day interval, usually for several months
    - For women with severe acne refractory to prolonged antibiotic therapy
    - Or: Spironolactone may be added as an antiandrogen
  - Adults: 50-200 mg orally daily

**Severe acne**
- Start with systemic antibiotics as above
- Oral isotretinoin (13-cis retinoic acid)
  - Adults: 0.5 - 1 mg/kg/day for 20 weeks for a cumulative dose of at least 120 mg/kg
  - Child 12-18 years: 500 micrograms/kg once daily, increased if necessary to 1 mg/kg in 1-2 divided doses
  - Occasionally, acne does not respond or promptly recurs after therapy, but may clear after a second course
  - At least a 4-month rest period from the drug is recommended before a second treatment course is considered

**Acne fulminans**
- Prednisolone 1.0 mg/kg/day for 7-10 days then taper off rapidly as isotretinoin is started
- Success has been reported with dapsone but only in toxic doses (100 mg three or four times daily)

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**Comedonal acne**
- Intracutaneous injection for deeper papules and occasional cysts
- Dilute suspensions of tetracycline hydrochloride
  - 2.5 mg/mL or 0.05 mL per lesion
- Laser, dermabrasion for cosmetic improvement of scars

**Notable adverse drug reactions, caution and contraindications**

**Topical preparations:**
- Creams and water-based gels are less irritating than alcohol/aceton-based gels
- Always initiate treatment with lower strength and increase as tolerance develops to initial irritant reaction
- Occasionally contact sensitivity may occur
- Benzoyl peroxide
  - May bleach fabrics, hair and skin
  - Avoid contact with eyes, mouth, and mucous membranes

**Antibiotic resistance may occur**
- Avoid the use of different oral and topical antibiotics at the same time
- Vaginitis and perianal itching due to Candida may occur
- Tetracyclines, minocycline and doxycycline are contraindicated in pregnancy and in children less than 12 years
- May reduce the effectiveness of oral contraceptives
- Often cause GIT symptoms
- Minocycline and doxycycline may cause photodermatitis
- Erythromycin cannot be used in conjunction with azimetinazole or tefenadine, as serious cardiovascular complications may occur
- Salicylic acid
  - Significant absorption may occur from the skin in children
- Isotretinoin:
  - Dry skin, lips and eyes
  - Decreased night vision
  - Epistaxis
  - Hypercholesterolaemia
  - Hypertriglyceridaemia
  - Pseudotumour cerebri and headaches
  - Depression
  - Musculoskeletal or bowel symptoms
- Thinning of hair
- Bony hyperostoses
- Premature epiphyseal closure in children
  - Absolutely contraindicated during pregnancy (teratogenicity)
  - Obtain informed consent before use; start oral contraceptives one month before commencing therapy and continue for another month after conclusion of therapy
  - Women of childbearing age are strongly advised to avoid pregnancy for up to 3 years following cessation of therapy

**PRURITUS**

**Introduction**
- Commonly known as itching
- The most common unpleasant experience involving the skin; provokes a desire to scratch
- May be elicited by many normally occurring stimuli e.g.
  - Light touch
  - Temperature change
  - Emotional stress
  - Chemical, mechanical, thermal and electrical stimuli
- Mediated by the release of chemical substances e.g.
  - Histamine, kinins, and proteases
  - Prostaglandin E lowers the threshold for histamine-induced pruritus, while enkephalins, pentapeptides which bind to opiate receptors in the brain modulate pain and itching centrally

**Clinical features**
- At a low level, may merely be annoying
- May actually torture the patient, interfere with sleep and lead to less than optimal performance
- There are great variations from person to person
  - In the same person there may be variation in reactions to the same stimuli
  - In the elderly, senile pruritus due to dry skin may be particularly bothersome
  - Psychologic trauma, stress, absence of distractions, anxiety, and fear may all enhance itching

**Treatment**
- Tends to be most severe at the time of undressing for bed
- There are also regional variations
  - The ear canals, eyelids, nostrils, and perianal and genital areas are especially susceptible to pruritus
  - May be localized or generalized
  - May or may not be associated with skin lesions
- Excoriation are typically linear and occur where the patient can reach with his hands
  - The middle of the back is typically spared except where the patient has used a back scratcher
  - The scratch is usually erythematous, with many tiny erosions scattered along it
  - Fresh marks are usually weepy or bloody; older ones
Ketotifen
2 mg orally taken before bath (with food)
Or:
- Urea 10% hydrocortisone cream 1%

Adverse drug reactions, caution and contraindications
Dilute with aqueous cream in first 1 week

Doxepin
- Initially 75 mg orally daily in divided doses
- Increased if necessary to a maximum of 300 mg daily in 3 divided doses
- Up to 100 mg may be given as a single dose

Elderly: initially 10 - 50 mg daily; range of 30 - 50 mg daily may be adequate

- Not recommended for children
- Temperature-dependent pruritus due to cold/heat
- Cholinergic pruritus (when the core temperature is increased and there is sweating)
- Allergy to bath sponge or soap
- Mechanical scrubbing of the skin with coarse sponge causing degranulation of mast cells
- A forceful jet of water from the shower may trigger pruritus in some cases.

Differential diagnoses
All the above causes of pruritus

Complications
- Sleep disturbance
- Less than optimal performance at home, work or school
- Emotional disturbance
- Suicidal ideation

Investigations
As suggested by meticulous history and physical examination

Treatment objectives
- Suppress itch
- Identify and treat cause(s)
- Improve quality of life
- Prevent complications

Drug treatment
- Hydroxyzine hydrochloride
  - Adult: initially 25 mg at night, increased if necessary to 25 mg 3 - 4 times daily
  - Child: 6 months - 6 years: initially 5 - 15 mg daily,
  increased if necessary to 50 mg daily in divided doses
  Over 6 years: initially 15 - 25 mg daily, increased if necessary to 50 - 100 mg daily in divided doses

- Aquagenic pruritus, mastocytosis, and pruritus of neurofibromatosis
  - Pruritus without skin lesions suggests
  - Biliary obstruction
  - Diabetes mellitus
  - Uraemia
  - Lymphoma
  - Hyperthyroidism
  - Adverse reaction to medicines e.g. Histamine liberators, opioids
  - Occult scabies
  - Pediculosis
  - Onchodermatitis
  - Dermatitis herpetiformis
  - Atopic eczema in remission
  - HIV/AIDS
  - Systemic mastocytosis
  - Polycythaemia vera is a notable cause of pruritus;
  usually induced by temperature changes

- Some patients complain of pruritus provoked by bath or immediately post-bath

Factors include:
- Aquagenic pruritus
- Temperature-dependent pruritus due to cold/heat
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**Chapter 6: Dermatology**

**VITILIGO**

**Introduction**

A disease characterized by acquired loss of melanocytes, leading to areas of depigmentation

- Sometimes associated with uveitis and other autoimmune phenomena
- Many autoantibodies can be demonstrated in vitiligo patients; those against melanocytes may rarely be demonstrable
- There is also a neural hypothesis
- Vitiliginous patches often follow a dermatome
- A neurochemical mediator responsible for destroying the melanocytes has therefore been suggested
- There is also an occupational vitiligo
- Due to chemically induced depigmentation
- Seen among workers who are in contact with para-phenolic compounds or hydroquinones (but this is considered a different disorder)

**Clinical features**

All ages are affected

- The dermatomal type is more common in the paediatric age
- The completely depigmented patches have distinct borders
- A few patients may have inflammatory vitiligo with raised erythematous borders
- Some may have hypopigmented skin between the depigmented and normal skin (trichrome vitiligo)

**Complications**

- Emotional distress in chronic cases

**Investigations**

- Exclude other autoimmune diseases if clinically suggestive
- See also notes on caution below

**Treatment objectives**

- To alleviate symptoms
- To prevent further depigmentation

**Drug treatment**

**Chlorphenamine maleate**

- Adult: 4 mg orally every 4 - 6 hours (maximum 24 mg daily)
- Child: under 1 year, not recommended
- 1 - 2 years: 1 mg every 12 hours; 2 - 5 years: 1 mg every 4 - 6 hours (maximum 6 mg daily); 6 - 12 years: 2 mg every 4 - 6 hours (maximum 12 mg daily)
- If less sedation is required (e.g. day time)
- Adult and Child over 6 years: 10 mg orally daily or 5 mg every 12 hours

**Adverse drug reactions, caution and contraindications**

- Chlorphenamine maleate:
  - Fatality
  - Conglomerative reaction
  - Tachycardia, agitation, visual disturbances, alopecia, gynaecomastia and impotence
  - Caution in hepatic impairment, pregnancy and in breast feeding
  - Cetirizine, loratadine, and acrivastine:
    - Headache, dry mouth, drowsiness, dizziness and nausea
  - Caution in the elderly especially if renal function is compromised
  - Cetirizine:
    - Caution in cardiac disease
  - Contraindicated in recent myocardial infarction, arrhythmias, glaucoma and severe liver disease
  - May cause dry mouth, sedation, blurred vision, constipation, nausea, difficulty with micturition

**Prevention**

- Eliminate/avoid any identified/possible causal factor(s)

- Usually a good prognostic sign since it suggests an effective immune reaction against the tumour cells
- Segmental vitiligo affects only one part of the body
- It spreads rapidly in that area and then stabilizes
- It is not associated with autoimmune diseases
- Favoured sites are the trigeminal area or an intercostal nerve distribution (zosteriform pattern)
- Just as with albinism, the interplay between the melanocytes of the eyes, ears, and skin is apparent
- The prototype is Vogt-Koyanagi-Harada syndrome
- Vitiligo of the face, eyelashes, and scalp hair in association with:
  - Uveitis
  - Dysacousis
  - Aloppecia areata
- Chemical vitiligo affects sites of contact with the chemicals
- When the chemicals are inhaled or a substantial quantity is absorbed through the skin, the distribution of the white patches may simulate the generalized autoimmune type

**Differential diagnoses**

- Post-burns depigmentation
- Tertiary stage of pinta
- Morphoea
- Lichen sclerosis
- Pityriasis alba
- Tinea versicolor
- Pseudobaldism
- Hypomelanosis of Ito

**Complications**

- Emotional problems due to cosmetic disfigurement

**Investigations**

- Exclude other autoimmune diseases if clinically suggestive
- See also notes on caution below

**Treatment objectives**

- To alleviate symptoms
- Prevent further depigmentation
- Improve cosmetic appearance

**Topical**

- Corticosteroids
- Hydrocortisone 1% or betamethasone valerate

**Adult:** 0.1% apply once or every 12 hours (for focal or limited lesions)

- Child: apply 1 - 2 times daily
- Psoralsens
- 8-methoxypsoralen (MOP)
  - 0.05% - 0.1% in combination with ultraviolet-A radiation (PUVA) for focal or limited lesions

**Adult and child:** apply twice weekly

- Tacrolimus
- 0.1% ointment twice daily for 24 weeks
- Topical depigmentation
- Monobenzyl ether of hydroquinone
  - 20%, apply twice daily for 3 - 6 months (if more then
CHAPTER 7: EAR, NOSE AND THROAT

ACUTE OTITIS MEDIA

Introduction
Acute inflammation of the middle ear due to pyogenic organisms Usually secondary to upper respiratory infection spreading from nasopharynx Common in infants and young children; more frequent during winter and rainy periods Usual organisms are streptococcus pneumococcus and staphylococcus

Clinical features
Main symptoms: Earache Fever Deafness Ear discharge Malaise In babies, irritability Clinically increasing inflammation and redness of the eardrum Later, perforation and pulsating mucopurulent discharge

Differential diagnoses
Acute otitis externa Referred otalgia Acute mastoiditis Facial nerve paralysis Labyrinthitis Intracranial Meningitis Brain abscesses - Lateral sinus thrombosis

Investigations
Ear swab for culture and sensitivity- swab taken properly for microscopy, culture and sensitivity Full Blood Count Treatment objectives Control infection Restore normal hearing

Drug treatment
Antibiotics - Amoxicillin Adult: 500 mg -1 g orally every 8 hours for 5 - 7 days Child: 40 mg/kg orally every 8 hours Analgesics - Paracetamol Adult: 500 mg - 1 g orally every 4 - 6 hours (to a maximum of 4 g) for 5 - 7 days Child over 50 kg: same as adult dosing 6 - 12 years: 250 -500 mg; 1 - 5 years: 125 - 250 mg; 3 - 5 years 2.5 mL Or: - Ephedrine nasal drops (0.5%) Instil into nostrils twice daily and at night time

Supportive measures Bed rest and adequate fluids

Notable adverse drug reactions, caution
Many preparations of pseudoephedrine contain antihistamines and may cause drowsiness

Prevention
Good general health and clean airy environment to reduce incidence of upper respiratory infections (colds)

ADENOID DISEASE

Introduction
A manifestation of hyperplasia/hypertrophy of the adenoid tissue in the nasopharynx Usually occurs in children aged 2 - 6 years Excessively large adenoids may cause obstruction of the nasopharyngeal airway with symptoms of nasal obstruction Large adenoids may encroach on the Eustachian tube openings causing secretory otitis media with deafness in the child Chronic infection of adenoid tissue is also often present Symptoms usually subside spontaneously as adenoids regress physiologically and become atrophic with age

Clinical features
Nasal obstruction and mouth-breathing Snoring at night Obstructive sleep apnoea Progressive deafness due to secretory otitis media

Differential diagnoses
Allergic rhinitis Sinusitis Otitis media

Complications
Sinusitis Recurrent otitis media Pneumonitis

Investigations
X-ray of nasopharynx X-ray sinuses and chest

Treatment objectives
To significantly improve nasopharyngeal airway and thereby improve nasal breathing Treat concurrent infection

Non-drug treatment
Adenoidec tomy in severe cases

Drug treatment
Decongestants

Non-drug treatment
Careful ear toilet and regular ear dressing with antiseptic pack With dry ear, persistent perforation may be closed surgically (myringoplasty) to protect middle ear and improve hearing In the serious type with cholesteatoma not responding to treatment, mastoid operation is done to clear out disease and prevent complications

Systemic decongestant
Psuedoephedrine

Adult: 60 mg orally every 4 - 6 hours (up to 4 times daily)
Child: 6 - 12 years: 30 mg (5 mL of syrup) 3 times daily; 2 - 5 years 15 mg, (2.5 mL)

Supportive measures
Bed rest and adequate fluids

Notable adverse drug reactions, caution
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Prevention
Good general health and clean airy environment to reduce incidence of upper respiratory infections (colds)

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Notable adverse drug reactions, caution
Many preparations of pseudoephedrine contain antihistamines and may cause drowsiness

Prevention
Good general health and clean airy environment to reduce incidence of upper respiratory infections (colds)
Identify and treat aetiological factors

Non-drug treatment
Pressure and compression of the nose between fingers to arrest bleeding
Cotton wool pack soaked in epinephrine 1:1000 may be placed on bleeding area before compression to induce vasoconstriction
Nasal packing with lubricated ribbon gauze
Arrest of posterior bleed with rubber tampon or improvised Foley’s catheter balloon
Cauterization of bleeding point or dilated vessels in anterior nasal septum
- Diathermy cautery (electrical) or chemical cautery with silver nitrate stick

Drug treatment
Treat underlying aetiologies
Sedation if necessary
- Diazepam 5 mg orally twice daily for 1-2 days
Antibiotics if infection is present
- Amoxicillin
Adult: 500 mg orally every 8 hours for 5-7 days
Child: 250-500 mg orally for 5-7 days
Other drugs depending on identified causative factors

Supportive measures
- Intravenous infusion, crystalloids and blood as necessary
Bed rest
Prevention
Avoid/treat predisposing conditions

FOREIGN BODIES IN THE AIRWAYS
Introduction
- Children (most commonly) may aspirate pieces of play objects or food items accidentally into the airway
- May present as serious emergencies with imminent upper respiratory obstruction

Differential diagnoses
Various pathological conditions, both local and systemic present with nasal bleeding

Complications
- Haemorrhagic shock
- Fatality
Investigations
- Full Blood Count, including platelet count
- Bleeding and clotting time; partial thromboplastin time
- Urea and Electrolytes and Creatinine
- X-ray sinuses
- CT scan

Treatment objectives
To arrest bleeding in actively bleeding cases
Replace significant blood losses and treat shock

In the lower airways objects may remain for long periods, with unexplained chest symptoms

Differential diagnoses
- Acute laryngitis
- Acute laryngeal oedema
- Bronchopneumonia
- Pulmonary tuberculosis

Complications
- Life-threatening asphyxia
- Lung collapse and atelectasis

Investigations
- Radiograph of neck and chest

Treatment objectives
- To maintain the airway and adequate respiratory function
- Remove the foreign object as expeditiously as possible

- Non-drug treatment
- Immediate removal under anaesthesia by direct laryngoscopy or bronchoscopy as appropriate
- Tracheostomy where necessary to maintain airway

Drug treatment
- Antibiotic prophylaxis if necessary (for 3 days)
- Amoxicillin
Child: 6-12 years: 250 mg orally every 12 hours; under 6 years: 125 mg orally every 12 hours
Steroid
- Hydrocortisone (for pneumonitis)
Child: 1 month-1 year: initially 25 mg by intravenous or intramuscular injection every 8 hours; 1-6 years: initially 50 mg every 8 hours; 6-12 years: initially 100 mg every 8 hours; 12-18 years: initially 100-500 mg 3 times daily, adjusted in all age groups according to response

Supportive measures
- Oxygen
- Steam inhalation/nebulizer

Prevention
Vigilant supervision of young children

FOREIGN BODIES IN THE EAR
Introduction
- Children often insert various objects into the nares while playing: pieces of plastic toys, rolled paper, foam, seeds, some metal objects, etc
- The objects may remain undetected for long periods, particularly organic items, until they become infected

Technically result in foul smelling unilateral nasal discharge
Some inorganic objects may (after long periods) become coated by hard calcific deposits and become known as rhinolith

Clinical features
- Often no indication or symptom
- May be accidentally noticed by parent
- Later, complaints of foul purulent unilateral nasal discharge of unknown origin

Differential diagnoses
- Acute or chronic rhinitis
- Sinusitis
- Nasal growth/polyp

Complication
Secondary infection: rhinosinusitis

Investigation
- Radiograph of nose: for metallic or radio-opaque objects

Treatment objectives
- Remove object safely with little discomfort to patient

- Non-drug treatment
- Removal by ear syringing
- Removal with appropriate hook, or alligator forceps
- Examination and removal under anaesthesia if difficult in the clinic

Prevention
Vigilant supervision of young children

FOREIGN BODIES IN THE NOSE AND RHINOLITHS
Introduction
- Children often insert various objects into the nares while playing: pieces of plastic toys, rolled paper, foam, seeds, some metal objects, etc
- The objects may remain undetected for long periods, particularly organic items, until they become infected

Technically result in foul smelling unilateral nasal discharge
Some inorganic objects may (after long periods) become coated by hard calcific deposits and become known as rhinolith

Clinical features
- Often no indication or symptom
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Differential diagnoses
- Acute or chronic rhinitis
- Sinusitis
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Complication
Secondary infection: rhinosinusitis

Investigation
- Radiograph of nose: for metallic or radio-opaque objects

Treatment objectives
- Remove object safely with little discomfort to patient

- Non-drug treatment
- Removal by ear syringing
- Removal with appropriate hook, or alligator forceps
- Examination and removal under anaesthesia if difficult in the clinic

Prevention
Vigilant supervision of young children

MASTOIDITIS
Introduction
- Develops as a complication of acute supplicative otitis media, mostly in children
- Follows acute otitis media (untreated or inadequately treated), or due to particularly virulent organisms
- Infection spreads from the tympanum posteriorly into the mastoid antrum and air cells
- Colliquative necrosis of the air cells and suppuration in the mastoid bone follows
A subperiosteal abscess forms behind the ear in a child with a discharging ear

**Clinical features**
- Fever
- Pain behind the ear
- Muscle spasm of the head
- Progressive inflammatory swelling over the mastoid region
- Swelling is tender and fluctuant

**Complications**
- Suppurating post-aural lymphadenitis from otitis externa
- Suppurating mastoiditis
- Lateral sinus thrombophlebitis

**Investigations**
- Ear swab for microscopy, culture, and sensitivity
- Radiographs of the mastoid

**Treatment objectives**
- Control and eradicate infection
- Prevent more serious complications

**Non-drug treatment**
- Exenterate the infected air cells and drain the mastoid

**Drug treatment**
- Large doses of parenteral antibiotics
  - Amoxicillin
    - Adult: 500 mg - 1 g intravenously every 6 - 8 hours for 7 - 10 days
  - Ceftriaxone
    - Adult: 1 g every 12 hours intravenously for 7 days
  - Neonates: 20 - 50 mg/kg once daily, up to 80 mg/kg in severe infections

**Analgesics**
- Paracetamol
  - Adult: 500 mg - 1 g orally every 4 - 6 hours (to a maximum of 4 g) for 5 - 7 days
  - Child: 40 mg/kg every 6 - 8 hours for 5 - 7 days
- Chlorphenamine
  - Adult: 4 mg orally every 4 - 6 hours; maximum 24 mg daily
  - Child: not recommended under 1 year
- Promethazine
  - Adult: 25 mg orally at night, increased to 25 mg twice daily

**NASAL ALLERGY**

**Introduction**
- Hypersensitivity of the nasal mucosa to various foreign substances, of the atopic type
- Manifests as recurrent episodes of sneezing, rhinorrhea
- Nasal obstruction whenever patient comes in contact with the offending allergen
- Symptoms are attributed to the effect of histamine and other chemical substances released from ruptured mast cells in the nasal mucosa
- Common allergens are pollens of various plants, flowers and trees; house-dust; hairs; some foods; fungi and cosmetics

**Complications**
- A common condition and affects all age groups
- May be familial, often associated with allergic asthma or dermatitis

**Clinical features**
- Repeated episodes of sneezing
- Watery nasal discharge
- Nasal obstruction with itching and conjunctival irritation whenever patient is in contact with allergen
- Nasal mucosa may be congested or sometimes normal at the time of clinical examination
- Presentation may be seasonal as with pollen allergy, or perennial with allergy to house dust, etc
- Nasal polyps may develop

**Pharyngitis**
- Chronic rhinitis from other causes
- Vasomotor rhinitis
- Chronic sinusitis

**Diagnosis**
- Skin tests for allergens: intradermal or prick tests
- Smear of nasal secretions for eosinophilia
- Serological tests: radio-immunoassay for IgE antibodies

**Treatment**
- Control or suppress the allergic symptoms
- Prevent allergic reactions

**Non-drug treatment**
- Elimination of allergens
- Hyposensitisation by vaccination

**Drug treatment**
- Antihistamines
- Chlorphenamine
  - Adult: 4 mg orally every 4 - 6 hours; maximum 24 mg daily
  - Child: not recommended under 1 year
- Adult: 6 - 12 years: 2 mg orally every 4 - 6 hours; maximum 12 mg daily; 2 - 5 years: 1 mg every 4 - 6 hours; maximum 6 mg daily
- Or: - Promethazine
  - Adult: 25 mg orally at night, increased to 25 mg twice daily

**PERITONSILLAR ABSCESS (Quinsy)**

**Introduction**
- The main common local complication of acute tonsillitis
- A virulent streptococcal infection; may spread beyond the tonsillar capsule into the peri-tonsillar space, causing, first cellulitis, and later suppuration in the space
- More common in adults with tonsilitis

**Clinical features**
- Pain and itching
- Ear discharge
- Sensation of blockage due to accumulated debris in the canal
- Deafness is variable
- Canal is red and swollen, full of inflammatory debris
- In tonsillectomy whith mass of debris with black spots

**Treatment**
- Antithrombosis by vaccination
- Chlorphenamine
- Adult: 4 mg orally every 4 - 6 hours; maximum 24 mg daily
- Child: not recommended under 1 year
- 6 - 12 years: 2 mg orally every 4 - 6 hours; maximum 12 mg daily; 2 - 5 years: 1 mg every 4 - 6 hours; maximum 6 mg daily
- Or: - Promethazine
- Adult: 25 mg orally at night, increased to 25 mg twice daily

**Urinalysis for glycosuria**
- Blood glucose estimation in cases of recurrent furunculosis to exclude diabetes mellitus

**Treatment objectives**
- Control infection / inflammation
- Relieve discomfort

**Non-drug treatment**
- Careful ear toilet to clear out debris
- Daily dressing with antiseptic gauze packed with Aspergillus in spirit
- Furunculosis: dressing with magnesium sulfate wick or steroid and antibiotic ointment dressing

**Drug treatment**
- Antibiotics
- Amoxicillin
- Adult: 500 mg - 1 g orally every 8 hours for 5 - 7 days
- Child: 40 mg/kg orally every 6 - 8 hours for 5 - 7 days
- Neomycin/hydrocortisone ear drops
- Adult and child: instil 2 - 3 drops 3 - 4 times daily

**Supportive measures**
- Prevent water from entering ear for one month
- Prevention
- Avoid trauma to ear canal (especially scratching)
- Keep ears dry

**Chapter 7: Ear, Nose and Throat**
**Standard Treatment Guidelines for Nigeria 2008**

**Urinalysis for glycosuria**
- Blood glucose estimation in cases of recurrent furunculosis to exclude diabetes mellitus

**Treatment objectives**
- Control infection / inflammation
- Relieve discomfort

**Non-drug treatment**
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- Daily dressing with antiseptic gauze packed with Aspergillus in spirit
- Furunculosis: dressing with magnesium sulfate wick or steroid and antibiotic ointment dressing

**Drug treatment**
- Antibiotics
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- Child: 40 mg/kg orally every 6 - 8 hours for 5 - 7 days
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- Adult and child: instil 2 - 3 drops 3 - 4 times daily

**Supportive measures**
- Prevent water from entering ear for one month
- Prevention
- Avoid trauma to ear canal (especially scratching)
- Keep ears dry
Tonsillar tumours

Complications
- Septicaemia
- Parapharyngeal suppuration/abscess

Investigations
- Throat swab
- Full Blood Count with differentials

Treatment objectives
- Rapid control of infection
- Relief of pain and discomfort

Non-drug treatment
- Throat swab, preferably under local anaesthetic when suppuration is definite

Drug treatment
- Antibiotics
  - Amoxicillin
    - **Adult:** 500 mg - 1 g intravenously every 6 hours for 7 days
  - **Child:** 50 - 100 mg/kg orally every 8 hours

  Analgesics
  - Paracetamol
  - Aspirin (Acetylsalicylic acid)

  **Adult:** 300 - 900 mg orally every 4 - 6 hours within necessary; maximum 4 g
  Not recommended in children (risk of Reye's syndrome)

Supportive measures
- Intravenous infusion
- Bed rest

Notable adverse drug reactions
- Aspirin may cause gastrointestinal irritation

Prevention
- Elective tonsillectomy is advised after an episode of quinsy to prevent further (more severe) attacks

PHARYNGITIS (Sore Throat)

Introduction
- A common cause of persistent sore throat in young and middle-aged adults, usually unaccompanied by other symptoms
- Often secondary to chronic nasal conditions with nasal obstruction e.g.
  - Vasomotor rhinitis
  - Nasal polyps
  - Septal deviation
- Obstruction causes mouth breathing with dryness of the throat
- Other causes:
  - Secondary inflammation from postnasal discharge of sinuses

Clinical features
- Rhinorrhea
- Nasal obstruction
- Fever with pain over affected sinuses in acute cases
- Less dramatic symptoms in chronic sinusitis
  - Intermittent nasal obstruction and discharge over a long period
  - Little pain

Differential diagnoses
- Chronic tonsillitis
- Pharyngeal or laryngeal tumour

Complications
- More often related to the primary sources of irritation or infection

Investigations
- Throat swab: microscopy, culture and sensitivity
- X-ray of paranasal sinuses

Treatment objectives
- Control symptoms by identifying and treating primary causes

Non-drug treatment
- Treat sinusitis
- Surgery for obstructive nasal conditions
- Treat dental caries

Drug treatment
- Appropriate antibacterial agent if indicated

Supportive measures
- Reduction or avoidance of exposure to known irritants: tobacco, alcohol, etc

SINUSITIS

Introduction
- Inflammation of the mucosal lining of the paranasal sinuses
- May be acute or chronic and affect one or more of the sinuses
- Most commonly the maxillary sinus or antrum (in very young children the ethmoidal sinuses)
- Acute sinusitis is often sequel to acute rhinitis
- Common organisms are streptococcus, pneumococcus, and haemophilus
- Chronic sinusitis is more insidious
- May be associated with chronic rhinitis and allergy but other factors such as air pollution, smoking, dental sepsis and poor general health may be contributory
- Bacteriology is mixed: sometimes Gram negative and fungal organisms

Clinical features
- Rhinorrhea
- Nasal obstruction
- Fever with pain over affected sinuses in acute cases
- Less dramatic symptoms in chronic sinusitis
  - Intermittent nasal obstruction and discharge over a long period
  - Little pain
- Treatment objectives
  - Control and eradicate infection
  - Restore adequate drainage of sinuses

Non-drug treatment
- Antrum wash-out/lavage
- Trephining of frontal sinus
- Radical surgery for non-responsive cases
- Intranasal antrostomy
- Caldwell-Luc operation
- Fronto-ethmoidectomy

Drug treatment
- Antibiotics
  - Amoxicillin
    - **Adult:** 500 mg - 1 g orally every 8 hours for 5 - 7 days
    - **Child:** 40 mg/kg orally every 8 hours for 5 - 7 days
  - Cotrimoxazole
    - **Adult:** 500/125 mg orally every 8 hours for 5 - 7 days
    - **Child:** 500/125 mg every 12 hours

Surgery for obstructive nasal conditions
- Elective tonsillectomy is advised after an episode of quinsy to prevent further (more severe) attacks

Complications
- Nasal discharge, preferably under local anaesthetic when suppuration is definite

Drug treatment
- Antibiotics
  - Amoxicillin
    - **Adult:** 500 mg - 1 g intravenously every 6 hours for 7 days
    - **Child:** 50 - 100 mg/kg orally every 8 hours
- Cotrimoxazole
  - **Adult:** 960 mg orally every 12 hours
  - **Child:** 60 - 90 mg/kg orally every 6 hours for 5 - 7 days

Supportive measures
- Intravenous infusion
- Bed rest

Notable adverse drug reactions
- Amoxicillin
  - Minor gastrointestinal disturbance
  - Cotrimoxazole
  - Fixed drug eruption
  - Nausea and vomiting
  - Erythema multiforme

Prevention
- Treat contributory nasal pathology as appropriate
- Avoid airway irritants, smoking, and alcohol
- Avoid air pollution
- Maintain good general health and nutrition

TONSILLITIS

Introduction
- An inflammatory condition of the palatine tonsils, most common in children
- In half or more cases infection is by beta-haemolytic streptococcus, in others viral
- Typically an acute infection
- Chronic tonsillitis presents usually as recurrent acute infection
- Essentially a disease of children but also occurs in young adults

Clinical features
- Fever
- Sore throat
- Dysphagia

Supportive measures
- Steam inhalations with menthol
- Treat contributory nasal pathology as appropriate
- Avoid airway irritants, smoking, and alcohol
- Avoid air pollution
- Maintain good general health and nutrition

Additional information
- Tonsillar tumours: not discussed

Additional references
- Standard Treatment Guidelines for Nigeria 2008
- Clinical features
- Fever
- Sore throat
- Dysphagia

Additional notes
- Prevention
  - Avoid airway irritants, smoking, and alcohol
  - Avoid air pollution
  - Maintain good general health and nutrition

Additional comments
- Notable adverse drug reactions
  - Amoxicillin
    - Minor gastrointestinal disturbance
  - Cotrimoxazole
    - Fixed drug eruption
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TRACHEOSTOMY

Introduction
A surgical procedure in which an opening is created into the trachea from the outside, commonly to bypass an upper respiratory obstruction.

May also be done to provide easier access for care of the chest in some seriously ill patients.

- Also for respiratory support and artificial ventilation in patients with respiratory insufficiency or paralysis.

Most cases are done to by-pass upper airway obstruction:
- Acute infections of the larynx
- Trauma
- Foreign body aspiration
- Acute laryngeal oedema
- Vocal cord paralysis
- Tumours

Some cases are done as part of, or to facilitate major head and neck surgery.

An appropriate-sized tracheostomy tube, portex or metal, is inserted to maintain the opening.

Clinical features

Acute presentation with clinical features of airway obstruction, stridor and incipient asphyxia following trauma.

Acute inflammatory conditions of the larynx, which would require the operation as an emergency.

Progressive lesions: may require less urgent intervention in anticipation of likely obstruction.

Cases with medical indications requiring respiratory support are usually done on a more elective basis.

Complications

- Haemorrhage
- Infection: wound and chest
- Damage to nerves and large vessels in the neck

Treatment objectives

To secure the airway.

Non-drug treatment

Postoperative care of tracheostomy preferably in an intensive care unit, with suction, humidification, stoma care as appropriate.

Drug treatment

Broad spectrum antibiotic cover.

WAX IN THE EAR

Introduction

Wax (or cerumen) is a normal product of the human external ear.

- A dark brownish mixture of the secretions of the ceruminous and sebaceous glands in the outer third of the external auditory canal.

Small quantities are produced continuously and function to lubricate the canal.

Quantities produced and the consistencies vary.

- May be excessive in some people, causing deafness, ear ache, secondary infection and even vertigo.

Clinical features

- Sensation of blockage and some degree of deafness are the most common complaints.

- Sometimes, pain and irritation.

- Ear discharge in some cases.

- Quantity seen varies.

- May be soft or hard.

- May be impacted in the deep meatus.

Differential diagnoses

- Foreign bodies
- Otitis externa

Complications

Superimposed infection: otitis externa.

Hearing impairment.

Treatment objectives

Evacuate the wax and clear the ear.

Non-drug treatment

Removal with probe and cotton wool: for soft wax.

Ear drops to soften and loosen wax.

- Warm olive oil.
- Chlorobutanol 5% paradichlorobenzene 2%, arachis (peanut) oil 57.3%.

It is associated with acute as well as long-term complications affecting the eyes, kidneys, feet, nerves, brain, heart and blood vessels.

Its classification has been revised by the WHO and is based on aetiology:

Type 1:
- Results from destruction (usually autoimmune) of the pancreatic β cells.
- Insulin is required for survival.

Type 2:
- Characterized by insulin resistance and/or abnormal insulin secretion (either may predominate); both are usually present.
- It is the most common type of diabetes.

Other specific types of diabetes: less common, and include:
- Genetic disorders.
- Infections.
- Diseases of the exocrine pancreas.
- Endocrinopathies.
- Drugs.

Gestational diabetes: appears for the first time in pregnancy.

Clinical features

Type 1 diabetes:
- Patients present at a young age (usually teens or twenties); earlier presentation may also occur.

Rapid onset of severe symptoms: weight loss, thirst and polyuria.

Blood glucose levels are high and ketones are often present in the urine.

If treatment is delayed, ketoacidosis (DKA) and death may follow.

The response to insulin therapy is dramatic and gratifying.

- Misclassification of patients as “Type 1” is relatively common.
- Insulin-treatment is not the same as insulin-dependence.

Type 2 diabetes:
- Most patients present with the classical symptoms including polyuria, polydipsia and polyphagia.
- Some patients present with sepsis, diabetic coma (hyperosmolar non-ketotic states).
- A minority is asymptomatic and therefore identified at screening.
- The patients usually do not seek medical attention early because of the insidious nature of the disease.
- Many present at diagnosis with features of diabetic.
with periodic re-testing until the diagnostic situation becomes clear
Take into consideration additional risk factors for diabetes before deciding on a diagnostic or therapeutic course of action
The diagnosis of diabetes must be confirmed biochemically prior to initiation of any therapy
Symptoms of hyperglycaemia
Plus:
- Random venous plasma glucose ≥ 11.1 mmol/L or fasting venous plasma glucose ≥ 7.0 mmol/L
- Confirms the diagnosis of diabetes

Diagnosis
- In asymptomatic subjects, a single abnormal blood glucose result is inadequate to make a diagnosis of diabetes
- Abnormal values must be confirmed at the earliest possible date using any of the following:
  - Two separate fasting or random blood samples
  - A 75 g oral glucose tolerance test

Diabetes which arises in pregnancy
- Must be distinguished from existing diabetes in women who become pregnant
- Of particular importance because it is associated with poor pregnancy outcomes, especially if not recognised and not treated

Symptoms of hyperglycaemia:
- Fasting venous plasma glucose 7.0 mmol/L - Confirms the diagnosis of diabetes

Core components of diabetes care
- Treatment of co-morbidities
- Prevention and treatment of macrovascular and microvascular complications

Non-drug treatment
- Education
  - The provision of knowledge and skills to people with diabetes mellitus
- To empower them to render self-care in their management

Principles of Diabetes Education
- Should be locally applicable, simple and effective
- All members of the diabetes care team should be trained to provide the education
- It must empower people with diabetes as well as their families
- Provide them with adequate knowledge of diabetes and its sequelae
- Create the right attitudes and provide resources to provide appropriate self care
- The effectiveness of the programme must be evaluated and modified as necessary

What people with diabetes need to know
- Diabetes is serious but can be controlled
- Complications can be prevented
- That the cornerstones of therapy are education, diet and exercise
- Their metabolic and blood pressure targets
- How to look after their feet and thus prevent ulcers and amputations
- How to avoid other long term complications
- That regular medical check ups are essential
- When to seek medical help

Diet
- One of the cornerstones of diabetes management
- Based on the principle of healthy eating in the context of social, cultural and psychological influences on food choices
- Dietary modification (and increasing level of physical activity) should be the first step in the management of newly diagnosed persons with Type 2 diabetes
- Should be maintained throughout the course of diabetes management

Goals of dietary management of Type 2 diabetes mellitus
- To achieve an ideal body weight
- An appropriate diet should be prescribed along with an exercise regimen
- Caloric restrictions should be moderate and yet provide a balanced nutrition
- Eat at least three meals a day. Binge eating should be avoided
- A snack between meals can be healthy for certain groups of people
- - The diet should be individualized, based on traditional eating patterns, be palatable and affordable
- - Animal fat, salt, and so-called diabetic foods should be avoided
- - Pure (simple sugars) in foods and drinks should be avoided
- - Eating plans should be high in carbohydrates and fibre, vegetables and fruits should be encouraged
- - Dietary instructions should be written out, even if the person is illiterate: someone at home should be available to interpret to him/her
- - Food quantities should be measured in volumes using available household items (e.g. cups), or be countable (e.g. number of fruits or slices of yam or bread)
- - Weighing scales are generally unaffordable and/or difficult to understand
- - Appetite suppressants generally yield poor and/or unsustainable weight reductions and are expensive

Physical activity
- One of the essentials in the prevention and management of Type 2 diabetes mellitus
- Regular physical activity:
  - Improves metabolic control
  - Increases insulin sensitivity
  - Improves cardiovascular health
  - Helps weight loss
  - Gives a sense of well-being
- Two main types of physical activity:
  - Aerobic or endurance exercise (e.g. walking, running)
  - Anaerobic or resistance exercise (e.g. lifting weights)
- Both types of activity may be prescribed to persons with type 2 diabetes mellitus; the aerobic form is usually preferred

General principles and recommendations
- Detailed evaluation
- Cardiovascular, renal, neurological and foot assessments
- Evaluation should be done before a formal exercise programme is commenced
- The presence of chronic complications excludes certain forms of exercises
- Prescribed physical activity programmes should be

Values for the Diagnosis of Categories of Hyperglycaemia

<table>
<thead>
<tr>
<th>Glucose Tolerance State</th>
<th>Venous plasma (mmol/L)</th>
<th>Venous plasma (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fasting</td>
<td>≥ 7</td>
<td>≥ 126</td>
</tr>
<tr>
<td>2 hour post-75 g glucose load</td>
<td>≥ 11.1</td>
<td>≥ 200</td>
</tr>
<tr>
<td>Impaired glucose tolerance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fasting AND</td>
<td>&lt; 7.0</td>
<td>&lt; 110</td>
</tr>
<tr>
<td>2 hour post-75 g glucose load</td>
<td>≥ 7.8 and &lt; 11.1</td>
<td>≥ 140 and &lt; 200</td>
</tr>
<tr>
<td>Impaired fasting glycaemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fasting</td>
<td>≥ 6.1 and &lt; 7.0</td>
<td>≥ 5.6 and &lt; 6.1</td>
</tr>
</tbody>
</table>

Unless there is unequivocal hyperglycaemia with acute metabolic decompensation or obvious symptoms, the diagnosis of diabetes should always be confirmed by repeating the test on another day.
appropriate for:
- The age
- Socio-economic status
- State of physical fitness
- Lifestyle
- Level of control

Physical activity should:
- Be regular (about 3 days/week)
- Be at least 20 - 30 minutes per session
- Be at least of moderate activity

Activities like walking, climbing steps (instead of taking lifts) should be encouraged.

For sedentary persons with diabetes, a gradual introduction using a low intensity activity like walking is mandatory.

Avoid exercising if:
- Ambient glycaemia is > 250 mg/dL blood glucose
- Patient has ketonuria
- Blood glucose is less than 80 mg/dL

To avoid exercise-induced hypoglycaemia in patients on insulin:
- Increase peri-exercise carbohydrate intake
- Reduce insulin dose
- Adjust injection site (avoid exercising muscles site)

Extra carbohydrate should be taken before and after the exercise.

In those on short acting secretagogues (e.g. glipizide, repaglinide) the post exercise dose should be omitted.

Glycaemia should be monitored (using strips and meters) before and after planned physical activity.

Delayed hypoglycaemia may occur.

Proper foot wear must always be worn during exercise.

Drug treatment

Oral hypoglycaemic agents:
- For Type 2 diabetes mellitus

Indicated:
- When individualized targets are not met by the combination of dietary modifications and physical activity/exercise

- (In some cases) at the first presentation of diabetes (i.e. fasting blood glucose more than 11 mmol/L or random blood glucose more than 15 mmol/L).

May be used as monotherapy or in combination therapy, targeting different aspects in the pathogenesis of hyperglycaemia in Type 2 diabetes mellitus.
- Exercise generally improves metabolic control, but can precipitate acute complications like hypoglycaemia and hyperglycaemia.

Important notes on Oral Glucose Lowering Agents (OGLAs)

- Sulphonylureas and biguanides are the agents most widely available.
- Stocking these agents would meet the diabetes care needs of most diabetes facilities.

Standard Treatment Guidelines for Nigeria 2008

Insulin Therapy in Type 2 Diabetes

Insulin is increasingly being used.
- In combination with OGLAs or as monotherapy in the management of Type 2 diabetes to achieve optimum targets.
- Hyperglycaemic emergencies.
- Peri-operatively, especially major or emergency surgeries.
- Organ failure: renal, liver, heart etc.
- Pregnancy.
- Latent Autoimmune Diabetes of Adults (LADA).

Sulphonylureas

Initial monotherapy in non-obese patients.

Ad: Adult: Glibenclamide 1.25 - 10 mg orally twice daily.

Child 12 - 18 years: initially 2.5 mg orally daily, or immediately after breakfast, adjusted according to response; maximum 15 mg daily.

- Not indicated for Type 2 diabetes, maturity-onset diabetes of the young, under specialist care.

Notable adverse drug reactions

Weight gain
Hypoglycaemia
Syndrome of inappropriate ADH secretion
Blood dyscrasias
Heart burn
Abdominal pain

Contraindications
Allergy to sulpha drugs.

Metformin 500 mg - 1 g orally twice or three times daily.

- When specific targets are not met by the combination of dietary modifications and physical activity/exercise.

- Whenever individualized targets are not met by the combination of dietary modifications and physical activity.

- When combining sulphonylureas and biguanides.

Contraindications

Add-on as combination therapy.
- Increase or decrease in the amount of sulphonylurea.
- Increase or decrease in the amount of biguanide.

Monotherapy in obese Type 2 diabetes mellitus.

Combination therapy.

Metabolic syndrome.

Severe renal failure.

Pregnancy.

Age > 80 years.

Biguanides

Indicated in:
- Monotherapy in obese Type 2 diabetes mellitus.
- Combination therapy.

Metabolic syndrome.

Allergy to sulphonylureas.

Ad: Adult: Metformin 500 mg - 1 g orally twice or three times daily.

Child 10 - 18 years: initially 500 mg orally once daily, adjusted according to response at intervals of not less than 1 week; maximum 2 g daily in 2-3 divided doses.

- Under specialist supervision ONLY.
- Not licensed for use in children less than 10 years old.

Notable adverse drug reactions

Gastrointestinal upset/nausea/loose bowel motions.

Metallic taste.

Lactic acidosis.

Contraindications

Impaired hepatic and renal function.

Congestive cardiac failure.

Contrast studies.

Chronic obstructive airways disease.

Alcoholism.

Secondary failure of OGLAs is said to be common (5 - 10% of patients annually) although no reports from Africa are available.

Referral to an endocrinologist should be considered if more than 30 units of insulin are required per day.
Chapter 8: Endocrine System

**Diabetic non-ketotic hyperosmolar state**

*Introduction*

Characterized by the insidious development of:
- Marked hyperglycaemia (usually > 30 mmol/L)
- Dehydration
- Pre-natal uraemia
- Significant hyperketonaemia does not develop
- Two-thirds of cases occur in previously undiagnosed cases of diabetes
- Usually affects middle-aged or elderly patients and carries a mortality of over 30%

**Precipitating factors include:**
- Infections
- Diuretic treatment
- Drinking glucose-rich beverages

**Treat specific thromboembolic complications if they occur**

**Standard Treatment Guidelines for Nigeria 2008**

- 100% oxygen by intermittent positive pressure ventilation
- Intravenous dexamethasone, mannitol for cerebral oedema (see cerebral oedema)
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**Diabetic ketoacidosis**

*Introduction*

Diabetic ketoacidosis (DKA) is any degree of glucose intolerance first recognised in pregnancy

If inadequately managed, GDM is associated with increased risk of perinatal morbidity and mortality

Diabetes and prompt institution of therapy reduce the risk of poor outcomes

**Screening for GDM**

When:

- Between 24 and 28 weeks of gestation

Who: Women with
- High-risk for GDM
- BMI ≥ 25 kg/m²
- Previous history of GDM
- Glocusuria
- Previous large baby (> 4 kg)
- Poor obstetric history
- Family history of diabetes
- Known IGT / IFG

**Management**

Combined health care team- obstetrician, diabetologist, diabetes educator, and paediatrician/neonatologist

**Initial therapy is dietary modification**
- Spread carbohydrate over 3 small to moderate sized meals and 2 - 3 snacks/day
- Consider an evening snack to prevent starvation ketosis
- Energy intake should provide for desirable weight gain during pregnancy
- For obese women a 30 - 33% calorie restriction is advised

**Daily SBGM (urine glucose monitoring) is not useful in pregnancy**

Initiate insulin therapy if:
- Fasting plasma glucose is ≥ 5.8 mmol/L
- 1 hour post-prandial glucose is ≥ 8.6 mmol/L
- 2 hour post-prandial plasma glucose is ≥ 7.5 mmol/L

**Both foot ulcers and amputations can be prevented by education, anticipation, early recognition and prompt management**

The most common predisposing factors for ulcers and amputations are:
- Peripheral neuropathy with loss of sensation
- Poor foot hygiene
- Peripheral vascular disease
- Deformities and abnormal biomechanics
- Unsuitable or no footwear

**Regular inspection and examination of the foot at risk**

Identify the at-risk foot

**Education of healthworkers, people with diabetes and their families**

**Appropriate footwear**

**Early treatment of non-ulcerative and ulcerative foot problems**

Increased awareness of foot problems may prevent amputations which are major causes of morbidity and disability

**Diabetes in pregnancy**

*Introduction*

Gestational diabetes mellitus (GDM) is any degree of glucose intolerance first recognised in pregnancy

If inadequately managed, GDM is associated with increased risk of perinatal morbidity and mortality

Diagnosis and prompt institution of therapy reduce the risk of poor outcomes

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- Between 24 and 28 weeks of gestation

Who: Women with
- High-risk for GDM
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**Monitoring glycaemic control**

Clinical and laboratory methods are employed

HbA1c tests are desirable standard tests but are unavailable in most of the primary and secondary health facilities in Africa

Fasting plasma glucose performed in the laboratory in place of HbA1c is the best alternative

- Its average for repeated measurements gives a reliable indication of the control

Glocusuria is a poor means of assessment of control

Self Blood Glucose Monitoring (SBGM) should be encouraged

Results of self urine testing or blood glucose tests should be recorded in a logbook

Clinic protocols should set out in some detail, the parameters to be monitored at the initial visits, at regular follow-up visits, and at annual reviews

At the initiation of insulin therapy, appropriate advice on SBGM and diet should be given

**Treatment of co-morbidities**

Examples are obesity, hypertension and dyslipidaemias

- See relevant chapters

**Diabetic foot problems**

*Introduction*

People with diabetes are at increased risk of foot ulcers and amputations which are major causes of morbidity and disability

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**Acute metabolic complications of diabetes mellitus**

These are:
- Diabetic ketoacidosis
- Non-ketotic hyperosmolar states
- Hypoglycaemia
- Lactic acidosis
- Acute hyperglycaemic complications may present with coma or altered levels of consciousness in people with diabetes

**Differential diagnoses**

Stroke
Seizures
Tremulousness
Drug overdose
Ethanol intoxication

**Diabetic ketoacidosis**

*Introduction*

Severe uncontrolled diabetes requiring emergency treatment with insulin and intravenous fluids

- Blood ketones (acetoacetate and 3-hydroxybutyrate) concentration > 5 mmol/L
- Carries a high mortality in Africa
- Through late presentation, delayed diagnosis and inadequate treatment
- Presents at any age although there is a well defined peak at puberty

Causes include:

**Infection**
- Management errors
- New cases of diabetes (treatment not commenced)
- No obvious cause in about 40% of cases

**Indications for immediate hospital admission**

- Repeated vomiting or inability to take adequate oral fluids
- Hyperventilation
- Any disturbance of consciousness
- Persistent ketonuria
- Presence of infections

**Initial treatment plan for Diabetic Ketoacidosis in adults**

- Fluids and electrolytes
  - One litre per hour for 3 hours; thereafter according to need
  - Sodium chloride 0.9% injection
  - Hypotonic (half-normal) saline: 75 mmol/L if plasma sodium exceeds 150 mmol/L
  - Glucose 5% when blood glucose level falls below 14 mmol/L
  - Plus:
    - Potassium (K+) replacement
    - To be added into each litre of fluid
    - Initially, 5 - 10 units/hour; by continuous intravenous infusion
    - Maintenance 2 - 4 units/hour, titrated against blood glucose levels

- Other measures:
  - Intramuscular injections:
    - 20 units immediately, then 5 - 10 units/hour, titrated against blood glucose levels
  - Drug overdose
  - Alcohol intoxication
  - Other causes of hypoglycaemia
    - Light headedness
    - Headaches
    - Tachycardia
    - Hypertension (usually systolic)
    - Stroke-like presentations
    - Coma

**Acute management**

- Oral glucose if patient is conscious
- If patient is unconscious:

- 100% oxygen by intermittent positive pressure ventilation
- Intravenous dexamethasone, mannitol for cerebral oedema (see cerebral oedema)
- Treat specific thromboembolic complications if they occur

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**Precipitating factors include:**
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- Diuretic treatment
- Drinking glucose-rich beverages

**Treat specific thromboembolic complications if they occur**

**Hypoglycaemia**

*Introduction*

Affects over 70% of patients on insulin therapy

**Common causes of hypoglycaemia in persons with diabetes mellitus**

- Engaging in more exercise than usual
- Delay or omission of a snack or main meal
- Administration of too much insulin
- Eating insufficient carbohydrate
- Overindulgence in alcohol
- Overdosing with sulphonylureas
- In the presence of low blood glucose (< 2 mmol/L)

**Characteristic symptoms and signs include:**

- Light headedness
- Headaches
- Tremulousness
- Palpitations
- Sweating
- Feeling of hunger
- Tachycardia
- Hypertension (usually systolic)
- Stroke-like presentations
- Coma

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- Oral glucose if patient is conscious
- If patient is unconscious:

- 100% oxygen by intermittent positive pressure ventilation
- Intravenous dexamethasone, mannitol for cerebral oedema (see cerebral oedema)
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Intravenous glucose
- 50% glucose given as a bolus of 40 - 50 mL
Or:
- 20% glucose 100 - 150 mL followed by 8 - 10% glucose infusion if necessary
Or:
- Injectable glucagon
  - 1 mg intramuscularly stat
If hypoglycaemia is due to long acting sulphonylureas, or long and intermediate acting insulin or alcohol
Prolonged intravenous glucose infusion (5 - 10% for 12 - 24 hours; even longer) may be necessary
Consider nasogastric or rectal glucose
Or:
- Give glucagon 1 mg intramuscularly
As a last resort:
  - Administer epinephrine (adrenaline)
  - 1 mL of 1 in 1000 strength, subcutaneously stat
On recovery:
- Give a long acting carbohydrate snack
  - Attempt to identify the cause of hypoglycaemia and correct it
- Assess the type of insulin used, injection sites and injection techniques
- Lipohypertrophy can alter the rate of absorption
- Enquire into, and correct inappropriate habits of eating, exercise and alcohol consumption
- Review other drug therapy and renal function
- Adjust insulin or OGLA dosages as appropriate

Prevention of diabetes
Generalised obesity, central obesity and physical inactivity are the major modifiable risk factors, and should be avoided/corrected

Onset of diabetes can be delayed in people at high risk by active lifestyle modification
- Lifestyle modification should be the cornerstone of preventative strategies in the following categories of people:
  - Age > 45 years
  - Overweight and obesity (BMI > 25 kg/m²)
  - Physical inactivity
  - First degree relatives with diabetes
  - Previous gestational diabetes
  - Previously identified IGT or IFG
  - Dyslipidaemia
  - Hypertension
The components of lifestyle modification should include (but not be limited to) the following:
- Lose 5 - 10% weight
- Reduce fat intake (<30% of total daily calories)
- Reduce saturated fat intake (<10% of total daily calories)
- Increase fibre intake to >15 g/1000 kcal
- Traditional African diets are high in fibre content
- Increase levels of physical activity e.g. brisk walking producing a heart rate >150/min
- Exercise should last for at least 30 minutes and should be undertaken at least three times a week
- Reduce high alcohol intake

HYPERTHYROIDISM (Thyrotoxicosis)
Introduction
A clinical syndrome which results from exposure of the body to excess levels of the thyroid hormones, Thyroxine (T₄) and Tri-iodothyronine (T₃).
More females are affected than males (usually in the ratio of 5:1)
**ACUTE ANTERIOR UVEITIS (Iritis)**

**Introduction**
Inflammation of the iris (with or without the ciliary body).

**Clinical features**
- Eyeball is tender
- Photophobia due to ciliary spasm
- Exudation into anterior chamber
- Flare and cells
- Keratic precipitates
- Hypopyon
- Posterior synechiae
- Miosis due to spasm of sphincter pupillae

**Differential diagnoses**
- Infective conjunctivitis
- Acute iritis
- Acute glaucoma

**Complications**
- Secondary glaucoma
- Cataracts

**Investigations**
- Chest radiograph to exclude sarcoidosis and tuberculosis
- Spinal X-ray (especially lumbosacral segment) to exclude ankylosing spondylitis

**Treatment**
- Corticosteroid drops for treatment of inflammation:
  - Betamethasone sodium phosphate 0.1%
  - 1 drop up to 4 times daily
- Spinal X-ray (especially lumbosacral segment) to exclude ankylosing spondylitis

**Prevention**
- No real preventive measures

**ACUTE KERATITIS**

**Introduction**
Infection or inflammation of the cornea

**Clinical features**
- Irritation, pain
- Red eye (conjunctival congestion)
- Eye discharge: watery; purulent if bacterial
- Photophobia
- Visual impairment, depending on the site and size of ulcer and if interstitial

**HYPOTHYROIDISM (Myxoedema)**

**Introduction**
Refers to subnormal amounts of thyroid hormones in the circulation, and the clinical features associated with this

**Aetiology**

- May be primary or secondary
- Primary hypothyroidism more common
- - Probably an autoimmune disease; may occur as a sequel to Hashimoto’s thyroiditis
- - Post therapeutic hypothyroidism (medical or surgical)
- Secondary hypothyroidism:
  - Occurs when there is failure of the hypothalamic-pituitary axis due to
  - - Deficient secretion of TRH from the hypothalamus
  - - Lack of secretion of TSH from the pituitary

**Clinical features**
- Generally striking contrast to those of hyperthyroidism; may be quite subtle, with an insidious onset

- In adults:
  - Dull facial expression, slow speech and poor memory
  - Puffiness of the hands, feet and face
  - Lethargy and fatigue
  - Thinning, dryness and loss of hair
  - Hyperthermia
  - Bradycardia
  - Reduced systolic and increased diastolic blood pressure

- Weight gain
- Decreased reflexes
- Constipation
- Menstrual abnormalities
- In infants:
  - Mental and physical retardation
  - - If not corrected, cretinism

**Differential diagnoses**
- Endogenous depression
- Reactive depression

**Complications**
- Myxoedema coma
- Cretinism in the young

**Investigations**
- Total serum T and T levels
- TSH stimulation test
- TRH test

**Treatment objectives**
- Establish cause
- - Establisn the severity of hypothyroidism
- - Restore normal body functions
- - Prevent complications

**Drug treatment**
- - Replacement therapy
  - - Levothyroxine sodium (thyroxine sodium)
  - Adult: initially 20 - 100 micrograms (50 micrograms for those over 50 years) orally daily, preferably before breakfast
  - - Adjusted in steps of 50 micrograms every 3 - 4 weeks until metabolism normalizes (usually 100 - 200 micrograms daily)

- Supportive measures
  - Treat anaemia, constipation and other complications as appropriate
  - - Appropriate care of any system affected e.g. eye care, treatment of heart failure

**Thyroid storm**

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Inflammation of the iris (with or without the ciliary body)

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- - Subconjunctival injection of steroid if severe
- - Atropine sulfate 0.5% or 1%
  - 1 drop up to 4 times daily

**Caution**
- Avoid atropine drops if there is risk of acute glaucoma

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- In infants:
  - Mental and physical retardation
  - - If not corrected, cretinism

**Differential diagnoses**
- Endogenous depression
- Reactive depression

**Complications**
- Myxoedema coma
- Cretinism in the young

**Investigations**
- Total serum T and T levels
- TSH stimulation test
- TRH test

**Treatment objectives**
- Establish cause
- - Establisn the severity of hypothyroidism
- - Restore normal body functions
- - Prevent complications

**Drug treatment**
- - Replacement therapy
  - - Levothyroxine sodium (thyroxine sodium)
  - Adult: initially 20 - 100 micrograms (50 micrograms for those over 50 years) orally daily, preferably before breakfast
  - - Adjusted in steps of 50 micrograms every 3 - 4 weeks until metabolism normalizes (usually 100 - 200 micrograms daily)
Chapter 9: Eye Disorders

Foreign bodies in the eye

Introduction
Foreign bodies are usually in the form of small particles of metal, vegetable matter or insects which embed on the surface of the eye.
Occasionally a high velocity material, usually a metal or plastic could be propelled into the eye.

Clinical features
May be embedded on the tarsal or bulbar conjunctiva, the cornea or inside the eye.
- Intraocular foreign body (IOFB)
- IOFBs may be in the anterior chamber, iris, lens or vortex; on the retina or even behind the eyeball after doubly perforating the eye.

Differential diagnoses
- Cornal abrasion
- Endophthalmitis
- Orbital cellulitis
- Complications
- Perforation of the eye
- Endophthalmitis
- Retinal toxicity from a metallic IOFB

Investigation
Radiograph of the orbit with a localizing ring

Management
Removal of sub-tarsal, conjunctival or corneal foreign body under magnification e.g. slit lamp microscope

Caution
Ultrasound should be avoided in an eye with a perforating wound

Prevention
Appropriate protective goggles for sports, welding and when working with chemicals

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INFECTIVE CONJUNCTIVITIS

Introduction
The commonest cause of a red eye is infective conjunctivitis which could be caused by bacteria or viruses.

Clinical features
- Red eye (generalized)
- Eye discharge: purulent or catarrhal, worse on waking from sleep
- Eye discomfort: grittiness
- Photophobia: mild
- Swollen eyelids in ophthalmia neonatorum

Aetiology
- Staphylococcus aureus
- Neisseria gonorrhoea
- Pneumococcus
- Haemophilus influenzae
- Gonococcus: ophthalmia neonatorum

Complications
- Infection of the lash follicle and its associated gland of Zeis or Moll
- Infection of the meibomian gland

Investigation
- Conjunctival swab for microscopy, culture and sensitivity
- Non-drug measures
  - Dark glasses for photophobia

Drug treatment
- Antibiotic eye ointments or drops
  - Chloramphenicol 0.5%
  - Gentamicin 0.3%
- Treat arthritis if active

Caution
- Avoid prolonged use of steroids

Prevention
- No real preventive measures available

STYE (HORDEOLUM)

Introduction
- External sty
- Infection of the lash follicle and its associated gland of Zeis or Moll

Clinical features
- Painful lump growing on the eyelid
- It may be impossible to see the baby's eye because of the swelling
- Orbital cellulitis
- Systemic antibiotics

Prevention
- Apply warm wet pads for 15 minutes 4 times daily until the stye drains

Non-drug measures
- Chloramphenicol ointment apply 4 times daily for 2 weeks

SCLERITIS/EPISCELITIS

Introduction
- Inflammation of the sclera and episclera

Clinical features
- Dull, deep-seated pain in the eye

Differential diagnoses
- Near visual loss

Complications
- Discourage the use of traditional eye medication

Prevention
- Clean eyelids regularly and thoroughly

THE RED EYE

Causes
- Infective conjunctivitis including ophthalmia neonatorum
- Allergic conjunctivitis
- Keratitis
-35 kg: 300 mg once daily for 3 days; body weight 36 - 45 kg: 400 mg once daily for 3 days

**Surgical treatment**
Indicated for the treatment of trichiasis, entropion, corneal scarring
Corneal graft, but entropion must be corrected first

**Caution and contraindications**
Systemic tetracycline is contraindicated in young children

**Prevention**
Improve personal and public hygiene
Treat the whole community with topical or systemic antibiotics
Prompt surgery for trichiasis and entropion to prevent blindness from corneal scarring

**CHAPTER 10: GENITO-URINARY SYSTEM**

**NEPHROLOGY**

**ACUTE RENAL FAILURE**

**Introduction**
A syndrome characterized by rapid decline in glomerular filtration rate with retention of nitrogenous waste products, disturbance of extracellular fluid volume, electrolytes and acid-base homeostasis

**Classification/aetiology**

**Pre-renal Acute Renal Failure**

- Hypovolaemia (e.g. from haemorrhage, severe diarrhoea and vomiting etc)
- Low cardiac output (e.g. myocarditis)
- Renal hypoperfusion (e.g. from use of angiotensin converting enzyme inhibitors)
- Systemic vasodilatation (e.g. sepsis)
- Hyperviscosity syndromes (e.g polycythaemia)

**Intrinsic renal failure**

- Renovascular obstruction (e.g. renal vein thrombosis)
- Acute tubular necrosis (e.g. from ischemia)
- Interstitial nephritis (e.g. infections, allergic, from antimicrobials like rifampicin)
- Intratubular deposition and obstruction (e.g. uric acid, oxalate stones)

**Post renal Acute Renal Failure**

- Renal allograft rejection

**Prevention**
Close attention to cardiovascular function and intravascular volume in high risk patients, especially those with pre-existing renal insufficiency
Avoid hypovolaemia (especially in patients on nephrototoxic drugs)
Adequate hydration and sodium loading in patients to be exposed to radiocoustic dye investigations (for example)

**CHRONIC KIDNEYDISEASE**
Also chronic renal failure

**Introduction**
A progressive and persistent deterioration in kidney structure and function ultimately resulting in accumulation of nitrogenous waste products and disruption of acid-base homeostasis.
- Also associated with derangement in the kidney's osmoregulatory, metabolic and endocrine function

**Aetiology**
- Hypertension
- Diabetes mellitus
- Chronic glomerulonephritis
- Systemic lupus erythematosus
- Chronic pyelonephritis
- Genetic e.g. adult polycystic kidney disease, Alport's syndrome

**Clinical features**
- Nocturia
- Oliguria
- Bleeding tendencies
- Anaemia
- Hypertension (not invariable)
### Chapter 10: Genito-Urinary System

**Body swelling**
- Pruritus
- Bone pains

**Complications**
- Hyperkalaemia
- Anaemia
- Hypertensive heart disease
- Atherosclerosis
- Uræmic pericarditis
- Renal osteodystrophy
- Metabolic acidosis

**Investigations**
- Urine
  - Urinalysis
  - Urine microscopy, culture and sensitivity
- Blood
  - Serum Electrolytes, Urea and Creatinine
  - Creatinine clearance
  - Full Blood Count; ESR
  - Serum lipids
  - Serum proteins
  - Serum calcium and phosphate
- Abdominal ultrasound scan

**Treatment objectives**
- Slow down rate of decline of GFR
- Manage hypertension
- Control hypertension
- Provide renal replacement therapy (if in end stage)

**Non-drug treatment**
- Diet: low salt, low protein, low potassium
- Avoid nephrotoxic agents

**Drug Treatment**
- Antibiotics
  - 200 mg orally 3 times daily (see treatment of hypertension)
- Diuretics (furosemide at doses appropriate for clinical condition)
- Vitamin D and calcium supplements
-warfarin
- Erythropoietin
  - Initially 50 units/kg 3 times weekly; adjusted according to response in steps of 25 units/kg 3 times weekly at intervals of at least 4 weeks
  - Total 75 - 300 units/kg weekly, as a single dose or in divided doses
- Iron supplements
- Ferrous sulphate
- Adult: 200 mg orally 3 times daily
  - Child: 6 - 18 years: prophylactic 1 tablet (200 mg) daily; therapeutic 200 mg 2 - 3 times daily
- Treat hyperkalaemia (see chapter on hyperkalaemia)
- Phosphate binding agents
- Calcium carbonate:
  - Adult: 500 mg - 1.25 g orally
  - Starting dose usually 500 mg - 1 g orally 2 times daily after meals

**NPHORTIC SYNDROME**

**Introduction**
- A clinical complex characterized by
  - Proteinuria: 2 g per 24 hours
  - Hypoaalbuminaemia
  - Generalized oedema
  - Hyperlipidaemia; lipiduria
  - Hypercoagulability

**Aetiology**
- Idiopathic in a significant proportion of cases
- Known causes include:
  - Inflammatory diseases of the glomeruli (glomerulonephropathies)
  - Viral infections e.g. Hepatitis B, HIV
  - Immunologic disorders e.g. SLE
- Allergies: insect bites, poisonous plants
- Intravenous drugs e.g. heroin
- Others:
  - Diabetes mellitus
  - Carcinomas
  - Amyloid deposition

**Histologic types**
- Minimal change disease
- Focal segmental glomerulosclerosis

**Differential diagnoses**
- Other causes of body swelling
  - Congestive heart failure
  - Decompensated chronic liver disease
  - Protein losing enteropathy

**Investigations**
- Blood:
  - Serum proteins
  - Serum lipids
  - Urine
    - Urinalysis
    - 24 hour urine collection for protein estimation
    - Abdominal ultrasound scan
  - Renal biopsy

**Drug treatment**
- Diuretics e.g. loop diuretics like furosemide
- Gluocorticoids (e.g. prednisolone)
- If renal biopsy and histology reveal a steroid-responsive cause of the nephrotic syndrome
- Cytotoxic drugs (e.g. cyclophosphamide) in some steroid-resistant cases

**Prevention**
- Avoid nephrotoxins
- Treat bites and stings to prevent beta haemolytic streptococcal infection

**SEXUALLY TRANSMITTED INFECTIONS**

**BACTERIAL VAGINOSIS**

**Introduction**
- A clinical syndrome resulting from replacement of the normal hydrogen peroxide-producing *Lactobacillus* sp. in the vagina by high concentrations of anaerobic bacteria, such as *Gardnerella vaginalis*
- *Mycoplasma hominis*
- *Mobiluncus curtisii*
- The cause of the microbial alteration is not fully understood

- The associated malodour is due to the release of amines produced by anaerobic bacteria that decarboxylate lysine to caverdine, and arginine to putrescine
- Predisposing factors are the use of antiseptic/antibiotic vaginal preparations or vaginal douching

**Clinical features**
- Malodorous and increased white vaginal discharge that is homogeneous, low in viscosity, and uniformly coats the vaginal walls
- The fishy-smelling discharge is particularly noticeable after sexual intercourse; usually no pruritus or inflamed vulvae

**Differential diagnoses**
- Other causes of vaginal discharge: see Gonorrhoea

**Complications**
- Acute salpingitis
- Premature rupture of membranes
- Peritoneum delivery and low birth weight

**Investigations**
- Homogeneous milky discharge with pH > 4.5 (pH > 6.0 highly suggestive)
- Fishy odour from the biogenic amines; altered by addition of 10% KOH (Sniff test)
- Clue cells on a wet mount
- Clue cells are normal vaginal epithelial cells studded with bacteria, giving the cells a granular appearance

**Treatment objective**
- To eliminate the organisms

**Drug therapy**
- Recommended regimen:
  - Metronidazole 400 mg orally, every 12 hours for 7 days
- Alternative regimen:
  - Metronidazole 2 g orally, as a single dose
  - Metronidazole 0.75% gel 5 g intravaginally, twice daily for 7 days
- Initial dose of 10% KOH: 10 mL as a 10% solution
- Clue cells on a wet mount
- Clue cells are normal vaginal epithelial cells studded with bacteria, giving the cells a granular appearance

**Recommended regimen for pregnant women**
- Metronidazole 200 orally, every 8 hours for 7 days, after the first trimester
- Or: 2 g orally, as a single dose
- If treatment is imperative in the first trimester of pregnancy
- Give metronidazole 2 g orally as a single dose

**Notable adverse drug reactions, caution and contraindications**
- Metronidazole: see Trichomoniasis
- Advise to return if symptoms persist as re-treatment may be needed
- Recommended regimen for pregnant women
- Metronidazole 200 orally, every 8 hours for 7 days, after the first trimester
- Or: 2 g orally, as a single dose
**Chapter 10: Genito-Urinary System**

**Standard Treatment Guidelines for Nigeria 2008**

- Patients should therefore be followed up weekly until there is clear evidence of improvement

**Notable adverse drug reactions, caution and contraindications**

- Ciprofloxacin and ceftriaxone (see gonorrhoea)
- Erythromycin and azithromycin (see chlamydia)

**Prevention**

- Counselling, Compliance, Condom use and Contact treatment

**CHLAMYDIAL INFECTION**

(Other than Lymphogranuloma venereum)

**Introduction**

The chlamydiae occupy a special place between bacteria and viruses.

- They are a large group of obligate intracellular organisms
- Typically has an incubation period of 10 - 14 days

**Clinical features**

- **Incubation period** is about 3 - 7 days
- Begins as a small, tender papule, changing into a pustule which rapidly progresses to a painful ulcer with a bright red areola
- Neither the edge nor base of the ulcer is indurated (unlike syphilis)
- The ulcer feels soft, hence the name 'soft sore' (ulcus molle)

**CHANCROID (Ulcer Molle, Soft Chancre)**

**Introduction**

An infectious disease caused by Haemophilus ducreyi, a small gram-negative bacillus

Common in the tropics, especially in Africa, the Far East, and the Caribbean

**Clinical features**

- **Incubation period** is about 3 - 7 days
- Begins as a small, tender papule, changing into a pustule which rapidly progresses to a painful ulcer with a bright red areola
- Neither the edge nor base of the ulcer is indurated (unlike syphilis)
- The ulcer feels soft, hence the name 'soft sore' (ulcus molle)

With superimposed bacterial infection it often feels indurated

The ulcers may be multiple due to auto-inoculation

Sites of predilection in men are the prepucce, frenulum, glans, shaft or penis

In women the labia, fourchette, vestibule, clitoris, cervix, or perineum are favored sites

Lesions may cause dyspareunia, pain on voiding or defaecation and vaginal discharge

Women may be asymptomatic carriers

- About 7 - 14 days after the appearance of the ulcer, a bubo appears
- A mass of glands matted together, often adherent to the overlying skin
- The glands above the inguinal ligament are usually affected, and often there is a unilateral enlargement

Central softening is often found and if untreated the bubo may rupture and discharge through a fistula

The combination of a painful genital ulcer and suppurative inguinal adenopathy is almost pathognomonic of chancroid

**Patients may present with bubo, the initial ulcer having**

**Adjuvant therapy**

- Keep ulcerative lesions clean
- Aspirate fluctuant lymph nodes through the surrounding healthy skin, preferably from a superior approach to prevent persistent dripping and sinus formation
- Incision and drainage, or excision of nodes may delay healing and is not recommended

**Follow-up**

- All patients should be followed up until there is clear evidence of improvement or cure
- In patients infected with HIV, treatment may appear to be less effective, but this may be a result of co-infection with genital herpes or syphilis
- Chancroid and HIV infection are closely associated and therapeutic failure is likely to be seen with increasing frequency

**Complications**

- Epididymo-orchitis and sterility in males
- Pelvic inflammatory disease (PID) and infertility in females
- Adverse pregnancy outcomes

**Differential diagnoses**

- Other causes of urethral and vaginal discharge (see Gonorrhoea)

**Investigations**

- Microscopy, culture and sensitivity (of discharge)
- Direct immunofluorescence assay

**Note**

There is no evidence that additional therapy with a topical agent provides further benefit

If inclusion conjunctivitis recurs after therapy has been completed, erythromycin treatment should be reintroduced for 2 weeks

It is important to treat the mother and her sexual partner

**Enzyme-linked immunoassay**

- DNA probe test
- Ligase chain reaction (LCR)

**Treatment objectives**

- Same as for gonococcal infection

**Drug therapy**

**Recommended regimen:**

- Doxycycline 100 mg orally, every 12 hours for 7 days
- Or:
- Azithromycin 1 g orally, in a single dose

**Chlamydial infection during pregnancy**

**Recommended regimen:**

- Erythromycin 500 mg orally every 6 hours for 7 days
- Or:
- Amoxicillin 500 mg orally every 8 hours for 7 days

**Neonatal chlamydial conjunctivitis**

- Typically has an incubation period of 10 - 14 days compared to 2 - 3 days for gonococcal ophthalmia

**Recommended regimen:**

- Erythromycin syrup 50 mg/kg per day orally, every 6 hours for 14 days

**Alternative regimen:**

- Trimethoprim 40 mg with sulfamethoxazole 200 mg orally, every 12 hours for 14 days

**Adjuvant therapy**

- Caution in patients with hepatic impairment, systemic lupus erythematosus and myasthenia gravis
- Antacids, aluminium, calcium, iron, magnesium and zinc salts, and milk decrease the absorption of tetracyclines

- Deposition of tetracyclines in growing bones and teeth (by binding to calcium) causes staining and occasionally dental hypoplasia
- Should not be given to children under 12 years, or to pregnant or breast-feeding women

- With the exception of doxycycline and minocycline, tetracyclines may exacerbate renal failure and should not be given to patients with kidney disease
- May cause nausea, vomiting and diarrhoea; hypersensitivity reactions. Headache and visual disturbances may indicate benign intracranial hypertension
- Candidal superinfection with prolonged therapy

**Azithromycin and Erythromycin**

- Erythromycin estolate is contraindicated during pregnancy because of drug-related hepatotoxicity; only erythromycin base or erythromycin ethylsuccinate should
Littre abscess involving periurethral glands
Paraurethral abscesses
Proximal urethral involvement with frequency and terminal haematuria
Cowper's gland abscess involving the bulbourethral glands, producing a swelling behind the base of the scrotum that can produce a proximal or Cowper's stricture
Prostatitis
Proctitis
Urethral stricture leading to hydroureters and hydronephrosis
Chronic epididymo-orchitis leading to sterility
Contaminated fingers or other fomites can also lead to infection of the eyes- gonococcal conjunctivitis
- Haemogenous spread leading to meningitis, arthritis etc

differential diagnoses
Urethral discharge: Spermatorrhoea/prostatorrhoea (sexual arousal)
- Trichomonas vaginalis and Candida albicans can also give rise to urethral discharge and balanitis
Ascending infections: Escherichia coli, a common cause in the male homosexuelles
- Oral organisms may be transmitted non-sexually following genitourinary infections, surgery and instrumentation (including catheterisation)
Scrotal swelling (epididymo-orchitis):
- In older men, where there may have been no risk of STIs, other general infections may be responsible, e.g. Escherichia coli, Klebsiella spp., or Pseudomonas aeruginosa
- Tuberculous epididymo-orchitis, secondary to lesions elsewhere, especially in the lungs or bones
Brucellosis, caused by Brucella melitensis or Brucella abortus
- Orchitis is usually clinically more evident than an epididymitis
In pre-pubertal children the usual aetiology is coliform,
psudomonas infection or mumps virus
- Non-infectious causes of scrotal swelling: Trauma (haematocoele)
Testicular torsion
Tumour
Hydrocoele of the tunica vaginalis
Cyst of epididymis
Varicocele
Inguinoscrotal hernia

Investigations
Urethral swab for microscopy and culture and sensitivity

Gonorrhoea in women

Clinical features
Inflammation of the cervix and cervical canal (cervicitis) is the commonest presentation in women
Urethritis: the urethra becomes the most common site in women who have had hysterectomy
The most frequent complaint is discharge, often accompanied with burning on urination
Over 50% of infected women are asymptomatic
Oropharyngeal gonorrhoea from orogenital sex (fellatio) may present as sore throat

Complications
Local:
Infections of Skene's periurethral glands and Bartholin's labial glands; a Bartholin's gland abscess may cause pain on sitting or walking
Vulvitis
Ascending infection to the endometrium, fallopian tubes, ovaries and peritoneum (pelvic inflammatory disease)
Ectopic pregnancy
Infertility
Perihepatic abscess (Fitz-Hugh-Curtis syndrome)
Risk of disseminated gonococcal infection during pregnancy and menstruation
Risk to the newborn infant:
- Premature rupture of membranes
- Premature labour
- Chorioamnionitis
- Septic abortion
- Ophthalmia neonatorum
- Oropharyngeal gonorrhoea

Differential diagnoses
Other causes of vaginal discharge in young girls:
A vaginal foreign body such as a small toy, bead, or even a piece of food
Other infections caused by T. vaginalis, and C. albicans
Intestinal bacteria or pin worms due to inadequate cleaning after defecation

Ophthalmia neonatorum
Gonococcal conjunctivitis in the neonate can be acquired perinatally
- Purulent conjunctivitis; the lids swell; eyes are red and tender
- If not treated promptly, the cornea may be eroded and perforated, leading to secondary glaucoma, conophthalmus and blindness
- About 30% of babies infected will also have oropharyngeal gonorrhoea

Differential diagnoses
The silver nitrate prophylaxis can produce a chemical conjunctivitis, usually appearing 6 - 8 hours after treatment and resolving over 24 hours
The most common cause of neonatal conjunctivitis in most countries is C. trachomatis.
- E. coli, staphylococci, streptococci and Pseudomonas sp. can also cause conjunctivitis in the neonate

Treatment objectives
Eliminate the organism in the patient and sexual partner(s)
Prevent re-infection
Prevent complications
Counsel and screen for possible co-infection with HIV
so that appropriate management can be instituted

Drug therapy
Recommended regimen:
Ciprofloxacin 500 mg orally, as a single dose
Or:
Ceftriaxone 125 mg by intramuscular injection, as a single dose
Neonatal gonococcal conjunctivitis
Recommended regimen:
Ceftriaxone 50 mg/kg by intramuscular injection, as a single dose, to a maximum of 125 mg
Or:
Spectinomycin 25 mg/kg by intramuscular injection as
Secondary stage

- The addition of a parenteral aminoglycoside such as gentamicin should be carefully considered for treating HIV-infected patients

Follow-up

- Patients should be followed up clinically until signs and symptoms have resolved

**Notable adverse drug reactions, caution and contraindications**

- Sulfamethoxazole/trimethoprim - Contraindicated in persons with hypersensitivity to sulfonamides or trimethoprim; porphyria
- - Caution required in renal impairment (avoid if severe); hepatic impairment (avoid if severe); maintain adequate fluid intake (to avoid crystalluria)
- - May cause nausea, vomiting, diarrhoea, headache, hypersensitivity reactions, including fixed drug eruption, pruritus, photo-sensitivity reactions, exfoliative dermatitis, and erythema nodosum

- - See Chlamydia

**Prevention**

- Counselling, Compliance, Condom use and Contact treatment

**LYMPHOGRANULOMA VENEREUM**

(Chlamitic bubo; lymphogranuloma inguinale; lymphopathia venereal; Durand-Nicolas-Favre Disease)

**Introduction**

A chronic disease caused by *Chlamydia trachomatis* (serotypes L1, L2, L3), an obligate intracellular microorganism

Most common in Asia, Africa, and South America

In Europe and North America, it is most prevalent among homosexuals, immigrants from endemic areas and people returning from endemic areas, such as soldiers, seamen, and vacationers

**Clinical features**

A chronic granulomatous, locally destructive disease that is characterized by progressive, indolent, serpiginous ulceration of the groins, pubes, genitals and anus

May be classified into primary, secondary, and late stages

**Primary stage**

After an incubation period of 7 - 15 days, a papule or small non-indurated painless ulcer appears

- Usually goes unnoticed
- Extra-genital lesions (rectal, oral) have also been described
- Women probably act as asymptomatic carriers

Patients are very rarely seen at the primary stage

**Complications**

Systemic spread of in the secondary stage resulting in arthritis, pneumonia, hepatitis or rarely perihepatitis

Other rare systemic complications include pulmonary infection, cardiac involvement, aseptic meningitis, and ocular inflammatory disease

The late stage may be complicated by the genito-anorectal syndrome

- Reported more in homosexual men, and women who engage in receptive anal intercourse

Patients may also complain of fever, pain, and tenesmus.

Obstructed labour from elephantiasis of the vulva

**Differential diagnoses**

- Chancroid
- Infections of the lower limbs
- Hodgkin’s disease and other lymphomas
SYPHILIS

Introduction
Infection caused by the spirochaete Treponema pallidum
Occurs worldwide
Can be classified as:
- Congenital (transmitted from mother to child in utero)
- Acquired (through sex or blood transfusion)
- Manifestations of secondary syphilis include a skin rash, condyloma lata, mucocutaneous lesions and generalized lymphadenopathy
- Primary syphilis: primary, secondary and early latent stages

Secondary syphilis: skin rash, condyloma lata, mucocutaneous lesions and generalized lymphadenopathy
Late syphilis: late latent syphilis, gummatous, neurological and cardiovascular syphilis

This section is only on primary syphilis

Clinical features
After an incubation period of 2 - 4 weeks (full range 90 days) the first lesion of syphilis may appear at the site of exposure, most commonly, the genitals
Chances may also be located on the lips or tongue; anorectal chancre is frequently seen in male homosexuals
- Begins as a small, dusky-red macule which soon develops into a papule
The surface of the papule erodes to form an ulcer which is typically round and painless with a clean surface and exudes a scanty yellow serum discharge teeming with spirochaetes
Lesion is indurated and feels firm or hard on palpation; surrounding skin is oedematous
Regional inguinal (or generalized) lymphadenopathy follows
- The glands are painless, moderately enlarged (not bubs), discrete and never suppurate
- Atypical lesions may be seen for various reasons e.g. bacterial superinfection, trauma or co-infection with other diseases
Even without treatment, the primary lesion(s) gradually heals up and will disappear after approximately 3 - 8 weeks, sometimes leaving a thin atrophic scar which is easily overlooked

Differential diagnoses
Other causes of genital ulcers:
- Chancreoid
- Herpes
- Lymphogranuloma venereum
- Granuloma inguinale
- Trauma
- Fixed drug eruption
- Behcet's disease
- Erythema multiforme
- Tuberculous ulcer
- Amoebic ulcer
- Cancer

Complications
Phimosis and paraphimosis
Late syphilis: gummatous, neurological and cardiovascular syphilis

Investigations
Dark field examination and direct fluorescent antibody tests of lesion exudates or tissue
VDRL; RPR

Treatment objectives
Eliminate the organism in the patient and sexual partner(s)
Prevent re-infection

Prevent complications
Counsel and screen for possible co-infection with HIV so that appropriate management can be instituted

Drug therapy
Recommended regimen:
- Benzathine benzylpenicillin
  - 4 g (2.4 million units) by intramuscular injection, at a single session
  - Because of the volume involved, this dose is usually given as two injections at separate sites
- Alternative regimen:
  - Procaine benzylpenicillin
  - 2 g (1.2 million units) by intramuscular injection, daily for 10 consecutive days
- Alternative regimen for penicillin-allergic (non-pregnant) patients:
  - Erythromycin
    - 100 mg orally, every 12 hours for 14 days
  - Tetracycline 500 mg orally, every 6 hours for 14 days

Note
Other 5-nitroimidazoles are also effective, both in single and in multiple dose regimens

TRICHOMONIASIS

Introduction
Caused by the flagellated protozoan, Trichomonas vaginalis
An extremely common infection, almost always transmitted via sexual contact
Women are far more frequently affected and more likely to have symptoms
Men are more likely to be asymptomatic and serve as carriers

Clinical features
Vaginal discharge: a white-yellow frothy discharge is characteristic
- Burning sensation
- Dysuria
- Dyspareunia
- The labia are often swollen
- The cervix may have punctuated haemorrhages

Recommended regimen:
- Procaine benzylpenicillin
  - 2 g (1.2 million units) by intramuscular injection, daily for 10 consecutive days

Investigations
Microscopy and culture of vaginal discharge
- See Gonorrhoea

Other causes of vaginal discharge or urethral discharge:
- Squamous cell or basal cell carcinoma
- Adenocarcinoma
- See Chlamydia

Prevention
Counselling, Compliance, Condom use and Contact treatment

- Screening for syphilis should be conducted at the first prenatal visit
- Other causes of genital ulcers:
  - Chancroid
  - Herpes
  - Lymphogranuloma venereum
  - Granuloma inguinale
  - Trauma
  - Fixed drug eruption
  - Behcet's disease
  - Erythema multiforme
  - Tuberculous ulcer
  - Amoebic ulcer
  - Cancer

- Complications
  - Phimosis and paraphimosis
  - Late syphilis: gummatous, neurological and cardiovascular syphilis

- Investigations
  - Dark field examination and direct fluorescent antibody tests of lesion exudates or tissue
  - VDRL; RPR

- Treatment objectives
  - Eliminate the organism in the patient and sexual partner(s)
  - Prevent re-infection

- Prevent complications
  - Counsel and screen for possible co-infection with HIV so that appropriate management can be instituted

- Drug therapy
  - Recommended regimen:
    - Benzathine benzylpenicillin
      - 4 g (2.4 million units) by intramuscular injection, at a single session
      - Because of the volume involved, this dose is usually given as two injections at separate sites
  - Alternative regimen:
    - Procaine benzylpenicillin
      - 2 g (1.2 million units) by intramuscular injection, daily for 10 consecutive days
  - Alternative regimen for penicillin-allergic (non-pregnant) patients:
    - Erythromycin
      - 100 mg orally, every 12 hours for 14 days
    - Tetracycline 500 mg orally, every 6 hours for 14 days

- Note
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Chapter 10: Genito-Urinary System

VULVO-VAGINAL CANDIDIASIS

Introduction
Inflammation of the vagina and vulva, usually evolving from vaginal discharge and secondary external irritation. Candida albicans is the commonest cause of candidal vulvo-vaginitis; Candida glabrata has also been identified. Candidal vaginitis is most common in:
- Pregnancy
- Patients with diabetes mellitus
- Those on long-term antibiotic therapy or oral contraceptives
- Conditions associated with immunosuppression - Corticosteroid use
- Usually not acquired through sexual intercourse
Because of the close proximity between the anus and female genitalia, re-infections may occur from the gastrointestinal tract.

Clinical features
Up to 20% of women with the infection may be asymptomatic. If symptoms occur, they usually consist of vulval itching, soreness and a non-offensive vaginal discharge which may be curdy.

Differential diagnoses
- Other causes of vaginal discharge: see Gonorrhoea in women

Complications
- Emotional problems because of the recurrent nature of the infection, and dyspareunia
- Very serious emotional problems in a non-sexually active person wrongly “accused” by parents, spouse or health care providers

Investigations
- Positive KOH examination
- Culture of vaginal discharges

Treatment objectives
- Cure the infection
- Prevent recurrence

Drug therapy
Recommended regimen:
- Clotrimazole 1% vaginal cream
  - Insert 5 g at night as a single dose; may be repeated once if necessary
  - Or:
  - Miconazole 2% intravaginal cream
  - Insert 5 g applicator once daily for 10 - 14 days or twice daily for 7 days
  - Or:
  - Clotrimazole 500 mg intravaginally, as a single dose
  - Or:
  - Fluconazole 150 mg orally, as a single dose

Recommended topical regimen for balanoposthitis
- Clotrimazole 1% cream apply twice daily for 7 days
- Or:
- Miconazole 2% cream twice daily for 7 days

Notable adverse drug reactions, caution and contraindications
- Fluconazole:
  - Caution in patients with renal impairment
  - Avoid in pregnancy and breastfeeding
  - Monitor liver function
  - Discontinue if signs or symptoms of hepatic disease develop (risk of hepatic necrosis)
  - May cause nausea, abdominal discomfort, diarrhoea, flatulence, headache, skin rash and Steven-Johnson syndrome
  - Discontinue treatment or monitor closely if infection is invasive or systemic

Prevention
- Reduce or eliminate predisposing factors
- After defecation cleaning should be done backwards to prevent faecal contamination of the vulva and vagina

UROLOGY

BENIGN PROSTATIC HYPERPLASIA

Introduction
A common cause of lower urinary tract obstruction among elderly males.
- Non-cancerous increase in size of the prostate gland
- Increase in size impacts on the urethra and partially or totally obstructs urine outflow
- Occurs after the age of 40 years; cause is uncertain

Symptoms are due to mechanical obstruction or spasms of the smooth muscles around the bladder neck and prostate.

Clinical features
- Lower urinary tract symptoms
  - Irritative symptoms: Frequency, Urgency, Nocturia
  - Urge incontinence
  - Obstructive symptoms: Poor stream
  - Hesitancy
  - Straining
  - Intermittency
  - Retention of urine
  - Haematuria
  - Recurrent urinary tract infections
  - Progressive renal failure

Differential diagnoses
- Prostate cancer
- Bladder cancer
- Bladder calculi
- Urethral stricture
- Prostatitis
- Neurogenic bladder

Complications
- Acute or chronic urine retention
- Recurrent urinary tract infections
- Bladder calculi
- Haematuria
- Hydronephrosis
- Progressive renal failure

Investigations
- Urinalysis
- Urine microscopy, culture and sensitivity

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Surgical procedures
- Open prostatectomy or transurethral resection
- Minimally invasive procedures
- High intensity focused ultrasound
- Transurethral balloon dilation
- Intracrineal stent
- Transurethral vaporization of the prostate
- Intermittent self-catheterization

Drug treatment
- Alpha adrenergic blockers
  - Prazosin, doxazosin, tamsulosin
  - Doses are titrated from 1 -10 mg depending on individual response
  - 400 microgram orally daily as single dose for tamsulosin
  - 5-Alpha reductase inhibitors
  - Finasteride 5 mg orally daily

Notable adverse drug reactions, caution
- Alpha-adrenergic blockers: dizziness, syncope, palpitations, tachycardia
- Should therefore be taken at night before going to bed
- 5-Alpha reductase inhibitors: loss of libido, erectile dysfunction, gynaecomastia

CARCINOMA OF THE PROSTATE

Introduction
- The most commonly diagnosed malignancy affecting men beyond the middle age
- The commonest malignancy of the genitourinary tract
- Exact cause is not known
- About 90% are adenocarcinomas

Risks factors
- Increasing age
- Familial and genetic factors
- High levels of testosterone and dihydrotestosterone

Clinical features
- Lower urinary tract symptoms
- Frequency
- Urgency
- Nocturia
- Poor stream
- Straining
- Terminal dribbling

Acute or chronic urine retention
- Recurrent urinary tract infections
- Bladder calculi
- Haematuria
- Hydronephrosis
- Progressive renal failure

Investigations
- Urinalysis
- Urine microscopy, culture and sensitivity
- Serum Urea, Electrolytes and Creatinine
- Prostate Specific Antigen (PSA)
- Trans-rectal ultrasound
- Abdominal ultrasound scan
- Full Blood Count

Treatment objectives
- Relieve obstruction
- Treat or prevent complications

Non-drug treatment
- Surgery: open prostatectomy or transurethral resection
- Minimally invasive procedures
- High intensity focused ultrasound
- Transurethral balloon dilation
- Intracrineal stent
- Transurethral vaporization of the prostate
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Chapter 10: Genito-Urinary System

Haematuria
Features of metastasis
Low back pain
Paraplegia
Pathological fractures
Pedal oedema
Weight loss
Rectal Examination: hard, nodular, asymmetrical prostate

Differential diagnoses
Benign prostatic hyperplasia
Chronic prostatitis
Bladder cancer/calculi
Prostatic calculi
Urethral stricture
Complications
Urinary retention
Urinary tract infection
Hydrourourhynephrosis
Progressive renal failure
Paraplegia
Pathological fractures
Lymphoedema

Investigations
Prostate Specific Antigen
Prostate biopsy
Trans-rectal ultrasound
Abdominal ultrasound
CT scan
Liver function tests
Chest radiograph
Serum Urea, Electrolytes and Creatinine
Full Blood Count

Treatment objectives
Aim at cure for early disease
Palliation for advanced disease

Non-drug treatment
Watchful waiting
Radical prostatectomy
Radiotherapy (brachytherapy or external beam radiation)
Bilateral orchidectomy
Cryosolation therapy
Laser therapy

Drug treatment
LHRH agonist: Goserelin acetate
- 3.6 mg by subcutaneous injection into the anterior abdominal wall every 28 weeks
Anti-androgens: Cyproterone acetate
100 mg orally twice daily for long term palliative therapy
Or: Bicalutamide 50 mg orally daily in advanced cases, with orchidectomy
Or:
Flutamide 250 mg orally three times daily
Or:
Diethyl stilbestrol 3 mg orally daily
Cytotoxic chemotherapy:
Docetaxel 75 mg/m² every 3 weeks

Notable adverse drug reactions, caution and contraindications
Anti-androgens:
- Loss of libido
- Benign prostatic hyperplasia
- Impotence
- Diethyl stilbestrol:
- Fluid retention
- Hypertension
- Thrombo-embolic disease
- Loss of libido
- Gynaecomastia
- Contraindicated in patients with cardiovascular diseases

ERECTILE DYSFUNCTION (Impotence)

Introduction
Persistent inability to obtain and sustain an erection sufficient for sexual intercourse
May be non-organic (psychogenic) or organic, resulting from physical causes
- Vascular, neurologic or endocrine dysfunction
- Other causes include drugs and trauma

Clinical features
Inability to obtain or sustain erection
History suggestive of possible causes e.g. drugs, systemic disease like hypertension, diabetes mellitus
With or without gynaecomastia
With or without penile deformity, plaques or impaired sensation

Complications
Psychological disturbances
Infertility

Investigations
Full Blood Count
Hormonal assay (LH, FSH, testosterone, prolactin)
Serum Urea, Electrolytes and Creatinine
Blood glucose
Nocturnal penile tumescence test

Treatment objective
To obtain and sustain erection

Non-drug treatment
Psychotherapy
Use of vacuum suction devices
Placement of intracorporal prosthesis
Microsurgical vascular anastomosis

Drug treatment

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Androgen replacement in those with androgen deficiency:
Testosterone enanthate
- 250 mg intramuscularly every 2-4 weeks
Or:
Oral methyl testosterone or fluoxymesterone
120 - 160 mg daily for 2 - 3 weeks; maintenance 40 - 120 mg daily
Intra-corporal administration of:
Prostaglandin E
- 5 - 15 microgram
5-Phosphodiesterase inhibitors:
Sildenafil citrate
- 25 - 100 mg one hour before intercourse

Notable adverse drug reactions, caution and contraindications
Androgens
- Not to be given to patients with prostate carcinoma
Phosphodiesterease inhibitors
- Altered vision, headache, dizziness and nasal congestion
- Contraindicated in patients taking nitrates
- Should be used with caution in patients with ischaemic heart disease

MALE INFERTILITY

Introduction
Failure to achieve conception after one year of regular, unprotected sexual intercourse in a couple trying to achieve pregnancy
Primary:
- When the man has never impregnated a woman
Secondary:
- When the man had impregnated a woman in the past
Male factor is responsible for about 50% of infertility unions

Clinical features
Vital points in the history:
- Duration of infertility
- Ability to have erection, penetration and ejaculation
- Family history of infertility
- History of systemic disease e.g. diabetes mellitus, hypertension, chronic liver disease and tuberculosis
- History of sexually transmitted infections and urinary tract infections
- History of genital trauma
- History of surgery: henniorphy, orchidopexy, urethral surgeries, etc

Examination:
Gynaecomastia
Penis: epispadias, hypospadia, penile deformities
Scrotum: absence of testis, small sized testis, varicoceles, hard and irregular epididymis

Investigations
Semen analysis x 3

Hormone profile (LH, FSH, testosterone, and prolactin)
Scrotal ultrasound
Trans-rectal ultrasound
Testicular biopsy
Vasography

Treatment objectives
To improve semen quality and restore reproductive capability

Non-drug treatment
Surgical options:
Varicocelectomy
Vasovasotomy
Epididymy-osotomy
Transurethral resection of obstructed ejaculatory duct
Assisted reproductive techniques:
Intra-uterine insemination
In vitro fertilization
Gamete intra-fallopian tube transfer
Intra-cytoplasmic sperm injection

POSTERIOR URETHRAL VALVES

Introduction
Congenital mucosal folds situated in the prostatic/membranous urethra, causing urine outflow obstruction
- Occurs in males
- The most common mechanical cause of renal deterioration in children

Clinical features
Obstructive urinary symptoms
Urinary retention
Failure to thrive
Distended bladder with palpable kidneys

Differential diagnoses
Anterior urethral valves
Congenital bladder neck hypertrophy
Congenital urethral stricture
Meatal stenosis
Posterior urethral polyp

Complications
Recurrent urinary tract infections
Septicaemia
Bladder dysfunction
Bladder stones
Hydrourourhynephrosis
Progressive renal impairment
Failure to thrive

Investigations
Urinealysis
Urine microscopy, culture and sensitivity
Full Blood Count
Serum Urea, Electrolytes and Creatinine
Abdominal ultrasound
Supportive measures
- Adequate hydration
- Pain relief
- Prevention
  - Avoid causative drugs

PROSTATITIS
Introduction
An inflammation of the prostate or pain in the prostate, similar to that caused by an inflammation.
Accounts for 2% of prostatic pathology
Classified into:
- Acute bacterial prostatitis
- Chronic bacterial prostatitis
- Chronic non-bacterial prostatitis
- Prostatodynia

Risk factors:
- Ductile reflux
- Urinary tract infection
- Indwelling urethral catheterization
- Penetrating anal sex
- Sexually transmitted infections

Treatment objectives
- Non-drug treatment
  - Non-steroidal e.g. diclofenac, ibuprofen etc
  - Steroids e.g. prednisolone, dexamethasone
- Drug treatment
  - Alpha blockers e.g. prazocin, doxazosin
  - Hormonal therapy e.g. finasteride, cyproterone
- Prostatic abscess
  - Trans-rectal ultrasound
- Biopsy: culture and histology
- Piriformis syndrome

Prostatic calculi
- Infertility
- Infertility
- Septicaemia

Management
- Hormone therapy:
  - Human chorionic gonadotropin
  - 1,500 units/week intramuscularly, for a total of 9 injections
  - Applicable only to special cases
- Surgical treatment:
  - Urethrocystoscopy
  - Laparoscopy
  - Magnetic Resonance Imaging
  - Intracavernosal injection of alpha adrenergic agonist:
    - Phentolamine
    - 250 - 500 microgram
    - Or:
      - Ephedrine
    - 50 - 100 mg

Pharmacological treatment
- Analgesics
- Antibiotics (based on local sensitivity)
- Anti-inflammatory drugs
  - Non-steroidal e.g. diclofenac, ibuprofen etc
  - Steroids e.g. prednisolone, dexamethasone
  - Alpha blockers e.g. prazocin, doxazocin
- Hormonal therapy e.g. finasteride, cyproterone
- Physiotherapy
- Sitz baths

Management
- Hormone therapy:
  - Human chorionic gonadotropin
  - 1,500 units/week intramuscularly, for a total of 9 injections
  - Applicable only to special cases
- Surgical treatment:
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  - Laparoscopy
  - Magnetic Resonance Imaging

TORSION OF THE TESTIS
Introduction
Twisting of the spermatic cord with compromise of the blood supply to the testis
An uncommon affliction that is most commonly seen in adolescent males. A few cases occur in infancy

Clinical features
- Pain in one testicle: of sudden onset, severe in intensity and radiates to the lower abdomen
- Nausea and vomiting
- Swollen, high lying testis with reddening of the scrotal skin
- Tenderness. Pain can be increased by lifting the testicle up
- Absence of the cremasteric reflex

The empty scrotum
Introduction
A clinical situation in which the testis is absent from the scrotum

May be bilateral or unilateral
Causes include:
- Undescended testis
- Ectopic testis
- Retractile testis
- Absent (vanishing) testis

The testes, if palpable cannot be manipulated into the scrotum
Inguinal hernia may be present on the affected side

Complications
- Torsion of the spermatic cord
- Trauma to the testis
- Malignancy
- Infertility

Investigations
- Urinary 17-ketosteroids, gonadotropins
- Serum testosterone
- Intracavernosal injection of alpha adrenergic agonist:
  - Phenylephrine
  - 250 - 500 microgram
  - Or:
    - Ephedrine
    - 50 - 100 mg

STANDARD TREATMENT GUIDELINES FOR NIGERIA 2008

Perineal pain
Haemorrhage
Painful ejaculation
Rectal examination: enlarged, tender, firm prostate

Differential diagnoses
- Benign prostatic hypertrophy
- Cystitis
- Urethral stricture
- Prostate cancer

Complications
- Prostatic abscess
- Prostatic calculi
- Infertility
- Septicaemia

Investigations
- Urinalysis
- Urine microscopy, culture and sensitivity
- Prostatic massage: microscopy, culture and sensitivity
- Trans-rectal ultrasound
- Biopsy: culture and histology
- Urethrocystoscopy (chronic prostatitis only)
- Full Blood Count; ESR

Treatment objectives
- Control pain
- To relieve obstruction
- Treat any complications
- Prevent

Supportive measures
- Correct dehydration and electrolyte imbalance
- Treat infection with appropriate antibiotics
- Urinary diversion: vesicostomy

Prevention
- Not applicable

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- Nausea and vomiting
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- Serum testosterone
- Intracavernosal injection of alpha adrenergic agonist:
  - Phenylephrine
  - 250 - 500 microgram
  - Or:
    - Ephedrine
    - 50 - 100 mg
**Differential diagnoses**
- Acute epididymo-orchitis
- Mumps orchitis
- Trauma to the testis
- Strangulated inguinal hernia
- Inflammatory vasculitis (Henoch-Schönlein purpura)
- Idiopathic scrotal oedema
- Testicular tumour
- Fournier's gangrene

**Complications**
- Testicular atrophy
- Sympathetic orchidopathy
- Abnormal sperm count
- Infertility

**Examination of the external genitalia may reveal:**
- Urethral indurations
- Periurethral or perineal abscess
- Urinary fistula
- Benign prostatic hypertrophy
- Prostate cancer
- Bladder calculi
- Bladder neck stenosis

**Urinary tract infections**
- Urethral/bladder calculi
- Urinary retention
- Fournier's gangrene
- Perineal urinary fistulae
- Progressive renal failure

**Complications**

**Investigations**
- Colour Doppler sonography
  - An absence of arterial flow is typical
- Radionuclide scan using TC-99m pertechnetate
- The twisted testis is avascular

**Treatment objectives**
- Detorsion
- Fixation of the testis to prevent recurrence

**Treatment**
- Fixation on the affected side and prophylactic fixation on the opposite side

**URETHRAL STRICTURE**

**Introduction**
An abnormal narrowing or loss of distensibility of any part of the urethra, as a result of fibrosis

One of the commonest causes of urine retention in tropical Africa

Very rare in females.

May result from trauma or inflammation; may be iatrogenic

**Traumatic causes:**
- Penetrating or blunt injury to the urethra
- From pelvic fractures or falling astride an object

**Infective causes:**
- Gonococcal urethritis or non-gonococcal urethritis from chlamydia, tuberculosis or schistosomiasis

**Iatrogenic causes:**
- Urethral instrumentation e.g. catheterization and urethroscopy
- May be congenital
- May be complete or partial, single or multiple
- Can affect any part of the urethra, anterior or posterior

**Clinical features**
- Dysuria
- Frequency
- Urgency
- Poor stream
- Straining
- Hesitancy

**Drug treatment**
- Serial dilatation/bouginage
- Endoscopic direct visual urethrotomy
- Urethroplasty: excision and end-to-end anastomosis
- Substitution urethroplasty

**Prevention**
- Ensure prevention of sexually transmitted infections
- Prompt and appropriate treatment of sexually transmitted infections
- Care and attention to asepsis during instrumentation procedures involving the urethra

**URETHRAL STRICTURE**

**Introduction**
A common parasitic infection of the urinary tract caused by a body fluke, Schistosoma haematobium

Acquired while bathing/wading in infected water

Endemic in many parts of Africa

Gets to the urinary tract through the blood vessels after penetrating the skin

**Clinical features**
- Soon after penetration of the skin:
  - Pricking sensation and itching (cercarial dermatitis)
  - Four weeks later:
    - Intermittent fever, malaise, urticaria and cough

**Investigations**
- Urinalysis
- Urine microscopy, culture and sensitivity
- Urethroscopy
- Uroflowmetry
- Abdominal ultrasound
- Serum Urea, Electrolytes and Creatinine
- Full Blood Count

**Treatment objectives**
To restore urethral patency

**Drug treatment**
- Nitrofurantoin

**Prevention**
- Prophylaxis

**Schistosoma haematobium**

**Acquired while bathing/wading in infected water**

**Endemic in many parts of Africa**

**Gets to the urinary tract through the blood vessels**

**Penetrating the skin**

**Clinical features**
- Pricking sensation and itching (cercarial dermatitis)
- Four weeks later:
  - Intermittent fever, malaise, urticaria and cough

**Treatment objectives**
To eradicate the fluke and ova

**Prevent complications**

**Drug treatment**
- Nitrofurantoin

**Prevention**
- Prophylaxis

**Schistosoma haematobium**

**Acquired while bathing/wading in infected water**

**Endemic in many parts of Africa**

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**Penetrating the skin**

**Clinical features**
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- Four weeks later:
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**Treatment objectives**
To eradicate the fluke and ova

**Prevent complications**

**Drug treatment**
- Nitrofurantoin

**Prevention**
- Prophylaxis
FOOD POISONING

Introduction

A spectrum of disorders arising from:
Infections acquired by eating contaminated food
Clinical problems that result from eating food
contaminated with toxins

Clinical sequelae from inherently poisonous animals,
plants or mushrooms

Clinical forms:
Staphylococcal food poisoning:
Streptococcal food poisoning:
Clostridial food poisoning:
**Chapter 11: Infectious Diseases/Infestations**

**HELMINTHIASIS**

**Introduction**

Parasitic worm infestations can arise from different groups:

- **Nematodes (round worms)**
  - Child up to 10 years:
  - Adult:
- **Ascaris**
- **Ancylostoma (hookworm)**
- **Trichuris (whipworm)**

- **Cestodes (flat worms/tapeworms)**
  - Child weeks to 5 months:
  - Adult and child:

**Investigations**

- **Trematodes (flukes)**
  - Child:
  - Adult:

- **Pelvic/perineal granulomas**

**Drug Treatment**

- **Hookworm**

**Presentation**

- **Abdominal pain**
- **Nausea**
- **Diarrhoea**
- **Gastrointestinal bleeding**
- **Mild chronic colitis**

**Identification**

- **Child:**
  - **Enterobiasis**
  - **Ascaris**
  - **Trichuris**
  - **Ancylostoma**
  - **Trichiuris**
- **Adult:**
  - **Enterobius**
  - **Ancylostoma**

**Treat specific complications as appropriate e.g**

- **Antibiotic-unresponsive toxic megacolon:** colectomy
- **Haemolytic-uraemic syndrome:** dialysis
- **Malnutrition from protein-losing enteropathy:** nutritional support; optimal nutritional management

**Prevention**

- **Appropriate environmental and personal hygiene**
- **Hand washing with soap and water**
- **Decontamination of water supplies**
- **Use of sanitary latrines or toilets**
- **Identify and treat chronic carriers among food handlers**
- **Hygienic preparation and storage of food**
- **Ensure that food is cooked at temperatures sufficient to kill bacteria**
- **Refrigerate food whenever possible**
- **Encourage exclusive breastfeeding**
- **Encourage measures measures to reduce the burden of malnutrition (with its attendant predisposition to severe infections)**

**Administer a pentavalent vaccine (A, B, C, D, and E)**

**for persons at high of botulism**

**Report new cases to public health authorities**

**Standard Treatment Guidelines for Nigeria 2008**

- **Abdominal pain**
- **Weight loss**
- **Vulvo-vaginitis**
- **Pelvic/perineal granulomas**

**Trichuriasis**

- **Adult:**
  - **Abdominal pain**
  - **Anorexia**
  - **Bloody or mucoid diarrhoea**
  - **Rectal prolapse**
  - **Growth retardation**

**Strongyloides**

- **Distinguished by its ability to replicate in the human host**

- **Can thus persist for decades without further exposure of the host to exogenous infective larvae**

**Schistosomiasis**

- **Usually no symptoms**
  - **Features of small bowel obstruction**
  - **Features of perforation**
  - **Intussusception**

**Effect of migration of an adult worm up the oesophagus:**

- **Coughing**
- **Oral expulsion of the worm**

**Hookworm**

- **Most are asymptomatic**
  - **Maculopapular dermatitis**
  - **Mild transient pneumonitis**
  - **Ergicatric pain, often with post-prandial accentuation**
  - **Diarrhoea**

**Enterobiasis**

- **Perianal pruritus, worse at night owing to the nocturnal migration of the female worms**
- **Skin excoriation and bacterial superinfection**

**Presentation**

- **Stool examination for ova and parasites**

**Drug Treatment**

- **Piperazine phosphate**
  - **Adult:**
    - **4 g (i.e. the contents of one sachet) stirred into water or milk and taken at bedtime—Repeat after 14 days**

**Enterobiasis**

- **Oral expulsion of the worm**

**Praziquantel**

- **Adult:**
  - **40 mg/kg given orally at once**
  - **Repeat dose 2 weeks later; several treatments may be necessary**

**Trematodes**

- **Piperazine phosphate**
  - **Adult:**
    - **100 mg orally every 12 hours for 3 days**

**Ascaris**

- **Mebendazole**

**Schistosomiasis**

- **Praziquantel**
  - **Adult:**
    - **40 mg/kg given orally at once**
  - **Repeat dose 2 weeks later; several treatments may be necessary**

**Amoxicillin**

- **Plus:**
  - **Gentamicin**

**Prevention**

- **Appropriate environmental and personal hygiene**
  - **Hand washing with soap and water**
  - **Decontamination of water supplies**
  - **Use of sanitary latrines or toilets**
  - **Identify and treat chronic carriers among food handlers**

**Differential Diagnosis**

- **Other causes of acute-onset diarrhoea and/or vomiting**
- **Other conditions depending on the predominant clinical presentation**

**Investigations**

- **Stool examination for ova and parasites**
- **Urine examination: microscopy**

**Haematology:** cosinophilia and anaemia may be present

**Serology and CT scan may be required in some instances**

**Drug Treatment**

- **Hookworm**
  - **Mebendazole**
  - **Adult and child:** 100 mg orally every 12 hours for 3 days
  - **Iron supplementation may be given if anaemia is present**

**Ascaris**

- **Mebendazole**
  - **Adult and child:** 100 mg orally every 12 hours for 3 days

**Prevention**

- **Identify and treat chronic carriers among food handlers**
  - **Hygienic preparation and storage of food**

**Report new cases to public health authorities**
**Prevention**
- Good personal and food hygiene
- Access to safe and potable water
- Regular deworming
- Adequate cooking of food and meats

**HUMAN IMMUNODEFICIENCY VIRUS INFECTION**

**Introduction**
Human Immunodeficiency Virus (HIV) is a retrovirus which infects primarily CD4 T cells (T helper cells). Infection leads to a progressive destruction of the immune system with a consequent myriad of opportunistic infections and the development of certain malignancies.

- Acquired Immuno Deficiency Syndrome (AIDS) is defined as the presence of an AIDS-defining illness (see table 1) with a positive antibody test for HIV.

**HIV transmission**
- Sexual transmission through vaginal and anal sex is the commonest route globally and in Nigeria, accounting for about 80%.
- Transfusion of infected blood and blood products.
- Use of contaminated instruments; sharing needles, tattooing and occupational exposures.
- Mother-to-child transmission of HIV: from an infected mother to her baby during pregnancy, at delivery and, after birth through breast-feeding.

**Clinical features**
- Transient early acute symptoms: commonly “flu”-like illness, often not recognized in the first 2 - 3 weeks of HIV infection:
  - Generalized lymphadenopathy
  - Sore throat
  - Fever
  - Skin rash
- Asymptomatic period:
  - The individual feels well despite on-going viral replication.
- Initial symptoms:
  - Generalized lymphadenopathy
  - Wasting syndrome/fever/night sweats
  - Neurologic disease
  - Early immune failure
  - Oral thrush
  - Herpes zoster
  - AIDS (opportunistic infections)
- Recurrent bacterial pneumonias
- Pulmonary and extrapulmonary tuberculosis
- Pneumocystis carinii infection
- Viral infections including cytomegalovirus

**Other protozoan infections including**
- Cryptosporidium, cryptosporidium.
- Systemic fungal infections
- Other cancers (lymphomas, cervical cancer, etc.)

**Staging of HIV/AIDS**

**WHO Staging System for HIV Infection and Disease in Adults and Adolescents**

**Clinical Stage I:**
- Asymptomatic
- Generalised lymphadenopathy
- Performance scale 1: asymptomatic, normal activity

**Clinical Stage II:**
- Weight loss < 10% of body weight
- Minor mucocutaneous manifestations (seborrhoeic dermatitis, prurigo, fungal nail infections, recurrent oral ulcerations, angular cheilitis)
- Herpes zoster within the last five years
- Recurrent upper respiratory tract infections (i.e. bacterial sinusitis)
- And/or performance scale 2: symptomatic, normal activity

**Clinical Stage III:**
- Weight loss > 10% of body weight
- Unexplained chronic diarrhoea, > 1 month
- Unexplained prolonged fever (intermittent or constant) > 1 month
- Oral candidiasis (thrush)
- Oral hairy leucoplakia
- Pulmonary tuberculosis within the past year
- Severe bacterial infections (i.e. pneumonia, pyomyositis)
- And/or performance scale 3: bedridden < 50% of the day during last month

**Clinical Stage IV:**
- HIV wasting syndrome
- Pneumocystis carinii pneumonia
- Toxoplasmosis of the brain
- Cryptosporidiosis with diarrhoea > 1 month
- Cryptococcosis, extrapulmonary
- Cytomegalovirus disease of an organ other than liver, spleen or lymph node (e.g. retinitis)
- Herpes simplex virus infection, mucocutaneous (> 1 month) or visceral
- Progressive multifocal leucoencephalopathy
- Any disseminated endemic mycosis
- Candidiasis of esophagus, trachea, bronchi
- Atypical mycobacteriosis, disseminated or lungs
- Non-typhoid salmonella septicemia
- Extrapulmonary tuberculosis
- Lymphoma
- Kaposi sarcoma
- HIV encephalopathy
- And/or performance scale 4: bedridden > 50% of the day during last month
- Weight loss of > 10% plus either unexplained chronic diarrhoea > 1 month, or chronic weakness and unexplained prolonged fever > 1 month.

**WHO Improved Clinical Staging**

**Laboratory indices**

<table>
<thead>
<tr>
<th>CD4</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
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<tbody>
<tr>
<td>&gt; 2000</td>
<td>&gt; 500</td>
<td>1A</td>
<td>2A</td>
<td>3A</td>
</tr>
<tr>
<td>1000 - 2000</td>
<td>200 - 500</td>
<td>1B</td>
<td>2B</td>
<td>3B</td>
</tr>
<tr>
<td>&lt; 1000</td>
<td>&lt; 200</td>
<td>1C</td>
<td>2C</td>
<td>3C</td>
</tr>
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</table>

**CDC classification**

<table>
<thead>
<tr>
<th>CD4</th>
<th>Stage A</th>
<th>Stage B</th>
<th>Stage C</th>
</tr>
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<tr>
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<td>C1</td>
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<tr>
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<td>A2</td>
<td>B2</td>
<td>C2</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>A3</td>
<td>B3</td>
<td>C3</td>
</tr>
</tbody>
</table>

**Differential diagnoses**
- Tuberculosis
- Malignancies
- Diabetes mellitus
- Other wasting syndromes
### Complications

**Infectious complications**
- Acute HIV, candidal vaginitis
- PGL, Guillain-Barré syndrome, myopathy, aseptic meningitis
- Cervical cancer, anaemia, lymphomas
- Wasting, peripheral neuropathy, progressive polyradiculopathy, HIV-associated dementia, cardiomyopathy
- HIV-associated Kaposi's sarcoma
- Fatal wasting due to cryptococcosis, toxoplasmosis, and salmonellosis

**Non-infectious complications**
- Malignancies: cervical cancer, lymphomas
- Myopathy, aseptic meningitis
- Agranulocytosis

### Investigations

- **Full Blood Count and differentials**
- **Serological tests**
- **Lipid studies**
- **Liver function tests**
- **Lumbar puncture**
- **Sputum smear**
- **HIV DNA (PCR)**
- **CD4 count testing**
- **Drug resistance testing**

### Treatment objectives

- **Clinical**: prevent disease progression
- **Immunological**: restore immunity
- **Virological**: control or suppress viral replication
- **Public health**: reduce infectivity

### Criteria for initiating ART based on Nigerian ART guidelines

- **Adults and Adolescents**
  - Initiation of therapy depends on availability of CD4 cell count testing
  - If CD4 count is available:
    - WHO Stage IV disease irrespective of CD4 cell count
    - WHO Stage III disease with CD4 cell count < 350/mm³
  - If CD4 count is unavailable:
    - WHO Stage IV disease irrespective of TLC count

- **Children**
  - Monitoring using CD4 percentage
  - Diagnosis depends on the age of the child and availability of virological testing

### Drug treatment

- **Preferred first line regimen**
  - d4T/3TC/EFV
  - ABC/3TC/EFV

- **Alternative first line regimens**
  - ddI/3TC/NVP or EFV
  - TDF/3TC/NVP or EFV
  - ZDV/3TC/NVP or EFV

- **First line recommendations for HIV/TB patients**
  - Children with tuberculosis require rifampicin-containing regimen for TB treatment
  - Children with TB/TB: (ZDV or dT4) + 3TC + NVP during non-rifampicin-containing continuation phase

### Drug resistance

- Diagnosis of HIV to be made using identifying HIV DNA by PCR
- HIV-seropositive children aged <18 months
  - WHO Paediatric Stage III disease irrespective of CD4 %
  - WHO Paediatric Stage II disease, with consideration of using CD4 ≤ 200 to assist in decision making
- WHO Paediatric Stage I (asymptomatic) and CD4 < 200
  - If HIV-seropositive status is not virologically proven but CD4 cell counts are available, ART can be initiated when child has:
    - WHO Stage II or III disease and CD4 ≤ 200
    - In such cases, HIV antibody testing must be repeated at age 18 months to definitively confirm that child is HIV infected
- Only children with confirmed infection should have ART therapy continued

### Management of virological treatment failure

- Children with WHO Paediatric Stage III disease (e.g. clinical AIDS) irrespective of CD4 count
- WHO Paediatric Stage II disease with CD4 < 15%

- Children with WHO Paediatric Stage I disease (e.g. asymptomatic appendix I) and CD4 < 15% (Appendix I)

- For children > 8 years adult criteria for initiation of therapy are applicable

- Children with WHO Paediatric Stage II or III disease and CD4 < 20%
  - d4T or ZDV/3TC/NVP or EFV
  - Abacavir (ABC)

- Children with WHO Paediatric Stage II or III disease and CD4 < 20%
  - Zidovudine (ZDV)
  - Lamivudine (3TC)

- Children with WHO Paediatric Stage II disease with TLC < 1200/mm³:
  - Nevirapine (NVP)
  - 200 mg orally once daily for 2 weeks; then 200 mg twice daily

- Efavirenz (EFV)
  - 600 mg orally once daily; 800 mg once daily when using anti-tuberculosis drug

- Zidovudine (ZDV)
  - 250-300 mg orally twice daily

- Stavudine (d4T)
  - 40 mg orally twice daily
  - If weight < 60 kg: 30 mg twice daily

- Lamivudine (3TC)
  - 150 mg orally twice daily
### Recommended second line regimens

<table>
<thead>
<tr>
<th>Adults and adolescents</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>First line</td>
<td>TDF/FTC/IDV/r or SQV/r or LPV/r</td>
</tr>
<tr>
<td></td>
<td>Or: ABC/ddI/IDV/r or SQV/r or LPV/r</td>
</tr>
<tr>
<td></td>
<td>Or: ZDV/3TC or ddI/IDV/r or SQV/r or LPV/r</td>
</tr>
<tr>
<td></td>
<td>Or: TDF/FTC/IDV/r or SQV/r or LPV/r</td>
</tr>
</tbody>
</table>

**Note**

- The dose of ddll should be reduced from 400 mg to 250 mg when co-administering with TDF in an adult > 60 kg.
- Reduce dose to 125 mg in adult < 60 kg.
- IDV/r, LPV/r and SQV/r require secure cold chain for storage.
- Co-formulations of the medications above may be used to reduce the pill burden.

### Child dosages

<table>
<thead>
<tr>
<th>Didanosine (ddI)</th>
<th>Lamivudine (3TC)</th>
<th>Stavudine (d4T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 8 months: 100 mg/m² orally twice daily</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt; 8 months: 120 mg/m² twice daily</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&lt; 1 month: 2 mg/kg orally twice daily</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&gt; 1 month: 4 mg/kg orally twice daily</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Adolescents &lt; 50 kg: 2 mg/kg orally twice daily</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note**

- Life-threatening hypersensitivity in 3 - 9% of patients.
- Peripheral neuropathy; worse if combined with ddI.
- Lactic acidosis with or without hepatic steatosis.
- Renal insufficiency and bone demineralization.
- Hemolytic anemia.
- Contraindications.

### Mechanisms with established merit:

- Reduction of viral load with HAART.
- Voluntary counselling and testing (VCT).
- Promotion of safer sex and low-risk behaviour.

### Prevention

- Prevention of mother-to-child transmission (PMTCT).
- Caesarian section.
- Infant feeding choices (Exclusive Formula).
- Safer sex (condom use).
- Post exposure prophylaxis among health workers.
- Needle exchange programmes for IVUs.
- Mechanisms with anticipated (potential) merit:
  - Reduction of viral load with HAART.
  - Post exposure prophylaxis following sexual exposure (rape).
  - Sexual risk reduction.
  - Promotion of safer sex and low-risk behaviour.

### A: Abstinence

**Precautions**

- Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.
- Dress syndrome (drug rash, eosinophilia and systemic symptoms); manifests as fever, arthralgia, etc.
- Hepatitis and jaundice reported.
- Efavirenz (EFV).
- Morbilliform rash may appear; usually not life-threatening.
- CNS side effects in about 50% of patients (usually self-limiting).

### Note

- Refer to standard texts for possible drug-drug interactions in all cases.

### Treatment of STIs

- Nevirapine (NVP).
- Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.
- Dress syndrome (drug rash, eosinophilia and systemic symptoms); manifests as fever, arthralgia, etc.
- Hepatitis and jaundice reported.
- Efavirenz (EFV).
- Morbilliform rash may appear; usually not life-threatening.
- CNS side effects in about 50% of patients (usually self-limiting).

### Contraindications

- Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.
- Dress syndrome (drug rash, eosinophilia and systemic symptoms); manifests as fever, arthralgia, etc.
- Hepatitis and jaundice reported.
- Efavirenz (EFV).
- Morbilliform rash may appear; usually not life-threatening.
- CNS side effects in about 50% of patients (usually self-limiting).

### Oral solution contains: propylene glycol which may precipitate:

- Seizures.
- Stupor.
- Tachycardia.
- Hypersomnolence.
- Lactate acidosis.
- Renal failure.
- Haemolysis.

### Chemotherapeutic regimens

- Children

<table>
<thead>
<tr>
<th>First line</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>ddI or ZDV/3TC/NVP or EFV</td>
<td>ddT or ZDV/3TC/ABC/LPV/r (preferred) or NFV</td>
</tr>
<tr>
<td>ddI or ZDV/3TC/NVP or EFV</td>
<td>ZDV/3TC/LPV/r (preferred) or NFV</td>
</tr>
</tbody>
</table>

**Note**

- Didanosine (ddI):
  - <4 years: not used.
  - 4 - 17 years: 500 mg/m² orally twice daily; (maximum 800 mg) three times daily.
  - Nelfinavir (NFV):
    - <1 year: 40 - 50 mg/kg orally three times daily; or 65 - 75 mg/kg twice daily.
    - 1 - 13 years: 55 - 65 mg/kg twice daily.
    - 7 kg to < 15 kg: lopinavir 12 mg/kg, roxatidine 3 mg/kg orally twice daily with food.
    - 15 - 40 kg: lopinavir 10 mg/kg, roxatidine 2.5 mg/kg orally twice daily with food.
    - >40 kg: lopinavir 400 mg, roxatidine 100 mg orally twice daily with food.

**Adverse drug reactions, caution and contraindications**

- Nevirapine (NVP):
  - Life-threatening skin rash (Stevens-Johnson syndrome); occurs in < 5% of patients, usually within 8 weeks of treatment.
  - Dress syndrome (drug rash, eosinophilia and systemic symptoms); manifests as fever, arthralgia, etc.
  - Hepatitis and jaundice reported.
  - Efavirenz (EFV).
  - Morbilliform rash may appear; usually not life-threatening.
  - CNS side effects in about 50% of patients (usually self-limiting).

- Zalcitabine (dDC):
  - Not available.

- Zidovudine (ZDV):
  - 160 mg/m³ orally every 4 hours.

- Efavirenz (EFZ):
  - Taken orally once daily.

- Zidovudine (ZDV):
  - 800 mg/100 mg over 12 hours.

- Lopinavir/roxatidine (Lop/r):
  - >7 kg to < 15 kg: lopinavir 12 mg/kg, roxatidine 3 mg/kg orally twice daily with food.
  - >15 kg: lopinavir 15 mg/kg, roxatidine 3.75 mg/kg orally twice daily with food.

- Nelfinavir (NFV):
  - 15 - 30 days: 5 mg/kg orally once daily for 14 days, then 120 mg/m² twice daily for 14 days, and 200 mg/m² twice daily.

- Lopinavir/ritonavir (LPV/r):
  - 2 mg/kg orally twice daily up to a maximum of 40 mg per dose.

- Zalcitabine (dDC):
  - Not available.

- Zidovudine (ZDV):
  - 160 mg/m³ orally every 4 hours.

- Efavirenz (EFZ):
  - Taken orally once daily.

- Zidovudine (ZDV):
  - 800 mg/100 mg over 12 hours.

- Efavirenz (EFZ):
  - Taken orally once daily.

- Lamivudine (3TC):
  - 15 - 30 days: 5 mg/kg orally once daily for 14 days, then 120 mg/m² twice daily for 14 days, and 200 mg/m² twice daily.

- Nelfinavir (NFV):
  - 15 - 30 days: 5 mg/kg orally once daily for 14 days, then 120 mg/m² twice daily for 14 days, and 200 mg/m² twice daily.
### Chapter 11: Infectious Diseases/Infestations

#### MALARIA

**Introduction**
An infectious protozoan disease transmitted by the female *Anopheles* mosquito

A major public and private health problem and indeed a cause and consequence of national underdevelopment

Four species of the parasite cause the disease in humans: *Plasmodium falciparum*, * vivax*, * ovale* and * malariae*

* P. falciparum accounts for 98% of all cases of malaria in Nigeria and is responsible for the severe form of the disease

**Classification**

**Uncomplicated**

There are no life-threatening manifestations

**Complicated**

* P. falciparum asexual parasitaemia, with the presence of clinical and/or laboratory life-threatening features

**Clinical features**

These are non-specific:

- Fever
- Chills
- Headache
- Malaise
- Aches and body pain
- Weakness
- Tiredness
- Pallor
- Anorexia
- Vomiting
- Bitterness in the mouth
- Excessive sweating
- Pallor
- Hepatosplenomegaly
- Jaundice

Malaria is severe when there is:

- Repeated vomiting
- Prostration
- Impaired consciousness
- Severe anaemia
- Circulatory collapse
- Hypoglycaemia
- Pulmonary oedema
- Abnormal bleeding
- Jaundice
- Haemoglobinuria
- Febrile seizures
- Renal failure
- Hyperparasitaemia

**Cerebral malaria**

A severe form of malaria

Occurs usually in children and in non-immune adults

Manifests with diffuse and symmetric encephalopathy;

focal neurologic signs are unusual

Requires prompt and effective therapy to avoid fatality

**Diagnosis of malaria**

Absence of fever does not exclude a diagnosis of malaria

Microscopic diagnosis should not delay appropriate treatment if there is a clinical suspicion of severe malaria

**Differential diagnoses**

- Typhoid fever
- Meningitis (daily mosquito)
- Encephalitis
- Septicaemia
- Other causes of fever

**Complications**

- Early:
  - Hypoglycaemia
  - Lactic acidosis
  - Haematological abnormalities
  - Liver dysfunction
  - Pneumonia
  - Septicaemia
  - Non-cardiogenic pulmonary oedema
  - Cerebral malaria
  - 'Blackwater' fever
  - Acute tubular necrosis

- Late:
  - Anaemia
  - Preterm contractions/preterm labour
  - Abortions
  - Low birth weight
  - Intrauterine deaths
  - Congenital malaria

- Hyperreactive malaria splenomegaly
- Quinine or artemisinin derivatives given parenterally are the drugs of choice

**Treatment objectives**

- Eradicate parasitaemia
- Prevent severe malaria
- Attend to the immediate threats of life
- Prevent complications
- Provide personal protection against malaria

**Drug treatment**

Uncomplicated malaria

It is vital to prevent severe disease, therefore as soon as a presumptive diagnosis of malaria is made:

- Insert artesunate suppository per rectum as a single dose
  - Re-insert if expelled; in young children the buttocks may need to be held or taped together for 10 minutes to ensure retention of the rectal dose

Artemisin-based combination therapy is the treatment of choice

**Adult and child over 16 years:**

- Adult:<br>Adult over 14 years: 2 tablets every 12 hours for 3 days; 9 - 14 years: 3 tablets every 12 hours for 3 days; 4 - 8 years 2 tablets every 12 hours for 3 days; 6 months - 3 years: 1 tablet every 12 hours for 3 days
- Child:
  - 9 - 14 years: 3 tablets daily for 5 days
  - 3 - 8 years: 2 tablets daily for 2 days
  - 6 months - 2 years: 1 tablet every 12 hours for 3 days

- Not recommended for children <5 kg or >15 kg

**Definitive treatment**

Artemether-lumefantrine (20 mg/120 mg)

Adult and child over 14 years: 4 standard tablets orally every 12 hours

Child:

- 9 - 14 years: 3 tablets daily for 3 days; 4 - 8 years 2 tablets every 12 hours for 3 days; 6 months - 3 years: 1 tablet every 12 hours for 3 days
- Not recommended for children under 3 months or >5 kg

**Supportive measures**

- Paracetamol (oral/rectal) for symptomatic relief of fever
- If temperature is >38.5°C, when using wet towel, and fan to lower the temperature

**Standard Treatment Guidelines for Nigeria 2008**

- Adult: 20 mg/kg of salt to a maximum of 1.2 g loading dose intravenously, diluted in 10 ml/kg isotonic fluid over 4 hours
- 8 hours after start of the loading dose: 10 mg/kg salt to a maximum of 600 mg over 4 hours, every 8 hours until the patient is able to take orally
- Then change to tablets 10 mg/kg hourly for 7 days or give full dose of artemether-lumefantrine

**Child:**

- 20 mg/kg of salt as loading dose diluted in 10 mL/kg of 4.3% glucose in 0.18% saline or in 5% glucose over 4 hours; later, give 10 mg salt/kg as infusion over 4 hours, and every 8 hours until patient is able to take orally
- Change to tablets 10 mg/kg every 8 hours to complete a total of 7 days

- Where intravenous access is not possible, give quinine dihydrochloride 20 mg/kg salt as loading dose, diluted to 60 - 100 mg/ml intramuscularly in different sites
- 8 hours after loading dose, give 10 mg/kg 8 hours until patient is able to take orally
- Thereafter, change to tablets 10 mg/kg 8 hourly for 7 days or give a full dose of artemether-lumefantrine

**Or:**

- Artesunate

**Adult:**

- 2.4 mg/kg intravenous bolus; repeat 1.2 mg/kg every 12 hours until 1.2 mg/kg once daily for 3 days

**Child:**

- intravenous use reserved for specialists

- Once patient can tolerate oral medication give a full dose of artemether-lumefantrine

**Or:**

- Artemether

- 3.2 mg/kg intramuscular loading dose followed by 1.6 mg/kg daily for 6 days

**Alternatively:**

- Once patient can tolerate oral medication, give full dose of artemether-lumefantrine

**In all cases, patient’s progress should be monitored and management changed as deemed necessary**

**Investigations**

- Blood smear for malaria parasites
- Blood transfusion
- Mother-to-child transmission

**Definitions**

- Acute: 1-21 days
- Late: >21 days

**Investigations**

- Blood sugar
- Urinalysis
- Electrolytes and Urea; Creatinine
- Chest radiograph
- Stool microscopy for ova; occult blood
- White cell count with differentials
- Blood transfusion
- Mother-to-child transmission

**Definitions**

- Acute: 1-21 days
- Late: >21 days

**Complications**

- Early:
  - Hypoglycaemia
  - Lactic acidosis
  - Haematological abnormalities
  - Liver dysfunction
  - Pneumonia
  - Septicaemia
  - Non-cardiogenic pulmonary oedema
  - Cerebral malaria
  - ‘Blackwater’ fever
  - Acute tubular necrosis

- Late:
  - Anaemia
  - Preterm contractions/preterm labour
  - Abortions
  - Low birth weight
  - Intrauterine deaths
  - Congenital malaria

- Hyperreactive malaria splenomegaly
- Quinine or artemisinin derivatives given parenterally are the drugs of choice

**Quinine:**

- 10 mg/kg 8 hourly for 7 days

**Artemisin-based combination therapy**

- Artemether-lumefantrine (20 mg/120 mg)
- Adult and child over 14 years: 4 standard tablets orally every 12 hours

Child:

- 9 - 14 years: 3 tablets daily for 3 days; 4 - 8 years 2 tablets every 12 hours for 3 days; 6 months - 3 years: 1 tablet every 12 hours for 3 days
- Not recommended for children under 3 months or >5 kg

**Artesunate-amodiaquine (4 mg/10 mg base)**

- 4 standard tablets orally every 12 hours

Child:

- 9 - 14 years: 3 tablets daily for 3 days; 4 - 8 years 2 tablets every 12 hours for 3 days; 6 months - 3 years: 1 tablet every 12 hours for 3 days
- Not recommended for children under 3 months or <5 kg

**Brackets**

- The type of bracket signifies whether the drug is sulfonamide (S), tetracycline (T), or quinolone (Q) in order of decreasing line of attack on the organism.

**References**

Chapter 11: Infectious Diseases/Infestations

RABIES

Introduction
An acute disease of the CNS caused by a bullet-shaped rabdovirus that affects all mammals. The virus is a single-stranded RNA virus found in animals, in all regions as urban rabies or sylvatic rabies.

Transmission of infected secretions, usually saliva.
Most exposures are through bites of an infected animal; occasionally contact with a virus-containing aerosol or the ingestion or transplant of infected tissues may initiate the disease process.

Human infection is through contact with unimmunized domestic animals.
Dogs are the most important vectors worldwide.

Clinical features

Prevention

Chemoprophylaxis is not recommended for
- Children born to non-immune mothers in endemic areas
- Pregnant women (see section on antenatal care)
- Travellers to endemic areas

Chemoprophylaxis is recommended for
- Children living in (or travelling to) areas where rabies is enzootic and/or where there is limited access to prompt medical care

Other severe diseases should be treated accordingly

Certain port officials
Bat handlers

Persons living in (or travelling to) areas where rabies is enzootic and/or where there is limited access to prompt medical care
- Those caring for patients caring for patients with rabies
- Although there is no proven evidence of human-human transmission

Pregnancy is not a contraindication; if there is substantial risk of exposure, and rapid access to post-exposure prophylaxis is limited, give pre-exposure prophylaxis

Rabies vaccine:
- 1 ml by deep subcutaneous or intramuscular injection in the deltoid region on days 0, 7, 21, and 28

Booster doses every 2 - 3 years for those at continued risk

TETANUS

Introduction
A common, infectious disease affecting individuals of all ages and sexes, particularly the socio-economically deprived.

Neurologic disorder characterized by increased muscle tone and spasm that is caused by tetanospsasmin, a powerful protein toxin elaborated by Clostridium tetani.

The bacteria are found in the soil, inanimate environment, animal faeces and occasionally in human faeces.

Ports of entry:
- Umbilical stump
- Female genital mutilation (FGM)
- Male circumcision
- Abortion sites
- Penetrative wounds (e.g. nail puncture or intramuscular injection)

Head injury; scalp wounds
- Traditional scarification (e.g. for tribal identity)
- Trado-medical incisions
- Post-operative surgical sites
- Chronic otitis media

Clinical forms:
- Generalized tetanus
- Neonatal tetanus
- Localized tetanus
- Cephalic tetanus

Clinical features

Generalized tetanus
- Lock jaw
- Dysphagia
- Stiffness or pain in the neck, shoulder and back muscles
- Rigid abdomen and stiff proximal limb muscles
- The hands and feet are relatively spared

Neonatal tetanus
- Poor feeding
- Rigidity
- Spasms

There are four stages:
- Non-specific prodrome of 1 - 4 days consisting of
  - Fever
  - Headache
  - Malaise
  - Myalgia
  - Anorexia
  - Nausea
  - Vomiting
  - Sore throat
  - Cough
  - Paraesthesia
  - An acute encephalitic stage
  - Excitement
  - Agitation
  - Confusion
  - Hallucinations
  - Comatose
  - Bizarre aberrations of thought
  - Muscle spasms
  - Meningismus
  - Seizures
  - Focal paralysis
  - Hydrophobia
  - Brainstem dysfunction
  - Diplopia
  - Facial paralysis
  - Optic neuritis
  - Difficulty with mastication
  - Priapism
  - Spontaneous ejaculation
  - Coma
  - Death or recovery

Differential diagnosis:

Gullain-Barré syndrome
Other causes of viral encephalitis
Polyneuritis
Allergic encephalomyelitis

Complications

Inappropriate secretion of ADH
Diabetes insipidus
Cardiac arrhythmias
Adult Respiratory Distress Syndrome (ARDS)
Gastrointestinal (GI) bleeding
Thrombocytopenia
Paralytic ileus

Investigations

Full Blood Count and differentials
Urea and E Electrolytes
Culture of secretions
Cerebro Spinal Fluid (CSF) analysis
Serology
Pulmonary Chain Reaction (PCR)

Treatment objectives

Disinfect wound; avoid early suturing
Provide passive immunization with antitoxin
Differential diagnoses

- Benzylpenicillin (Penicillin G)
  - Adults: 0.6 - 2.4 g daily by slow intravenous injection or infusion in 2 - 4 divided doses; higher doses in severe infections
  - Child: 1 month - 18 years, 100 mg/kg in 4 divided doses every 6 hours; dose doubled in severe infections (maximum 2.4 g, every 4 hours)
  - 1 - 4 weeks: 75 mg/kg daily in 3 divided doses, every 8 hours; dose doubled in severe infection
- Preterm neonate and neonate under 7 days: 25 mg/kg every 12 hours; dose doubled in severe infection

Complications

- Adult: 500 mg intravenously, every 6 hours for 10 days
- Child: neonate, initially 15 mg/kg by intravenous infusion then 7.5 mg/kg twice daily; 1 month - 12 years: 7.5 mg/kg (maximum 400 mg) every 8 hours; 12 - 18 years: 400 mg every 8 hours

Investigations

- Human tetanus immune globulin (TIG)
  - Adult: 250 units by intramuscular injection, increased to 500 units if:
    - The wound is older than 12 hours
    - There is risk of heavy contamination
- TUBERCULOSIS

- M. tuberculosis
- African trypanosomiasis is an acute or chronic disease caused by Trypanosoma brucei gambiense (West Africa) and Trypanosoma brucei rhodesiense (East Africa)
- Clinical features (Gambian Sleeping Sickness)
  - Two clinical stages:
    - Early stage:
      - CNS stage
      - Early stage:
      - Adult: 10 - 21 days later: 3.6 mg/kg intravenously in 3 divided doses for 3 days
      - Child: 10 - 21 days later: 3.6 mg/kg intravenously in 3 divided doses for 3 days
  - Caution
    - Urine should be examined for casts and protein before and after treatment with suramin

TREATMENT GUIDELINES FOR NIGERIA 2008

- Treatment objectives
  - Non-drug treatment
    - Admit patient to a quiet room
    - Protect airway
    - Explore wounds
    - Cleanse and thoroughly debride the wound

- Standard treatment guidelines for Nigeria 2008
  - Malaria fever
  - Meningitis
  - Viral infections involving the CNS

- Early stage:
  - Suramin
    - Adult and child: 5 mg/kg on day 1, 10 mg/kg on day 3, and 20 mg/kg on days 5, 11, 17, 23 and 30

- Late stage:
  - Melarsoprol
    - Adult: 2.0 - 3.6 mg/kg intravenously in 3 divided doses for 3 days, followed 1 week later with 3.6 mg/kg intravenously in 3 divided doses for 3 days
    - Child: 10 - 21 days later: 3.6 mg/kg intravenously in 3 divided doses for 3 days

- Caution
  - Urine should be examined for casts and protein before and after treatment with suramin

- Lumbar puncture follow-up for at least 1 year after treatment with melarsoprol is required

- Surveillance and treatment
  - Chemoprophylaxis
    - Vector control by selective clearing of vegetation and use of insecticides

- Control of muscle spasms
  - Diazepam
    - 20 mg intravenously slowly stat and titrate up to 100 mg/minute, up to maximum total dose of 1g
  - As determined by clinical situation

- Prevent muscle spasms
  - Monitor the patient’s condition and provide support (especially respiratory support) until recovery

- Treatment objectives
  - Neutralize untreated toxoid
  - Prevent muscle spasms
  - Phenerbarbital (dilute injection, 1 in 10 with water for injection)
    - Adults: 10 mg/kg intravenously at a rate of not more than 100 mg/minute, up to maximum total dose of 1g

- Diagnosis
  - Presumptive
    - Based on the clinical suspicion and history of exposure to the tsetse fly
    - A finding of the trypanosome in peripheral blood, lymph node aspirate or CSF is confirmatory

- TRANSPORTATION
  - Centrifugation
  - Blood and urine, urine and other body fluids
  - Cerebrospinal fluid for biochemistry; microscopy, culture and sensitivity
  - Peripheral blood film for the detection of trypanosomes
  - Diagnosis
    - Adult: 250 units should be given after 3 - 4 weeks if patient immunosuppressed or if active immunization with tetanus vaccine is contraindicated

- Investigations
  - Peripheral blood smear for the diagnosis of trypanosomiasis
  - Rapid Card Agglutination Trypanosomiasis Test (CATT) for antibody detection

- Prevention
  - Active immunization of all partially or un-immunized adults, those recovering from tetanus, all pregnant women, infants and un-immunized (missed) children

- Health education
  - Improvement in socio-economic status

- Vector control
  - Selective clearing of vegetation and use of insecticides

- Eliminate the source of toxin
  - Neutralize untreated toxoid
  - Prevent muscle spasms
  - Monitor the patient’s condition and provide support (especially respiratory support) until recovery

- Treatment objectives
  - Neutralize untreated toxoid
  - Prevent muscle spasms
  - Monitor the patient’s condition and provide support (especially respiratory support) until recovery

- Non-drug treatment
  - Administer to a quiet room
  - Protect airway
  - Explore wounds
  - Cleanse and thoroughly debride the wound

- Localized tetanus
  - Increased tone; spasms are restricted to the muscles near the wound
  - Prognosis is excellent

- Cephalic tetanus
  - Trismus
    - Dysfunction of one or more cranial nerves, often the 7th nerve
  - Mortality is high

- Diagnosis
  - Entirely clinical

- Differential diagnoses
  - Alveolar abscess
  - Dysrrhythma
  - Hyperpyrexia
  - Profuse sweating
  - Peripheral vasoconstriction
  - Cardiac arrest
  - Aspiration pneumonia
  - Fractures
  - Muscle rupture
  - Deep vein thrombophlebitis
  - Pulmonary emboli
  - Decubitus ulcers
  - Rhabdomyolysis

- Investigations
  - Wound swab for microscopy, culture and sensitivity
  - Cerebrospinal fluid for biochemistry; microscopy, culture and sensitivity
  - Full Blood Count; ESR
  - Urinalysis; urine microscopy, culture and sensitivity
  - Blood glucose
  - Electrocardiography
  - Serum Electrolytes, Urea and Creatinine
  - Electromyography

- Non-drug treatment
  - Administer to a quiet room
  - Protect airway
  - Explore wounds
  - Cleanse and thoroughly debride the wound

- Provide intubation or tracheostomy for hypoventilation
  - Physiotherapy
  - Monitor bowel, bladder and renal function
  - Prevent decubitus ulcers

- Drug treatment
  - Benzylpenicillin (Penicillin G)
    - Adults: 0.6 - 2.4 g daily by slow intravenous injection or infusion in 2 - 4 divided doses; higher doses in severe infections
    - Child: 1 month - 18 years, 100 mg/kg in 4 divided doses every 6 hours; dose doubled in severe infections (maximum 2.4 g, every 4 hours)
    - 1 - 4 weeks: 75 mg/kg daily in 3 divided doses, every 8 hours; dose doubled in severe infection
    - Preterm neonate and neonate under 7 days: 25 mg/kg every 12 hours; dose doubled in severe infection

- Caution
  - Benzyl penicillin: hypersensitivity reactions
  - Metronidazole: taste disturbances
  - Phenobarbital: caution in renal and hepatic impairment
  - May cause paradoxical excitement, restlessness and confusion in the elderly; hyperkinesia in children

- TRYPANOSOMIASIS (Sleeping sickness)

- Introduction
  - Active immunization of all partially or un-immunized adults, those recovering from tetanus, all pregnant women, infants and un-immunized (missed) children

- Trypanosoma brucei
  - Health education
  - Improvement in socio-economic status

- Adult: Child:

- Early stage
  - African trypanosomiasis is an acute or chronic disease caused by Trypanosoma brucei namely
  - T. brucei rhodesiense (East Africa)
  - T. brucei gambiense (West Africa)

- Clinical features
  - (Gambian Sleeping Sickness)
    - Two clinical stages:
      - Early stage
      - CNS stage
      - Early stage:
      - Adult: 10 - 21 days later: 3.6 mg/kg intravenously in 3 divided doses for 3 days
      - Child: 10 - 21 days later: 3.6 mg/kg intravenously in 3 divided doses for 3 days

- Caution
  - Urine should be examined for casts and protein before and after treatment with suramin

- Lumbar puncture follow-up for at least 1 year after treatment with melarsoprol is required

- Surveillance and treatment
  - Chemoprophylaxis
    - Vector control by selective clearing of vegetation and use of insecticides

- One of the oldest diseases known to affect humans, globally

- Nearly one third of the global population (i.e. 2 billion) people are infected with Mycobacterium tuberculosis and at risk of developing the disease

- More than 6 million people develop active tuberculosis (TB) every year; about 2 million die

- More than 90% of global TB cases and deaths occur in the developing world where 75% of cases are in the most economically productive age group (15 - 54 years)

- M. tuberculosis usually affects the lungs although in up to one third of cases other organs are involved

- If properly treated, TB caused by drug-susceptible strains is curable in virtually all cases; however if untreated it may be fatal within 5 years in more than half of cases

- Transmission usually takes place through the airborne spread of droplet nuclei produced by patients with infectious pulmonary TB and aerosolized by coughing
  - As many as 3,000 infectious nuclei per cough can be produced
  - Droplet nuclei could also be spread by sneezing and speaking

- Poverty and widening gap between rich and poor, hunger, neglect of the disease, the collapse of health infrastructure plus the impact of HIV pandemic
Chapter 11: Infectious Diseases/Infestations

TB of the upper airways
Nearly always a complication of advanced cavitary pulmonary TB
May involve the larynx, pharynx and epiglottis
Hoarseness
Dysphagia
Dysphonia
Chronic productive cough

Genitourinary TB
Urinary frequency
Dysuria
Haematuria
Flank pain

Skeletal TB
Weight bearing joints are affected: spine, hips and knees

Splanic TB (Pott’s disease)
Paraparesis
Paraplegia

TB meningitis
Headache
Mental changes
Confusion
Lethargy
Altered sensorium
Neck rigidity
Ocular nerve paresis
Hydrocephalus

Gastrointestinal TB
Commonly affects the terminal ileum and caecum
Abdominal pain (may be similar to that of appendicitis)
Diarrhoea
Intestinal obstruction
Haematochezia
Palpable mass

Fever
Weight loss
Night sweats
TB peritonitis

Pericardial TB
Fever
Dull retrosternal pain
Friction rub
Cardiac tamponade

Military TB
Fever
Night sweats
Anorexia
Weakness
Weight loss
Cough

Hepatomegaly
Splenomegaly
Lymphadenopathy
Chorioidal tubercles (pathognomonic)
Meningitis

There are no clinical findings specific for a diagnosis of pulmonary TB; a history of contact with a smear positive pulmonary TB case, respiratory symptoms for more than 2-3 weeks not responding to broad spectrum antibiotics, and weight loss; failure to thrive may suggest TB

Differential diagnoses
Will vary depending on the system affected:
- Asthma
- Bronchectasis
- Whooping cough
- Inhaled foreign body
- Cardiac disease
- Carcinomas
- Intracranial space-occupying lesions
- Osteoarthritis, etc

Investigations
- Sputum for AFB, microscopy, culture and sensitivity
- Tuberculin skin test
- Chest radiograph
- Full Blood Count; ESR
- HIV screening
- Urinalysis; microscopy, culture and sensitivity
- CSF microscopy, culture, sensitivity; chemistry
- Nucleic acid amplification
- Drug susceptibility testing
- Others: IVP, bone biopsy, etc as indicated

Complications
- Lung abscess
- Destroyed lung syndrome
- Pressure effects from enlarged lymph nodes
- Obstructive uropathy
- Chronic kidney disease
- Infertility
- Skeletal deformities (varus and valgus; kyphosis, scoliosis)

Treatment objectives
- Cure the disease
- Prevent death from active TB or its late effects
- Prevent relapse of TB
- Decrease transmission of TB
- Prevent the development of acquired drug resistance

Treatment
- Regimen should include at least 4 drugs in the initiation phase
- Standardized regimens are the choice in settings where susceptibility testing of reserve drugs is not available

TPHYPID FEVER
Introduction
A systemic disease characterized by fever and abdominal pain, caused by dissemination of Salmonella typhi or S. paratyphi.
- Transmitted only through close contact with acutely infected individuals or chronic carriers (from ingestion of contaminated food or water)
- Incidence of chronic carriage is higher among women and persons with biliary abnormalities: gall stones, carcinoma of the gall bladder; also higher in persons with gastrointestinal malignancies

Clinical features
- Incubation periods range from 3 - 21 days
- Prolonged fever (38.8 C to 40.5 C)
- A prodrome of non-specific symptoms:
  - Chills
  - Headache
  - Anorexia
  - Cough
  - Weakness
  - Sore throat
  - Dizziness
  - Muscle pains

Gastro-intestinal:
- Diarrhoea or constipation
- Genitourinary TB
- Abdominal pain
- Investigations
  - Rash (rose spots)
  - Hepato-splenomegaly
  - Relative bradycardia

Skeletal TB
- Weight bearing joints are affected: spine, hips and knees

Other diseases
- Leucopenia, neutropenia, leucocytosis can develop early, especially in children; late if complicated by intestinal perforation or secondary infection
- There are no diagnostic tests other than positive cultures

Typhoid fever
- Full Blood Count
- Leucopenia, neutropenia, leucocytosis can develop early, especially in children; late if complicated by intestinal perforation or secondary infection
- Liver function tests
- Values may be elevated
- Electrocardiography
- ST and T wave abnormalities may be present
- Serological tests
- Widal test gives high rates of false positives and negatives

Treatment objectives
- Eliminate S. typhi and S. paratyphi

Non-specific stool, urine, bone marrow; gastric and intestinal secretions
- Nearly always a complication of advanced cavitary tuberculosis
- The probability of contact with a case of TB
- The intimacy and duration of that contact
- The shared environment of the contact (crowding in poorly ventilated rooms)

Clinical features
- Determinants of transmission: from exposure to infection (exogenous factors)
- Determinants of developing TB: from infection to disease (endogenous factors)

Innate susceptibility to disease
- Level of function of the individual’s cell mediated immunity

Age
- Incidence highest during late adolescence and early childhood, women aged 25 - 34 years and the elderly

Other diseases
- The outcome of infection by M. tuberculosis is affected by the presence of:
  - HIV co-infection
  - Silicosis
  - Chronic renal failure and haemodialysis
  - Insulin dependent diabetes mellitus

Immunosuppressive treatment
- Malnutrition
- Old, self-healed fibrotic TB lesions

Clinical features
- Generally non-specific:
  - Fever (low grade and intermittent)
  - Night sweats
  - Wasting
  - Anorexia

General malaise
- Weakness
- Cough (initially non-productive, subsequently productive of purulent and/or blood streaked sputum)
  - Haemoptysis
  - Chest pain
  - Dyspnoea

Adult respiratory distress syndrome (ARDS)
- Pallor
- Finger clubbing
- Extrapulmonary TB

Lymph node TB
- Painless swelling of lymph nodes (usually cervical and supraventricular sites)
  - Usually discrete in early disease; may become inflamed and have a fistulous tract draining caseous material

Plural TB
- Fever
  - Pleuritic chest pain
  - Dyspnoea
  - Dulness to percussion
  - Absence of breath sounds
### Chapter 12: Musculoskeletal System

#### BACK PAIN

**Introduction**
A common complaint which most adults will have had at one time or the other. Defined as any pain of the back, at any site between the neck and the buttocks.

- Low back pain is the commonest; involves essentially the lumbar sacral/coccygeal spine.
- Most cases result from mechanical causes and usually last less than six weeks.
- Causes include:
  - Spondylitis
  - Intra-spinal abscess
  - Tumours (primary or secondary)
  - Osteoporosis
  - Osteomyelitis
  - Trauma
  - Pregnancy

**Clinical features**
Patients will complain of aches, pains, or sometimes proppery sensation. Pain is usually worsened on bending forward if due to a disc pathology.

- Worsened when the intra-abdominal pressure is increased as in sneezing and coughing.
- Worsened on extension of the back if it is due to apophysal lesion.
- Most back pains are from mechanical causes and are self-limiting.

There are danger or 'red flag' features that indicate more serious causes as infections, or malignancy.

- Starting for the first time in persons aged 50 years and above.
- Worsened at night.
- Worse on lying supine.
- Associated with constitutional disturbances such as fever, loss of weight, anorexia, anaemia.
- Associated with radicular pain.
- Associated with structural abnormalities such as kyphosis or scoliosis.

**Differential diagnoses**
Pancreatic or gall bladder, stomach, or intestinal disorders with referred pain.

- Retro-peritoneal tumours
- Alcohol gastric
- Acute appendicitis
- Trauma
- Osteomyelitis
- Pelvic inflammatory disease

**Complications**
Complications of underlying cause(s) or pressure effects on the spinal cord and nerve roots.

**Investigations**

#### GOUT

**Introduction**
A disorder of uric acid metabolism.

- Deposition of uric acid crystals in joints results in recurrent episodes of arthritis, usually in one joint.
- Deposition of uric acid crystals in tissues and joint destruction may occur if untreated.

**Clinical features**
- Acute presentation: acute gout.
- Chronic tophaceous gout: there is deposition of uric acid in tissues such as skin and kidneys.

**Prevention**
- Weight reduction.
- Physical exercise.
- Avoid using inflamed joint(s) during acute attacks.
- Avoid operating on tophi deposits.

**Drug treatment**
- Non Steroidal Anti-inflammatory Drugs (NSAIDs):
  - Indomethacin: 50 mg orally three or four times daily.
  - Ibuprofen: 1.2 - 1.8 g orally daily in 3 - 4 divided doses.
  - Naproxen: 500 mg orally three times daily for 3 days then 500 mg twice daily thereafter.

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**Standard Treatment Guidelines for Nigeria 2008**

- Full Blood Counts; ESR
- C-Reactive Protein
- Calcium, phosphate, alkaline phosphatase levels
- Radiograph of the lumbosacral spine, myelogram
- CT Scan
- MRI
- Bone densitometry

**Treatment objectives**
- Treat underlying cause.
- Relieve pain.
- Treat complications.

**Drug treatment**
- Paracetamol:
  - 1 g orally every 8 hours.
- NSAIDs.
- Ibuprofen 1.2 - 1.8 g orally in 3 - 4 divided doses daily.
- Narcotic analgesics:
  - Morphine 10 mg orally every 4 hours (if necessary).
- Antidepressants.
- Physical therapy.
- Acupuncture.
- Surgery.

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**Prevention**
- Eliminate Salmonella by effective treatment of cases, improved sewage management, improved water treatment and improved food hygiene.
- Typhoid immunization is recommended for those at risk.
- Not a substitute for scrupulous personal and environmental hygiene.

**Investigations**
- Serum uric acid:
  - Normal: 2 - 6 mg/100 mL in females; 2 - 7 mg/100 mL in males.
- During acute attacks in 20% of patients.
- Always elevated in chronic tophaceous gout.
- In patients with urolithiasis and schistosomiasis appropriate treatment should be instituted.
- Correct anatomic abnormalities associated with the disease surgically.
- Cholecystectomy may be required in some cases.
Diclofenac sodium
- 75 mg orally twice daily
Oral corticosteroids:
Prednisolone
- 40 mg in divided doses for 3 days, tapered over 2 weeks
Intra-articular steroids:
Triamcinolone
- 5 - 40 mg by intra-articular/intradermal injection according to patient's size (maximum 80 mg); may be repeated when relapse occurs
Methylprednisolone
- 4 - 80 mg (depending on patient's size) intra-articularly; may be repeated at intervals of 7 - 35 days

Uricosuric agents:
- Allopurinol
- Initially 100 mg orally once daily then maintenance 300 - 400 mg/day
Or:
- Probencid
- 250 mg orally twice daily for 1 week, then 500 mg twice daily
- Increase up to 3 g/day

Notable adverse drug reactions, caution and contraindications
- Allopurinol
- Hypeensionality rashes
- Reduce dose in renal insufficiency
- Probencid
- Blood dyscrasias
- NSAIDs
- Risk of peptic ulceration, bleeding, perforation, renal insufficiency, cardiac decompensation
- Uricosuric agents
- Not to be used during acute gout: arthritis may worsen or evolve into polyarticular disease

OSTEOARTHRITIS
Introduction
A heterogeneous group of diseases manifesting with symptoms and signs in the synovial joints, attributable to dysfunction of the articular cartilage and subchondral bone
It is the end result of all forms of diseases in the joints
- When such changes occur in the intervertebral disc, it is called spondylosis

Clinical features
Affects mostly females 40 years and above. If less than 40 years, underlying causes e.g. trauma or repetitive injuries should be looked for
- Affects mostly weight-bearing joints such as knees, ankles. Other joints such as hips (especially in sickle cell disease), hands and spine may be affected
- Presence of features are:
  - Peeks
  - Morning stiffness of short duration
  - Swelling
  - Creakiness while walking
  - Loss of function and deformity

Complications
Joint deformity
Septic arthritis

Differential diagnoses
Rheumatoid arthritis
Gouty arthritis
Benign Hypermobility Syndrome
Bursitis
Psoriatic arthritis

Investigations
None diagnostic:
Radiographs of affected joints
Investigations to exclude other differentials

Treatment objectives
Reduce pain
Enhance mobility
Prevent deformity

Non-drug treatment
Patient education
Exercise
Physiotherapy
Hydrotherapy
Occupational therapy
Intra-articular lavage

Drug treatment
Paracetamol
- 500 mg - 1 g orally every 8 hours
NSAIDs
- Orally or local application
- Ibuprofen
Adult: 400 - 800 mg orally every 8 hours
- Naproxen
Adult: 500 mg orally every 12 hours
- Diclofenac sodium
Adult: 75 - 150 mg orally in 2-3 divided doses daily
Narcotic analgesics
- Morphine
Adult: 5 - 20 mg orally every 4 hours
Anti-depressants for night pain
- Amitriptyline
Adult: 25 - 75 mg orally in divided doses or as a single dose at bedtime
Capsaicin cream
0.075% cream, apply small amounts up to 3 - 4 times daily
Intra-articular steroids

RHEUMATOID ARTHRITIS
Introduction
A chronic inflammatory disease of unknown cause
Possibly occurs as a result of auto-immunity
Affects primarily the peripheral joints in a symmetric pattern; may affect other organs

Clinical features
Common manifestations are usually preceded by constitutional symptoms such as fatigue, malaise, fever, weight loss, loss of appetite
Joint involvements are characterized, serially or simultaneously, by the following
Significant joint morning stiffness
Polyarthritis
Arthritis of joints of the hands
Bilaterally symmetrical arthritis
- Any joint could be affected but mostly the knees, ankles, hips, shoulders, elbows; not joints of the back

Other clinical features
Rheumatoid nodules
Lymph glands enlargement
Anemia
Hepatosplenomegaly

Differential diagnoses
Systemic Lupus Erythematosus
Polyarticular gout
**Chapter 12: Musculoskeletal System**

**RHEUMATOID ARTHRITIS**

Rheumatoid arthritis is a chronic, autoimmune, inflammatory disease that affects mainly women of child-bearing age. It typically runs a relapsing and remitting course, affecting one or more organs simultaneously.

**Clinical features**
- Warmth
- Redness
- Swelling
- Loss of function

**Treatment objectives**
- Reduce pain
- Improve mobility
- Prevent such organ involvement as kidney and brain

**Drug treatment**
- Disease Modifying Anti-Rheumatic Drugs (DMARDs)
  - Methotrexate: 50 - 150 mg orally daily
  - Azathioprine: Consider withdrawal if no improvement within 3 months
- Biologic agents:
  - Anti-TNF agents
  - B-cell depleting agents
  - Crystal Modulating Agents

**Complications**
- Opporuntistic infections
- Anemia
- Arthritis
- Myocardial infarction
- Premature atherosclerotic disease
- Myocardial infarction

**Investigations**
- Full Blood Count: leucopaenia, thrombocytopaenia, and anaemia
- ESR, CRP
- Urine analysis and microscopy: albuminuria, casts, haematuria
- Urea, Electrolytes and Creatinine
- LE cell test
- Serology: ANA, Anti-ds DNA, Anti-SM, Ro/Ssa, La/SSB, Anti-Cardiolipin antibody
- Radiographs of affected joints
- Echocardiogram
- MRI

**OPPORTUNISTIC INFECTIONS**

Opportunistic infections are common in patients with rheumatoid arthritis, particularly when the disease is severe.

**Prevention**
- Effective treatment of the primary infective agents and other predisposing disease states e.g. sickle cell disease, complicated fractures.

**DISEASE MODIFYING ANTI-RHEUMATIC DRUGS (DMARDs)**

**DMARDs**
- Methotrexate: 10 - 25 mg orally once weekly
- Diclofenac potassium: 50 - 150 mg orally daily
- Chloroquine base: 150 mg orally daily
- Corticosteroids: Pulse methylprednisolone
- Antimalarials: Hydroxychloroquine sulphate

**Non-drug treatment**
- Physiotherapy
- Occupational therapy
- Aches and pains all over the body

**Standard Treatment Guidelines for Nigeria 2008**

**SEPTIC ARTHRITIS**

An inflammation of synovial tissues by bacteria, with production of pus into the joint space.

**Introduction**
- An inflammation of synovial tissues by bacteria, with production of pus into the joint space.
- Also variously called suppurative, purulent or infectious arthritis.

**Drug treatment**
- Antibiotic choice (based on culture report)
- Ceftriaxone 1 g intravenously every 24 hours
- Treatment may be continued for 4 weeks
- There can be a change to oral antibiotics after the first week

**Complications**
- Opportunistic infections
- Anemia
- Arthritis
- Myocardial infarction
- Premature atherosclerotic disease
- Myocardial infarction

**DIFFERENTIAL DIAGNOSES**
- Malaria
Review existing laws on abortion with a view to promoting and protecting the overall wellbeing of mother and unborn child.

**ANTENATAL CARE (ANC)**

**Introduction**
ANC is clinical assessment of mother and foetus, with an overall goal of obtaining the best possible outcomes for both.

An excellent example of preventive health care, as it deals mainly with normal individuals with an emphasis on the practice of health promotion.

Availability, accessibility and utilization of ANC remain poor in Nigeria as in many other developing nations.

**Aims of antenatal care**
- Assessment and management of maternal risk and symptoms
- Antenatal care and management of foetal abnormality
- Diagnosis and management of perinatal complications
- Decision making: timing and mode of delivery
- Parental education regarding pregnancy and childbirth
- Parental education regarding child-rearing

**Providers of antenatal care**
- Community care, supervised predominantly by the midwife
- Shared care between the woman's general practitioner, midwife and obstetrician, with visits interspersed between all health professionals concerned.
- Basic care component — 75% of pregnant women usually qualify for this.
- Hospital-only care — in cases where there is increased risk to the mother, foetus, or both.
- Specialized care component — 25% of women will usually fall under this category.

**Schedule of visits during pregnancy**
- Monthly until 28 weeks gestation, then fortnightly until 36 weeks, and weekly thereafter until delivery, resulting in up to 14 hospital visits during pregnancy.
- Best available evidence indicates that there is no difference in outcome between a four-visit schedule and a twelve-visit schedule.
- Current trends favour fewer visits, while establishing clearly defined objectives to be achieved at each visit.
- Pre-conception visit
- 1st ANC visit
- 2nd ANC visit
- 3rd ANC visit
- 4th ANC visit
- 5th ANC visit
- 6th ANC visit
- 7th ANC visit
- 8th ANC visit
- 9th ANC visit
- 10th ANC visit
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- 148th ANC visit
- 149th ANC visit
- 150th ANC visit
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- Best before, and not later than the 12th week
- 2 ANC visit
- Scheduled around the 26th week
- 3 ANC visit
- Scheduled around the 32th week
- 4 ANC visit
- Between the 36th and 38th week

Postnatal visit-scheduled within 1 week postnatally

This model is suited for the basic care component; the specialized care component is better managed with the 12-visit schedule

Activities during each visit

Pre-conception visit

Assess the general health and well-being of the patient
Take appropriate action based on the outcome assessment

- General advice regarding nutrition and lifestyle

1st ANC visit

Should be in the 1st trimester, preferably before the 12th week

Should last between 30 - 40 minutes

Key objective is to obtain the patient's medical and obstetric history:

- Assess the woman's eligibility to follow the basic component of the new WHO model using the classifying form which contains 18 sets of questions
Activities during the visit should include:

- Physical examination
  - General examination including height and weight
  - Blood pressure
  - Chest and heart auscultation
  - SFH and abdominal palpation

- Vaginal examination, specifically for PAP smear if the woman has not done one in the past 2 years; also for women with past history suggestive of cervical incompetence

Assessment for referral

- Any medical or obstetric conditions that require specialized care

Investigations

- Urinalysis for bacteriuria, proteinuria

For nulliparous women and those with a history of hypertension or pre-eclampsia/eclampsia

Haemoglobin concentration/packed cell volume only if there is evidence of anaemia

Interventions

- Iron
- Folic acid
- Malaria prophylaxis

- Intermittent treatment with sulfadoxine/pyrimethamine

- One full treatment dose in the 2nd and 3rd trimesters

- Last dose not later than 1 month before the Expected Date of Delivery

Or:

- Proguanil 100 - 200 mg orally daily

- Maintain complete clinic records as well as ANC card records

2nd ANC visit

Should be around the 32th week

Expected to take about 20 minutes

Activities during the visit:

- Review history for any changes

- Assess adherence to routine ANC medicines

- Extra attention to advice on:
  - What to do if labour occurs
  - What to do if membranes rupture
  - Birth spacing and counselling on contraception

- Assess for referral

Physical examination

- General examination: pallor, oedema, dyspnoea

- Breast examination

- Blood pressure

- Abdomen: SFH palpation for twin gestation

Investigations

- Haemoglobin concentration or packed cell volume

For practical purposes in developing and tropical countries a haemoglobin concentration of 10 g/dL or haematocrit of 30% is taken as cut off

- Below these levels there may be adverse foetal and maternal outcomes

Classification

- Mild
  - PCV 25 - 29%
- Moderate
  - PCV 20 - 24%
- Severe
  - PCV < 20%

Clinical presentation

- Varies; depends on the severity

- May be asymptomatic or symptomatic

Symptoms

- Generalised weakness
- Lassitude
- Easy fatigability
- Headaches
- Dyspnoea on mild exertion
- Ankle swelling

Signs

- Pallor
- Jaundice may or may not be present
- Pedal oedema
- Tachypnoea
- Tachycardia
- Haemorrhagic or pseudo-tolaemia

- Systolic hypertension, oedema and albuminuria

There may, or not be clinical evidence of causative pathology:

- Sickle cell facies, urinary tract symptoms, etc
- Hepatomegaly: not invariable
- Splenomegaly: not invariable
- Anaemic heart failure in extreme cases

Differential diagnoses

- Nutritional deficiencies
  - Iron, folic acid, protein, vitamin C; trace elements, and rarely vitamin B12
- Physiological demands of pregnancy
  - Excessive red cell haemolysis as in malaria, haemoglobinopathies
- Infections: urinary tract infection, HIV/AIDS
  - Hookworm infestation
- Excessive sweating in the tropics
  - Anaemia
  - Haemolysis

- Reduced ability to tolerate anaesthesia
- Diminished resistance to infection

Anaemia in Pregnancy

Introduction

- Anaemia is the most common complication of pregnancy in Sub-Saharan Africa

- World Health Organization definition of anaemia
  - Haemoglobin concentration less than 11 g/dL or a haematocrit less than 33% in peripheral blood

Interventions

- Iron

- Folic acid

- Tetanus toxoid (2nd injection)

- Antimalarials

- Maintain complete records: clinic as well as ANC card records

4 ANC visit

- The final visit before labour or delivery

- Should take place about or between the 36th - 38th weeks

Activities during the visit include:

- Review history for any changes

- Assessment of adherence to routine ANC medicines

- Physical examination

- General examination

- Blood pressure

- Urinary tract infection, proteinuria and glycosuria

- Haemoglobin genotype

- Blood group

- HIV screening

- VDRL

- Haemoglobin concentration/packed cell volume

Interventions

- Anaemia is the most common complication of pregnancy in Sub-Saharan Africa

- It is a diminution below normal of the total circulating haemoglobin mass

- World Health Organization definition of anaemia

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  - Haemolysis

- Reduced ability to tolerate anaesthesia
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**Preterm labour**
- Precipitate labour
- Death

**Foetal**
- Abortion
- Intrauterine growth restriction
- Intrauterine foetal death
- Still birth
- Prematurity
- Risk of developing anaemia within 2 - 3 months of birth if mother suffered iron deficiency anaemia

**Aetiology/risk factors**
- Present in advanced stages; lack of organized screening programmes for detection of the preclinical stages in many countries
- History of sexually transmitted infections particularly Human Papilloma Virus infection;
- Early first child birth
- High parity

**Investigations**
- Packed cell volume; haemoglobin concentration
- Urinalysis
- Blood Group
- White cell count, differentials
- Electrolytes and Urea
- Liver function tests
- Midstream urine specimen for microscopy, culture and sensitivity
- Chest radiograph
- HIV screening
- Haemoglobin genotype

**Prevention**
- Counseling on contraception; adequate spacing of pregnancies
- Malaria prophylaxis in pregnancy
- Chemoprophylaxis against helminthiasis
- Prompt and appropriate treatment of febrile illnesses in pregnancy
- Provision of accessible and affordable maternity care facilities

**CANCER OF THE CERVIX**
- The second most common malignancy and the leading cause of death among women in developing countries
- 75% of the patients present in advanced stages
- Early sexual exposure
- Multiple sexual partners
- Apromiscuous male partner
- History of sexually transmitted infections particularly Human Papilloma Virus infection;
- Early first child birth

**Introduction**
- Two age groups with highest incidence: 35 - 40 years; 45 - 55 years
- May be asymptomatic
- Blood transfusion
- Consider as from the 37th week for mild anaemia and from the 32nd week for moderate anaemia
- Usually, packed cells under furosemide cover

**Liquid iron**
- Parenteral iron: indicated in mild to moderate anaemia, near term
- Oral haematinics
- Ferrous sulfate
- Vitamin C (ascorbic acid)
- 100 mg three times daily

**Prevention**
- Counselling on contraception; adequate spacing of pregnancies
- Malaria prophylaxis in pregnancy
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- Liver function tests
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- Chest radiograph
- HIV screening

**Principles of management**
- Examination Under Anaesthesia
- Staging and Biopsy
- Treatment of invasive carcinoma of the cervix
- Surgery
- Radiotherapy
- Surgery plus radiotherapy
- Chemo-radiation

**Treatment options will depend on**
- The skill of the surgeon
- Availability of facilities
- The stage of the disease
- Age of the patient
- Ability of available personnel to manage untoward effects of the modality of treatment chosen

**Stages I to II A**
- Surgery or radiotherapy (as primary modes of treatment respectively)
- Radiotherapy can be used as primary mode of treatment in all stages of the disease

**Follow up**
- This is for life
- Regular cytology of vault smears for early detection and prompt treatment of recurrence

**CARDIAC DISEASE IN PREGNANCY**
- A rare but potentially serious clinical entity
- Occurs in about 1% of all pregnancies
- Incidence and prevalence of all heart disease varies from place to place
- Lacunar heart disease is more commonly found in less affluent societies while congenital heart disease now accounts for approximately 50% of cardiac diseases in pregnancy in the UK

**Types of cardiac diseases in pregnancy**
- Acquired
- Rheumatic heart diseases
- Mitral > Aortic > Tricuspid > Pulmonary
- Cardiomyopathies
- Particularly peripartum cardiomyopathy which could be either congestive or obstructive
- Pre-existing hypertensive heart disease
- Iatrogenic heart disease
- Congenital
- Acyanotic heart disease

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- Intravenous urography
- Low socio-economic status
- Smoking
- Micronutrient deficiency
- Oral contraceptive usage
- Poor sexual hygiene
- Intrauterine asphyxia
- Prematurity
- Risk of developing anaemia within 2 - 3 months of birth if mother suffered iron deficiency anaemia

**Treatment objectives**
- Correct haematorcit
- Treat underlying cause(s)
- Of growth and wellbeing for IUGR and intrauterine asphyxia
- Correction of haematorcit
- Mitral > Aortic > Tricuspid > Pulmonary
- Parenteral iron: indicated in mild to moderate anaemia, near term
- Oral haematinics
- Ferrous sulfate
- Vitamin C (ascorbic acid)
- 100 mg three times daily

**Prevention**
- Counselling on contraception; adequate spacing of pregnancies
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- Packed cell volume; haemoglobin concentration
- Urinalysis
- Blood Group
- White cell count, differentials
- Electrolytes and Urea
- Liver function tests
- Midstream urine specimen for microscopy, culture and sensitivity
- Chest radiograph
- HIV screening
Atrial septal defect, ventricular septal defect, patent ductus arteriosus, etc
Cyanotic heart disease
Tetralogy of Fallot, Eisenmenger's syndrome
Acquired forms of cardiac disease appear to be more lethal in association with pregnancy, in women aged 25 years or more, and in third or later pregnancies
Congenital malformations are more prevalent in younger women and in those of lower parity

Clinical features
Severity of heart disease in pregnancy
The New York Heart Association Guidelines (1965) is used.
- Relies on the cardiac response to physical activity; may not bear any relationship to the extent of the lesion present
- Class 1: No limitation of physical activity
- Class 2: Slight to moderate limitation of physical activity: ordinary day-to-day activities cause dyspnoea
- Class 3: Marked limitation of activity. Minimal exertion causes dyspnoea
- Class 4: Symptoms at rest; unable to carry out any physical activity without dyspnoea; orthopnoea may be present

Other symptoms
Palpitations
Nasal stuffiness
Dizziness; light headedness; syncope
Epigastric or subxiphoid pain; bloating, heartburn
Heat intolerance, sweating and flushing

Signs
Plethoric facies
Oedema (legs; occasionally hands and face)
Varicose veins
Bounding pulses and capillary pulsations
Capillary telangiectasia
Prominent jugular venous pulsations
Lateral displacement of cardiac apex
Sinus tachycardia, ectopic beats
Third heart sound

Widely split S, and S, heart sounds
Murmurs
Crepitations

Investigations
Full Blood Count
Serum Electrolytes, Urea and Creatinine
Urinalysis
Blood Glucose
Echocardiography (Doppler) or Electrocardiography
Serial blood cultures (if infective endocarditis is suspected)

Chest radiograph is better avoided in pregnancy

Management
Pre-pregnancy
Fully evaluate patient in conjunction with a cardiologist
Surgically correct any defect that is amenable
Counsel on the following points:
- Risk of maternal death
- Possible reduction of maternal life expectancy
- Risk of foetus developing congenital heart disease;
tetralogy of Fallot restriction
- Possibility of pre-term labour
- Need for frequent hospital attendance; possibly admission
- Need for intensive maternal and foetal monitoring in labour

Antenatal Care
Joint management with the cardiologist
Extreme vigilance: most features of cardiac failure are present in pregnancy
Watch out for anaemia, obesity and multiple gestations for intensive care. Intensive care also required when other medical or psychological conditions co-exist

Examination:
- Ankle and sacral oedema
- Pulse rate and rhythm
- Blood pressure
- Jugular venous pressure
- Basal crepitations
- Symphysio-fundal height (SFH) measurement

Competent dental care:
- Full inspection
- Advice on oral hygiene
- Dental treatment e.g. tooth extraction should be done under antibiotic cover to prevent infective endocarditis

Admission:
- Individualised; usually when complications or intercurrent illnesses occur

Supportive measures
Elastic stockings or tights to prevent pooling of blood in the veins of the lower limb

Anticoagulation
- Indicated for example in patients with congenital heart disease, with pulmonary hypertension; artificial valves;
replacements; those with atrial fibrillation
- Heparin safer in pregnancy; warfarin is teratogenic

Termination of pregnancy and sterilization
- In the absence of high blood pressure
- After 7 days post-partum

Incidence is widely variable. Worldwide range reported to be 1 in 100 – 1 in 3,448 pregnancies

In Nigeria, it is commoner among unbooked patients

Aetiology
- Not exactly known. Its precursor is pre-eclampsia
- A disease of primigravidae, or multigravidae with pregnancy for a new consort

ECLAMPSIA
Introduction
The occurrence of generalized convulsions, associated with signs of pre-eclampsia during pregnancy, labour, or within 7 days of delivery; not caused by epilepsy or other convulsive disorders
Referred to as atypical eclampsia if it occurs
- In the absence of high blood pressure
- After 7 days post-partum

Incidence is widely variable. Worldwide range reported to be 1 in 100 – 1 in 3,448 pregnancies

In Nigeria, it is commoner among unbooked patients

Investigations
Haemoglobin concentration/haematocrit
Bedside crude clotting time
Haemoglobin genotype
Platelet count
Blood Group
Serum Urea and Electrolytes; Creatinine
Liver function tests
Urinalysis

Management
Manage in conjunction with the physician

Supportive measures
Stabilise the patient
Chapter 13: Obstetrics and Gynaecology

Deliver foetus by the safest and most expeditious route
- Prevent complications

Stabilization
- Control (and prevent further) fits
- Control blood pressure
- Maintain the airway
- Ensure adequate urinary output

Monitor
- Controlling fits
- Intravenous diazepam: 10mg stat to abort seizures or prevent fits during examination; then
- Intravenous infusion of glucose 5% in water with 40 mg of diazepam added, and titrated against the patient's level of consciousness

Magnesium sulfate (see details below)

Treatment packs are contained in cardboard boxes containing magnesium sulfate for the loading dose, 24-hour maintenance therapy and treatment of one (recurrent) convolution. Syringes, swabs, drip sets and fluids also contained in treatment packs;

- Calcium gluconate should always be available to manage toxicity
- Intravenous infusion of magnesium sulfate
  - Loading dose: 4 g by slow intravenous injection over a period not less than 5 minutes (preferably over 10 - 15 minutes)
  - Maintenance: 10 g in litre of sodium chloride 0.9%, given by intravenous infusion at a rate of 1g per hour
- The intramuscular magnesium sulfate (Pritchard) regimen
  - Loading dose: 4 g by slow intravenous injection over a period not less than 5 minutes, then 10 g intramuscularly, 5 g by deep intramuscular injection into each buttock
- Maintenance therapy: 5 g by deep intramuscular injection. 2.5 g in each buttock every 4 hours
  - Continue for 24 hours after last convolution, or delivery.

Recurrent convulsions
- Magnesium sulfate
  - 2 - 4 g intravenously over 5 minutes
- Give lower dose (2 g) if the patient is small and/or weight is less than 70 kg

Monitoring during magnesium sulfate therapy
- Continue with intravenous infusion or give the next intramuscular dose only if
  - Patellar reflexes are normal
  - Respiratory rate is < 16 cycles/minute
  - Urine output is > 25 mL/hour (or > 100 mL in 4 hours)
- Consider reducing the dose if
- Renal function is impaired
- Respiratory depression occurs
- Urine output is < 100 mL in 4 hours
- More frequent monitoring is required in the first two hours on intravenous therapy

Magnesium toxicity
- Absent patellar reflexes:
  - Stop magnesium sulfate treatment
  - Administer oxygen by face mask
  - 1 g calcium gluconate by slow intravenous injection
- If respiratory arrest is abnormal:
  - Stop further magnesium sulfate
- If there are no respiratory abnormalities or abnormal patellar reflexes:
  - Reduce the dose by half
- Respiratory arrest:
  - Stop magnesium sulfate treatment
  - Intubate and ensure ventilation (manage with the anaesthetist)
- Calcium gluconate 1 g by slow intravenous injection

Control of blood pressure
- Intravenous hydralazine
  - 5 mg bolus slowly over 15 minutes, stat. Further boluses can be given every 20 - 30 minutes as long as diastolic blood pressure is 110 mg and above
  - Or:
    - Labeltal
    - 20 mg intravenously as a bolus
    - Repeat after 15 - 20 minutes (if need be, increasing the doses)
- The airway
  - Intermittent suction of the nostrils and oropharynx
  - Insert an airway

Urinary output
- Indwelling Foley's catheter for strict fluid input and output monitoring

Monitoring
- Quarter-hourly vital signs
- Record any further fits

Delivery
- Induction of labour
  - Is the first option if the cervix is favourable, particularly if the patient is not yet in established labour
  - Can be done by the use of escalating doses of oxytocin infusion or with misoprostol tablets
  - Elective forceps delivery
  - Should be done if patient is in the second stage to reduce the stress and cardiovascular changes, especially peaks of elevated blood pressure that accompany expulsive efforts at this stage in labour

Emergency Caesarean section is indicated when:
- - Patellar reflexes are unfavourable for induction
- - Foetal distress is present
- - Patient is unconscious (unless delivery is imminent)
- - Vaginal delivery is unlikely within 6 - 8 hours from the onset of the first eclamptic fit and there is an obstetric indication for a Caesarean section

Postpartum
- Continue parenteral anticonvulsant for another 24 hours after delivery (or after last seizure), whichever comes first

Prevention
- Adequate antenatal, intrapartum and postpartum care
- Early detection of pregnancy-induced hypertension
- Aggressive blood management
- This is the 'gold standard' towards achieving good foetal and maternal outcomes

Re-occurrence
- Occurs in 15.6% of cases
- Adequate counselling on the need for early booking, regular antenatal clinic attendance and hospital delivery in subsequent deliveries required

ECTOPIC PREGNANCY

Introduction
- Pregnancy in which the conceptus implants either outside the uterus (fallopian tube, ovary or abdominal cavity) or in an abnormal position within the uterus (cornua, cervix, angular and rudimentary horn)
  - The most common surgical emergency in women in many developing countries
  - A substantial cause of maternal mortality
  - Rapidly with which haemorrhage and shock occur
  - Pre-rupture diagnosis is elusive, with consequent delay in surgical management

Clinical features
- The clinical subsets include:
  - Acute ectopic gestation
  - 25% or less of cases
  - 2-4 g intravenously over 5 minutes
  - Give lower dose (2 g) if the patient is small and/or weight is less than 70 kg
  - Continue with intravenous infusion or give the next dose

Acute Ectopic Gestation
- Amenorrhoea
- Features of acute abdomen particularly lower abdominal pain
- Vaginal bleeding or brownish discharge
- Severe pallor
- Should be done if patient is in the second stage to reduce the stress and cardiovascula
dissolution of trophoblastic tissue (Ru 486)
- Hyperosmolar glucose solution, potassium chloride and prostaglandins can also been used
- Auto transfusion
- During surgery for ectopic gestation; very important in developing countries
- Inadequate blood banking services
- The risks of transfusion with donated blood are avoided
- Use only fresh blood

Auto transfusion
- During surgery for ectopic gestation; very important in developing countries
- Inadequate blood banking services
- The risks of transfusion with donated blood are avoided
- Use only fresh blood

HYPEREMESIS GRAVIDARUM
Introduction
A clinical situation in which vomiting in early pregnancy considered to be physiological becomes persistent or severe enough to disturb the patient's health and/or require hospitalization
- Occurs in approximately a third to 50% of women
- Often the first sign of pregnancy, beginning at about the 6th week and stops spontaneously before the 14th week
- Generally limited to the early morning but may occur at other times of the day

Cause is essentially unknown, but hypotheses include:
- Hormonal: Increased sensitivity to placental hormones such as hCG, estrogen or progesterone
- Psychogenic: The woman thinks she should have early morning sickness because generations before her have had it

Clinical features:
- Persistent and severe vomiting that leads to electrolyte and nutritional derangements

Differential diagnoses:
- It is a diagnosis of exclusion. Concerted effort must be made to exclude the under listed causes of pathological vomiting:
  - Multiple gestations
  - Hydatidiform mole
  - Malaria in pregnancy
  - Gastrointestinal disorders:
    - Heartburn due to hiatus hernia: a common cause of vomiting in late pregnancy
    - Enteritis
    - Appendicitis
    - Peptic ulcer disease
    - Hepatitis
    - Acute fatty liver of pregnancy
    - Pancreatitis
    - Cholecystitis
    - Urinary tract disorders: pyelonephritis

Acute polyhydramnios
- Commonly associated with monozygotic twinning and diabetic pregnancies
- Pre-eclampsia
- Accidents to ovarian cysts
- Infarction, haemorrhage, infection and rupture of Red degeneration in a fibroid

Complications:
- Biochemical abnormalities
  - Usually sequel to vomiting, starvation and dehydration
  - Ketoacidosis, electrolyte imbalance (alkalosis and hypokalaemia); vitamin deficiencies
- In neglected or poorly managed cases:
  - Severe weight loss
  - Tachycardia
  - Hypotension
  - Oliguria
  - Neurologic disorders from vitamin B1 deficiency
  - Retinal haemorrhages
  - Jaundice (from hepatic necrosis)
  - Oesophagael tears and spontaneous rupture of the oesophagus
  - Mendelson's syndrome
  - Foetal loss
  - Maternal mortality

Investigations:
- Full Blood Count with differentials
- Urea, Electrolytes and Creatinine
- Liver function tests
- Midstream urine for microscopy, culture and sensitivity
- Urinalysis for ketones
- Blood film for malaria parasites
- Ultrasound scan of the pelvis/abdomen

Management:
- Admit
- Start intake-output monitoring
- Intravenous fluid therapy to:
  - Correct electrolyte disturbances
  - Provide calories
  - Rehydrate the patient
- Anti-emetics
  - Those which have been proven not to be teratogenic:
    - Meclizine 25 mg orally
    - Cyclizine 50 mg orally
    - Promethazine 25 mg orally
  - All of these are taken three times daily
- Total parenteral nutrition
  - In severe cases
  - In persistent and intractable cases with significant maternal complications, termination of pregnancy may be considered

HYPEROSMOLAR GLUCOSE SOLUTION
- Rub 486 can be combined with:
  - Hydralazine
  - Methyldopa
- Can also be used in combination with:
  - Non-steroidal anti-inflammatory drugs
  - Oxytocin

IMMUNIZATION SCHEDULES
Introduction
Tetanus immunization for the pregnant woman is geared towards protecting the mother (and baby) against tetanus

Tetanus Immunization Schedule in Pregnancy

<table>
<thead>
<tr>
<th>TIMING OF IMMUNIZATION</th>
<th>PROTECTION OFFERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st dose at booking or on 1st contact</td>
<td>Confers no protection</td>
</tr>
<tr>
<td>2nd dose at 4 weeks after 1st dose</td>
<td>Confers protection for 3 years</td>
</tr>
<tr>
<td>3rd dose at 6 months after 2nd dose</td>
<td>Confers protection for 5 years</td>
</tr>
<tr>
<td>4th dose at 1 year after 3rd dose or in next pregnancy</td>
<td>Confers protection for 10 years</td>
</tr>
<tr>
<td>5th dose at 1 year after 4th dose or in next pregnancy</td>
<td>Confers protection for life</td>
</tr>
</tbody>
</table>

Immunization and Vitamin A Schedule

<table>
<thead>
<tr>
<th>At Delivery</th>
<th>Vitamin A to Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Birth</td>
<td>BCG; POLIO1, HBV1</td>
</tr>
<tr>
<td>6 Weeks</td>
<td>DPT1, POLIO1, HBV2</td>
</tr>
<tr>
<td>10 Weeks</td>
<td>DPT1, POLIO2</td>
</tr>
<tr>
<td>14 Weeks</td>
<td>DPT1, POLIO3, HBV3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9 Months</th>
<th>MEASLES, YELLOW FEVER, 1st Dose Vitamin A,</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Months</td>
<td>Vitamin A3</td>
</tr>
</tbody>
</table>

Many indicators of liver disease in the non-pregnant state are normal findings in pregnancy. These include:
- Spider naevi
- Decreased plasma albumin
- Increased alkaline phosphatase
Aetiology peculiar to pregnancy

- Viral hepatitis
- Haemolytic jaundice
- Adverse reactions to drugs e.g. chlorpromazine, tetracycline
- Congenital hyperbilirubinaemias such as Dubin-Johnson syndrome
- Liver cirrhosis

Clinical features

Aetiology peculiar to pregnancy

- Viral hepatitis
- Haemolytic jaundice
- Adverse reactions to drugs e.g. chlorpromazine, tetracycline
- Congenital hyperbilirubinaemias such as Dubin-Johnson syndrome
- Liver cirrhosis

Clinical features

Acute yellow atrophy

- A rare and serious disorder associated with high mortality
- Common in the order of 1: 10,000 pregnancies
- Unknown aetiology

Typically noted in primigravidae, occurring after the 30th week or few days after birth

- The jaundice is classically obstructive
- Onset usually sudden with:
  - Abdominal pain (right upper quadrant)
  - Headaches
  - Nausea and vomiting
  - Progressive jaundice
  - Encephalopathy

Histology

- Peribiliary fatty infiltration of the liver cells

There is no place for liver biopsy because of bleeding complications

Management

- Early diagnosis is mandatory
- Clinical features with evidence of deranged LFTs and renal failure

The management it requires a combined team of obstetrician, physician and anesthetist

Definitive treatment

Deliver the baby as soon as possible (frequently by Caesarean section)

Supportive measures

- Transfusion with blood, fresh frozen plasma, platelets as indicated
- Dialysis

Complications

- Increased serum lipids
- Prothrombin time, transaminases and bilirubin are unaltered in normal pregnancy
- Jaundice occurs in about 1 in 1,500 - 2,000 pregnancies

Chapter 13: Obstetrics and Gynaecology

- Disseminated intravascular coagulopathy
- Hypotension
- Significant risk of maternal and foetal death due to:
  - Maternal liver failure
  - Metabolic disturbance
  - Encephalopathy
  - Overwhelming haemorrhage associated with clotting defects

Prognosis

- Good

Post-natally, liver function returns to normal over a few weeks and there is no evidence of long-term liver dysfunction

Cholestasis of pregnancy

- Uncommon, in the order of 1: 2,000 pregnancies
- Common in certain southern American countries particularly Chile

Presented commonly in late third trimester, after 36 weeks

- Clinically significant because of its association with IUGR and IUPD (mechanism unclear)

It is not as a rule associated with maternal complications

Clinical features

Generalized pruritus

- Occurs foetal movements
- Upper abdominal pain
- Dark urine
- Steatorrhea

Occasionally there is jaundice (particularly in the later stages of the disease)

Investigations

- Liver function tests:
  - Mildly deranged
  - Serum bilirubin and bile salts may be elevated

Differential diagnoses

Viral hepatitis

Early HELLP syndrome

Acute fatty liver

Management

Careful maternal follow-up with LFTs

Foetal surveillance: by growth (serial USS biometry) and well-being (CTG) monitoring

If all is well induce at 38 weeks

Management of pruritus

- See Cholestasis of pregnancy

Recurrent

- Risk of recurrence is 50%

Can be precipitated by oestrogen-containing oral contraceptive pills

Viral hepatitis

- The most common cause of jaundice in pregnancy, accounting for about 40% of the causes
- Incidence during pregnancy is probably no more than normal population
- Pregnancy does not alter the course of the disease
- Hepatitis A virus does not affect the foetus
- Unlike other hepatotrophic viral infections, which carry a significant risk of vertical transmission (particularly in the third trimester)
- A severe attack may influence foetal outcome
- Slight increase in premature labour and stillbirths (as seen in any severe medical illness)

Treatmen

Avoid any further damage to the liver by drugs

- Bed rest
- Adequate nutrition
- If hepatitis B is present then the infant requires protection with immunoglobulins against HBsAg
- Hepatitis B immunoglobulin by intramuscular injection

Neonate: 200 units as soon as possible after birth

Child 1 month - 5 years: 200 units; 5 - 10 years: 300 units; 10 - 18 years: 500 units

Avoid breastfeeding

Delivery room personnel must exercise great care in dealing with these patients, as all their body fluids are highly infectious

Immediate delivery if hepatitis becomes fulminating

PELVIC INFLAMMATORY DISEASE

Introduction

Ascending pelvic infection involving the upper genital tract

Usually involves sexually transmitted organisms e.g. Neisseria gonorrhoeae and Chlamydia trachomatis

- May also be caused by organisms endogenous to the lower genital tract
- In severe cases, organisms may migrate via the peritoneum to the upper abdomen causing perihepatic adhesions: the so-called “violin strings” (Fitz-Hugh-Curtis syndrome)
- Responsible for significant morbidity in women, accounting for about 30% of all gynaecological admissions in sub-Saharan Africa
- It is thought that 3% of women have Pelvic
### Inflammatory Disease (PID) during their lifetime

**Risk factors**
- Peak incidence between 15 - 25 years
- Multiplicity of sexual partners
- Use of intrauterine contraceptive devices
- Usually within the first 4 months of use

**Clinical features**

#### Major criteria (the Westrom triad):
- Cervical excitation tenderness
- Adnexal tenderness

#### Minor criteria
- Fever (38°C)
- Leucocytosis
- Purulent vaginal discharge
- Adnexal mass

**Diagnosis**
- Based on the presence of the Westrom triad of symptomatology plus one of the minor criteria
- Confirmation by demonstration of causative organism(s) on microscopy, culture and sensitivity testing

**Differential diagnoses**
- Acute appendicitis
- Ovarian cyst accident
- Endometriosis
- Urinary tract infections
- Renal disorders (e.g. nephrolithiasis)
- Pelvic adhesions
- Lower lobe pneumonia
- Ectopic gestation

**Complications**
- Pelvic abscess
- Septicaemia
- Chronic pelvic pain
- Ectopic gestation
- Infertility
- Fitz-Hugh-Curtis syndrome
- Recurrence (about 25% rates)

**Investigations**
- Packed cell volume
- Haemoglobin genotype
- Blood Group
- White Blood Cell count
- Electrolytes and Urea
- Midstream urine microscopy, culture and sensitivity
- Endocervical swab
- High vaginal swab culture: to exclude trichomoniasis, bacterial vaginosis
- Urthral swab
- Ultrasound scan: to exclude cyes, ectopic gestation, adnexal mass (e.g. ovarian mass)

**Indications for admission**

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### Chapter 13: Obstetrics and Gynaecology

#### Risk factors
- Age:
  - Peak incidence between 15 - 25 years
- Sexual activity:
- Multiplicity of sexual partners
- Use of intrauterine contraceptive devices:
- Usually within the first 4 months of use

#### Clinical features

**Major criteria**
- Presence of a pelvic mass
- Presence of an intrauterine device
- Upper abdominal pain
- Adnexal tenderness
- Pregnancy
- Nulliparity

**Minor criteria**
- Presence of an intrauterine device
- Upper abdominal pain
- Adnexal tenderness
- Pregnancy
- Nulliparity

**Major diagnoses**
- Acute appendicitis
- Ovarian cyst accident
- Endometriosis
- Pelvic adhesions
- Lower lobe pneumonia
- Ectopic gestation

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**Indications for admission**

---

**Treatment objectives**
- Rehydrate adequately
- Indicating the infecting organism(s)
- Prevent complications

**Drug treatment**
- Appropriate antibiotics for an adequate period
- The antibiotic chosen should cover all possible causative organisms while awaiting culture/sensitivity results
- Outpatient therapy while awaiting culture results:
  - Ceftriaxone (or equivalent cephalosporin)
    - 1 g intramuscularly stat
- Doxycycline
  - 100 mg orally every 12 hours for 14 days
  - Or:
    - Clindamycin/gentamicin/metronidazole
    - 100 mg orally every 12 hours Plus:
- Admit, re-evaluate and give appropriate intravenous therapy
- Inpatient triple therapy:
  - Ceftriaxone/doxycycline/metronidazole
  - Metronidazole
  - If no response in 48 - 72 hours
- Admit, re-evaluate and give appropriate intravenous therapy
- Outpatient triple therapy:
  - Metronidazole
  - 400 mg orally every 8 hours for 10-14 days
  - Plus:
    - Doxycycline
    - 100 mg orally every 12 hours
    - Or:
      - Clindamycin/gentamicin/metronidazole
- Triple antibiotic regimen to be continued for 48 hours after the patient improves clinically
- Subsequently, the patient should continue therapy with:
  - Doxycycline
  - 100 mg orally every 12 hours
  - Plus:
    - Metronidazole
    - 400 mg orally every 8 hours for 10-14 days

**Prevention**
- Encourage the use of barrier contraceptive with spermicides
- Modify risky sexual behaviour: avoid multiplicity of sexual partners
- Contact tracing: to break the existing chain of infection and prevent recurrence
- Prompt diagnosis and treatment to prevent long term complications

**RAPE**
- **Introduction**
  - Performance of the act of sexual intercourse by force, duress, intimidation or without legal consent (as with a minor)
  - A growing social disorder afflicting the poor and rich, alike, with devastating and longstanding emotional consequences for the afflicted, family and society at large
  - An enormous societal problem that appears to be poorly recognized and grossly under-reported
  - An average of one in five adult women may have experienced sexual assault during her lifetime
  - Adult women are much more likely to be raped by a spouse, ex-spouse, or acquaintance than by a stranger
  - The girl-child is much more likely to be raped by her close male associates (non-strangers), not excluding her father, uncle, brother, cousin, neighbour, school teacher, family driver, security personnel, and even faith-based instructor
  - Mental illness, alcohol and drug abuse appear to be predisposing factors; neglect and inattentiveness to the needs of the girl-child also contribute

**Diagnosis**
- Based on the presence of the Westrom triad of symptomatology plus one of the minor criteria
- Confirmation by demonstration of causative organism(s) on microscopy, culture and sensitivity testing

**Differential diagnoses**
- Acute appendicitis
- Ovarian cyst accident
- Endometriosis
- Urinary tract infections
- Renal disorders (e.g. nephrolithiasis)
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- Urthral swab
- Ultrasound scan: to exclude cyes, ectopic gestation, adnexal mass (e.g. ovarian mass)

**Indications for admission**

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**Standard Treatment Guidelines for Nigeria 2008**

**Non-drug measures**
- Reassure patient
- Provide information about legal services

**Drug treatment**
- Treat physical injury (as appropriate)
- Treat STIs, UTI (as appropriate)
- Treat HIV infection (if detected)
- Reassure patient
- Provide information about legal services
- Rehydrate adequately
- Indicating the infecting organism(s)
- Prevent complications

**Prevention**
- Promote Basic Education for All
- Reduce adult illiteracy
- Promote family/community moral values
- Promote Basic Health Education
- Promote safe shelter and neighbourhoods
- Enforce existing laws on rape
- Promote socio-economic well-being for all

---

**Infections and pregnancy**
- It is important to document clinical findings
- **Reassure patient**
- Provide information about legal services
ACUTE EPIGLOTTITIS

Introduction

A life threatening, rapidly progressive cellulitis of the epiglottis that may cause complete airway obstruction.

Most common in children, in whom Haemophilus influenzae is the most common pathogen.

In adults, is often caused by Strept. pneumoniae and group A streptococcus.

Clinical features

Fullmant presentation in children with:

- Fever
- Irritability
- Cough
- Dysphonia

Airway occlusion
- Dyspnoea
- Dysphonia

Adults’ symptoms are less fulminant, presenting with:

- Sore throat
- Dysphagia
- Dysphonia

Absence of hoarseness distinguishes acute epiglottitis from acute laryngitis.

Differential diagnoses

Acute laryngitis

Laryngo-tracheo-bronchitis (Croup)

Complications

Complete airways obstruction and aspiration.

Investigations

Lateral X-ray of the neck

“Thumb sign” appearance of the enlarged epiglottis.

Blood culture

Do not view the epiglottis using a tongue depressor: this may cause laryngospasm, with complete respiratory obstruction.

Treatment objectives

- Safeguard the airway
- Control infection
- Drug treatment

Cefuroxime

Adult: 250 mg orally every 12 hours for 5 - 10 days.
Child: 125 mg orally every 12 hours for 5 - 10 days.

Or:

Ceftriaxone

Adult: 250 - 500 mg intramuscularly or intravenously for 5 - 10 days.
Child: neonate, infuse over 60 minutes, 20 - 50 mg/kg daily (maximum 50 mg/kg daily).

Daily in severe infections

Supportive measures

Oxygen

Steam inhalation

Nasotracheal intubation may be required.

Notable adverse drug reactions, caution

Cefuroxime: avoid in pregnancy and in patients with renal impairment.

Ceftriaxone: rashes, fever, gastrointestinal disturbances.

Recent dose reduction in the elderly.

Ceftriaxone: avoid in pregnancy and in patients with renal impairment.

Cefuroxime: avoid in pregnancy and in patients with renal impairment.

Acute LARYNGO-TRACHEO-BRONCHITIS (Croup)

Introduction

An infection of the upper and lower respiratory tract affecting children 2 - 3 years of age.

Causes significant sub-glottic oedema.

Most common aetiology is parainfluenza virus infection preceded by an upper respiratory tract infection.

Clinical features

- Fever
- Hoarseness
- ‘Bovine cough’
- Inspiratory stridor

Difficult diagnosis

Acute epiglottitis

Complication

Respiratory obstruction.

Investigations

Radiograph of the neck (postero-anterior view).

Treatment objectives

- Prevent asphyxiation.
- Treat inflammatory oedema.

Supportive measures

Humidification.

Hospitalization may be necessary.

Drug treatment

Nebulized epinephrine

Child: 400 micrograms/kg (maximum 5 mg).
- Repeat after 30 minutes if necessary.
- For use up to 300 micrograms/kg/day especially in emergencies.

- Give parenterally in more severe cases.
- May repeat dose after 12 hours if necessary.

Acute asthma episodes:

Nebulized salbutamol.

Adult: 10 micrograms every 3 minutes.

Child (1 - 5 years): 5 - 10 micrograms every 3 minutes.

Child (6 - 12 years): 10 - 20 micrograms every 3 minutes.

Intravenous aminophylline.

Adult: 250 - 500 mg slowly (with close monitoring) over 20 minutes.

Child (1 month - 18 years): by intravenous injection 5 mg/kg (maximum 500 mg), and by intravenous infusion.

Supportive measures

- Steam inhalation with a drop of eucalyptus oil.

Notable adverse drug reactions

Paracetamol: raised liver enzymes, renal papillary necrosis.

BRONCHIAL ASTHMA

Introduction

A chronic inflammatory disease of the airways that is characterized by hyper-responsiveness of the tracheo-bronchial tree to a multiplicity of stimuli.
Chronic management is based on severity:

**Intermittent symptoms**
- Inhaled salbutamol on as-needed basis

**Mild persistent asthma**
- Inhaled salbutamol
  - Adults: 100 - 200 micrograms for persistent symptoms up to 4 times daily
  - Child 1 month - 18 years: 100 - 200 micrograms (1 - 2 puffs) up to 4 times daily (for occasional use only)

**Moderate persistent asthma**
- Inhaled salbutamol
  - Adults: 100 - 200 micrograms for persistent symptoms up to 4 times daily
  - Child 1 month - 18 years: 100 - 200 micrograms (1 - 2 puffs) up to 4 times daily (for occasional use only)

**Severe persistent asthma**
- Inhaled salbutamol
  - Adult and child up over 18 months: nebulizer 2.5 mg repeated up to 4 times daily; may be increased to 5 mg if necessary
  - Child under 18 months: 1.25 - 2.5 mg up to 4 times daily
  - Repeated administration may be required in severe cases

**Notable adverse drug reactions, caution**
- In all cases, prescribers/dispensers should consult product literature to confirm the strengths of various aerosol preparations

**Bronchodilators**
- Inhaled salbutamol
- - Beclomethasone dipropionate 100 microgram 3 - 4 times daily
- Adult: 100 micrograms twice daily, up to 100 micrograms
- Child: 2 - 4 years: 25 micrograms (1 puff) every 12 hours; 4 - 12 years: 50 micrograms (2 puffs) every 12 hours; 12 - 18 years 50 - 100 micrograms (2 - 4 puffs) every 12 hours
- Child under 2 years: 50 micrograms every 12 hours;
  - 2 - 5 years: 100 - 200 micrograms every 12 hours;
  - 5 - 12 years: 100 - 200 micrograms every 12 hours; 12 - 18 years: 100 - 400 micrograms every 12 hours
- Child under 2 years: 50 micrograms every 12 hours;
  - 2 - 5 years: 100 - 200 micrograms every 12 hours;
  - 5 - 12 years: 100 - 200 micrograms every 12 hours; 12 - 18 years: 100 - 400 micrograms every 12 hours
- Child under 2 years: 50 micrograms every 12 hours;
  - 2 - 5 years: 100 - 200 micrograms every 12 hours;
  - 5 - 12 years: 100 - 200 micrograms every 12 hours; 12 - 18 years: 100 - 400 micrograms every 12 hours

**Diagnosis**
- Central chest pain precipitated by a dry harking cough:
  - Inhaled salbutamol on as-needed basis
  - Suggestive of tracheitis or tracheobronchitis
- Lateral burning chest pain associated with tenderness on physical contact: Bornholm's disease

**Investigations**
- Chest radiography
- Electrocardiography
- Echocardiography

**Treatment objectives**
- Treat primary cause
- Appropriate use of medicines
- Prevention of precipitating factors
- Training of patients in the techniques of the proper use of aerosols/spacer devices is important

**Drug treatment**
- Children:
  - Empirical antibiotics in acute exacerbations
- Adults:
  - Short-acting ß agonist: 40 mg/kg orally in 3 divided doses daily
  - Long-acting ß agonist: 1 - 2 puffs (100 - 200 micrograms) 3 - 4 times daily
  - Avoid precipitating factors
  - Oral corticosteroid
  - Prednisolone

**Child:**
- 40 - 50 mg orally daily for a few days, and then reduce gradually
- 1 - 2 mg/kg orally once daily for 3 - 5 days

**Supportive measures**
- Hydration
- Education on care and precipitating factors

**Clinical features**
- Central chest pain
- Painless palpitations
- Digital clubbing
- Crepitations, rhonchi and wheezes
- Physical findings:
  - Aesthenic features
  - Barbell-shaped chest
- Radiologic features:
  - Chest radiography: saccular, cylindrical or varicose

**Investigations**
- CT scan of the chest
- Bronchoscopy: biopsy of endobronchial lesion
- Sputum microscopy, culture; Ziehl Nielson microscopy
- Ventilatory function test: obstructive pattern

**Treatment objectives**
- Eliminate underlying pathology
- Improve mucus clearance
- Control infection
- Reverse airflow obstruction

**Drug treatment**
- Empirical antibiotics in acute exacerbations
  - Amoxicillin
  - Adult: 500 mg - 1 g orally every 8 hours for 5 - 7 days
  - Child: 40 mg/kg orally in 3 divided doses daily
  - Cotrimoxazole
  - Adult: 960 mg orally every 12 hours for 5 - 7 days
  - Child: 6 weeks to 5 months: 120 mg orally; 6 months - 5 years: 240 mg; 6 - 12 years: 480 mg

**Notable adverse reactions, caution**
- May cause CNS stimulation with insomnia and convulsions
- Avoid precipitating factors
- Appropriate use of medicines
- Training of patients in the techniques of the proper use of aerosols/spacer devices is important

**Bronchiectasis**
- Abnormal and permanent dilatation of medium sized bronchi
- A consequence of inflammation and destruction of the structural components of the bronchial wall, caused by bacterial or viral infections
- May be focal or diffuse

**Clinical features**
- Persistent or recurrent cough
- Purrulent fetid sputum
- Haemoptysis
- Pleuritic chest pain
- With or without a history of preceding pneumonic illness
- Digital clubbing
- Crepitations, rhonchi and wheezes
- Cor pulmonale and right ventricular failure in chronically hypoxic patients

**Differential diagnoses**
- Pulmonary tuberculosis
- Lung abscess
- Chronic bronchitis
- Bullous emphysema

**Complications**
- Massive haemoptysis
- Lung abscess
- Myotic brain abscess
- Pulmonary amyloidosis
- Ventilatory failure
- Cor pulmonale and right ventricular failure

**Investigations**
- Chest radiograph: cystic spaces with air-fluid levels
- Bronchography: saccular, cylindrical or varicose
- Chest CT scan
- Lung abscess
- Pulmonary amyloidosis
- Ventilatory failure
- Computed tomography

**Treatment guidelines**
- Standard Treatment Guidelines for Nigeria 2008

**Chronic obstructive airways disease**
- A pulmonary disorder of adults characterized by chronic airflow limitation in the small airways
- Complicates chronic bronchitis and emphysema
- Obstruction to air flow is only partially reversible with bronchodilator therapy
- Two extreme types of COAD are recognized although there is a lot of overlap

**Clinical features**
- Depending on the predominant syndromes, could be described as follows:
  - Pink puffers
    - Slowly progressive dyspnoea
    - Cough with scanty sputum
  - Aesthetic features
    - Barrel-shaped chest
    - Wheeze
  - These patients mainly have emphysema
  - Blue blouters
    - Prolonged periods of cough and copious sputum
Cough
Introduction
The explosive expiration that clears the tracheo-bronchial tree of secretions and foreign particles or noxious gaseous materials
A defensive reflex reaction
Comes to medical attention only when it becomes troublesome, affects life style and/or when there is concern about its cause
Clinical features
Cough may be:
Acute or chronic
Seasonal
Associated with breathlessness and or wheezing
Productive of sputum: note colour, smell; haemoptysis
Associated with fever
Associated with chest pain: note location and character of pain
Associated with risk factors, e.g. cigarette smoking
Associated with the use of drugs for other illnesses
Associated with other constitutional symptoms
Differential diagnoses
Triggers of cough may rise from the upper or lower airways, or lung parenchyma
Upper airways:
- Inhaled irritants: dust, fumes, smoke
- Upper airways secretion
- Gastroesophageal reflux
Lower airways:
- Inflammation
- Viral bronchitis
- Bronchiectasis
- Bacterial infection
- Bronchial asthma
- Endobronchial tuberculosis
- Bronchial infiltration/compression
Parenchymal lung disease:
- Pneumonia
- Infections
- Interstitial or endobronchial oedema due to heart disease
Drugs:
- ACE inhibitors
- Anti-asthma treatment
Investigations
- Macrorscopic and microscopic examination of sputum
- Sputum culture
Supportive measures
- Assisted ventilation
- Hydration
- Pulmonary physiotherapy
Differential diagnoses
- Avoidance of cigarette smoking
- Avoid / remove atmospheric pollutants
Non-drug measures
Exclude tuberculosis if cough is chronic
Sputum cytology for malignant cells
Chest radiograph where indicated
Differential diagnoses
Adequate rehydration to prevent insipissation
Encourage expectoration for productive cough
Do not use antitussives unless cough is dry, unproductive and distressing
Drug treatment
- Cough suppressants: for dry, unproductive cough
- - Codeine cough linctus
- - Not recommended in children
Notable adverse drug reactions, caution
- Cough suppressants
- Codeine cough linctus: sedation, constipation
Dyspnoea
Introduction
A normal and uncomfortable awareness of breathing
Effort of breathing is out of proportion with exertion
An abnormal and uncomfortable awareness of the discomfort of dyspnoea
Treatment objectives
- Treat cause(s) of dyspnoea
- Restore normal respiration
Complications
- Inflammation
- Viral bronchitis
- Bronchiectasis
- Bacterial infection
- Bronchial asthma
- Endobronchial tuberculosis
- Bronchial infiltration/compression
- Parenchymal lung disease
- Pneumonia
- Infections
- Interstitial or endobronchial oedema due to heart disease
- Drugs:
- - ACE inhibitors
- - Anti-asthma treatment
Investigations
- Macroroscopic and microscopic examination of sputum
- Sputum culture
Supportive measures
- Assisted ventilation
- Hydration
- Pulmonary physiotherapy
Differential diagnoses
- Avoidance of cigarette smoking
- Avoid / remove atmospheric pollutants
Non-drug measures
Exclude tuberculosis if cough is chronic
Sputum cytology for malignant cells
Chest radiograph where indicated
HIV screen if history and clinical features are suggestive
Treatment objectives
- Identify and treat the underlying cause(s)
- Abolish cough
Non-drug measures
Adequate rehydration to prevent insipissation
Encourage expectoration for productive cough
Do not use antitussives unless cough is dry, unproductive and distressing
Drug treatment
- Cough suppressants: for dry, unproductive cough
- - Codeine cough linctus
- - Not recommended in children
Notable adverse drug reactions, caution
- Cough suppressants
- Codeine cough linctus: sedation, constipation

Production
Dyspnoea
Frequent respiratory infections
Central cyanosis
These patients mainly have chronic bronchitis
Cystic fibrosis

Complications
Respiratory failure
Recurrent bronchial infections with Haemophilus influenza and Streptococcus pneumoniae
Cor pulmonale
Left ventricular failure
Pulmonary thromboembolism

Investigations
- Chest radiograph: hyperinflation, pulmonary hypertension
- Ventricular function tests: FEV/FVC ratio
- Blood gas analysis
- Blood pH
- Haematocrit
- Sputum microscopy and culture (during symptom exacerbation)
- Electrocardiogram
- Airways reversibility test

Drug treatment
- Long acting β - agonist
- - Theophylline
- - Aminophylline (see bronchial asthma)
- - Antibiotics (when necessary to control infection)
- - Erythromycin

Adult and child over 8 years: 250 - 500 mg orally every 6 hours, or 500 mg - 1 g every 12 hours (up to 4 g daily in severe infections)
Child: 2 - 8 years: 250 mg orally every 6 hours
Up to 2 years: 125 mg every 6 hours
- - Co-amoxiclavulinate

Adult: 500/125 mg orally every 12 hours
Child 1 month - 1 year: 0.25 mL/kg of 125/31 mg suspension orally every 8 hours; dose doubled in severe infections
1 - 6 years: 5 mL of 250/62 mg suspension every 8 hours; dose doubled in severe infections
6 - 12 years: 5 mL of 250/62 mg suspension every 8 hours; dose doubled in severe infections
- - Metronidazole

Child. neonate, initially 15 mg/kg orally then 7.5 mg/kg every 12 hours; 1 month - 12 years: 7.5 mg/kg (maximum 400 mg) every 8 hours; 12 - 18 years: 400 mg every 8 hours
- - Amoxicillin

Pain relief
Physotherapy

Drug treatment
- Antibiotics
- - Metronidazole

Adult: 500 mg orally every 8 hours
Child less than 5 years: a quarter adult dose; 5 - 10 days

Pain relief
Physotherapy
years: half adult dose
Or: Amoxicillin/clavulanic acid
Adult: 1 g/200 mg orally every 8 hours for 7 - 10 days
(Definitive antibiotic therapy should be based on culture and sensitivity results)

Good dental care
Adequate treatment of acute pneumonia
Prevent pneumonia with vaccination in persons at risk
- HIV infected patients who are still capable of responding to a vaccine challenge
- Patients with recurrent sinusopulmonary infection
- Patients with or acquired hypogammaglobulinaemia

PNEUMONIA
Introduction
An inflammation of the lung parenchyma
Various bacterial species, fungi and viruses may cause pneumonia
The setting in which infection is acquired could be a predictor of the infecting pathogen
Streptococcus pneumoniae is the most common pathogen in community-acquired pneumonia
Other causative organisms:
- Haemophilus influenzae
- Mycoplasma pneumoniae
- Pseudomonas aeruginosa (usually implicated in nosocomial pneumonia)

Clinical features
Typical pneumonia:
- Sudden onset fever, chills and rigors
- Cough with purulent sputum production
- Pleuritic chest pain
- Breathlessness with short inspiratory efforts

Signs:
- Fever
- Herpes labialis
- Tachypnoea
- Signs of lung consolidation
- Pleural friction rubs
Atypical pneumonia:
- Gradual onset
- Dry cough
- Prominent extra-pulmonary symptoms
- Headache
- Sore throat
- Fatigue
- Myalgia
- Chest crackles or rales

Differential diagnoses
- Pulmonary embolism
- Sepsis

Complications
- Lung abcess

- Pleural effusion
- Empyema thoracis
- Septicaemia
- Endocarditis
- Meningitis

Investigations
- Spzmptom examination
- Haemato logical evaluation
- Sputum culture
- Chest radiograph
- Blood cultures
- Serologic studies

Treatment objectives
- Eliminate the infection
- Return to normal lung function

Drug treatment
- Antibiotics
  - Co-amoxiclavulanate
  - Amoxicillin: 1 g/200 mg orally every 12 hours for 5 - 7 days
  - Chloramphenicol: 500 mg orally every 6 hours
  - Cefuroxime: 500 mg orally every 6 hours

- Soft and moderate embolus:
  - Cough
  - Pleuritic chest pain
  - Haemoptysis

- Adult:
  - Tachycardia

- Child:
  - Cough
  - Pleuritic chest pain
  - Haemoptysis

Drug treatment
- Antibiotics
  - Co-amoxiclavulanate
  - Amoxicillin: 1 g/200 mg orally every 12 hours for 5 - 7 days
  - Chloramphenicol: 500 mg orally every 6 hours
  - Cefuroxime: 500 mg orally every 6 hours

Investigations
- Chest radiograph
- Blood cultures
- Serologic studies
- Ventilation/perfusion scan
- Coagulation studies
- Electrocardiogram

Treatment
- Eliminate the infection
- Prevent fatality
- Restore normal lung perfusion

PULMONARY EMBOLISM
Introduction
- Occurs when a venous thrombus is dislodged from its site of formation (thrombotic embolus) or a fat globule from a long bone fracture or crush tissue injury or even a tumour fragment (non-thrombotic embolism), is carried in the blood stream to the pulmonary arterial circulation causing obstruction to alveolar perfusion

Clinical features
- Massive embolus in main pulmonary artery:
  - Sudden death
  - Sudden onset dyspnoea
  - Tachycardia
  - Tachypnoea
  - Hypotension
  - Circulatory collapse
  - Raised jugular venous pressure
  - Small volume pulse
  - Hypertension
  - Circulatory collapse
  - Raised jugular venous pressure

- Small-to-moderate embolus:
  - Cough
  - Pleuritic chest pain
  - Haemoptysis

- Adult:
  - Tachycardia

- Child:
  - Cough
  - Pleuritic chest pain
  - Haemoptysis

Drug treatment
- Antibiotics
  - Co-amoxiclavulanate
  - Amoxicillin: 1 g/200 mg orally every 12 hours for 5 - 7 days
  - Chloramphenicol: 500 mg orally every 6 hours
  - Cefuroxime: 500 mg orally every 6 hours

- Soft and moderate embolus:
  - Cough
  - Pleuritic chest pain
  - Haemoptysis

Supportive measures
- Analgesics
- Supplemental oxygen
- Psychological support

Non-pharmacologic therapy
- Pulmonary embolectomy
- Anticoagulants
- Antithrombotics

- Warfarin
  - Adults: 5.0 units (10.0 in severe pulmonary embolism) loading dose then continuous infusion at a rate of 15 - 25 units/kg/hour
  - Child: neonate, initially 75 units/kg (50 units/kg if under 35 weeks post-menstrual age), then 25 units/kg/hour by intravenous injection, adjusted according to aPTT
  - 1 month - 1 year: same as for neonate
  - 1 year - 18 years: initially 75 units/kg by intravenous injection, then 20 units/kg/hour by continuous intravenous infusion, adjusted according to aPTT

- Enoxaparin
  - Adults: 1.5 mg/kg (or 150 units/kg) by subcutaneous injection every 24 hours, for at least 5 days (until adequate oral anticoagulation is established)
  - Child: neonate, 1.5 - 2 mg/kg by subcutaneous injection twice daily; 1 - 2 months: 1.5 mg/kg twice daily; 2 - 12 months: 1 mg/kg twice daily

- Heparin
  - Adults: 5,000 units (10,000 in severe pulmonary embolism) loading dose then continuous infusion at a rate of 15 - 25 units/kg/hour
  - Child: neonate, initially 75 units/kg (50 units/kg if under 35 weeks post-menstrual age), then 25 units/kg/hour by intravenous injection, adjusted according to aPTT

- Anticoagulants
- Antithrombotics
- Warfarin
- Enoxaparin

- Focal oligoemia
- Pleural effusion
- Wedge-shaped opacity (Hampton's hump)
- Arterial blood gas analysis: hypoxaemia, respiratory alkalosis
- Full Blood Count: leucocytosis
- Raised ESR
- Raised LDH levels

- Prevent fatality
- Restore normal lung perfusion

PULMONARY EMBOLISM
- Prevention
- NOSOCOMIAL PNEUMONIA
- Typical pneumonia:
  - Sudden onset fever, chills and rigors
  - Cough with purulent sputum production
  - Pleuritic chest pain
  - Breathlessness with short inspiratory efforts

- Atypical pneumonia:
  - Gradual onset
  - Dry cough
  - Prominent extra-pulmonary symptoms
  - Headache
  - Sore throat
  - Fatigue
  - Myalgia
  - Chest crackles or rales

- Differential diagnoses
- Pulmonary embolism
- Sepsis

- Complications
  - Lung abcess
  - Septicaemia
  - Meningitis

- Notable adverse drug reactions, caution and contraindications
  - Co-amoxiclavulanate: nausea, diarrhoea, skin rashes
  - Cefuroxime: nausea, vomiting, abdominal discomfort,
CHAPTER 15: INJURIES AND ACUTE TRAUMA

BITES AND STINGS

Introduction

Bites occur from:
- Humans
- Domestic animals such as cats and dogs
- Wild animals e.g. snakes, sharks and crocodiles
- Bites from common domestic animals usually result in bruises, lacerations and haemorrhage;
- Rabies may complicate dog bites

Dog bites

- Responsible for 80% of bite wounds
- Bacteriology usually mixed
- Alpha haemolytic streptococci, pasteurella species, staphylococci, Eikenella chorrodeus, actinomyces, fusobacterium, prevotella, pophyomonas species

Cat bites

- Less common
- More than 50% result in infection
- Females are more affected than males
- The hands and arms are more commonly affected

Rats, mice, gerbils and animals that prey on them

- May transmit Streptobacillus moniliformis or Spirillum minor
- Usually affect hunters or laboratory handlers of rats

Clinical features

- Pain
- Fever
- Lymphadenopathy
- Cellulitis

If the canine tooth penetrates synovium or bone:

- Septic arthritis
- Osteomyelitis

Myalgias

Headaches

Severe migratory arthralgia

A maculopapular rash involving the palms and soles

Human bites

May be:

- Self-inflicted
- Sustained by medical personnel caring for patients
- Sustained during fights, rapes or during sexual activity

May become infected more than bites from other animals

The oral microflora include multiple species of aerobic and anaerobic bacteria

Those of hospitalized and debilitated patients often include Enterobacteriaceae

HIV, HBV have been reported due to human bites

Snake bites

In Africa, often occur among farmers who walk unshod

Occasionally occur around homes when snakes are accidentally stepped upon

Poisonous snakes belong to the families of:

- Viperidae
- Elapidae
- Colubridae
- Snakes from common domestic animals usually result in bruises, lacerations and haemorrhage;

Rabies may complicate dog bites

Infections occur 8 - 24 hours after bite and may manifest as:

- Pain
- Fever
- Lymphadenopathy
- Cellulitis

If the canine tooth penetrates synovium or bone:

- Septic arthritis
- Osteomyelitis

Cat bites

- Less common
- More than 50% result in infection
- Females are more affected than males
- The hands and arms are more commonly affected

Usual organisms include P. multocida and those ones following dog bites

Rats, mice, gerbils and animals that prey on them

- May transmit Streptobacillus moniliformis or Spirillum minor
- Usually affect hunters or laboratory handlers of rats

May manifest as:

- Fever
- Chills
### Chapter 15: Injuries and Acute Trauma

**Adrenaline (epinephrine), hydrocortisone must be immediately on hand for the treatment of anaphylaxis if it occurs**

**Prevention**
- Appropriate clothing and footwear while outdoors
- Attention and care to observe general safety measures

**BURNS**

**Introduction**
- A common form of trauma in our environment
- Involves coagulative necrosis of tissue cells following varied insults
  - Flames
  - Chemicals
  - Electricity
  - Friction
  - Cold or hot fluids
- The various types occur with varying frequencies in various segments of the population
- For example scalds occur with great frequency in children while flame burns occur commonly in young adults

**Clinical features (and complications)**
- Extensive skin loss with dehydration
- Airway burns leading to dyspnoea, tachypnoea, stridor, hypoxia, hypercarbia, airway obstruction and death
- Breathing difficulties from circumferential chest burns
- Acute respiratory distress syndrome, acute lung injury and pulmonary oedema
- Massive fluid losses from evaporation and interstitial fluid shifts leading to hypovolaemic shock
- Acute renal failure from pre renal failure, acute tubular necrosis, and the crush syndrome
- Electrolyte abnormalities: hyper or hypokalaemia with acute gastric dilatation
- Stress ulcerations in the gastrointestinal system
- Limb compartment syndrome
- Crush syndrome
- Deep vein thrombosis
- Systemic Inflammatory Response Syndrome (SIRS)
- Organ Dysfunction Syndrome (MODS)

**Investigations**
- Full Blood Count
- Electrolytes and Urea
- Grouping and cross-matching
- Arterial blood gases
- Chest radiograph
- Electrocardiogram

**Treatment**
- Copiously irrigate the wound with cold water (not ice) for 10 - 15 minutes
- Avoid hypothermia and the use of agents such as raw eggs and palm oil
- They are not useful and may promote wound sepsis
- In hospital perform a quick primary survey

**Check:**
- Airway
- Breathing
- Circulation
- Disability
- Exposure
- Correct problems identified
- Give patient 100% oxygen
- Pass an endotracheal tube if there is risk of airway obstruction
- Obtain specimens for investigations as detailed above
- Determine percentage total body surface area (TBSA) burned
- Wallace rule of nines is recommended in adults
- In children there are several charts e. g Lund and Browder charts

**Calculate the total fluid requirement in the first 24 hours using appropriate formulae**
- We recommend the Parkland's Determine burn depth
- Apply burns dressing
- Pass all relevant tubes and gadgets
- Nasogastric tube, urethral catheter, etc
- Perform a detailed secondary survey (especially if combined with other trauma)
- Obtain the AMPLE history

**Allergies,**
- Medications,
- Past medical history, pregnancy,
- Last meal

**Environment (including details of the incident)**
- Administer tetanus prophylaxis depending on immune status
- Apply relevant splintage

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**Wound swab for microscopy, culture and sensitivity**
- Blood culture
- Intracompartmental pressure monitoring

**Treatment objectives**
- At the scene: to stop the burning process or remove victim from the burn situation
- Transfer the patient to hospital as soon as possible
- In the hospital identify life threatening injuries and treat
- Perform a detailed survey
- Restore patient's physiology as much as possible
- Promote wound healing
- Prevent complications
- Rehabilitation

**Prevention**
- Health education to promote healthy life style and avoidance of risky behaviour
- Installation of fire warning systems such as smoke detectors in buildings
- Control of petroleum products
- An efficient fire service
- Fire protocols in all establishments

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**DISASTER PLAN**

**Introduction**
- A disaster is an event which causes serious disruption to community life, threatens or causes death or injury in that community, and/or damage to property
- It is beyond the day-to-day capacity of the prescribed statutory authorities and requires special resources other than those normally available to those authorities
- Could arise from natural causes (cyclones, earthquakes and tsunamis) or from man-made situations such as plane crashes and wars
- Occurs with little or no warning
- Only well-prepared systems will be able to limit the damages and losses that follow disasters
- The effectiveness and quality of response to a disaster is highly dependent on the level of preparation
- An ill-prepared system will lead to an ineffective and uncoordinated response
- Apart from an effective response, other advantages of preparation include cost savings and an improved and alert system
- There are four phases of disaster management:
  - Prevention
  - Preparation
  - Response
  - Recovery

**Prevention**
- Essentially the evolution and implementation of strategies to prevent or mitigate the impact of disasters

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**Prevent specific infections such as rabies in high risk cases**

**Non-drug measures**
- Limb splinting (and rest the limb)
- Use of venom detection kit (if available)
- Application of pressure bandage
- Control/care of the airway
- Incision is discouraged; the mouth should not be used to suction
- Identification of the snake would help in the choice of antivenom (where specific antivenoms are available)

**Wound debridement and fasciotomy for compartment syndrome may become necessary**

**Drug treatment**
- Administration of high flow oxygen
- Intravenous fluid administration to maintain circulation: use colloids or crystalloids as clinically appropriate
- Treatment of anaphylaxis with antihistamines (H, blockers), epinephrine (adrenaline) and corticosteroids
- Tetanus prophylaxis
- For animal bites in which rabies is considered a significant risk it is imperative that anti-rabies prophylaxis be instituted
- If the patient is not previously vaccinated local wound cleansing should be done. Rabies immune globulin administered and the vaccine given

**Antirabies prophylaxis**
- Rabies immune globulin
  - Adult and child: 20 units/kg body weight by infiltration in and around the cleansed wound; if whole volume not exhausted, give remainder by intramuscular injection into anterior-lateral thigh (distant from vaccine site)
  - Half of the dose is infiltrated around the wound and the rest given intramuscularly into the gluteal muscles
- Human Diploid Cell Vaccine (HDCV) or Rabies Vaccine Adsorbed (RVA)
  - 1 mL is given into the deltoid on days 0, 3, 7, 14, and 28
  - Should not be administered in the gluteal area
  - If the patient has previously been vaccinated clean the wound and give the vaccine given on days 0 and 3 only

**Indications for anti-snake venom treatment**

**Symptoms or signs of systemic envenoming:**
- Hypotension, angioedema, urticaria, diarrhoea and vomiting, spontaneous bleeding, adult respiratory distress syndrome, acute renal failure, etc
- Electrocardiograph abnormalities
- Marked local envenoming e.g. swelling extending beyond wrist within 4 hours of bite on hand, or beyond ankle after bite on foot
- Adult and child: contents of the antivenom vial diluted in sodium chloride 0.9% intravenous infusion, and infused intravenously over 30 minutes

**Prevention**
- Commence prophylaxis against deep venous thrombosis
- Physiotherapy
- Decide whether patient should go to a burns unit or burns centre following standard criteria

**Drug treatment**
- Oxygen
- Tetanus toxoid
- Anti-tetanus serum, antitetanus globulin as appropriate
- Narcotic analgesics e. g. morphine, pethidine, tramadol
- Nonsteroidal anti inflammatory analgesics e. g. diclofenac
- H, receptor antagonists e. g ranitidine
- Prophylactic antibiotics e. g cephalosporins
- Topical wound dressing agents e. g with zinc oxide based creams, antibiotic-containing dressings

**Prevention**
- Health education to promote healthy life style and avoidance of risky behaviour
- Installation of fire warning systems such as smoke detectors in buildings
- Control of petroleum products
- An efficient fire service
- Fire protocols in all establishments

**Standard Treatment Guidelines for Nigeria 2008**

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Chapter 15: Injuries and Acute Trauma

Ensure management commitment to disaster management
Committee composition
The committee should be composed of the following:
The Hospital Trauma Director
The Emergency Department Chief
The Head of Surgery
The Head of Anaesthesia
The Chief of Nursing services
The Head of Security
The Head of Stores
The Head of Pharmacy
Representative of the Hospital Manager

The disaster protocol in the hospital should address the following principal issues:
- Who activates the disaster protocol?
- What are the criteria for activation?
- Information relay to critical departments: laboratories, blood bank, theatres, ICU, radiology, anaesthesia, Emergency Department (ED), Management, Hospital Management, Portage and Security
- Pattern of staff call up to the Emergency Department in a disaster situation
- Method of staff call
- Pre-determined plan for Emergency Department evacuation

Recovery
A phase that involves rebuilding, reconstruction and rehabilitation, with a goal to restoring the community to its pre-event state or as close to it as possible.

For a disaster plan to be effective it needs to involve all the stakeholders in its design.

Disaster plan is necessary at various levels of health care and political terrain: national, regional, state and local government levels.

There should be disaster plans within organizations such as the hospitals, fire service, Army, Air force and Navy; the Ministries of health, the police and the Emergency Medical Service (EMS).

There is need for a coordinating agency such as the National Emergency Management Agency (NEMA) to supervise, monitor and coordinate inter-agency procedures, protocols, joint training sessions and drills.

Personnel in all the relevant response agencies must be familiar with the policies, protocols and procedures to be implemented following a disaster.

Training and retraining is essential.

The hospital disaster plan
There should be a Disaster Committee in the hospital which should:
- Design a disaster plan for the hospital
- Put in place procedures and protocols to be implemented in a disaster situation
- Supervise staff training for disaster management
- Be engaged in capacity building
- Promote staff awareness regarding disaster prevention and preparation
- Promote inter-departmental interaction regarding disaster management
- Determine staff competency levels in disaster management
- Allocate staff roles in disaster management
- Ensure regular drills, seminars, tabletop exercises, computer simulations and interactions on disasters
- Ensure stockpile of drugs and equipment to be mobilized in disaster situation
- Ensure quality assurance and audit
- Promote inter-hospital and inter-agency interaction within the municipality with regard to disaster management

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- This is associated with hypertension and bradycardia (Cushing’s reflex)
- Sequentially apnoea, arrhythmias, hypotension and death ensue

Clinical features
These patients may present with:
- Features of multisystem trauma
- Altered level of consciousness
- Skull fractures and mass effect from intracranial lesions
- Features of raised intracranial pressure
- Headaches
- Nausea
- Projectile vomiting
- Drowsiness
- Papilloedema

Complications of TBI:
- A lucid interval (often occurs in extradural haematoma)
- Post injury, the patients maintain a satisfactory level of consciousness until sudden consciousness is lost

Extradural haematoma
Rare, overall, occurs in less than 1% of head injuries
- More common in young patients
- Often results from torn middle meningeal vessels
- CT shows a biconvex or lenticular opacity

Subdural haematoma
More common
- Occurs in 20 - 30% of severe head injuries
- More commonly in the elderly (due to brain atrophy)
- Results from torn bridging veins
- The opacity on CT follows the contour of the brain

Basal skull fracture
May be suggested by:
- Periorbital ecchymosis (racoon eyes)
- Retroauricular ecchymosis (Battle sign)
- CSF leaks
- Facial nerve palsy

Complications of TBI
- Early:
  - Coma
  - Post concussion headaches
  - Post traumatic amnesia
- Retrograde amnesia
- Abnormalities of salt and water metabolism such as diabetes insipidus and syndrome of inappropriate ADH
- Anterior pituitary dysfunction such as ACTH abnormalities and poor cortisol stress response
- Late:
  - Chronic subdural haematoma
  - Infections such as meningitis and brain abscess
  - Hydrocephalus
  - Epilepsy
  - CSF leaks
  - Carotico-cavernous fistulae
  - Traumatic aneurysms
  - Chronic headaches
  - Personality changes
Chapter 15: Injuries and Acute Trauma

Treatment objectives
- Identify life threatening injuries and treat
- Limit primary injury
- Prevent secondary brain injury
- Provide critical care
- Rehabilitate

Primary survey
- Assess airway and maintain patency
- Suctioning and manoeuvres to elevate the tongue (jaw thrust and chin lift) may be useful
- A patent airway is important in optimizing outcome in TBI
- Ventilation is next addressed
- Administer 100% oxygen
- Hypoxia is one of the causes of secondary head injury and must be avoided
- Hypotension is a cause of secondary brain injury and must be avoided
- Intravenous lines should be set up; administer crystalloids
- Assess the GCS and the state of the pupils
-Expose patient to perform a quick general examination but avoid hypothermia.

Secondary survey:
- (See section on multiple injuries)
- Secondary brain injury

Cerebral injury that is not present at the time of the primary insult but develops in response to subsequent intracranial or extracranial events

Extracranial causes:
- Hypoxia
- Hypotension
- Seizures
- Hyperthermia
- Hypotension
- Hypnothermia
- Hyperpyrexia
- Hypoglycaemia
- Hyperpyrexia

Intracranial causes:
- Extrudural haematoma
- Subdural haematoma
- Intracerebral haematoma
- Cerebral oedema
- Cerebral contusion
- Hydrocephalus
- Meningitis
- Brain abscess

CT scan in TBI
- Has revolutionized the management of traumatic brain injury as it can readily diagnose intracranial haematomas and skull fractures
- In trauma it is advisable to do a non-contrast CT scan

Indications for CT scan
- GCS of 14 or less
- GCS of 15 with:
  - Loss of consciousness > 5 minutes
  - Amnesia for injury
  - Focal neurological deficit
  - Signs of calvarial or basal skull fracture

Intracranial pressure monitoring
- Best done through a ventriculostomy catheter, with or without concomitant intraparenchymal transducer

Indications for ICP monitoring in TBI
- Patients with post resuscitation GCS of 8 or less
- Intubated patients in ICU

- Patients with intracranial haematomas but are adjudged not to need surgery

Emergency management of raised intracranial pressure
- Endotracheal intubation
- Controlled ventilation to a pCO2 of 35 mmHg
- Volume resuscitation
- Maintain normal blood pressure
- Narcotic sedation
- Neuromuscular blockade
- Bolus mannitol (1 g/kg)
- See Meningitis
- Head up tilt at 30 degrees
- Controlled hypothermia

Surgery in TBI
- Often indicated in head injury for the evacuation of intracranial haematoma or elevation of depressed skull fractures
- Indications may depend on the centre and the neurosurgeon, but all agree that an intracranial haematoma causing significant mass effect should be removed
- A midline shift of more than 5 mm is considered significant

Indications for surgery will depend on:
- The neurological status of the patient
- Findings on CT
- Extent of intracranial injury
- Intracranial pressure.

The procedures include:
- Burr holes
- Craniotomy
- Craniectomy
- Elevation of depressed skull fractures
- Drill holes
- Diuretics to reduce intracranial pressure e.g. mannitol (see Meningitis)
- Sedatives e.g. diazepam (see Tanus)
- Muscle relaxants e.g. diazepam, suxamethonium
- Muscle relaxants e.g. phenytoin, phenobarbital (see Epilepsy)
- Antibiotics as appropriate

Vasopressors e.g. noradrenaline, dobutamine if there is hypotension, and in collaboration with a physician

Prevention
- Measures aimed at reducing accidents in transportation (especially road traffic accidents), in homes and in factories:
  - Motorbike crash helmet laws and enforcement
  - Alcohol laws
  - Speed limits
  - Better motor licensing rules
  - Health education
  - Better motor engineering
  - Good road designs
  - Safety procedures at work and a good EMS and trauma system

MULTIPLE INJURIES

Introduction
- The multiply injured patient is that patient with injury to more than one organ system

- Often victims of motor vehicle crashes, motor bike accidents, pedestrians hit by cars, or falls from heights
- Present a challenge to the managing team in terms of priority of medical intervention

- If the priorities are not well ordered the results can be catastrophic

- Difficult to outline clinical features for these patients as virtually any injury is possible

Treatment objectives
- Identify life threatening injuries and treat
- Identify all injuries, institute primary management and limit progress of injuries and further tissue damage

- Restore patient's physiology paying special attention to the triad of hypothermia, acidosis and coagulopathy
- Format a prioritized plan of definitive treatment and rehabilitation

Advanced trauma life support (ATLS) principles should apply
- Patient should be received by a trauma team consisting of at least:
  - A trauma team leader
  - An airway and a procedure doctor
  - Two nurses in similar capacity
  - A radiographer
  - A scrub nurse
  - A social worker

- It is important that hospitals which regularly manage trauma patients should maintain a standing trauma team on a 24-hour basis
- This helps to optimize outcomes in patient management

Prehospital information
- The trauma team needs this information from the prehospital team

- Relayed in the MIST format, preferably before the patient's arrival to enable adequate preparation to be made beforehand

M: Mechanism of injury
I: Injuries sustained
S: Prehospital vital signs: pulse, blood pressure, respiratory rate, oxygen saturation, temperature
T: Treatment given e.g. cervical collar, intravenous fluids etc

Primary Survey
- Quick survey to identify life threatening injuries and treat
- Airway
- Talking? Assume airway is alright. If not suction, Guedel's airways
- Careful with airway manoeuvres such as the jaw thrust and chin lift
- Always protect the cervical spine
- Apply rigid cervical collar
- May need endotracheal intubation
- Breathing
- Check the breathing, respiratory rate, oxygen saturation
- Examine the chest:
  - Tension pneumothorax? Haemorrhorax? Flail chest?
  - Chest tube decompression?
- Always obtain a chest radiograph before decompression if possible
- Perform arterial blood gas estimations
- Circulation:
  - Check the pulse, blood pressure, capillary refill
  - Listen to the heart sounds
  - Apply electrocardiograph leads
  - Set up an intravenous line with a large bore cannula size 14 or 16 FG
  - Collect blood for investigations: ABGs, FBC, electrolytes and urea, grouping and cross matching; pregnancy tests
  - Focused Assessment using Sonography in Trauma (FAST)
- Disability and Neurology
  - Assess patient's level of consciousness using the Glasgow coma scale
  - Check the state of the pupils and their reaction to light
  - Expose the patient to perform a quick general examination but prevent hypothermia
  - Cover with warm blanket or put on artificial warmer if available
  - Record core temperature
- The trauma series of radiographs is part of the primary survey. These are:
  - A-P chest view
  - A-P pelvic view
  - Lateral cervical view
  - (In the above order)
CHAPTER 15: INJURIES AND ACUTE TRAUMA

Secondary survey

This is a total body examination to detect injuries sustained
- Involves obtaining the AMPLE history (allergies, medications, past medical history, pregnancy, last meal, environment including details of the accident)
- Head:
  - Check for scalp haematoma, lacerations, skull fractures, CSF leaks (rhinorrhoea, otorrhoea); facial fractures, raccoon eyes
  - Remove contact lenses; examine pupils, oral examination; Battle sign
  - Neck:
    - Perform a careful neck examination
    - Leave in collar if there is a high index of suspicion for cervical injury
- Chest:
  - Inspect for dyspnoea, tachypnoea, chest movements, flail chest, open pneumothorax or obvious penetration
  - Palpate for chest expansion, crepitus (subcutaneous emphysema) and rib fractures
  - Assess position of the trachea and determine any tracheal shift
  - Determine percussion notes in both lung fields (dull in haemothorax and hyperresonant in pneumothorax)
  - Auscultate for breath sounds and air entry
- Abdomen:
  - Examination findings often unreliable in the multiply injured patient
  - This may be as a result of altered sensorium due to head injury, inebriation or drugs, neurological injury, or distracting injury
  - There is need to augment examination with bedside investigations like FAST and DPL (Diagnostic Peritoneal Lavage) if indicated
  - In the haemodynamically stable patient the best imaging modality is the CT scan with contrast
  - Inspect for seat belt marks, lacerations, abdominal contour and movements with respiration
  - Palpate for tenderness, rebound tenderness and rigidity
  - Percuss if indicated
  - Auscultate for bowel sounds
  - Pass a nasogastric tube
- Pelvis:
  - Perform anteroposterior and lateral compression tests to check for pelvic fractures
  - If fracture is suspected, apply a pelvic girdle or pelvic sheet to decrease pelvic volume, improve tamponade and decrease pelvic haemorrhage

Examine the perineum:
- Check for perineal bruising, bogginess, scrotal haematoma, and blood at the tip of the penis
- If there is blood at the tip of the penis it is inadvisable to pass a urethral catheter: a partial urethral rupture may be converted to a complete rupture. Do an urethrocystogram to confirm urethral rupture
- If not contraindicated pass an indwelling urethral catheter to monitor urinary output and tissue perfusion
- Haematuria is suggestive of bladder or kidney injury

Perform a vaginal examination, checking for bleeding and lacerations

Lower limb examination:
- Check for obvious lacerations, deformity, fractures and dislocations
- Undertake an appropriate neurovascular assessment
- Assess muscle power in each limb
- Same as for lower limb
'LOG ROLL'
- The patient is now log rolled by four persons so as to examine the back
  - The spine is examined from the occiput to the coccyx
  - Checking for deformity, swellings, stepings, and tenderness
- While still in this position perform a digital rectal examination to assess anal tone, presence of blood in the rectum and the position of the prostate
- A high riding prostate is suggestive of urethral rupture

Return patient to the supine position

Neurological examination:
- Perform a detailed neurological examination as indicated

Clinical features

The trauma team should now note all the observed injuries and format a plan for:
- The further management of the patient
- Removal from the emergency department and definitive management of the patient under the appropriate surgical units and consultants

CHAPTER 16: SURGICAL CARE AND ASSOCIATED DISORDERS

ACUTE ABDOMEN

Introduction

- An abdominal condition of sudden onset requiring immediate (urgent) attention

Aetiology

Surgical:
- Inflammatory/infective conditions:
  - Acute appendicitis: the commonest cause of acute abdomen
  - Acute salpingitis: a common cause in sexually active young females
  - Acute cholecystitis
  - Acute pancreatitis
  - Acute diverticulitis: not very common in this environment

These conditions usually begin with a localized peritonitis which progresses to generalized peritonitis if left untreated.

Tracheal shift

Perforation of hollow viscera:
- Perforated chronic duodenal ulcer
- Perforated typhoid ileitis: a common cause in this environment

Traumatic gastrointestinal perforation
- Perforated gastrointestinal malignancies

Intestinal obstruction:
- Strangulated external and internal hernias
- Intussusception
- Peritoneal adhesions and bands (congenital or acquired)
- Gastrointestinal tumours
  - Intra-abdominal haemorrhage
  - Trauma (injury to solid viscer e.g. spleen and liver)
  - Ruptured abdominal aortic aneurysm
  - Haemorrhage from tumours (e.g. primary liver cell carcinoma)

Obstruction to urinary/biliary tract:
- These usually present as colics due to stones
  - Ureteric colic
  - Biliary colic
- Gynaecologic (outside those listed above)
  - Bleeding Graffian follicle
  - Twisted ovarian cyst
  - Ecopic pregnancy
  - Salpingitis
  - Degenerating fibroids
- Non-specific abdominal pain:
  - Includes a variety of conditions that do not come under the above causes
  - Medical:
    - These should always be borne in mind so as to avoid unnecessary surgery

Note the following:
- Location
- Onset and progression
- Nature and character
- Aggravating and relieving factors
- Abdominal tenderness
- Palpation
- Percussion
- Auscultation

Inflammatory/infective conditions:
- In typhoid perforation, fever precedes abdominal pain, while the reverse is true for acute appendicitis

Nausea and vomiting:

Altered bowel habits
- Diarrhoea may suggest an infective/inflammatory condition
- Constipation occurs in intestinal obstruction and late in peritonitis
- The presence or absence of blood, mucus in stool should be ascertained

Fever:
- An early feature in inflammatory/infective conditions
- A late feature in most other causes of acute abdomen

Gynaecologic history:
- In every female, the following should be ascertained
  - Last menstrual period: this will help in the suspicion of ectopic gestation and bleeding Graffian follicle
  - Vaginal discharge: salpingitis

Non-specific abdominal pain:
- Urinary symptoms:
  - Ascertain the presence or absence of the following
    - Pain on micturition
    - Pus in urine or cloudy urine
    - Urethral discharge
  - Loin pain
  - Past medical history:
    - Diabetes mellitus
    - Sickle cell disease
  - Physical examination:
    - General examination
    - Dehydration
    - Temperature (the exact temperature should be taken with a thermometer: oral, axillary or rectal temperature)
Evidence of adequate resuscitation
- Pulmonary capillary wedge pressure
- Urine output, volume, colour
- Hydration status
- Skin turgor
- Sensorium
- Pulse rate begins to fall towards, or below 100 beats/minute
- Blood pressure: begins to towards normal
- Urine output: 50 - 100mL/hr (1 - 2 mL/kg/hr); clear or Prognosis
Consult a physician as appropriate, to treat the condition accordingly

Outcome and survival depends on:
- Early presentation and diagnosis
- Prompt and adequate resuscitation before surgery
- Appropriate and meticulous surgery and other treatments as indicated
Postoperative surgical site infection (wound infection) is a rather common, but undesirable occurrence in this environment
Surgical site infection tends to increase postoperative morbidity and may lead to mortality
Efforts therefore need to be made to prevent surgical site infection

Diagnostic peritoneal lavage:

Differential diagnoses
- Urinalysis: test the urine for sugar, protein, ketones, etc
- Random blood sugar to exclude diabetes mellitus
- Serum electrolytes and urea; correction may be needed
- Serum amylase to exclude acute pancreatitis

Haematological tests:
- Haemogram to exclude anaemia
- Packed cell volume may not be reliable because of haemoconcentration from dehydration
- If there is suspicion of sickle cell disease, the haemoglobin genotype should be obtained
- A complete blood count may show evidence of acute infection (leucocytosis, neutrophilia)
- Blood should be grouped, and compatible blood cross-matched and made ready

Other investigations:
- Computed tomography may be needed when there is diagnostic confusion
- Cultures: any suspicious fluid and materials should be obtained for microbiology and culture (e.g. vaginal discharge, peritoneal fluid)

Diagnosis
Follow a detailed evaluation (as above) and make a reasonable (probable) list of not more than 3 - 5 differential diagnoses

Resuscitation
- Rehydration and correction of electrolyte derangements
- Correct shock by giving crystalloids (sodium chloride 0.9%, Ringer's lactate) or colloid (e.g. dextran)
- Maintenance fluids are calculated based on degree of dehydration
- Nasogastric decompression: the largest possible size of tube for patient
- Aspirate intermittently using low pressure suction or large syringe
- Urethral catheterization (to monitor urine output)
- Correct anaemia (by blood transfusion)
- Commence broad spectrum, intravenous antibiotics e.g. against likely microorganisms

Aetiology
Mechanical (dynamic):
- Extra-luminal (compression from outside the intestinal wall)

INTESTINAL OBSTRUCTION
Introduction
A condition in which there is failure of onward propulsion of intestinal contents
A common surgical emergency

Principles of antibiotic prophylaxis
To prevent postoperative infection in susceptible patients

Patients with valvular heart disease
Use of prostheses and implants
Orthopaedic implants
Neurosurgical implants
Patients with cardiac prostheses
Other prostheses
Immunocompromised patients:
HIV/AIDS
Diabetes mellitus
Cancer; patients on cytotoxic chemotherapy
Patients on steroids
Severely malnourished patients
Others:
Patients with peripheral vascular disease undergoing surgery on that limb

Complications
- Antibiotic misuse
- Antibiotic resistance
- Complications of antibiotics (e.g. pseudomembranous colitis)
- False sense of surgical security
Antibiotic prophylaxis should be effective and efficient

INTENTINAL OBSTRUCTION
Introduction
A condition in which there is failure of onward propulsion of intestinal contents
A common surgical emergency

Aetiology
Mechanical (dynamic):
- Extra-luminal (compression from outside the intestinal wall)
Chapter 16: Surgical Care and Associated Disorders

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- Haematology:
  - Haemogram
  - Complete blood count (leucocytosis and neutrophilia suggest strangulation)
  - Group and cross match blood and store appropriately
  - Ultrasoundography
  - Useful in intussusception, suspected intra-abdominal tumours

- Pathology:
  - Laparoscopy:
    - May be helpful in some instances to identify the cause of obstruction
    - In difficult cases, other investigations may be necessary depending on the presentation and clinical suspicion
    - Avoid contrast studies (as much as possible) in acute intestinal obstruction

- Resuscitation:
  - Urethral catheterization to monitor urine output
  - Gram negatives, gram positives
  - Correct anaemia by blood transfusion
  - Should only be embarked upon after adequate fluid and electrolyte replacement is achieved

- Surgery:
  - Most of the causes will require laparotomy
  - Treat identified cause on its merits:
    - Small intestine:
      - Non-mechanical (adynamic) obstruction
    - Large intestine:
      - Simple obstruction
      - Strangulated obstruction
      - Closed loop obstruction

Preoperative Evaluation

Introduction

The assessment of a patient before surgery to ensure that the patient is in optimal physiologic state and fitness for the surgical procedure.

- A most important aspect of the care of a surgical patient
- No elective operation should be carried out without an adequate preoperative assessment
- In the emergency situation, all efforts must be made to ensure that the patient can withstand anaesthesia and the surgical procedure
- Occasionally (e.g. with severe on-going haemorrhage, airway obstruction) resuscitation, anaesthesia and surgery may commence simultaneously

Aim of Preoperative evaluation

- To detect any fluid and electrolyte derangements
- To detect any haematological derangements (e.g. anaemia, bleeding diathesis, sickle cell disease)
- To detect any coexisting medical conditions that may adversely affect the outcome of anaesthesia and surgery

- All patients scheduled to have surgery should be in a haemodynamically stable condition before surgery

Clinical evaluation

- Efforts should be made to identify the following by history and physical examination:
  - Cardiopulmonary disorders: Cough, Chest infection, Bronchial asthma, Chronic obstructive airways disease
  - Hypertension, Cardiac failure, Metabolic disorders: Diabetes mellitus, Haematologic disorders: Sickle cell disease
  - Allergy: Drug allergies (e.g. penicillins, talc, elastoplast, anti-infective agents; prednisolone, oral contraceptives; tricyclic antidepressants
  - Social habits: Cigarette smoking, alcohol use
  - Previous anaesthetic experience: How long ago, type of anaesthesia

Investigations

- Cardiopulmonary: Chest radiograph: especially for patients 60 years and above, and those with chest infection
  - Look for evidence of chest infection and cardiomegaly
  - Electrocardiogram: especially for patients over 60 years and those with heart disease or hypertension
  - Pulmonary function tests may be necessary in patients with obstructive airways disease

- Adequate preoperative assessment
  - In the emergency situation, all efforts must be made to ensure that the patient can withstand anaesthesia and the surgical procedure
  - Occasionally (e.g. with severe on-going haemorrhage, airway obstruction) resuscitation, anaesthesia and surgery may commence simultaneously

- Objectives of preoperative evaluation
  - To detect any fluid and electrolyte derangements
  - To detect any haematological derangements (e.g. anaemia, bleeding diathesis, sickle cell disease)
  - To detect any coexisting medical conditions that may adversely affect the outcome of anaesthesia and surgery

- All patients scheduled to have surgery should be in a haemodynamically stable condition before surgery

- The above may not always be possible, but efforts must be made to improve cardiopulmonary and renal function

- Correct any detected abnormality

- Patient evaluation and correction of abnormalities may need to be done in conjunction with others: the anaesthetist, physician, paediatrician etc.

- Efforts should be made to identify the following by history and physical examination:

- Cardiopulmonary disorders:
  - Cough
  - Chest infection
  - Bronchial asthma
  - Chronic obstructive airways disease
  - Hypertension
  - Cardiac failure

- Metabolic disorders: Diabetes mellitus

- Haematologic disorders: Sickle cell disease

- Allergy:
  - Drug allergies (e.g. penicillins, talc, elastoplast, anti-infective agents; prednisolone, oral contraceptives; tricyclic antidepressants
  - Social habits: Cigarette smoking, alcohol use

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  - Electrocardiogram: especially for patients over 60 years and those with heart disease or hypertension
  - Pulmonary function tests may be necessary in patients with obstructive airways disease

- Metabolic:
Airways management

Effects of anaesthesia

The cardiopulmonary status (pulse rate, blood pressure, respiration) needs to be monitored very closely (every 15 minutes) in order to promptly detect any abnormality.

Where available, electronic monitors with an alarm system should be used.

Airways management

The patient may still be under some effect of anaesthesia.

- Airways need to be kept patent.
- Prevent the tongue from falling backwards by positioning.
- Secretions should also be cleared using a low-pressure suction.
- The neck should be prevented from falling on itself as this can occlude the airway.

Secretions should also be cleared using a low-pressure suction.

Nursing position

Different operations require specific positioning in the postoperative period to reduce venous pressure, keep airways patent, enhance drainage etc.

The surgeon should be conversant with the specific positions and give appropriate instructions.

Analgesia

Pain is a most undesirable effect of surgery. Patients should not be allowed to suffer from pain unduly.

The appropriate analgesic technique should be chosen for the nature of surgical procedures performed.

Adequate analgesia will ensure early ambulation and help to limit atelectasis.

Minor/moderate surgery

Patient taking orally:

- Paracetamol
- Non steroidal antiinflammatory drugs
- Patient not taking orally: Injectable nonsteroidal antiinflammatory drugs (e.g. diclofenac sodium)

Major surgery:

- Parenteral analogesics (e.g. morphine)
- NSAIDs (e.g. diclofenac sodium)

Nasogastric decompression

The stomach may need to be kept decompressed for 24 - 48 hours.

- All adults and patients with history suggestive of upper abdominal surgery are prone to basal atelectasis and hypostatic pneumonia.
- These should be prevented by appropriate chest physiotherapy.
- Ensure adequate analgesia to enhance chest excursion.
- Encourage coughing and expectoration, with a hand supporting any abdominal wound.
- Periodic chest percussion to loosen bronchial secretions.
- Ambulate as early as possible.

Mobilization and ambulation

Mobilize and ambulate patients as early as is practicable to avoid the complications of prolonged recumbency.

Ambulation should be gradual; prop up in bed, sit out of bed, short walks etc.

Early ambulation should help prevent hypostatic pneumonia and deep vein thrombosis (very important in obese and elderly patients).

Antibiotics

Appropriate antibiotics as indicated.

Irrational or indiscriminate use is not to be encouraged.

Wound care

Specific surgical wounds are cared for in different ways.

Clean surgeries: do not open wound (unless indicated) until day 5 - 7.

Inspect wounds immediately if there are features suggestive of surgical site (wound) infection.

- Undue pain
- Undue swelling
- Discharge of serosanguinous fluid or pus

Infected wounds:

Wound swab for microbiological culture and sensitivity tests.

Adequate local wound care.

Appropriate antibiotics.

If there are systemic features (e.g. fever, anorexia)
Complications of massive blood transfusion

**Complications**
- Early complications:
  - Immune reactions
  - ABO incompatibility
  - Rhesus incompatibility
  - Febrile reactions
  - Allergic reactions
  - Reactions to plasma proteins

- Biochemical complications:
  - Hyperkalaemia
  - Citrate toxicity (hypocalcaemia)
  - Haemoglobinemia

- Infective complications:
  - Bacteraemia
  - Transfusion of parasites (e.g. malaria)
  - Transfusion of viruses (HIV, Hepatitis B, C, D)

- Physical complications:
  - Volume overload
  - Air embolism
  - Hypothermia

**Contraindications to autologous transfusion**
- Appropriate for patients undergoing laparotomy or thoracotomy for haemorrhage into these cavities (e.g. traumatic haemothorax, splenic injury, ectopic gestation)
- Special salvage equipment may be available sometimes
- Contaminated blood must not be transfused

**Contraindications to autologous transfusion**
- Pregnancy
- Chronic medical conditions
- Cancer

**Situations where the blood may have become contaminated**
- For intraoperative blood salvage
- Umbilical cord blood

**MEASLES (Rubeola)**
- Introduction
  - An acute viral infection caused by an RNA virus of the genus *Morbillivirus* in the family Paramyxoviridae
  - Only one serotype is known
- Endemic throughout the world
  - 30 - 40 million cases and 745,000 deaths for the year 2001
  - 50 - 60% of estimated deaths due to vaccine-preventable diseases
- Also a major cause of preventable blindness
  - Transmission is by droplet infection during the prodromal stage
  - Incubation period: 9 - 11 days
  - Time of exposure to appearance of rash: about 14 days

**Clinical features**
- The essential lesion is found on the skin, mucous membranes of the nasopharynx, bronchi, intestinal tract and conjunctivae
- Three stages:
  - Incubation period
  - Prodromal stage with an enanthem
  - Final stage
- Incubation period:
  - Mild fever; 10 - 11 days
  - 3 - 5 days
  - Low grade to moderate fever
  - Dry cough
  - Coryza
  - Conjunctivitis
  - Koplik spots
  - Photophobia
- Final stage:
  - Temperature rises abruptly as the rash appears
  - Rash begins from the upper lateral part of the neck, behind the ears, along the hairline and posterior parts of the cheek then spreads to the rest of the body
  - Rash fades in the same pattern in 3 - 4 days

**Differential diagnoses**
- Rubella
- Roseola infantum
- Infections from Echovirus, Coxsackie Virus and Adenovirus
- Infectious mononucleosis
- Toxoplasmosis
- Meningococcaemia
- Scarlet fever
- Rickettsial diseases
- Kawasaki disease
- Serum sickness
- Drug rashes
**Complications**
- Diarrhoea
- Otitis media
- Pneumonia
- Laryngo-tracheobronchitis
- Encephalitis
- Blindness
- Subacute sclerosing panencephalitis

**Investigations**
- Isolation of the virus by tissue culture
- ELISA: first IgM and later IgG response
- Demonstration of Warthin Finkeldy giant cells in smears of the nasal mucosa

**Full Blood Count:** low white blood cell count with relative lymphocytosis
- Lumbar puncture: increase in CSF protein; and small increase in lymphocytes, normal glucose level

**Treatment objectives**
- Relieve symptoms
- Hydrate adequately
- Treat secondary bacterial infection
- Prevent complications

**Non-drug treatment**
- Humidification of the room for those with croup
- Protection from strong light for those with photophobia
- Nutrition
- Fluids

**Drug treatment**
- No specific drugs
- Some children require supplemental vitamin A
- - 100,000 IU stat for age 6 months - 1 year
- - 200,000 IU stat for age above 1 year
- - Repeat on days 2 and 14 for those with ophthalmologic evidence of vitamin A deficiency

**Specific treatment of complications**

**Notable adverse drug reactions**
- Vitamin A may cause features of pseudotumour cerebri
  - Nausea, vomiting, drowsiness, bulging fontanelle, diplopia, papilledema and cranial nerve palsies

**Prevention**
- Isolation precaution from the 5th day of exposure until 5 days after appearance of the rash
- Measles vaccine at 9 months
- - Vaccine may be given at 6 months for measles post-exposure, and in outbreak prophylaxis
- - Post-exposure prophylaxis
- - Passive immunization with immune globulin within 6 days of exposure

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**PILOMYELITIS**

**Introduction**
- An acute infectious disease of humans (particularly children) caused by any of three serotypes of poliovirus P1, P2, and P3
- Immunity to one serotype does not confer immunity to others
- Occurs in many regions of the developing world
- The global polio eradication initiative was launched in 1988
- - In 15 years, the number of cases has fallen by 99% and the number of infected countries reduced from 125 to 7
- - There was an increase in global cases as a result of an epidemic in India, and increase in cases in Nigeria

**Pathogenesis**
- Entry into mouth (via faecally-contaminated food/water)
- Replication in pharynx, gastrointestinal tract, local lymphatics
- Haematologic spread to lymphatics and central nervous system
- Viral spread along nerve fibres
- Destruction of motor neurons

**Clinical features**
- Incubation period: 6 - 20 days, with a range of 3 - 35 days
- Asymptomatic infection: 95%
- Minor non-specific symptoms: 4 - 8%
- Symptoms occur in less than 2%
- - Slight fever
- - Headache
- - Malaise
- - Sore throat
- - Vomiting
- Non-paralytic polio (1-2%)
  - Symptoms last 1-2 weeks
  - Moderate fever
  - Headache
  - Vomiting
  - Diarrhoea
  - Fatigue
  - Irritability
  - Pain or stiffness of the back, arms, legs, abdomen
  - Muscle tenderness and spasms in any part of the body
  - Neck pain and stiffness
- Skin rash

**Paralytic polio**
- 3 types depending on the level of involvement
  - Spinal in 79%
  - Bulbar polio: 2%
  - Bulbospinal: polio 19%
- Fever 5 - 7 days before other symptoms
- Headache
- Stiff neck and back
- Asymmetric muscle weakness
- Rapid onset

**Comlications**
- Multiple intestinal erosions
- Acute gastric dilatation
- Hyperaesthesia
- Difficulty in initiating micturition
- Constipation
- Blurred abdomen
- Dysphagia
- Muscle spasms
- Drooling
- Dyspnoea
- Irritability
- Positive Babinski’s sign

**Complications**
- Multiple intestinal erosions
- Acute gastric dilatation
- Hyperaesthesia
- Difficulty in initiating micturition
- Intestinal obstruction (in the abdomen)
- Dysphagia
- Muscle spasms
- Drooling
- Dyspnoea
- Irritability
- Positive Babinski’s sign

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**Complications**
- Multiple intestinal erosions
- Acute gastric dilatation
- Hyperaesthesia
- Difficulty in initiating micturition
- Constipation
- Blurred abdomen
- Dysphagia
- Muscle spasms
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- Irritability
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**Complications**
- Multiple intestinal erosions
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- Difficulty in initiating micturition
- Constipation
- Blurred abdomen
- Dysphagia
- Muscle spasms
- Drooling
- Dyspnoea
- Irritability
- Positive Babinski’s sign

**Treatment objectives**
- Allay fear
- Minimize ensuing skeletal deformities
- Anticipate and treat complications
- Prepare the child and family for a prolonged management of permanent disability if it seems likely

**Non-drug treatment**
- Bed rest
- Avoidance of exertion
- Anticipation and treatment of complications
- Suitable body alignment to avoid excessive skeletal deformity
- Active and passive motions as soon as pain disappears
- Manual compression of the bladder
- Adequate dietary and fluid intake
- Review by orthopaedist and psychiatrist
- Gravity drainage of accumulated secretions
- Treatment of coagulopathy

**Drug treatment**
- Bartholin 5 - 10 mg orally or 2.5 - 5 mg subcutaneously for bladder paralysis
- Analgesics
- - Avoid opiates if there is impairment of ventilation
- - Treat urinary tract infection with appropriate antibiotics

**Prevention**
- Hygienic practices
  - To prevent / limit contamination of food and water by the virus
  - Vaccination
  - - The only effective method of prevention
  - Oral Polio Vaccine
- Given at:
  - Birth
  - 6 weeks
  - 10 weeks
  - 14 weeks
  - - Highly effective
  - - 50% immune after 1 dose
  - - >95% immune after 3 doses
Chapter 17: Paediatric Perspectives

VITAMINA DEFICIENCY

Introduction

Vitamin A was the first fat-soluble vitamin to be discovered. It comprises a family of compounds called the retinoids. In nature, the active retinoids occur in 3 forms:
- Alcohol (retinol), aldehyde (retinal or retinaldehyde), and acid (retinoic acid). In the human body, retinol is the predominant form, and 11-cis-retinol is the active form.

Retinol-binding protein (RBP) binds vitamin A and regulates its absorption and metabolism. Vitamin A is essential for:
- Vision (especially dark adaptation)
- Immune response
- Epithelial cell growth and repair
- Bone growth
- Reproduction
- Maintenance of the surface linings of the eyes
- Epithelial integrity of respiratory, urinary, and intestinal tracts
- Embryonic development
- Regulation of adult genes

It functions as an activator of gene expression by retinoid alpha-receptor transcription factor and ligand-dependent transcription factor.

Deficiency of vitamin A is found among malnourished children, the elderly, and chronically ill populations in the United States, but it is more prevalent in developing countries.

Among the first signs of vitamin A deficiency (VAD) are:
- Abnormal dark adaptation
- Dry skin and dry hair
- Broken fingernails
- Decreased resistance to infections

Epidemiology

An estimated 250 million children in developing countries are at risk for vitamin A deficiency syndromes. The most widely affected group includes up to 10 million malnourished children who develop xerophthalmia and have an increased risk of complications and death from measles.

Each year 250,000 - 500,000 children become blind because of VAD.

Improving the vitamin A status of children (aged 6 - 59 months) with deficiencies can reduce rates of death from measles by 50%; from diarrhea by 33%, and from all causes of mortality by 23%.

Pathophysiology

Vitamin A deficiency may be secondary to:
- Decreased ingestion
- Defective absorption and altered metabolism
- Increased requirements

An adult liver can store up to a year's reserve of vitamin A, whereas a child's liver may have enough stores to last only several weeks.

Serum retinol concentration reflects an individual's vitamin A status.

Because serum retinol is homeostatically controlled, its levels do not drop until the body's stores are significantly limited.

The serum concentration of retinol is affected by several factors:
- Synthesis of Retinol Binding Protein in the liver
- Infection
- Nutritional status
- Adequate levels of other nutrients such as zinc and iron.

Recommended Daily Allowance

Infant (1 year or younger):
- 375 micrograms

Child 1 - 3 years:
- 400 micrograms

Child 4 - 6 years:
- 500 micrograms

Child 7 - 10 years:
- 700 micrograms

All males older than 10 years:
- 1,000 micrograms

All females older than 10 years:
- 800 micrograms

Aetiology

- Malnutrition
- The commonest cause of VAD in this part of the world

Iron panel

- Useful because iron deficiency can affect the metabolism of vitamin A

Serum albumin

- Levels are indirect measures of levels of vitamin A
- Full Blood Count with differentials
- If anaemia, infection, or sepsis is a possibility

Serum electrolytes

- To evaluate nutritional status
- Radiographs of the long bones
- To evaluate bone growth and excessive deposition of periosteal bone

Clinical testing for dark-adaptation threshold

Treatment objectives

Reduce morbidity
Prevent complications
Treat complications

Non-drug treatment

Eat foods rich in vitamin A
- Liver
- Beef
- Chicken
- Eggs
- Whole milk; fortified milk
- Carrots
- Mungos
- Orange fruits
- Sweet potatoes
- Spinach
- Green vegetables

At least 5 servings of fruits and vegetables per day is recommended to provide a comprehensive distribution of carotenoids.

Drug treatment

Daily oral supplements of vitamin A
- Child:
  - Less than, or 3 years: 600 microgram (2,000 IU) orally once daily
  - 4 - 8 years: 900 microgram (3,000 IU) orally once daily
  - 9 - 13 years: 1,700 microgram (5,665 IU) orally once daily
  - 14 - 18 years: 2,800 microgram (9,335 IU) orally once daily
- Adult: all ages 3,000 microgram (10,000 IU) orally once daily

Severe disease

- 60,000 microgram (200,000 IU) orally for a minimum of 2 days
- Has been shown to reduce child mortality rates by 35 - 70%

Notable adverse drug reactions, caution

Risk of teratogenicity increases in pregnant women at doses >800 micrograms/day (not recommended at these doses).
CHAPTER 18: EMERGENCIES

ACUTE LEFT VENTRICULAR FAILURE

Introduction
Sudden diminution in the function of the left ventricle
Pulmonary capillary and venous pressure increase
beyond plasma oncotic pressure
There is resultant accumulation of oedema fluid in the
pulmonary interstitial spaces and alveoli

Aetiology
Insipid left ventricular failure secondary to hypertension
Arhythmias
Myocardial infarction

Clinical features
Dyspnoea
Orthopnoea
Paroxysmal nocturnal dyspnoea
Cough
Heamoptysis
Restlessness
Wheeze
Hypoxia

Differential diagnoses
Pulmonary thromboembolism
Bronchial asthma
Pulmonary tuberculosis
Cardiac tamponade

Complications
Right-sided heart failure
Acute renal failure
Myocardial infarction

Investigations
Electrocardiography
Plain chest radiograph
Echocardiography
Cardiac catheterization
Pulmonary function tests
Arterial blood gasses
Electrolyte, Urea and Creatinine

Treatment objectives
To improve pump performance of the failing ventricle
To reduce the cardiac workload
To control salt and water retention

Non-drug treatment
As in hypertension

Drug treatment
Diuretics
- Furosemide
Adult: 40 - 80 mg by slow intravenous injection stat
- Then 40 - 160 mg orally or intravenously daily in 1 or 2 divided doses for maintenance
Child: neonate, 0.5 - 1 mg/kg by slow intravenous injection every 12 - 24 hours (every 24 hours if post-menstrual age is under 31 weeks)
1 month - 12 years: 0.5 - 1 mg/kg (maximum 4 mg/kg),
repeated every 8 hours as necessary
12 - 18 years: 20 - 40 mg every 8 hours; higher doses may be necessary in resistant cases
Angiotensin converting enzyme inhibitors - Captopril
Adult: 6.25 - 12.5 mg daily orally, then 25 mg in divided doses daily (maximum 150 mg daily) for maintenance
Child: not licensed for use in children
Or:
- Lisinopril
Adult: 2.5 mg orally daily; 5 - 20 mg daily for maintenance
neonate, initially 10 micrograms/kg orally once daily; monitor blood pressure carefully for 1 - 2 hours, increased as necessary up to 500 micrograms/kg daily in 1 - 3 divided doses
1 month - 12 years: initially 100 micrograms/kg orally once daily, monitor blood pressure carefully for 1 - 2 hours, increased as necessary up to a maximum of 1 mg/kg daily in 1 - 2 divided doses
12 - 18 years: initially 2.5 mg daily, monitor blood pressure carefully for 1 - 2 hours; usual maintenance dose 10 - 20 mg daily in 1 - 2 divided doses (maximum 40 mg daily if body weight is >50 kg)

May require morphine
Adult: 5 - 10 mg orally, subcutaneously or intramuscularly (usually a single initial dose)
Child: not listed for this indication

Digoxin
Adult: 125 - 250 micrograms orally daily may be required
Aminophylline
Adult: up to 250 mg by slow intravenous injection stat

Supportive measures
Oxygen
Nurse in cardiac position

Notable adverse drug reactions, caution and contraindications
- Use ACE inhibitors, and aminophylline and digoxin with caution
- Monitor potassium levels closely
- Monitor fluid input and output

Prevention
Adequate control of hypertension

CARDIAC ARREST

Introduction
Sudden cessation of cardiac pump function
If there is no spontaneous reversal or resuscitative measure, death results
Commonest cause of cardiovascular deaths among caucasions
Peaks between ages 0 - 6 months and 45 - 75 years

Aetiology
Congenital and acquired structural defects of the heart
Abnormal electrical activities of the heart

Investigations
After the initial rapid assessment and resuscitation
Electrocardiography
Echocardiography
Urea, Electrolytes and Creatinine
Lipid profile
Blood gases
Chest radiograph

Treatment objectives
Prompt restoration of cardiac and respiratory function
Monitoring of impact of cardiac arrest on the various associated organs
Intervention to restore normal functions
Formulation of a broader and more comprehensive diagnostic and treatment plan
Eliminate/control aetiological factor(s) in order to reduce morbidity/prevent mortality

Non-drug treatment
Ensure clear airway by tilting the head backwards, lifting the chin and exploring to remove foreign bodies/dentures
Remove wears/ornaments which may negate the above

Basic life support (CPR)
Ensure that patient is lying on a firm/hard surface
Cardiac massage (80 - 100 per minute)
Assisted ventilation using a masked ambu bag
- Twice in succession for every 15 cardiac massages (once every 5" massage when 2 people are in attendance)
- Watch out for spontaneous respiration during this exercise

Advanced life support
Intubation with an endotracheal tube
Defibrillation/cardioversion for patients with ventricular fibrillation/ventricular tachycardia

Differential diagnoses
Syncope
Seizures
Complications
Death
Sequela involving the vital organs
- Acute renal failure
- Myocardial infarction
- Cerebrovascular accident

Investigations (after the initial rapid assessment and resuscitation)
Electrocardiography
Echocardiography
Urea, Electrolytes and Creatinine
Lipid profile
Blood gases
Chest radiograph

Inflammatory, infiltrative, neoplastic and degenerative processes
Fluids and electrolyte imbalances
Drugs and other substances of abuse
Sudden infant death syndrome

Cardiac tamponade

Prevention
Eat foods rich in vitamin A, in adequate amounts
Family and community health education

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Clinical features

Promoting potassium loss
Limiting exogenous potassium intake
Discontinuation of anti-kaliuretic drugs
Shifting potassium into cells

Clinical features

If alive, patient is unconscious and not breathing
Hypoxemia and tissue hypoxia
Acute renal failure
Hemolysis

Complications of near-drowning

Hyperoxic brain injury with cerebral oedema (which may occur within 24 hours)
Cardiac arrhythmias
Dehydration
Acute Respiratory Distress Syndrome (ARDS)
Acute renal failure
Disseminated Intravascular Coagulopathy

Drug treatment

Sodium bicarbonate
- 1 milliequivalent/kg
- Additional 50% of this dose every 10 to 15 minutes as deemed clinically appropriate

Sodium bicarbonate
- 1 milliequivalent/kg
- Additional 50% of this dose every 10 to 15 minutes as deemed clinically appropriate

Lidocaine 1 mg/kg intravenously if there is unstable cardiac electrical activity. Repeat as required

Other antiarrhythmic drugs if necessary

For cardiac arrest secondary to bradyarrhythmias or asystole:
- Continue CPR
- Insert intravenous line

Prevention

Family and community basic support education

DROWNING AND NEAR-DROWNING

Introduction

Refers to death by suffocation due to immersion in water.

May be classified as “wet” - where the victim has inhaled water or “dry” - a less common condition, but one that involves the closing of the airway due to spasms induced by water.

Wet drowning could occur by either fresh or salt water.

Drowning typically accounts for a small but significant percentage of accidental deaths.

Near-drowning episodes refer to instances where rescue was successful and death prevented.

Near-drowning can be associated with considerable disability e.g. head injury, paralysis, and respiratory complications

Contributory factors

Swimming in deep waters
Falling unexpectedly into water
Not being able to swim
Breath-holding swimming and diving
Alcohol consumption
High water temperatures
Easy, illicit access to pools
Inadequate pool and spa covers

Pathophysiology

Inhalation of water results in ventilation-perfusion imbalance with hypoxaemia and pulmonary oedema
Absorption of hypotonic fresh water results in collapse of the alveoli, resulting in right-to-left shunting of un-oxygenated blood
Absorption of hypertonic salt water results in alveolar oedema, but the overall effects are the same for both inhalation of fresh and salt water
Infection may develop subsequently and is more likely when contaminated water is inhalled

Complications of near-drowning

Hypoxic brain injury with cerebral oedema (which may occur within 24 hours)
Cardiac arrhythmias
Dehydration
Acute Respiratory Distress Syndrome (ARDS)
Acute renal failure
Disseminated Intravascular Coagulopathy

Non-drug measures

Airway management
- Immobilize the cervical spine, as trauma may be present
- Treat hypothermia vigorously
- Endotracheal intubation with mechanical ventilation and Positive End-Expiratory Pressure if patient is apneic or in severe respiratory distress or has oxygen-resistant hypoxemia
- Admission for observation for at least 24 hours if any of the complications are observed even if briefly

Drug treatment

Ventilate with 100% oxygen
- Muscle cramps or epileptic attacks developing during swimming

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Drug treatment

Ventilate with 100% oxygen
- Muscle cramps or epileptic attacks developing during swimming
Calculation of potassium requirement

Caution

Hyponatraemia

Intravenous potassium (given in an infusion)
- Do not exceed 20 mmoles/L
- Add daily requirement of potassium and correct over 3 days

Hypokalaemia

Oral potassium supplements should be taken in an erect position or sitting upright and with plenty of water to avoid oesophageal erosions

Calculation of the total amount of sodium to administer

Hypertensive emergencies

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Hypoglycaemia

Introduction

Missed meal(s)During exerciseCan be due to intensive insulin therapyMay follow weight lossMay follow alcohol ingestionReduced insulin clearanceSepsisSecondary to non-ß cell tumours/insulinoma

Investigations

Electrocardiography Electrolytes, Urea and Creatinine Acid-base status Identifying the underlying disease

Treatment objectives

Correction of potassium deficit Minimize/stop on-going loss

Drug treatment

oral route preferred

Potassium chloride - Doses depend on deficits, on-going losses and renal status

Intravenous potassium (given in an infusion)
- Do not exceed 20 mmoles/L

Calculation of potassium requirement

Deficit body weight (kg) 0.3
- Add daily requirement of potassium and correct over 3 days

Caution

Oral potassium supplements should be taken in an erect position or sitting upright and with plenty of water to avoid oesophageal erosions

Hyponatraemia

Plasma Na < 135 mmol/L

Different types with varied aetiologies

Pseudo-hyponatraemia:
- With normal plasma osmolality as seen in hyperlipidaemia or hyper-proteinaemia
- With increased plasma osmolality as seen in hyperglycaemia, infusion of mannitol

Hypo-osmolar hyponatraemia:
- Due to a primary water gain and secondary sodium loss, or a primary sodium loss and secondary water gain
- Integumentary loss: sweating, burns
- Loss from the GIT: vomiting, tube drainage, fistula
- Renal loss: diuretics, hypaldosteronism, salt wasting

Cardiac failure

Hepatic cirrhosis

Nephritic syndrome

Decreased solute intake:

SIADH

Glucocorticoid deficiency

Hypothyroidism

Chronic renal insufficiency

Clinical features

Cerebral oedema

May be asymptomatic

Otherwise nausea, malaise, headache, lethargy, confusion, and altered consciousness

Coma when plasma sodium is less than 120 millimoles per litre

Differential diagnoses

Congestive cardiac failure

Hepatic cirrhosis

Nephritic syndrome

Investigations

Directed at establishing the cause and severity of hyponatraemia

Treatment objectives

To correct plasma sodium concentration by restricting water intake and promoting water loss

To correct the underlying disorder

Management

Mild asymptomatic hyponatraemia requires no treatment

HYPERTENSIVE EMERGENCIES

Introduction

Severely elevated blood pressure (>200/120 mmHg) with evidence of target organ damage such as:

Neurologic (e.g. altered consciousness)

Cardiovascular (myocardial ischaemia, left ventricular failure)

Renal deterioration

Fundoscopic abnormalities

Presentations include:

Aortic dissection

Hypertensive encephalopathy

Eclampsia

Malignant hypertension

Aetiology

Improperly managed hypertension

Renal vascular disease

Pheochromocytoma

Acute or chronic essential hypertension

Clinical features

Severely elevated blood pressure (>200/120 mmHg)

Headaches, malaise, vomiting, dizziness, blurred vision, chest pain, palpitations, dyspnoea, oliguria

Fundoscopic changes

Evidence of left ventricular failure

Changes in level of consciousness

Complications

Target organ damage

Cerebrovascular accident

Myocardial infarction

Cardiac failure

Renal failure

Dementia

Investigations

Plain chest radiograph

Echocardiography

Full Blood Count

Urea, Electrolytes and Creatinine

Urinalysis

Echocardiography

Mild hyponatraemia with ECF volume contraction:
- Sodium repletion with isotonic saline infusion

Hyponatraemia associated oedematous states:
- Restriction of both sodium and water intake
- Promotion of water loss in excess of sodium by use of a low-sodium diet

For severe cases which are symptomatic (plasma sodium concentration <115 mmoles/L):
- Hypertonic saline to raise sodium concentration by 1 - 2 mmoles/L/hour for the first 3 hours, but not more than 12 mmoles/L during the first 24 hours
- Calculation of the total amount of sodium to administer

Amount of sodium = (desired concentration -- actual concentration) X body weight X 0.6

HYPOGLYCEMIA

Introduction

Blood glucose level less than 2.5 mmol/L (45 mg/dL)
May occur in a fasting state or may be post-prandial

Aetiology

Most commonly iatrogenic

Antidiabetic drugs

Associated with quinine, salicylates and sulphonamide use

After overnight fast

Missed meal(s)

During exercise

Can be due to intensive insulin therapy

May follow weight loss

May follow alcohol ingestion

Reduced insulin clearance

Sepsis

Secondary to non-ß cell tumours/insulinoma

Clinical features

The two types are neuroglycopenic and neurogenic

Neurogenic manifestations:

Palpitations

Tremors

Anxiety

Sweating

Hunger

Treatment objectives

Prompt but gradual reduction in mean arterial pressure by not more than 25% within the first 2 hours

Further reduction of BP to (not less than) 160/100 mmHg

Lower pressures may be indicated for patients with aortic dissection

Initiate/re-initiate long term therapy to normotensive levels

Drug treatment

Sodium npprise - 0.3 micrograms/kg/min intravenously initially, 0.5 - 6 micrograms/kg/min maintenance (maximum of 6 micrograms/kg/min)

Notable adverse drug reactions, caution

Stop infusion if response is unsatisfactory after 10 minutes at maximum dose

Lower doses in patients already on anti-hypertensives

Hypotension may occur

Monitor blood cyanide and thiocyanate concentrations

Discontinue if adverse drug reaction to metabolites develop: tachycardia, sweating, hypertention, arrhythmias, acidosis

Reduce infusion over 15 - 30 minutes to avoid rebound effect when stopping therapy

Use sodium nitroprusside with caution in ischaemic heart disease, renal impairment, raised intracranial pressure and impaired pulmonary function

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Palpitations

Tremors

Anxiety

Sweating

Hunger
Chapter 18: Emergencies

Other tests to identify precipitating factors

Management
- Requires intensive monitoring
- Supportive care
- Identification and treatment of precipitating cause(s)

Loss of consciousness
- Cardiac failure
- Respiratory failure
- Death

Practitioners are advised to seek advice from experts, standard texts in medicine and toxicology, in the absence of a Poison Information Centre

Principles of management of poisoning
- Verify, validate or confirm all of the events related to the poisoning
- Take good clinical history
- Information from relatives, friends, emergency services personnel may be very useful especially where the patient is unwilling or unable to provide useful information

Emergency stabilization
- Quick clinical evaluation
- Elimination of the poison or decontamination
- Enhancing systemic clearance
- Administration of antidotes
- Supportive measures
- Observation
- Disposition

Emergency stabilization
- Life-saving measures take priority over all other decontamination techniques

The following ABC approach is recommended:

A - Establish a clear Airway
B - Ensure adequate Breathing and ventilation
C - Ensure adequate Circulation
D - Address Drug-induced depression of the respiratory and circulatory systems
E - Correct any Electrolyte and metabolic abnormalities

Clinical evaluation
- A quick clinical evaluation should be carried to:
  - Obtain a good history of the drug ingestion/exposure
  - Amount, time, etc.
  - Circumstances surrounding the event (from the patient, relatives and other eyewitnesses)
  - The patient may have no symptoms when seen early in the course of the poisoning
  - A thorough physical examination may further provide clues on the drug class causing toxicity e.g. pinpoint pupils with opioid overdose
  - The absence of a significant sign does not negate the diagnosis
  - Clinical laboratory patient data e.g. urine drug screens
  - Useful in patients with coma of unknown aetiology

Elimination of poisons (or Decontamination)
- The removal of the offending substance from the patient
- The presumption is that both the dose and duration of exposure are determinants of toxicity, and limiting continued exposure is beneficial
- Remove the patient from the toxic environment
  - Provide fresh air and oxygen (respiratory decontamination)
  - Flushing the areas (e.g. skin and eyes) with large volumes of fluid to remove the toxic substance
  - Gastrointestinal decontamination:
    - Emesis or lavage to evacuate the gastric contents

CO₂ retention and respiratory depression due to decreased cerebral blood flow

Differential diagnoses
- Coma due to CNS depressants
- Adrenal insufficiency
- Morbid depression

Complications
- Cardiac failure
- Respiratory failure
- Death

Investigations
- T₄, T₃, TSH assay

Treatment objectives
- To restore normal body metabolism
- To prevent death

Drug treatment
- Triiodothyronine
  - 20 micrograms intravenously stat, then 20 micrograms every 8 hours until there is sustained clinical improvement
- May also require hydrocortisone 100 mg intravenously every 8 hours
- Maintain therapy with oral thyroxine in a dose of 50 micrograms per day
- Treat precipitating factor(s)

Precaution
- Patients should not be re-warmed rapidly because of risk of cardiac arrhythmias

THYROID STORM (THYROTOXIC CRISIS)

Rare but life-threatening
- Mortality rate is up to 30% even with treatment
- Causes of death include cardiac failure, arrhythmias and hyperthermia

Precipitants include the following:
- Infections
- Trauma
- Surgery
- Stroke
- Diabetic ketoacidosis
- Radio iodine treatment of patients with partially treated or untreated hyperthyroidism

Clinical features
- Fever
- Diarrhoea
- Vomiting
- Jaundice
- Seizures
- Coma

Complications
- Cardiac failure
- Arrhythmias
- Hyperthermias

Investigations
- Thyroid function tests

POISONING

Introduction
- The ingestion by, or exposure of a patient to excessive doses of a medicine or other substances may cause harm
- This may be:
  - Self poisoning (may be suicidal)
  - Accidental
  - Homicidal

Clinical presentation
- Determined (amongst others) by:
  - Type of drug
  - Inherent toxicity
  - Dose and duration following exposure
  - Concurrent therapy
  - Co-existing disease states etc

This guideline provides only a brief overview.
Administer activated charcoal as an absorbent to bind the toxic substance in the gastrointestinal tract. Use cathartics or whole bowel irrigation to increase the rectal elimination of unabsorbed drugs. A combination of the above methods may be used.

**Enhancing systemic clearance**

Clinical features

Phosphorylation and increased rate of metabolism

Initial manifestations (occur 3 - 6 hours after an overdose of >150 mg/kg): Reflecting of the toxic substances may be enhanced by:

- Manipulation of urine pH
- Haemodialysis
- Haemo perfusion

**Antidotes**

An antidote is a drug that antagonizes the toxicity of another substance in a specific manner.

Examples:

- Naloxone for opioids
- N-acetylcysteine for paracetamol

**Prevention of Drug Poisoning**

- Keep all medicine out of reach when not needed
- Label all medicines appropriately
- Keep kerosene and other hydrocarbons away from children
- Use dedicate on tenants kerosene and other hydrocarbon

**SPECIFIC POISONS**

**Paracetamol**

Toxicity often occurs following an acute ingestion (within 24 hours) of =10 - 15 g (20 - 30 tablets) or 150 mg/kg.

- It could also in conditions with enhanced P450 enzyme activity (e.g. on-going use of anticonvulsants, rifampicin).

- Less often hepatotoxicity occurs following chronic ingestion of therapeutic or slightly greater amounts in conditions with decreased glutathione reserve

- Acute starvation
- Alcoholism
- Childhood
- Chronic malnutrition

**Clinical features**

Early manifestations are non-specific and also non-predictive of subsequent hepatotoxicity. They include:

- Nausea and vomiting
- Excessive sweating
- Onset of hepatotoxicity is heralded by right upper quadrant tenderness and hepatomegaly

Features of liver damage include:

- Encephalopathy
- Haemorrhage
- Hypoglycaemia
- Cerebral oedema
- Death

These symptoms are maximal in 3 - 4 days.

**Poor prognostic indices:**

- Encephalopathy or hepatic failure
- Greater than two fold prolongation of Prothrombin time
- Serum bilirubin > 68 micromol/L (4 mg/dL)
- Serum creatinine > 3.3

**Investigations**

- Liver function tests including prothrombin time and serum proteins
- Blood sugar estimation
- Cholesterol and triglycerides
- Blood levels of paracetamol (where facility is available)

**Laboratory evidence of hepatotoxicity includes:**

- Prolongation of prothrombin time
- Elevation of serum bilirubin and transaminase activity
- Renal function may also be impaired

**Treatment objectives**

- To prevent or reduce damage to organs
- To restore normal metabolic functions

**Drug treatment**

- Activated charcoal, especially within 4 hours of ingestion

**Adult:** 50 g orally, repeated if necessary

**Child:** under 12 years, 25 g (50 g in severe poisoning) Acetylcysteine

**Adult and child:** initially 50 mg/kg by intravenous infusion over 15 minutes, then 50 mg/kg every 4 hours and then 100 mg/kg over 16 hours

- Diluted 3:1 with a non-alcoholic, non-dairy beverage
- Loading dose is 140 mg/kg; maintenance dose 70 mg/kg every 4 hours for 17 doses
- Treatment is effective if started within 8 - 10 hours

**Alternatively:**

- Methionine

**Adult and child over 6 years:** 2.5 g orally followed by a further dose of 2.5 g every 4 hours

Child under 6 years: initially 1 g followed by 3 further doses of 1 g every 4 hours

**Supportive measures**

- As for all cases of acute poisonings

**Notable adverse drug reactions, caution and contraindications**

Acetylcysteine may cause nausea, vomiting and epigastric discomfort. Antiemetics (metoclopramide) may be required.

Methionine may cause nausea, vomiting, drowsiness, irritability

**Aspirin:**

Toxic doses are associated with increased sensitivity of the respiratory centre, incomplete oxidative phosphorylation and increased rate of metabolism

**Clinical features**

Initial manifestations (occur 3 - 6 hours after an overdose of >150 mg/kg):

- Vomiting
- Sweating
- Tachycardia
- Hyperventilation
- Tinnitus
- Fever
- Leukopenia
- Confusion
- Respiratory alkalosis
- Impaired renal function
- Increased anion gap
- Metabolic acidosis may result

**Severe poisoning:**

- Coma
- Respiratory depression
- Seizures
- Cardiovascular collapse
- Cerebral and pulmonary oedema

**Investigations**

- FBC, ESR
- Blood levels of paracetamol (where facility is available)
- Liver function tests including prothrombin time and serum proteins
- Blood sugar estimation
- Cholesterol and triglycerides
- Blood levels of paracetamol (where facility is available)

**Laboratory evidence of hepatotoxicity includes:**

- Prolongation of prothrombin time
- Elevation of serum bilirubin and transaminase activity
- Renal function may also be impaired

**Treatment objectives**

- As for paracetamol poisoning

**Drug treatment**

- Activated charcoal can be used up to 12 - 24 hours after ingestion (see Paracetamol poisoning)

**Notable adverse drug reactions**

Flumazenil, a competitive benzodiazepine receptor antagonist, can reverse CNS and respiratory depression.

- Give 0.1 mg intravenously at 1 minute intervals until desired effect is achieved

**Notable adverse drug reactions**

- Flumazenil with tricyclic antidepressants can cause seizures

**Activated charcoal colours stools black**

**Prevention of Drug Poisoning**

- Keep all medicine out of reach when not needed
- Label all medicines appropriately
- Kerosene poisoning prevention

Keep kerosene and other hydrocarbons away from children

**Use dedicate on tenants kerosene and other hydrocarbon**

- Co-poison prevention
  - (1) Keep working generator safely away from explosions
  - (2) Do not run mobile engine/vehicles within explosions
  - (3) Enact and enforce laws for safe engine/generator purchasing and use

**Carbon monoxide poisoning**

- Usually due to inhalation of smoke, car or generator exhaust fumes caused by incomplete combustion in a confined space.

- Carbon monoxide binds to haemoglobin, myoglobin and to mitochondria, inhibiting cellular respiration.

- Toxic effects of carbon monoxide are related to hypoxia

**Clinical features**

- Dyspnoea
- Tachypnoea
- Headache
- Emotional lability
- Confusion
- Impaired judgement
- Clumsiness
- Syncope
- Nausea, vomiting and diarrhea may occur

**Cardiovascular manifestations:**
Glucocorticoids are ineffective

Organophosphate/insecticide poisoning

Introduction

These substances irreversibly inhibit acetylcholinesterase and cause accumulation of acetylcholine at muscarinic and nicotinic synapses and in the CNS.

Organophosphates are absorbed through the skin, lungs, and gastrointestinal tract and are distributed widely in tissues.

Elimination is slow—by hepatic metabolism.

Clinical features

Onset from exposure to toxicity is between 30 minutes - 2 hours.

Muscarinic effects:

Nausea
Vomiting
Abdominal cramps
Increased urinary frequency; urinary and fecal incontinence
Increased bronchial secretions
Cough
Dyspnoea
Sweating
Salivation
Miosis
Blurred vision
Lacrimation
Bradycardia

Hypertension

Tachycardia

Ischaemic chest pain, arrhythmias, heart failure and hypotension

In severe poisoning:

Cerebral oedema
Pulmonary oedema
Respiratory depression
Coma may be seen in severe poisoning

Cherry-red colour of skin and mucus

Rarely cyanosis

Infections

To identify complications and establish a diagnosis:

- Full Blood Count and ESR
- Serum Urea, Electrolytes and Creatinine
- Liver function tests
- Acid-base status
- Blood gases

Non-drug treatment

Remove from carbon monoxide exposure; move to fresh air.

Drug treatment

Oxygen administration - face mask in conscious patients and entotraehal intubation in comatose patients after clearing the airways.

Treat hypotension and arrhythmia.

Mannitol - 10 - 20%; 250 mL intravenously over 30 minutes. Repeat every 8 hours.

Kerosene poisoning

Similar to poisoning by other petroleum distillates.

 Petroleum distillate hydrocarbons are poorly absorbed following ingestion but can be aspirated, causing significant toxicity to the airways.

More common in children.

Clinical features

CNS excitation in low doses; depression in high doses.

Rarely coma and seizures

Other effects: nausea, vomiting, abdominal pain and diarrhoea

Aspiration may occur and cause aspiration pneumonia.

Investigations

Electrolytes, urea and serum Creatinine

Liver function tests

Chest radiograph

Electrocardiography

Non-drug treatment

Gastric lavage and decongestion are contraindicated because of the risk of aspiration.

Oxygen administration

Respiratory support

Monitoring liver, renal and myocardial function

Correct metabolic abnormalities

Drug treatment

Antibiotics for aspiration pneumonia.

Isolation of the drug.

Rational prescribing entails the following process with various steps:

Step 1:

- Define the patient’s problem

Step 2:

- Specify the therapeutic objectives

Step 3:

- Verify whether your proposed treatment is suitable for this patient

Step 4:

- Start the treatment

Issuing a prescription is not conclusive treatment. Two further steps must be considered:

Step 5:

- Give information, instructions and warnings

Step 6:

- Monitor (and/or stop) the treatment

Details of this process will be found in the WHO’s “Guide to Good Prescribing.”

A prescription order should specify:

- What is to be administered
- To whom
- By whom prescribed
- Duration of therapy

Apart from its use in therapy, a prescription order is also important as a medico-legal document.
Chapter 19: Therapeutics

Prescription for special cases
Special precaution should be taken in children (especially neonates and infants), and the elderly when considering drug therapy.

- There are differences in drug handling (pharmacokinetics) and sensitivity in drug response (pharmacodynamics) in the different age groups.

Particular care should also be taken when prescribing for pregnant women.

Precaution should also be taken in clinical states associated with organ system failure (renal, hepatic) where dosage adjustment may be required.

Children (including neonates and infants)

There are notable differences in the proportions and constituents of body fluids between adults and children.

The immature enzyme systems result in poor oxidation and conjugation and may cause adverse effects.

- Grey Baby syndrome with chloramphenicol is an example.

Drugs predominantly excreted by the kidneys e.g. aminoglycosides, penicillins may require dose reduction.

- Use appropriate formulations for various routes e.g. rectal route (for diazepam, theophylline) in the uncomplicated child.

(T) Elderly

Persons 65 years or over: a growing segment of the Nigerian population.

A number of factors interplay to increase the incidence of adverse drug reactions in this group of patients:

- Bodily changes affecting drug handling and tissue response.
- The increasing number of medicines prescribed to treat multiple diseases, each with a potential to cause an adverse drug reaction as well as a drug-drug interaction.
- Poor adherence to therapy due to factors inherent in the elderly.

Dose reduction may be required for some drugs because of:

- Changes in volume of distribution.
- Reduced metabolism.
- Reduced renal elimination.

Particular care is necessary in administration of drugs where sensitivity in the elderly is increased e.g.:

- Hypno-sedatives.
- Neuroleptics.
- Diuretics.

If no drug is needed avoid unnecessary prescriptions.

Relevant drugs should be prescribed in the appropriate dose and monitored closely.

Consideration should be given to the formulation that is most appropriate in the clinical circumstances.

The possibility of drug-drug interactions should always be borne in mind.

Standard Treatment Guidelines for Nigeria 2008

Pregnancy and Lactation

Changes in fluid and tissue composition occur during pregnancy.

Reduced gastrointestinal motility delays gastric emptying and may delay drug absorption after oral administration.

Vasodilation may result in enhanced absorption following drug administration by the intramuscular route.

There is increased volume of distribution, increased hepatic metabolism and increased elimination of drugs.

Extreme care must be taken when administering drugs with teratogenic potential to women in the reproductive age group (See appendix IV).

Some drugs may cause harm to infants when administered to nursing mothers (see appendix V).

Other drugs e.g. bromocriptine inhibit lactation.

Drugs excreted significantly in milk and likely to cause toxicity are shown in appendix V.

ADVERSE DRUG REACTIONS

Introduction

The use of medicines is intrinsically linked to unintended responses.

The safe use of medicines is therefore an important consideration in therapy.

In this text the following WHO definitions will apply:

- Adverse drug reaction: A response to a medicine which is noxious and unintended.

- Occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease, or for the modification of physiologic function.

- Adverse drug event: Any untoward medical occurrence that may present during treatment with a pharmaceutical product, but which does not necessarily have a causal relationship with the treatment.

- Serious adverse event (experience, or reaction): Any untoward medical occurrence that at any dose:
  - Results in death.
  - Is life-threatening.
  - Requires patient hospitalization or prolongs existing hospitalization.
  - Results in persistent or significant disability/incapacity.
  - Causes a congenital anomaly or birth defect.
  - Requires an intervention to prevent permanent impairment or damage.

Side effect

Any unintended effect of a pharmaceutical product occurring at doses normally used in humans.

- Is related to the pharmacological properties of the drug.

There is need to have a high index of suspicion during therapy so as to recognize and adequately manage adverse effects.

Report any suspected adverse response to a drug to the hospitals' Adverse Reaction Registry or directly to the National Agency for Food and Drug Administration and Control (NAFDAC), Abuja.

A sample of the Yellow Form is shown in Appendix VI.

Analysis of such reports enables appropriate decisions to ensure safe and judicious use of medicines.

In the text a number of known adverse reactions are listed for medicines used for the treatment of the stated diseases.

- This list is by no means complete or comprehensive.
- There may be unknown adverse reactions peculiar to our population.

Abbreviations Only standard, official abbreviations should be used.

The following are some notable abbreviations:

- asc ante cibum (before food).
- b.d bis die (twice daily).
- o.d omni die (every day).
- o.m omni mane (every morning).
- p.c post cibum (after food).
- p.r.n pro re nata (when required).
- q.d.s quarter die sumendum (to be taken four times daily).
- q.q.h quarter quaque hora (every four hours).
- stat immediately.
- t.d.s ter die sumendum (to be taken three times daily).
- t.i.d ter in die (three times daily).

NOTE

Avoid abbreviations of drug names.

Doses should be written in the metric system or in international units (IU) when metric doses are not practicable.

If a drug is to be administered 'as required', specify the minimum dose interval and the total amount of drug to be administered.

Avoid unnecessary use of decimal points:

- 1 mg not 1.0 mg.
- 1 g state as g.
- If >1 g state as milligram e.g. 500 mg not 0.5 g.
- If <1 mg state as microgram: 100 microgram not 0.1 mg.
- If the decimal point is unavoidable, insert zero (0) in front of the point e.g. 0.5 mL not. 5 mL.

- Millilitre (mL) should be used for volume and not cubic centimetre, c.c or cm³.

Microgram and nanogram should not be abbreviated.

- 1 mg not 1.0 mg.
- If >1 g state as g.
- If <1 mg state as microgram: 100 microgram not 0.1 mg.
CHAPTER 20: NOTIFIABLE DISEASES

List of Notifiable diseases

1. AIDS
2. Anthrax (human)
3. Brucellosis (human)
4. Cerebro-spinal meningitis
5. Chicken pox
6. Cholera
7. Diarrhoea (simple without blood)
8. Diarrhoea with blood (dysentery)
9. Diptheria
10. Dracunculiasis
11. Filariasis
12. Food poisoning
13. Gonorrhoea
14. Hepatitis
15. Lassa Fever
16. Leprosy
17. Louse-borne typhus fever
18. Malaria
19. Measles
20. Onchocerciasis (River blindness)
21. Ophthalmia neonatorum
22. Pertussis (Whooping cough)
23. Plague
24. Pneumonia
25. Poliomyelitis
26. Rabies (human)
27. Schistosomiasis
28. Smallpox
29. Syphilis
30. Other sexually transmitted diseases (STD)
31. Tetanus (other)
32. Tetanus (neonatal)
33. Trachoma
34. Trypanosomiasis (sleeping sickness)
35. Tuberculosis
36. Typhoid and paratyphoid fevers
37. Viral influenza
38. Yaws
39. Yellow fever

List of emergency and immediate notifiable disease

1. AIDS (Acquired Immune Deficiency syndrome)
2. Acute Flaccid Paralysis
3. Anthrax
4. Cerebro-spinal Meningitis (CSM)
5. Cholera
6. Lassa fever
7. Plague
8. Rabies (human)
9. Smallpox
10. Typhoid and paratyphoid fevers
11. Yellow fever
APPENDIX I

WHO CLINICAL STAGING OF HIV FOR INFANTS AND CHILDREN WITH ESTABLISHED HIV INFECTION

Clinical Stage 1
Asymptomatic
Persistent generalized lymphadenopathy

Clinical Stage 2 (I)
Unexplained persistent hepatosplenomegaly
Papular pruritic eruptions
Fungal nail infections
Angular cheilitis
Linear gingival erythema
Extensive molluscum contagiosum
Recurrent oral ulceration
Unexplained persistent parotid enlargement
Herpes zoster
Recurrent or chronic upper respiratory tract infections (otitis media, otitis media, sinusitis, tonsillitis)

Clinical Stage 3 (I)
Unexplained moderate malnutrition or wasting not adequately responding to standard therapy
Unexplained persistent diarrhoea (14 days or more)
Unexplained fever (above 37.6 °C, intermittent or constant, for longer than one month)
Oral hairy leukoplaikia
Acute necrotizing ulcerative gingivitis or periodontitis
Lymph node tuberculosis
Pulmonary tuberculosis
Severe recurrent bacterial pneumonia
Symptomatic lymphoid interstitial pneumonitis
Chronic HIV-associated lung disease including bronchiectasis
Unexplained anaemia (<8.0 g/dl), neutropenia (<0.5 x 10^9/L) and or chronic thrombocytopenia

Clinical stage 4 (i) (ii)
Unexplained severe wasting, stunting or severe malnutrition not responding to standard therapy
Pneumocystis pneumonia
Recurrent severe bacterial infections (e.g. empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia)
Chronic herpes simplex infection; (orolabial or cutaneous of more than one month’s duration, or visceral at any site
Extrapulmonary tuberculosis
Kaposi sarcoma
Oesophageal candidiasis (or Candida of trachea, bronchi or lungs)
Cytomegalovirus infection; retinitis or cytomegalovirus infection affecting another organ, with onset at age over 1 month
Central nervous system toxoplasmosis (after the neonatal period)
Extrapulmonary cryptococcosis (including meningitis)
HIV encephalopathy
Disseminated endemic mycosis (extrapulmonary histoplasmosis, coccidiodymycosis)
Chronic cryptosporidiosis (with diarrhoea)
Chronic isosporiasis
Disseminated non-tuberculous mycobacteria infection
Cerebral or B cell non-Hodgkin lymphoma
Progressive multifocal leukoencephalopathy
HIV-associated cardiomyopathy or nephropathy

(i) Unexplained refers to the condition is not explained by other causes

(ii) Some additional specific conditions can be included in regional classifications (e.g. Disseminated Penicilliosis in Asia, HIV-associated rectovaginal fistula in Africa), and reactivation of American trypanosomiasis

APPENDIX II:

WHO NEW ANTENATAL CARE MODEL CLASSIFYING FORM 2001

Criteria for classifying women for the basic component of the new antenatal care model

<table>
<thead>
<tr>
<th>Name of patient:</th>
<th>Clinic record number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Clinic record number:</td>
</tr>
<tr>
<td>Telephone:</td>
<td>Clinic record number:</td>
</tr>
</tbody>
</table>

INSTRUCTIONS: Answer all of the following questions by placing a cross mark in the corresponding box.

OBSTETRIC HISTORY

1. Previous stillbirth or neonatal loss?
2. History of 3 or more consecutive spontaneous abortions?
3. Birthweight of last baby < 2500 g?
4. Birthweight of last baby > 4500 g?
5. Last pregnancy: hospital admission for hypertensive or pre-eclampsia/eclampsia?
6. Previous surgery on reproductive tract?
7. Age less than 16 years?
8. Age more than 40 years?
9. Is immunization Rh (-) in current or in previous pregnancy?
10. Vaginal bleeding?
11. Pelvic mass?
12. Diastolic blood pressure 90 mm Hg or more at booking?

CURRENT PREGNANCY

13. Intrauterine growth retardation?
14. Known ‘substance’ abuse (including heavy alcohol drinking)?
15. Any other severe medical condition?
16. Pneumocystis pneumonia
17. Chronic herpes simplex infection; (orolabial or cutaneous of more than one month’s duration, or visceral at any site

A “Yes” to any ONE of the above questions (i.e. ONE shaded box marked with a cross) means that the woman is not eligible for the basic component of the new antenatal care model.

Is the woman eligible? (circle) NO YES

If NO, she is referred to 

Date ____________________ Name ____________________ Signature ____________________
(staff responsible for ANC)
APPENDIX III

CALCULATION OF DOSAGE REQUIREMENTS IN CHILDREN

Introduction

Medicine doses are generally based on body weight (in kilogram) or the following age ranges:
- First one month (neonate)
- Up to 1 year (infant)
- 1 - 5 years
- 6 - 12 years

Unless the age is specified, the term child includes persons aged 12 years and below.

Dose Calculation

Calculated based on body weight (in kilogram) or the body surface area (in m²). Use this rather than attempting to calculate doses on the basis of doses used in adults.

Body Surface Area (BSA) estimates are more accurate for calculation of paediatric doses. Many physiological phenomena correlate better to BSA.

For most medicines the adult maximum dose should not be exceeded.

For example, if the dose is stated as 4 mg/kg (max. 180 mg), a child weighing 10 kg should receive 40 mg but a child weighing 50 kg should receive 180 mg and not 200 mg.

Young children may require higher doses per kilogram than adults because of their higher metabolic rate.

Calculation by body weight in an overweight child may result in much higher doses being administered than necessary. Such doses should be calculated based on ideal body weight in relation to height and age.

See table below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Ideal body-weight Kg</th>
<th>Height cm</th>
<th>Body Surface m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn⁺</td>
<td>3.5</td>
<td>50</td>
<td>0.23</td>
</tr>
<tr>
<td>1 Month⁰</td>
<td>4.2</td>
<td>55</td>
<td>0.26</td>
</tr>
<tr>
<td>3 Month⁰</td>
<td>5.6</td>
<td>59</td>
<td>0.32</td>
</tr>
<tr>
<td>6 Month</td>
<td>7.7</td>
<td>67</td>
<td>0.40</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>76</td>
<td>0.47</td>
</tr>
<tr>
<td>3 years</td>
<td>15</td>
<td>94</td>
<td>0.62</td>
</tr>
<tr>
<td>5 years</td>
<td>18</td>
<td>108</td>
<td>0.73</td>
</tr>
<tr>
<td>7 years</td>
<td>23</td>
<td>120</td>
<td>0.88</td>
</tr>
<tr>
<td>12 years</td>
<td>39</td>
<td>148</td>
<td>1.25</td>
</tr>
</tbody>
</table>

⁹ The figures relate to full term and not preterm infants who may need reduced dosage according to their clinical condition.
### APPENDIX IV:

**MEDICINES WITH TERATOGENIC POTENTIAL**

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiepileptics</td>
<td>Risk of teratogenicity greater if more than one medicine used</td>
</tr>
<tr>
<td>Bleomycin</td>
<td>Avoid (teratogenic and carcinogenic in animal studies)</td>
</tr>
<tr>
<td>Busulfan</td>
<td>Avoid (teratogenic in animals)</td>
</tr>
<tr>
<td>Carboplatin</td>
<td>Avoid (teratogenic and embryotoxic in animal studies)</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>Avoid (teratogenic and embryotoxic in animal studies)</td>
</tr>
<tr>
<td>Co-trimoxazol</td>
<td>Teratogenic risk (trimethoprim - a folate antagonist)</td>
</tr>
<tr>
<td>Cytarabine</td>
<td>Avoid (teratogenic in animal studies)</td>
</tr>
<tr>
<td>Daunorubicin</td>
<td>Avoid (teratogenic and carcinogenic in animal studies)</td>
</tr>
<tr>
<td>Doxorubicin</td>
<td>Avoid (teratogenic and toxic in animal studies)</td>
</tr>
<tr>
<td>Sulfasalazine/pyrimethamine</td>
<td>Possible teratogenic risk (pyrimethamine is a folate antagonist)</td>
</tr>
<tr>
<td>Hydroxocarbamide(hydroxyurea)</td>
<td>Avoid (fetotoxicity and teratogenicity in animal studies)</td>
</tr>
<tr>
<td>Idoxuridine</td>
<td>Teratogenic in animal studies</td>
</tr>
<tr>
<td>Isotretinoin</td>
<td>Teratogenic</td>
</tr>
<tr>
<td>Lithium salts</td>
<td>Avoid if possible (risk of teratogenicity)</td>
</tr>
<tr>
<td>Phenotoin</td>
<td>Congenital malformation (screening advised)</td>
</tr>
<tr>
<td>Trimeprin</td>
<td>Teratogenic</td>
</tr>
<tr>
<td>Trimeprin</td>
<td>Teratogenic risk (folate antagonist)</td>
</tr>
<tr>
<td>Vinblastine</td>
<td>Avoid (limited experience suggest fetal harm; teratogenic in animal studies)</td>
</tr>
<tr>
<td>Vincristine</td>
<td>Avoid (teratogenicity and fetal loss in animal studies)</td>
</tr>
</tbody>
</table>

### APPENDIX V:

**MEDICINES THAT COULD CAUSE HARM WHEN ADMINISTERED TO BREASTFEEDING MOTHERS**

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir</td>
<td>Breastfeeding not advised in HIV infection</td>
</tr>
<tr>
<td>Acetazolamide</td>
<td>Amount too small to be harmful</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Large amounts may affect infant and reduce milk consumption</td>
</tr>
<tr>
<td>Amantadine</td>
<td>Avoid; present in milk; toxicity in infants reported</td>
</tr>
<tr>
<td>Amiloride</td>
<td>Manufacturer advises avoid</td>
</tr>
<tr>
<td>Aminophylline</td>
<td>Present in milk- irritability in infants reported</td>
</tr>
<tr>
<td>Amitryptiline</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Amodipine</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Aminocillin</td>
<td>Trace amounts in milk</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>Significant amount in milk</td>
</tr>
<tr>
<td>Amprenavir</td>
<td>Breast feeding not advised in HIV infection</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Avoid- possible risk of Reye's syndrome; regular use of high doses could impair platelet function and produce hypoprothrombinaemia in infants if neonatal vitamin K stores low</td>
</tr>
<tr>
<td>Androgens</td>
<td>Avoid. May cause masculinization in the female infant or precocious development in the male infant; high doses suppress lactation</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>Oral Risk of haemorrhage; increased by Vitamin K deficiency; warfarin appears safe but phenindione should be avoided</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Significant amounts of some antihistamines present in milk, although not known to be harmful</td>
</tr>
<tr>
<td>Asparagin</td>
<td></td>
</tr>
<tr>
<td>Atropine</td>
<td></td>
</tr>
<tr>
<td>Azithromycin</td>
<td>Present in milk; manufacturer advises use only if no suitable alternative</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>Avoid if possible. Large doses may produce drowsiness</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>Avoid if possible</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Monitor infant; possible toxicity due to beta-blockade</td>
</tr>
<tr>
<td>Caffeine</td>
<td>Regular intake of large amounts can affect infant</td>
</tr>
<tr>
<td>Captopril</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Carbimazole</td>
<td>Use lowest effective dose</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>Present in milk in low concentrations</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>Present in milk in low concentrations</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>Use another antibiotic; may cause bone marrow toxicity in infant</td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>Drowsiness in infant reported</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>Manufacturer advises avoid</td>
</tr>
<tr>
<td>Contraceptives, oral</td>
<td>Avoid until weaning or for 6 months after birth (adverse effects on lactation)</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>Avoid maternal dose of prednisolone beyond 40 mg daily</td>
</tr>
<tr>
<td>Co-trimoxazol</td>
<td>Risk of kernicterus in jaundiced infants and of haemolysis in G6PD-deficient infants</td>
</tr>
<tr>
<td>Cyclophosphamide</td>
<td>Discontinue breastfeeding during and for 36 hours after stopping treatment</td>
</tr>
<tr>
<td>Dapsone</td>
<td>Haemolytic anaemia; although significant amount in milk, risk to infant very small unless infant is G6PD deficient</td>
</tr>
<tr>
<td>Desferroxamine</td>
<td>Use only if potential benefit outweighs risk</td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>Irritability and disturbed sleep reported</td>
</tr>
<tr>
<td>Ergotamine</td>
<td>Avoid</td>
</tr>
<tr>
<td>Furosemide</td>
<td>May inhibit lactation</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>Manufacturer advises avoid</td>
</tr>
<tr>
<td>Indometacin</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Iodine and iodides</td>
<td>Stop breastfeeding; danger of neonatal hypothyroidism and goitre</td>
</tr>
<tr>
<td>Lisonornipro</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Morphine</td>
<td>Withdrawal symptoms in infants of dependent mothers; breastfeeding not best method of treating dependence in offspring</td>
</tr>
<tr>
<td>Nicotinic acid</td>
<td>Avoid</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Oestrogens</td>
<td>Avoid</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>Avoid when possible</td>
</tr>
<tr>
<td>Phenotoin</td>
<td>Manufacturer advises avoid</td>
</tr>
<tr>
<td>Progesterone</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Statins</td>
<td>Manufacturers advise avoid</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Avoid</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Irritability in infants reported</td>
</tr>
<tr>
<td>Thiamine</td>
<td>Severely thiamine-deficient mothers should avoid breastfeeding as toxic methyl-glyoxal present in milk</td>
</tr>
<tr>
<td>Trimethadole</td>
<td>Avoid breastfeeding during and for 3 days after stopping treatment</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>Theoretical risk of toxicity in infants of mothers taking large doses</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Caution with systemic doses; may cause hypercalcaemia in infant.</td>
</tr>
</tbody>
</table>
### Appendixes

Standard Treatment Guidelines for Nigeria 2008

#### Form for Reporting of Suspected Adverse Drug Reactions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em>PATIENT'S DETAILS</em></td>
<td>Full Name or Initials: AGE DATE OF BIRTH: HOSPITAL/Treatment Centre:</td>
</tr>
<tr>
<td>2. <em>ADVERSE DRUG REACTION (ADR)</em></td>
<td>DATE Reaction Started: DATE Reaction Stopped: B. Was Patient Admitted Due to ADR:</td>
</tr>
<tr>
<td>C. OUTCOME OF REACTION</td>
<td>TICK AS APPROPRIATE: Recovered fully: Recovered with disability (Specify): Congenital Abnormality (Specify): Life Threatening (Specify): Death: Others (Specify):</td>
</tr>
</tbody>
</table>

#### Mandatory Fields

- **If Hospitalized, Was it Prolonged Due to ADR?:** Yes No
- **Drug Details:** Brand Name: NAFDAC No: Generic Name: EXP Date: NAFDAC No:
- **Indications for Use:** Name & Address of Manufacturer:
- **Concomitant Medicines:** Brand or Generic Name: Dosage: Route: Date Started: Date Stopped: Reason for Use:
- **Name of Reporter:** Address: Profession: Signature:

#### Table:

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. DRUG DETAILS</td>
<td>B. INDICATIONS FOR USE</td>
</tr>
<tr>
<td>C. CONCOMITANT MEDICINES</td>
<td>D. SOURCE OF REPORT</td>
</tr>
</tbody>
</table>

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